1 Appendices

Appendix 1: Scope for the development of the clinical guideline

Final version

8 August 2006

Guideline title

Attention deficit hyperactivity disorder: diagnosis and management of ADHD in children, young people and adults

Short title

ADHD

Background

The National Institute for Health and Clinical Excellence ('NICE' or 'the Institute') has commissioned the National Collaborating Centre for Mental Health to develop a clinical guideline on attention deficit hyperactivity disorder for use in the NHS in England and Wales. This follows referral of the topic by the Department of Health and Welsh Assembly Government (see Appendix). The guideline will provide recommendations for good practice that are based on the best available evidence of clinical and cost effectiveness.

The Institute's clinical guidelines will support the implementation of National Service Frameworks (NSFs) in those aspects of care where a Framework has been published. The statements in each NSF reflect the evidence that was used at the time the Framework was prepared. The clinical guidelines and technology appraisals published by the Institute after an NSF has been issued will have the effect of updating the Framework.

NICE clinical guidelines support the role of healthcare professionals in providing care in partnership with patients, taking account of their individual needs and preferences, and ensuring that patients (and their carers and families, where appropriate) can make informed decisions about their care and treatment.

Clinical need for the guideline

Attention deficit hyperactivity disorder (ADHD) is a heterogeneous behavioural syndrome and its diagnosis does not imply any specific cause. However various genetic and environmental risk factors have been implicated in its development. ADHD is characterised by the 'core' signs of inattention, hyperactivity and impulsiveness. There are two main sets of diagnostic criteria in current use, the International Classification of Mental and

Behavioural Disorders 10th Revision (ICD-10) and the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV). The ICD-10 definition makes reference to hyperkinetic disorder, primarily evidenced by high abnormal levels of hyperactivity, and a combined sub-type in which hyperactivity, impulsivity and inattention need to be present, together with stricter requirements for pervasiveness across situations, and exclusion of comorbidity. The DSM-IV criteria describes ADHD more broadly to include three subtypes: a combined subtype in which all three core signs are present; a predominantly inattentive subtype in which inattention is present but not hyperactivity or impulsiveness; and a predominantly hyperactive–impulsive subtype in which hyperactivity and impulsiveness are present but not inattention. Both ICD-10 and DSM-IV require 6 months duration of symptoms. The identification of ADHD in adults, and the diagnostic criteria that should underpin case recognition, are less clear and lead to uncertainties in practice.

ICD-10 and DSM-IV adopt a different approach to comorbidity. In ICD-10, secondary complications to hyperkinetic disorder include dissocial behaviour and low self-esteem. In DSM-IV common comorbidities include: Disruptive Behaviour Disorders, Mood Disorders, Anxiety Disorders, Learning Disorders and Communication Disorders, ADHD is not diagnosed if symptoms of inattention and hyperactivity occur exclusively during the course of a Pervasive Developmental Disorder or a Psychotic Disorder; but the problems may still need to be recognised and treated. It seems likely that a similar pattern of comorbidities pertains to adults with ADHD, although definitive research in this area is lacking.

A number of genetic and environmental risk factors for ADHD have been identified. Hereditary aspects, neuroimaging data and responses to pharmacotherapeutic agents support the suggestion that ADHD has a biological component. However, there is a continuing debate over the causes of ADHD.

ADHD affects children, young people and adults in different ways and to different degrees, but the consequences of severe ADHD can be serious for both the individual and their family and carers. Children with ADHD often have low self-esteem and can develop additional emotional and social problems. The secondary effects of ADHD can be damaging. For example, some children and young adults with ADHD are at increased risk of accidental harm and many later have an increased risk of automotive accidents. Moreover, affected children are often exposed to years of negative feedback about their behaviour and may suffer educational and social disadvantage. A sizeable proportion of children referred for hyperactivity disorders continue to have problems into adulthood, including emotional and social problems, substance misuse, unemployment and involvement in crime.

Estimates of the prevalence of hyperkinetic disorder / ADHD vary widely within and between countries. Prevalence estimates for hyperkinetic disorder in children and young people are around 1–2% in the UK. ADHD is estimated to affect 3–9% of school-aged children and young people in the UK, and about 2% of adults worldwide (using DSM IV diagnostic criteria). These differences are, at least in part, explained by differences in diagnostic criteria used in different countries.

Studies of clinic based diagnoses suggest that ADHD is nine times more common in males, although this gender imbalance is inflated to some extent by referral bias; epidemiological studies suggest that prevalence is only two to four times greater in males.

The prescribing of stimulant drugs for ADHD reflects the increased frequency of diagnosis of this condition. In 1998 there were about 220,000 prescriptions in England for stimulant drugs (methylphenidate and dexamfetamine) at a net cost of about £5 million; in 2004 this number had almost doubled to 418,300 at a cost of almost £13 million.

The use of CNS stimulants has been controversial and there are concerns about prescribing such medication to children. Further anxieties surround the potential for their inappropriate prescription, abuse and unauthorised trading and/or illegal selling.

The Guideline

The guideline development process is described in detail in two publications which are available from the NICE website (see 'Further information'). The guideline development process: an overview for stakeholders, the public and the NHS describes how organisations can become involved in the development of a guideline. Guideline development methods: information for National Collaborating Centres and guideline developers provides advice on the technical aspects of guideline development.

This document is the scope. It defines exactly what this guideline will (and will not) examine, and what the guideline developers will consider. The scope is based on the referral from the Department of Health (see Appendix below).

The areas that will be addressed by the guideline are described in the following sections.

Population

The guideline will cover:

- The treatment of children aged 3 years and older, young people and adults with a diagnosis of ADHD and related diagnoses: hyperkinetic

disorder (ICD-10) will be considered, along with the three DSM-IV ADHD subtypes.

- The management of common comorbidities in children, young people and adults with ADHD as far as these conditions affect the treatment of ADHD.
- The specific management of ADHD in those individuals who also have:
  - a learning disability
  - a defined neurological disorder.

The guideline will not cover:

- the separate management of comorbid conditions
- the management of children younger than 3 years

Healthcare setting

The guideline will cover the care provided by primary, community and secondary healthcare professionals who have direct contact with, and make decisions concerning, the care of children, young people and adults with ADHD.

This is an NHS guideline. It will comment on the interface with other services such as social services, educational services, the voluntary sector and young offender institutions, but it will not include recommendations relating to the services exclusively provided by these agencies; except insofar as the care provided in those institutional settings provided by healthcare professionals, funded by the NHS. Recommendations in the guideline will nevertheless map onto the tiered model of CAMHS services specified in the NSF for children and utilised in the NICE guideline on depression in children. Some of the recommendations will be made to staff in the education services, where this may have a positive contribution to the health of a child with ADHD, either directly (where this is appropriate) or indirectly through collaborative working with CAMHS professionals

The guideline will include:

- care in general practice and NHS community care
- hospital outpatient and inpatient care
- primary/secondary interface of care
- transition from childhood services to adult services.

Clinical management

Areas that will be covered by the guideline

- The full range of care routinely made available by the NHS.
- Validity, specificity and reliability of existing diagnostic criteria (ICD-10 and DSM-IV) in children, young people and adults, and to determine /

- Assessment both before and after diagnosis.
- Early identification of ADHD in children at risk, and identification of factors that should lead to investigation into the possibility of ADHD.
- Pathways to treatment.
- Identification and management of risk.
- The appropriate use of pharmacological interventions, for example initiation and duration of treatment, management of side effects and discontinuation. Specific pharmacological treatments considered will include:
    - methylphenidate and dexamfetamine (currently licensed for treatment of ADHD in children and young people)
    - atomoxetine (currently licensed for treatment of ADHD in children and in adults if treatment was initiated in childhood).
    - tricyclic and other antidepressants.
    - bupropion
    - nicotine (as skin patches)
    - clonidine
    - atypical antipsychotics (particularly risperidone)
    - modafinil

    Note that guideline recommendations will normally fall within licensed indications; exceptionally, and only where clearly supported by evidence, use outside a licensed indication may be recommended. The guideline will assume that prescribers will use a drug's Summary of Product Characteristics to inform their decisions for individual patients.

- All common psychological interventions currently employed in the NHS for example, family interventions, cognitive-behavioural treatments, and parent training.
- Combined pharmacological and psychological treatments.
- Other physical treatments, including dietary elimination and supplementation.
- Treatment approaches for adults with ADHD (including longer-term outcomes and transitions from child to adult healthcare).
- Sensitivity to different beliefs and attitudes of different races and cultures, and issues of social exclusion.
- The role of the family or carers in the treatment and support of people with ADHD (with consideration of choice, consent and help), and support that may be needed by carers themselves.

Areas that will not be covered by the guideline

- Treatments not normally available in the NHS.

Status

Scope

This is the final scope.

The guideline will incorporate the following relevant technology appraisal guidance issued by the Institute:

Methylphenidate, atomoxetine and dexamfetamine for the treatment of attention deficit hyperactivity disorder in children and adolescents (including a review of guidance no.13) NICE Technology Appraisal (Published March 2006)

Previous recommendations made in other guidelines may be updated by this guideline, based on the most up-to-date evidence for this particular population.

Guideline

The development of the guideline recommendations will begin in March 2006.

Further information

Information on the guideline development process is provided in:

- *The Guidelines Manual 2006.*

This booklet is available as PDF files from the NICE website (http://www.nice.org.uk/page.aspx?o=308639). Information on the progress of the guideline will also be available from the website.

Referral from the Department of Health and Welsh Assembly Government

The Department of Health and Welsh Assembly Government asked the Institute:

To prepare a guideline for the NHS in England and Wales on the diagnosis and treatment of attention deficit Hyperactivity disorder in children, young people and adults, where evidence for treatment effectiveness is available. Treatment should include the effectiveness of methylphenidate and other pharmacological and psychological interventions in combination or separately.

Appendix 2: Declarations of interests by GDG members

With a range of practical experience relevant to ADHD in the GDG, members were appointed because of their understanding and expertise in healthcare for people with ADHD and support for their families and carers, including: scientific issues; health research; the delivery and receipt of healthcare, along with the work of the healthcare industry; and the role of professional organisations and organisations for people with ADHD and their families and carers.

To minimise and manage any potential conflicts of interest, and to avoid any public concern that commercial or other financial interests have affected the work of the GDG and influenced guidance, members of the GDG must declare as a matter of public record any interests held by themselves or their families which fall under specified categories (see below). These categories include any relationships they have with the healthcare industries, professional organisations and organisations for people who misuse drugs and their families and carers.

Individuals invited to join the GDG were asked to declare their interests before being appointed. To allow the management of any potential conflicts of interest that might arise during the development of the guideline, GDG members were also asked to declare their interests at each GDG meeting throughout the guideline development process. The interests of all the members of the GDG are listed below, including interests declared prior to appointment and during the guideline development process.

Categories of interest

- **Paid employment**

- **GDG members were asked to declare the following interests annually and at each meeting:**

Personal pecuniary interest: Any financial involvement or planned financial involvement with the healthcare industry in the previous 12 months and, if so whether it is ongoing. This includes:

- holding a directorship, or other paid position
- carrying out consultancy or fee paid work
- having shareholdings or other beneficial interests
- receiving expenses and hospitality over and above what would be reasonably expected to attend meetings and conferences

Personal family interest: A family member with any financial involvement or planned financial involvement with the healthcare industry in the previous 12 months. This could include:

- holding a directorship, or other paid position
- carrying out consultancy or fee paid work
- having shareholdings or other beneficial interests
- receiving expenses and hospitality over and above what would be reasonably expected to attend meetings and conferences

Non-personal pecuniary interest: Managerial responsibility within the past 12 months for a department or organisation that has had financial involvement with the healthcare industry or for which such financial involvement is planned. This includes:

- a grant or fellowship or other payment to sponsor a post, or contribute to the running costs of the department
- commissioning of research or other work
- contracts with, or grants from, NICE

Personal non-pecuniary interest: Having expressed a clear opinion on the matter under consideration which has been:

- reached as a conclusion of a research project
- and/or expressed as a public statement
- Membership in a professional organisation or advocacy group with a direct interest in a matter under consideration by NICE
- Any other reason why people might assume bias in the work done for NICE

1

Declarations of interest	
Professor Eric Taylor - Chair, Guideline Development Group	
Employment	Professor of Child and Adolescent Psychiatry, Department of Child and Adolescent Psychiatry, Institute of Psychiatry, London.
Personal pecuniary interests	None
Personal family interests	None
Non-personal pecuniary interests	Research grants held: PI for Project grant: Research trial of omega-3 fatty acid supplementation. Main funding (£98,000) from Mother & Child Foundation; Equazen Ltd (oil manufacturers) fund £28,000 and contribute oil, placebo and administrative assistance. 2007-8. PI for Programme grant: Developmental psychopathology of hyperactivity and attention deficit (Medical research Council), 2000-2005; £1,026,000; 50% time. PI for Health services research project: Assessment of child mental health needs in Croydon and Lambeth (South London & Maudsley NHS Trust); £217,000; 2000-2003; 5% time. Co investigator for Equipment and infrastructure funding: Functional magnetic resonance scanning for developmental research (JIF); PI (with S. Williams), 2002; £2,700,000. Co investigator for Project grant: IMAGE; International multicentre genetic investigation of ADHD (National Institute of Mental Health, USA); (with S Faraone [PI], P Asherson, J Sergeant, J Buitelaar, A Rothenberger); 2002-2005; £2,400,000; 5% time.
Personal non-pecuniary interests	2004 – present Chair of the ADDISS charity professional board. 1968 – 2008. Extensive papers and reviews on ADHD including *People with Hyperactivity* book (2007, MacKeith press). 2005 – 2006 Expert for NICE technology appraisal of methylphenidate, dexamfetamine and atomoxetine. 2004. Presented to consensus conference on juvenile bipolar disorder for development of NICE bipolar disorder guideline. 2004. Senior author on European Clinical Guidelines for hyperkinetic disorder- first upgrade; 2006 Last author for European Clinical Guidelines on long-acting medications for ADHD 2007- present Member, Psychiatry Expert Advisory Group for Medicines and Health Products Regulatory Agency 2007- present Non-Executive Director, South London and Maudsley NHS Foundation Trust. 2007. Nutt et al. Evidence-based guidelines for management of attention-deficit/hyperactivity disorder in adolescents in transition to adult services and in adults: recommendations from the British Association for Psychopharmacology. *J Psychopharmacol* 2007:21. 10-41.

Professor Philip Asherson	
Employment	Professor of Molecular Psychiatry, Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, London
Personal pecuniary interests	2008. Talk to Regional Division of the Royal College of Psychiatry (special interest in psychopharmacology), in Manchester. £1,000 donated by Astra-Zeneca to University research fund. 2008. Talk to child and adolescent psychiatric services on clinical management of ADHD in adults in London. UCB Pharma donated £500 to University research fund. 2008. Talk to child and adolescent psychiatric services on clinical management of ADHD in adults in Manchester. UCB Pharma donated £500 to University research fund. 2008. Talk on genetics of ADHD at the European Academy for Childhood Disability meeting in Zagreb. Travel and accommodation funded, 2007: Live 'Web broadcast, on clinical diagnosis and treatment of ADHD in adults. Posted on website (http://www.flynnpharma.com/index.cfm/fuseaction/Pages.getPage/Id/34) Funded by Flynn Pharma. £1,000 donated to University Research Fund. 2007. Talk to specialist nurses on clinical management of ADHD in adults in Sheffield. UCB Pharma donated £500 to University research fund. 2007. Talk to specialist nurses on clinical management of ADHD in adults in London. UCB Pharma donated £500 to University research fund. 2007. Talk on clinical treatment of ADHD in adults at the Andrew Sims Centre. £500 from the centre donated to University research fund. 2007. Attended advisory board meetings for Shire, Janssen Cilag; reimbursements of approx. £2,000 donated to the University research fund. 2007. Talk to nurses, psychiatrists and psychologists on clinical management of ADHD in adults, to Central and North Western mental health trust. £500 donated to University research fund, sponsor Eli-Lilly. Talk on clinical management of ADHD in adults. Sponsored by Eli Lilly who donated £500 to University research fund. Talk on clinical management of ADHD in adults to child and adult psychiatrists in Bromley. £500 donated by Eli Lilly to University research fund. 2004-2005 Janssen-Cilag sponsored talks (x2) ($2000 each); Payments donated to University research fund. 2007. Advisory panel meeting for Pfizer (approximately £1,000 donated to University research fund; Talk on clinical management of adult ADHD & genetics of ADHD, Istanbul, sponsor unknown (travel + £500 donated to University research fund); Talk on clinical management of adult ADHD, Manchester funded by Janssen Cilag (travel + £500 donated to University research fund); Roadshow on treating adults with ADHD for nurses funded by Shire (travel + £800 donated to University research fund)

	British Association of Psychopharmacology training days (travel + £350 donated to University research fund). Masterclass on diagnosis and treatment of ADHD in adults. (April 2007; November 2007; March 2008) December 2004, 2005, 2007. Member of the international ADHD genetics consortium. International meeting for investigators studying genetic influences on ADHD. Accommodation and travel funded for by a grant from that National Institute of Mental Health to Steve Faraone. 2006: Attended European Network of Hyperactivity Disorder (Eunethydis) meeting in Belgium (funded for hotel stay during conference. Gave presentation of genetic association studies in ADHD. Dopamine 50 conference in Sweden (travel and accommodation funded), Talk on topic of genetic influences on the risk for ADHD.
Personal family interests	None
Non-personal pecuniary interests	2002-2007 US NIMH Programme grant International Multi-centre ADHD Genetic Project Approximately £2,000,000. 2005-2008. Collaborator on MRC study of cognitive function in ADHD families. Approximately £300,000 2007 – 2012 Programme grant from National Institute of Clinical Health Research to study the longitudinal outcomes of ADHD and to quantify rates of adult ADHD within the health service (approximately £2,000,000); 2003-2006. Co-investigator on Wellcome project of inattention and activity levels in a population sample of twins. Approximately £350,000; 2006-2007 Unrestricted grant from Janssen-Cilag for evoked response potential studies of adult ADHD (£5,000)
Personal non-pecuniary interests	2008. Royal College of Psychiatry training day. Talk on continuities between child and adult ADHD. 2007. Attended International Psychiatric genetics meeting and gave talk on linkage and association studies of ADHD. 2007, Attended international conference for whole genome association studies of ADHD. Author of 64 peer reviewed papers on clinical and genetic aspects of ADHD. . 2007: Talking genetics of ADHD with Robert Findlay – interview recorded and posted on the internet (no longer available) 2007. Published editorial in British Journal of Psychiatry on the need for clinical services for adults with ADHD. 2007: Article on ADHD in adults posted on BBC Horizon website. 2007: live interview for BBC Women's Hour on living with adult ADHD 2007. Nutt et al. Evidence-based guidelines for management of attention-deficit/hyperactivity disorder in adolescents in transition to adult services and in adults: recommendations from the British Association for Psychopharmacology. *J Psychopharmacol* 2007:21. 10-41. 1996 – 2008: Lead clinician in the National Adult ADHD clinic at the Maudsley Hospital.
Mr Simon Bailey (2006-2007)	
Employment	
Personal	None

pecuniary interests	
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	"Disordered Performances: An Ethnography of ADHD in Young Children" University of Nottingham. PhD research. Two published papers and one journal article, all expressing clear opinions on DSM-defined ADHD.
Dr Karen Bretherton	
Employment	Consultant Psychiatrist for Children with Learning Disabilities Child and Adolescent Mental Health Services, Leicestershire Partnership NHS Trust, Leicester.
Personal pecuniary interests	2006. Attendance at Child and Adolescent Learning Disability Professional Network. Fee reduced by UCB Pharmaceuticals, Eli Lilly and Janssen-Cilag by £42 per delegate.
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	2006 ADHD chapter co-author, Prescribing Guidelines for adults with learning disabilities;
Dr Val Harpin	
Employment	Consultant Paediatrician (Neurodisability), Ryegate Children's Centre, Sheffield
Personal pecuniary interests	Attended advisory meetings arranged by Pfizer,(2007) Janssen-Cilag (2006)and Eli Lilly.(2005,2007,2008) Gave non-promotional lectures at ADHD meetings sponsored by Pharmaceutical companies as listed below: 2006. Janssen-Cilag sponsored meeting on service networks for management of ADHD. £300 plus accommodation. 2006. Invited speaker at ADHD study session sponsored by Eli Lilly. £500. 2006. Invited speaker on ADHD and QOL sponsored by Janssen-Cilag. £400. 2006. ADHD chair of South Yorkshire meeting. Sponsored by UCB. £300. 2006. Invited speaker as ASCAPAP sponsored by Eli Lilly. £1000. 2006. Invited speaker on Quality of Life and ADHD sponsored by Eli Lilly. £800. Jan 2007 Invited Speaker on ADHD and Comorbidity (£250) Eli Lilly May 2007 invited Speaker ADHD and ASD. (sponsor UCB £400) August 2007 sponsored to attend ESCAP meeting by Lilly (course fee and accommodation)
Personal family interests	None
Non-personal pecuniary interests	Investigator on Trial using Atomoxetine in ADHD (2000 until 2007) and Investigator on Sunbeam trial (2005/6) both funded by Eli Lilly. The Ryegate Children's Centre received research funding from Eli Lilly for nursing and psychology assistant time to follow-up children with

	ADHD, on these Trials which involved using drug treatments Also enrolled some children in ADORE a naturalistic study following children on all kinds of ADHD management (funded for time by Lilly paid to SCH Trust)
Personal non-pecuniary interests	Advocate of using quality of life measures to monitor ADHD, has written articles on the effect on the family of having a child with ADHD Presented paper on September 15 2006 Quality of Life in ADHD and in October 2006 at EACD. Invited organizer of Symposium on ADHD at RCPCH Annual meeting 2007.
Professor Chris Hollis	
Employment	Professor of Child & Adolescent Psychiatry, Division of Psychiatry, University of Nottingham, Queens Medical Centre, Nottingham
Personal pecuniary interests	2005, Janssen-Cilag unrestricted support for chairing and organising an educational meeting on the implication of new European ADHD guidelines, Nottingham (£1000)
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	None
Dr Daphne Keen	
Employment	Consultant Developmental Paediatrician, Developmental Paediatrics, St George's Hospital, London
Personal pecuniary interests	2008. International Association of Child & Adolescent Psychiatry annual meeting Istanbul April/May 2008 funded by Janssen-Cilag. 2006. Attended advisory board meeting for UCB (Equasym XL) £400 2005. Advisory board meeting relating to modafinil. Cephalon. £2000. 2005 . Advisory board meeting relating to Concerta. Janssen-Cilag. £750. 2002, 2005. Attended advisory board meetings relating to Strattera. Eli Lilly. £750 per meeting.
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	Chair of Specialist Advisory Committee for mental health training for the Royal College of Paediatrics and Child Health; Treasurer and executive member of the British Paediatric Mental Health Group. Member of guideline development group commissioned by DoH on psychoanalytic psychotherapies in the treatment and care of individuals who have experienced sexual abuse, violence, and neglect in childhood. 2007-8.
Ms Christine Merrell	
Employment	Education Specialist, Curriculum, Evaluation and Management Centre, Durham University, Durham
Personal pecuniary interests	None

Personal family interests	None
Non-personal pecuniary interests	2007-2010. Evaluation of the impact of teaching and classroom management strategies on severely inattentive, hyperactive, and impulsive young children. Harlow Foundation. _£10,150 2005 – 2008 Department Member of grant on "Can school-based screening and interventions programmes for ADHD improve children's outcomes and access to services? A longitudinal study. Department of Health and Department for Education and Skills._£6,100_ 2005 – 2007 Member of grant "Cost effective smart identification of early attentional problems associated with literacy and numeracy indicators in preschool children". Australian Research Council. £10,000
Personal non-pecuniary interests	2001 - 2004. Member of grant on Screening and interventions for inattentive, hyperactive, and impulsive children; ESRC Award number R000223798. £45,670.
Ms Diane Mulligan	
Employment	Social Inclusion Advisor, Sightsavers International.
Personal pecuniary interests	2006-2007. British Medical Association patient liaison group and Equal Opportunities Committee (£250 reimbursement per day); 2007 Commission for Equality and Human Rights Disability Committee (£250 reimbursement per day)
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	2007 member of AMAZE (Brighton); 2007 member of the National Forum for Organisations of Disabled People Advisory Group; 2007 member of the Brighton and Hove Vocational Forum which works with the Commissioner for Mental Health . 2007. World Health Organisation community based rehabilitation guidelines, specialising in education for disabled chidren (including children with ADHD);
Ms Noreen Ryan	
Employment	Nurse Consultant, Child and Adolescent Mental Health Services, Bolton Hospital NHS Trust, Bolton
Personal pecuniary interests	None
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	2007. Writing a text book for nurses on ADHD with a colleague, manuscript due November 2008, Routledge. 2007. "Non-medical prescribing in CAMHS in the UK". Paper submitted to *Journal of American Psychiatric Nursing*. 2007 July. 'Nurse prescribing in CAMHS" *Mental Health Practice.* 2007 September. "Non-medical prescribing in ADHD in CAMHS" Mental Health Practice 2006. Nursing assessment chapter in *Child and Adolescent Mental Health*

	Nursing. 2005 –2006. Expert for NICE technology appraisal of methylphenidate, dextamphetamine and atomoxetine.
Dr Nicola Salt	
Employment	General Practitioner, Thurleigh Road Surgery, London
Personal pecuniary interests	2007 consultant for Nikko healthcare, £8000.
Personal family interests	None
Non-personal pecuniary interests	Pharmaceutical company sponsorship of practice meetings, providing lunch and speaker, up to 10 meetings per year. There have been no companies with an interest in ADHD.
Personal non-pecuniary interests	None
Dr Kapil Sayal	
Employment	Senior Lecturer in Child & Adolescent Psychiatry, Institute of Mental Health and University of Nottingham, Nottingham
Personal pecuniary interests	2005. Funded by Janssen Cilag to attend a conference, £1000. 2003 - co-author of Medscape CME Clinical Update Review, supported by Eli Lilly educational grant. £1000
Personal family interests	None
Non-personal pecuniary interests	2005 – 2008. Can schools-based screening and intervention programmes for ADHD improve children's outcomes and access to services? A longitudinal study. Department of Health, administered by Department for Education and Skills. £106,595. 2004 – 2006. Teacher recognition of hyperactivity: evaluation of a pilot intervention"; South London and Maudsley NHS Trust R&D funding. £37,000.
Personal non-pecuniary interests	2004-2006 Research study and a paper evaluating an educational session about ADHD for teachers. 2007. Chapter on 'Diagnosis and Assessment' in, 'People with Hyperactivity' (Taylor, E.)
Ms Linda Sheppard	
Employment	
Personal pecuniary interests	None
Personal family interests	None
Non-personal pecuniary interests	Janssen-Cilag unrestricted education grant to ADHD in Suffolk, Family Support Group, towards costs of National ADHD conference (£2000)
Personal non-pecuniary interests	None
Dr Geoff Thorley	
Employment	Consultant in Clinical Child and Adolescent Psychology and Neuropsychology, Child and Adolescent Mental Health Services, Leicestershire Partnership NHS Trust, Leicester; Private practice, Spire Hospital Leicester
Personal pecuniary interests	None

Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	Trustee of Cope Children's Charity, Leicester, 2005. author of, "Successful Parenting – A Four Step Approach"
Professor Peter Tymms	
Employment	Professor of Education, Curriculum, Evaluation and Management Centre, University of Durham
Personal pecuniary interests	
Personal family interests	
Non-personal pecuniary interests	2007 director of CEM centre, Durham University which schools buy into. The centre offers ADHD assessments and sells books on ADHD for teachers.
Personal non-pecuniary interests	
Dr Miranda Wolpert (2006-2007)	
Employment	Consultant Clinical Psychologist, Clinical Advisor on Child and Adolescent Mental Health – National Institute of Mental Health/Care Services' Improvement Partnership (England), London.
Personal pecuniary interests	2007. Developing a course on outcomes based CBT at UCL.
Personal family interests	
Non-personal pecuniary interests	
Personal non-pecuniary interests	2006 published "Drawing on the evidence"; 2007 published "Choosing what's best for you"
Professor Ian Wong	
Employment	Professor of Paediatric Medicine Research, Centre for Paediatric Pharmacy Research, The School of Pharmacy, London
Personal pecuniary interests	2007-2008. Director of research at Therakind Ltd., a spin-out company of the School of Pharmacy, University of London, but work is not related to ADHD. 2007-2008. Consultancy fees from Neuropharm Ltd via University of London on work not related to ADHD. 2007. Consultancy fees from Pharmaceutical Development Services, ADHD-related consultancy fees, £500.
Personal family interests	None.
Non-personal pecuniary interests	2005 – 2007 Cessation of Attention deficit hyperactivity Disorder Drugs in Young (CADDY). Department of Health, Health Technology Assessment Programme £110,000. 2003–2006. Educational grant to establish a research lecturer for 3 years. Pfizer. £150,000. 2004 – 2006. Tacrolimus Oral Paediatric Preparation Evaluation Research (TOPPER) Fujisawa Ltd, £100,000.

	2004 – 2007.Disclofenac Safety and Kinetic in Children post-operation Study (DISKCOS) Rosemont Pharmaceutical Company. £100,000. 2005 – 2008. Electronic Prescribing in Children (EPIC). First Databank, JAC and Great Ormond Hospital for Children. £80,000. 2004 – 2005 Evaluation of concordance in children taking orphan medications. Orphan Europe Ltd. £23,000. 2002 – 2007 National Public Health Career Scientist Award for Children and Adolescent Psychiatric pharmaco-therapy Evaluation research (Department of Health and National Health Service R&D Programme, £330,000. The Department of Practice and Policy of the School of Pharmacy has received funding from several pharmaceutical companies for medicines research, but none related to ADHD. 2006-2007. Staff at the Centre for Paediatric Pharmacy Research gave lectures to psychiatrists, paediatricians and health professionals on "Clinical pharmacology and research of ADHD treatments". These lectures were organized by Janssen Cilag. Honoraria are sent to the School of Pharmacy and no staff received personal honoraria.
Personal non-pecuniary interests	None.
Dr Susan Young	
Employment	Senior Lecturer in Forensic Clinical Psychology, Institute of Psychiatry, Kings' College London, Honorary Consultant Clinical and Forensic Psychologist, Broadmoor Hospital, West London Mental Health Trust
Personal pecuniary interests	Director of Psychology Services Limited - private company providing conference presentations, legal and clinical assessments, psychological treatment and training in these services. 2007. XII International Congress of the European Society for Child and Adolescent Psychiatry; Florence, Italy. Symposium "ADHD: Integrating Treatment Perspectives" Paper presented: Psychotherapy for Patients with ADHD". £1650 speaker fee including expenses paid to Psychology Services Ltd. by Eli Lilly. 2007. Leeds Mental Health Trust Conference "Adult ADHD – An Emerging Challenge" Paper Presented: Forensic Perspective, £150 including expenses paid to Psychology Services Ltd. 2007. Dorset ADHD support group, Weymouth. "Transitions: ADHD across the Lifespan" Paper presented: ADHD Adults £552 including expenses paid to Psychology Services Limited. 2007. University of Iceland Workshop on the Young-Bramham Programme for Adolescents and Adults with ADHD. £1,997.24 paid to Psychology Services Limited including expenses 2006. "The Management of Co-morbidities and Complexities in an ADHD Population", Crawley Paper presented "ADHD and Offending" Expenses paid directly to Psychology Services Limited. 2006. Associacao de Psiquiatria Biologica Annual Meeting, Portugal. Paper presented on "ADHD and the Legal Process" Paper presented on "Psychological Treatment" . Expenses paid directly to Psychology Services Limited. 2006. Janssen-Cilag sponsored South West Study Day "Criminal Youth

	Justice and Forensic Issues" Paper presented "The Impact of ADHD on offending" Expenses paid directly to Psychology Services Limited. 2006. Exeter meeting on forensic issues for people with ADHD. £104 and travel expenses funded by Janssen-Cilag paid directly to Psychology Services Limited.
Personal family interests	None.
Non-personal pecuniary interests	2006. Prevalence of ADHD in young offenders and adult prisoners. Research grant funded by Janssen-Cilag. £45,840. 2004. Unrestricted research grant into ADHD/forensic aspects. Eli-Lilly £5000.
Personal non-pecuniary interests	2007. Young, S.J. & Ross, R. R&R2 for ADHD Youths and Adults: A Prosocial Competence Training Program. Ottawa: Cognitive Centre of Canada (cogcen@canada.com) 2007. Young, S & Bramham, J. *ADHD in Adults, a psychological guide to practice*. Chichester: John Wiley & Sons. "British Pharmacological Guidelines" (Nutt et al, co-author); 2007, presented at ADDISS conference. 2007. Nutt et al. Evidence-based guidelines for management of attention-deficit/hyperactivity disorder in adolescents in transition to adult services and in adults: recommendations from the British Association for Psychopharmacology. *J Psychopharmacol* 2007:21. 10-41.

NCCMH Staff

Dr Tim Kendall - Facilitator, Guideline Development Group	
Employment	Joint Director, The National Collaborating Centre for Mental Health; Deputy Director, Royal College of Psychiatrists Research and Training Unit; Consultant Psychiatrist and Medical Director, Sheffield Care Trust.
Personal pecuniary interests	None.
Personal family interests	None.
Non-personal pecuniary interests	None.
Personal non-pecuniary interests	2008 Muñoz-Solomando, A., Kendall, T. & Whittington, C. J. Cognitive behavioural therapy for children and adolescents: a narrative synthesis of systematic reviews. *Current Opinion in Psychiatry*. (In press) 2007. BBC 1 o'clock News and 6 o'clock News re the Panorama programme on ADHD. 2007. Article in the Daily Mail re ADHD 2007. BBC Panorama programme on ADHD 2007. Daily Telegraph article re ADHD 2007. Telephone interview for News Hour BBC World Service "Child use of anti-depressants up four-fold" 2006. BBC News at 10 Interviewed in relation to prescribing anti-depressants to children under 4 years. 2006. Interviewed on 'Woman's Hour' on Children's mental health and purported rises in prescribing to children.

	2006. Organised and appeared in 'All in the Mind' on Radio 4 on mental health provision for children and young people and NICE guidelines produced to date. 2005. Whittington, C.J., Kendall, T., & Pilling, S. (2005). Are SSRIs and atypical antidepressants safe and effective for children and adolescents? *Current Opinion in Psychiatry*, 18: 21-25.
Ms Amy Brown	
Employment	Research Assistant, NCCMH (2006-2007)
Personal pecuniary interests	None
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	None
Ms Liz Costigan	
Employment	Project Manager, NCCMH (2005-2006)
Personal pecuniary interests	None
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	None
Mr Alan Duncan	
Employment	Systematic Reviewer, NCCMH
Personal pecuniary interests	None
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	None
Personal family interests	None
Other interests related to ADHD	None
Ms Angela Lewis	
Employment	Research Assistant, NCCMH (2007-2008)
Personal pecuniary interests	None
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	None
Dr Ifigeneia Mavranezouli	
Employment	Senior Health Economist, NCCMH
Personal pecuniary interests	None
Personal family interests	None
Non-personal pecuniary interests	None
Personal non-pecuniary interests	None
Dr Alejandra Perez	
Employment	Systematic Reviewer, NCCMH
Personal interests related to ADHD	None
Personal interests not specifically related to ADHD	None
Non-personal interests	None
Personal non-monetary interests	None
Dr Catherine Pettinari	
Employment	Centre Manager, Senior Project Manager NCCMH (2007-

	2008)
Personal interests related to ADHD	None
Personal interests not specifically related to ADHD	None
Non-personal interests	None
Personal non-monetary interests	None
Personal family interests	None
Other interests related to ADHD	None
Ms Sarah Stockton	
Employment	Information Scientist, NCCMH
Personal interests related to ADHD	None
Personal interests not specifically related to ADHD	None
Non-personal interests	None
Personal non-monetary interests	None
Dr Clare Taylor	
Employment	Editor, NCCMH
Personal interests related to ADHD	None
Personal interests not specifically related to ADHD	None
Non-personal interests	None
Personal non-monetary interests	None
Ms Jenny Turner	
Employment	Research Assistant, NCCMH (2007-2008)
Personal interests related to ADHD	None
Personal interests not specifically related to ADHD	None
Non-personal interests	None
Personal non-monetary interests	None

Appendix 3: Special advisors to the Guideline Development Group

Ms Mary Sainsbury	Practice Development Manager, Social Care Institute for Excellence
Dr Ilina Singh	Wellcome Trust University Lecturer in Bioethics and Society, London School of Economics
Dr Miranda Wolpert (2007-2008)	Director, CAMHS Evidence Based Practice Unit, University College London and Anna Freud Centre, London

Appendix 4: Stakeholders and reviewers who submitted comments in response to the consultation draft of the guideline

Stakeholders

ADDISS (Attention Deficit Disorder Information and Support Service)
Adults with Attention Deficit Disorder UK (AADD UK)
British Association for Psychopharmacology
British Association of Art Therapists
British Dietetic Association
British Psychological Society, The
Centre for Health Technology Evaluation
College of Mental Health Pharmacists
College of Occupational Therapists
Critical Psychiatry Network
Department of Health
Derbyshire Mental Health Services NHS Trust
Eli Lilly & Company
George Still Forum (National Paediatric ADHD Network Group)
GJ International Ltd
Hyperactive Children's Support Group (HACSG)
Janssen-Cilag Ltd
Learning Assessment & Neurocare Centre
Liverpool ADHD Foundation
Lundbeck Ltd
Medicines and Healthcare products Regulatory Agency (MHRA)
NASUWT (National Association of Schoolmasters Union of Women Teachers)
National Association of EBD Schools
Neonatal & Paediatric Pharmacists Group (NPPG)
Neurodevelopmental Paediatrics
Ofsted
Oxfordshire and Buckinghamshire Mental Health NHS Trust
Royal College of Nursing
Royal College of Nursing
Royal College of Paediatrics and Child Health
Shire Pharmaceuticals Limited
Southampton City Primary Care Trust
Sussex Partnership NHS Trust
Trafford Primary Care Trust
UCB Pharma Ltd
UK Psychiatric Pharmacy Group (UKPPG)
West Dorset Attention and Concentration Group
West London Mental Health NHS Trust
Young Minds

Reviewers

Kusay Hadi

Jonathan Leo

Michael Rutter

Appendix 5: Researchers contacted to request information about unpublished or soon-to-be published studies

Dr Albert Allen
Professor Gene Arnold
Professor Michael Schlander

Appendix 6: Clinical questions

1. DIAGNOSIS

Diagnosis and assessment		
1.1	1.1.1 1.1.2 1.1.3 1.1.4	Is there a consistent pattern of signs and symptoms demarcating ADHD from other disorders? ▪ is this pattern associated with clinically meaningful impairment? ▪ is this pattern of signs and symptoms the same in children than in adults? ▪ can the clinical features and impairments of ADHD be distinguished from another diagnosis? *to consider: (associated disorders)* - conduct disorder & oppositional defiant disorder & antisocial - obsessive compulsive disorder - bipolar disorder - affective disorders & anxiety disorders - premorbid impairments in schizophrenia - personality disorders (borderline) - Tourette's syndrome - global learning disorder - specific learning disorder (e.g. dyslexia, dyscalculia) - attachment disorder - autistic spectrum disorders - alcohol/drug abuse

1.2		Does ADHD have a characteristic course?

1.3	 1.3.1 1.3.2 1.3.3	Is there any evidence of: ▪ heritability of ADHD from family and genetic studies? ▪ neurobiological underpinning of ADHD? *to consider:* - neurotransmitters - brain structure (MRI) and function (fMRI/ERP) is the neurobiological evidence linked to core signs/symptoms?

1.4		Is there evidence of the social context (environmental, familial [not including genetics] and/or educational factors) influencing ADHD?

1.5		Is there evidence of over/under-diagnosis in some groups? *to consider:*

		- 3 sub-types of ADHD + Hyperkinetic Disorder - age groups - gender - socio-economic status - ethnicity - country - forensic settings - alcohol/drug users - looked after children - learning disabilities

1

1.6	1.6.1 1.6.2 1.6.3 1.6.4 1.6.5	What is the most reliable way of diagnosing the three sub-types of ADHD plus Hyperkinetic Disorder? ▪ should the diagnosis be given by specialists only? ▪ what is the minimum required assessment for a diagnosis to be given? ▪ should sub-typing be based on cross-sectional assessment of symptoms only (e.g. last 6 months) or also consider sub-type at onset? ▪ is the diagnostic approach different in adults compared to children?

2

1.7		What are the criteria that trigger the use of this guideline (i.e. which children, young people and adults should be included in this guideline and which should not)? ▪ (severity of symptoms)

3

4 **2. PSYCHOLOGICAL AND COMBINED INTERVENTIONS**

5

No.	**Question**
Treatment effectiveness, choice and moderating factors	
2.1	For people with ADHD, do

	a) psychological interventions:[1] ▪ Cognitive training ▪ CBT ▪ Behavioural approaches / parent (effectiveness) training ▪ Multimodal interventions b) other approaches: ▪ biofeedback ▪ physical therapies (relaxation etc) ▪ other approaches	when compared to: ▪ no intervention ▪ waiting lists ▪ 'standard care' ▪ other psychological interventions ▪ medication for ADHD	produce harm/benefits on the desired outcomes* and does this depend on: ▪ ADHD subtype ▪ associated disorder ▪ social context ▪ age ▪ gender ▪ severity ▪ delivery systems (group / indiv., family / group of fam., manualised or not, student vs. specialist, rater)? * ADHD symptoms / associated mental health problems / peer relationships / school learning and progress / family relationships / quality of life / burden of care (in write-up: care needs), self-esteem **Plus additional outcomes agreed as relevant to psychological interventions for ADHD**
2.2	Is the use of more that one type of psychological therapy more effective than single therapies (including psychological interventions with the child combined with parent interventions)?[2]		

[1] The clinical questions originally listed: family therapy (systemic/psychodynamic, behavioural); CBT (individual behaviour therapy, individual cognitive therapy, environmental manipulation & management.

2.3	Is there evidence of the added value in terms of benefits/harm from combined treatment (medication for ADHD plus psychological interventions)?[3] ▪ medication for ADHD + psychological intervention vs. medication for ADHD only ▪ medication for ADHD + child psychological intervention vs. medication for ADHD + parent-training intervention ▪ medication for ADHD + psychological intervention vs. psychological intervention ▪ parent-training + child psychological intervention (or multimodal psych intervention) vs. medication for ADHD
Treatment decisions: Initiation, duration, discontinuation and effect evaluation	
2.4	When should psychological treatment be initiated? ▪ does the waiting for a treatment influence outcome?
2.5	What is the optimum duration of treatment? ▪ what are the long-term consequences of treatment?
2.6	What is the most effective first line treatment and under what circumstances (e.g. epilepsy, potential for misuse, tics, Tourette syndrome, etc.)? ▪ what is the recommended order of combined treatments?
Adherence	
2.7	What approaches can be used to optimise adherence with psychological treatment?

[2] Inserted in place of question under *Interventions for carers*: 'Is there evidence on: the effectiveness of combined therapies compared to a single therapy?'

[3] Separate section for clinical questions on combined interventions deleted and combination comparisons rationalised to fit the scheme for psychological interventions (combinations of drugs to be dealt with in pharma. questions).

3. INTERVENTION FOR CARERS

No.	Question
3.1	Are there interventions that improve the well-being of parents/carers and may provide an indirect benefit for the child, but where evidence on outcomes for the child with ADHD is not available (peer support groups, counselling, advice/information and guidance?[4]

4. PHARMACOLOGICAL INTERVENTIONS

No.	TG	Question
Drug effectiveness, choice and moderating factors		
4.1		For people with ADHD, does

[4] The clinical questions originally listed the following interventions for carers: psychoeducational interventions (advice/information, parental guidance); parent effectiveness training; counselling; CBT – however, as parent training interventions are behavioural interventions these are addressed in clinical question 2.1. The section on interventions for carers will address other interventions with carers where the aim is to improve the wellbeing of the parents/carers and where effectiveness is measured by parental outcomes. This is outside the scope of the guideline and will be addressed by a (brief) narrative overview of the types of intervention available and evidence on their effectiveness.

		drug treatment* ▪ methylphenidate (including modified-release preparations) ▪ atomoxetine ▪ dexamphetamine ▪ tricyclic and other antidepressants ▪ bupropion ▪ nicotine (as skin patches) ▪ atypical antipsychotics ▪ modafinil ▪ clonidine	when compared to: ▪ waiting lists ▪ placebo ▪ other drug (head to head trials) ▪ psychological interventions ▪ parent training	produce harm/benefits on the desired outcomes* and does this depend on: ▪ ADHD subtype ▪ associated disorder ▪ social context ▪ age ▪ gender ▪ severity ▪ delivery systems (group/individual, family/group of families, manualised or not, student versus specialist, rater)? * ADHD symptoms/associated mental health problems/peer relationships/school learning and progress/family relationships/quality of life/burden of care (in write-up: care needs), self-esteem
Treatment decisions: Duration, discontinuation and effect evaluation				
4.2		Which drugs should be used as a 1st line, 2nd line, etc. treatment? How should drug treatment be initiated, dose titrated and effectiveness evaluated? What is the optimum duration of drug treatment* (length of time; continuous vs. intermittent treatment) and ▪ when is discontinuation attempted? ▪ what advice is given for discontinuation?		
4.3		Is there any evidence on: ▪ what is the most effective type of drug administration (to improve adherence) and ▪ what is the dose optimisation and how is this best achieved (where outcome is optimal)?		
Side effects, monitoring, precautions and abuse potential				
4.4		What conditions contraindicate or caution the use of specific drug treatments?		

		What are the necessary baseline investigations and on-going monitoring to support drug treatment? What are the side effects of drug treatments (including abuse potential)? What action should be taken in response to side-effects? What action should be taken in response to lack of effectiveness?
4.5		What are the risks of prescribing drug treatment in the presence of recreational drug use and/or alcohol use and ▪ what approaches should be taken if in the presence of recreational drug use and/or alcohol use?
Education, adherence and shared-care		
4.6		How is drug treatment monitored and ▪ by who(by specialist, by GP and/or by care coordinator)?
4.7		What approaches to drug treatment can be used to support drug adherence? ▪ are there any interventions that can improve adherence when initiating drug treatment? ▪ when there are problems regarding adherence to drug treatment in people with ADHD are there any interventions that can improve adherence with medication?

1

1 **3. EDUCATION**

2

No.	TG	Question		
Education				
6.1		Does educational intervention* ▪ school screening ▪ teacher training on ADHD ▪ curriculum modification ▪ classroom management ▪ remedial teaching ▪ a multi-agency partnership between schools and other agencies	when compared to: ▪ standard education ▪ health interventions	produce harm/benefits on the desired outcomes* and does this depend on: ▪ ADHD subtype ▪ associated disorder ▪ social context ▪ age ▪ gender ▪ severity * Behaviour in classroom, academic achievement and progress, attitude to school, teachers' quality of life, self-esteem, behaviour and employment.

3

1 # Appendix 7: Review protocols

Relevant questions	Q1.1 – **Diagnosis and Assessment** 1.1.1 Is there a consistent pattern of signs and symptoms demarcating ADHD from other disorders? ▪ 1.1.2 is this pattern associated with clinically meaningful impairment? ▪ 1.1.3 is this pattern of signs and symptoms the same in children than in adults? ▪ 1.1.4 can the clinical features and impairments of ADHD be distinguished from another diagnosis?
Chapter	5 Diagnosis and Assessment
Sub-section	
Topic Group	TG1 Diagnosis
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	1st search: OS, empirical reviews [high spec] 2nd search: Diagnosis, ER, OS
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	
• Comparator	
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes document for definitions)	- validity of ADHD category
• Study design	SR, observational studies, cross-sectional studies, cohort studies, factor analytic studies
• Publication status	[Published and unpublished (if criteria met)

• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q1.1 – **Diagnosis and Assessment** 1.2 Does ADHD have a characteristic course?
Chapter	5 Diagnosis and Assessment
Sub-section	
Topic Group	TG1 Diagnosis
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	1st search: OS, empirical reviews [high spec] 2nd search: OS
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	
• Comparator	
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD (oppositional defiant disorder, conduct disorder and/or disruptive behaviour).
• Outcomes (see Outcomes document for definitions)	- continuity of ADHD diagnosis
• Study design	SR, observational studies, cross-sectional studies, cohort studies

• Publication status	[Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q1.1 – **Diagnosis and Assessment** Is there any evidence of: ▪ 1.3.1 heritability of ADHD from family and genetic studies? ▪ 1.3.2 neurobiological underpinning of ADHD? *to consider:* - neurotransmitters - brain structure (MRI) and function (fMRI/ERP) 1.3.3 is the neurobiological evidence linked to core signs/symptoms?
Chapter	5 Diagnosis and Assessment
Sub-section	
Topic Group	TG1 Diagnosis
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	OS, empirical reviews [high spec]
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	
• Comparator	
• Population (including	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD (oppositional defiant disorder,

age, gender etc)	conduct disorder and/or disruptive behaviour).
• Outcomes (see Outcomes document for definitions)	- gene associations in people with ADHD
• Study design	SR of genetic studies
• Publication status	[Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

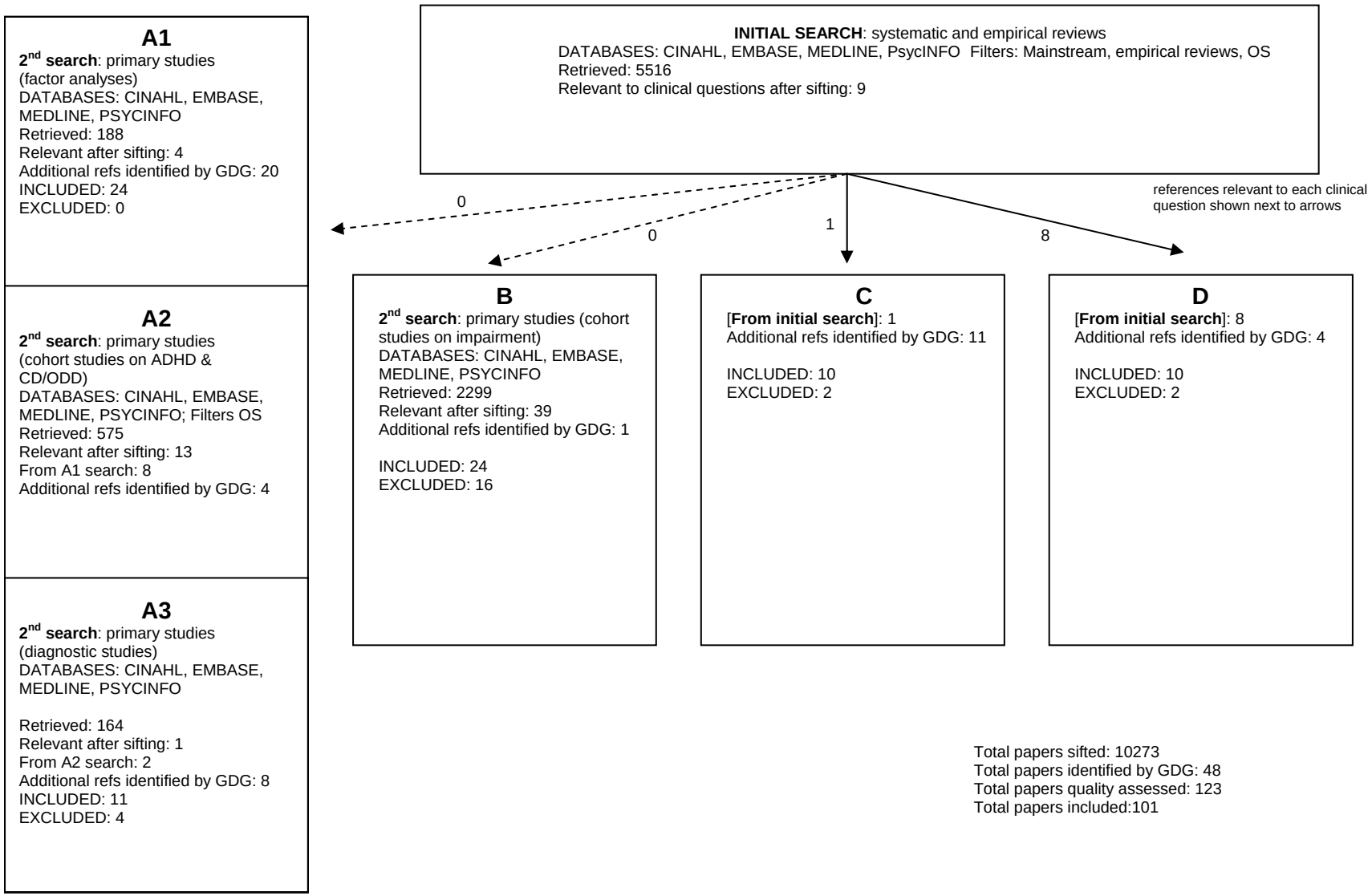
1
2

Relevant questions	Q1.1 – **Diagnosis and Assessment** 1.4 Is there evidence of the social context (environmental, familial [not including genetics] and/or educational factors) influencing ADHD? 1.5 Is there evidence of over/under-diagnosis in some groups? 1.6.1 What is the most reliable way of diagnosing the three sub-types of ADHD plus Hyperkinetic Disorder? ▪ 1.6.2 should the diagnosis be given by specialists only? ▪ 1.6.3 what is the minimum required assessment for a diagnosis to be given? ▪ 1.6.4 should sub-typing be based on cross-sectional assessment of symptoms only (e.g. last 6 months) or also consider sub-type at onset? ▪ 1.6.5 is the diagnostic approach different in adults compared to children? 1.7 What are the criteria that trigger the use of this guideline (i.e. which children, young people and adults should be included in this guideline and which should not)? (severity of symptoms)

Chapter	5 Diagnosis and Assessment
Sub-section	
Topic Group	TG1 Diagnosis
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	OS, empirical reviews [high spec]
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	
• Comparator	
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD (oppositional defiant disorder, conduct disorder and/or disruptive behaviour).
• Outcomes (see Outcomes document for definitions)	- validity of ADHD diagnosis
• Study design	SR
• Publication status	[Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1

1 Searches made for Diagnosis and Assessment


A1
2nd search: primary studies (factor analyses)
DATABASES: CINAHL, EMBASE, MEDLINE, PSYCINFO
Retrieved: 188
Relevant after sifting: 4
Additional refs identified by GDG: 20
INCLUDED: 24
EXCLUDED: 0
A2
2nd search: primary studies (cohort studies on ADHD & CD/ODD)
DATABASES: CINAHL, EMBASE, MEDLINE, PSYCINFO; Filters OS
Retrieved: 575
Relevant after sifting: 13
From A1 search: 8
Additional refs identified by GDG: 4
A3
2nd search: primary studies (diagnostic studies)
DATABASES: CINAHL, EMBASE, MEDLINE, PSYCINFO
Retrieved: 164
Relevant after sifting: 1
From A2 search: 2
Additional refs identified by GDG: 8
INCLUDED: 11
EXCLUDED: 4
INITIAL SEARCH: systematic and empirical reviews
DATABASES: CINAHL, EMBASE, MEDLINE, PsycINFO Filters: Mainstream, empirical reviews, OS
Retrieved: 5516
Relevant to clinical questions after sifting: 9
references relevant to each clinical question shown next to arrows
0
0
1
8
B
2nd search: primary studies (cohort studies on impairment)
DATABASES: CINAHL, EMBASE, MEDLINE, PSYCINFO
Retrieved: 2299
Relevant after sifting: 39
Additional refs identified by GDG: 1
INCLUDED: 24
EXCLUDED: 16
C
[From initial search]: 1
Additional refs identified by GDG: 11
INCLUDED: 10
EXCLUDED: 2
D
[From initial search]: 8
Additional refs identified by GDG: 4
INCLUDED: 10
EXCLUDED: 2
Total papers sifted: 10273
Total papers identified by GDG: 48
Total papers quality assessed: 123
Total papers included:101

1

Relevant questions	Q2.1 – **Psychological interventions**
Chapter	6 Psychological interventions and parent training
Sub-section	
Topic Group	TG2 Psychology
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	RCT
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	• Family therapy (systemic/psychodynamic, behavioural) • CBT (individual behavioural therapy, individual cognitive therapy) • Environmental manipulation and management
• Comparator	Waiting lists, standard care, other psychological interventions, medication
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes document for definitions)	- Improvement on score of Conners Rating Test (including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on academic performance - Improvement on social skills - Reduction of impairment - Leaving study early
• Study design	RCT
• Publication status	[Published and unpublished (if criteria met)

• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q2.1 – **Psychological interventions** 2.2 When should psychological treatment* be initiated? does the waiting for a treatment influence outcome? 2.3 What is the optimum duration of treatment*? what are the long-term consequences of treatment? 2.4 What approaches can be used to optimise adherence with psychological treatment?
Chapter	6 Psychological interventions and parent training
Sub-section	
Topic Group	TG2 Psychology
Sub-section lead	
Search strategy	**Databases:** CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	OS, empirical reviews [high spec]
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	
• Comparator	
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes	- Duration, discontinuation of psychological treatment and treatment adherence

document for definitions)	
• Study design	Observational studies
• Publication status	[Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q3.1 – **Intervention for carers**
Chapter	6 Psychological interventions and parent training
Sub-section	
Topic Group	TG2 Psychology
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	RCT
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	• Psychoeducational interventions (advice/information, parental guidance) for carers • Parent effectiveness training • Counselling forcarers • CBT for carers
• Comparator	

• Population (including age, gender etc)	Parents of children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes document for definitions)	- Improvement on score of Conners Rating Test (including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on social skills - Improvement on academic performance - Reduction of impairment - Leaving study early * as in the rest of the clinical questions, outcomes are taken from children and young people with ADHD regardless if the interventions are directed at carers
• Study design	RCT
• Publication status	[Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q4.1 - **Drug Treatment** (stimulants)
Chapter	9 Pharmacology
Sub-section	Stimulants (methylphenidate, dexamphetamine)
Topic Group	TG3 Pharma
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	NICE Report (2000), Technology Appraisal Report (2006)

General search filter used	RCT
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	• Methylphenidate (including modified-release preparations) • Dexamphetamine
• Comparator	Waiting lists, placebo; active comparator (head-to-head trials, for example, atomoxetine, TCAs, etc.)
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes document for definitions)	- Improvement on score of Conners Rating Test (including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on academic performance - Reduction of impairment - Side effects (e.g. s) - Leaving the study early
• Study design	RCT (efficacy, acceptability, tolerability, adverse events)
• Publication status	[Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q4.1– **Drug treatment** (atomoxetine)
Chapter	9 Pharmacology
Sub-section	Atomoxetine
Topic Group	TG3 Pharma
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	NICE Report (2000), Technology Appraisal Report (2006)
General search filter used	RCT
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	• Atomoxetine
• Comparator	Waiting lists, placebo; active comparator (head to head trials, e.g. atomoxetine, TCAs, etc.)
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes document for definitions)	- Improvement on score of Conners Rating Test (including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on academic performance - Reduction of impairment - Side effects (e.g.) - Leaving the study early
• Study design	RCT (efficacy, acceptability, tolerability, side effects)
• Publication status	Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]

• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q4.1 – **Drug Treatment** (other medication)
Chapter	9 Pharmacology
Sub-section	Other medication
Topic Group	TG3 Pharma
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	RCT
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	• TCAs • Bupropion • Nicotine (as skin patches) • Atypical antipsychotics • Modafinil • Clonidine
• Comparator	Waiting lists, placebo; active comparator (head to head trials, e.g. atomoxetine, TCAs, etc.)
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes	- Improvement on score of Conners Rating Test

(see Outcomes document for definitions)	(including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on academic performance - Reduction of impairment - Side effects (e.g.) - Leaving the study early
• Study design	RCT (efficacy, acceptability, tolerability, side effects)
• Publication status	Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q4.2 **1st, 2nd, 3rd Line Treatment** (including 4.2.1: Which drugs should be used as a 1st, 2nd, and 3rd line treatment? 4.2.2: How should drug treatment be initiated, dose titrated and effectiveness evaluated? 4.2.3: What is the optimum duration of drug treatment? 4.2.4: When is discontinuation attempted? 4.2.5: What advice is given for discontinuation?
Chapter	9 Pharmacology
Sub-section	
Topic Group	TG3 Pharma
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	RCT
Question specific	

search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	
• Comparator	Waiting lists, placebo; active comparator (head to head trials, e.g. atomoxetine, TCAs, etc.)
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes document for definitions)	- Improvement on score of Conners Rating Test (including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on academic performance - Reduction of impairment - Side effects (e.g.) - Leaving the study early
• Study design	RCTs (efficacy outcomes/ acceptability/ tolerability/ side effects)
• Publication status	Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q5.1 – **Combination treatments**
Chapter	10 Combined interventions
Sub-section	
Topic Group	TG2 Psychology
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE,

	PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	RCT
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	• Combination of medication and psychological intervention with mediation alone or psychological intervention alone
• Comparator	Waiting lists, placebo; medication, psychological intervention
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes document for definitions)	- Improvement on score of Conners Rating Test (including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on academic performance - Improvement on social skills - Reduction of impairment - Side effects - Leaving the study early
• Study design	RCTs (efficacy outcomes/ acceptability/ tolerability/ side effects)
• Publication status	Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]

Additional assessments	

1
2

Relevant questions	Q6.1 – **Education interventions**
Chapter	7 Education
Sub-section	
Topic Group	TG4 Education
Sub-section lead	
Search strategy	**Databases:** CENTRAL, CINAHL, EMBASE, MEDLINE, PsycINFO, ERIC
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	OS, [NR]
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	• School screening • Teacher training on ADHD • Curriculum modification • Classroom management • Remedial teaching • Multi-agency partnership with other schools and other agencies
• Comparator	Standard education, health interventions
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes (see Outcomes document for definitions)	- Improvement on score of Conners Rating Test (including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on academic performance - Reduction of impairment - Reading

	- Mathematics
• Study design	RCT, cluster RCT (efficacy)
• Publication status	[Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

1
2

Relevant questions	Q7.1 – **Dietary Interventions**
Chapter	8 Dietary
Sub-section	
Topic Group	TG5 Dietary
Sub-section lead	
Search strategy	**Databases:** CINAHL, EMBASE, MEDLINE, OLD MEDLINE, PsycINFO
Existing reviews	
• **Updated**	
• **Not updated**	
General search filter used	RCT
Question specific search filter	
Amendments to filter/ search strategy	
Eligibility criteria	
• Intervention	• Elimination diets • Supplementation diets
• Comparator	Waiting lists, placebo
• Population (including age, gender etc)	Children, adolescents, and adults with ADHD, ADD, MBD, comorbid ADHD.
• Outcomes	- Improvement on score of Conners Rating Test

(see Outcomes document for definitions)	(including all variations of this test and subscales) - Improvement on score of ADHD Rating Scale - Improvement on score of DuPaul Test - Improvement on score of SKAMP Test - Improvement on score of SNAP Test - Improvement on academic performance - Reduction of impairment - Side effects - Leaving the study early
• Study design	RCT (efficacy outcomes/ acceptability/ tolerability/ side effects)
• Publication status	[Published and unpublished (if criteria met)
• Year of study	[Any]
• Dosage	[Any]
• Minimum sample size	n > 10
• Study setting	[Any]
Additional assessments	

Appendix 8: Search strategies for the identification of diagnostic studies, clinical studies and reviews

Search: ADHD – Diagnosis Q1.2, 1.7, 1.8

Interface: OVID	**Databases**: CINAHL, EMBASE, MEDLINE, PSYCINF

Notes: ER filter modified for more specificity

1	(attenti$ or disrupt$ or impulsiv$ or inattenti$).sh.
2	((attenti$ or disrupt$) adj3 (adolescen$ or adult$ or behav$ or child$ or class or classes or classroom$ or condition$ or difficult$ or disorder$ or learn$ or people or person$ or poor or problem$ or process$ or youngster$)).tw.
3	disruptive$.tw,it,tm.
4	impulsiv$.tw.
5	inattentiv$.tw.
6	adhd.tw.
7	addh.tw.
8	ad hd.tw.
9	ad??hd.tw.
10	(attenti$ adj3 deficit$).tw.
11	hyperactiv$.mp.
12	(hyper adj1 activ$).tw.
13	hyperkin$.mp.
14	(hyper adj1 kin$).tw.
15	hkd.tw.
16	overactiv$.tw. not overactive bladder$.ti.
17	(over adj1 activ$).tw. not overactive bladder$.ti.
18	(minimal adj1 brain).tw.
19	or/1-18
20	*"attention deficit and disruptive behavior disorders"/di or attention deficit disorder with hyperactivity/di or *attention deficit disorder/di or *attention deficit hyperactivity disorder/
21	exp "sensitivity and specificity"/
22	likelihood functions/ or maximum likelihood/
23	exp diagnostic error/ or exp diagnostic errors/
24	(area under curve or area under the curve).sh.

25	(reproducibility of results or reproducibility).sh.
26	(diagnos$ or differential diagnosis$ or misdiagnos$ or psychodiagnos$).sh.
27	(sensitivity$ or specificit$).tw.
28	predictive value$.tw.
29	likelihood ratio$.tw.
30	(false adj (negative$ or positive$)).tw.
31	(valid$ adj3 (adhd or attention deficit$ or hyperkin$ or diagnos$)).tw.
32	or/20-31
33	early diagnosis.sh.
34	((earl$ or initial or onset or preclinical or pre clinical) adj3 (detect$ or diagnos$ or distinguish identif$ or intervention$ or recogni$ or therap$ or treat$)).tw.
35	or/33-34
36	((early or under) adj3 diagnos$).tw.
37	19 and (or/32,35-36)
38	(clinical study or cohort analysis or correlational studies or cross sectional studies or epidemiologic studies or family study or longitudinal study or nonconcurrent prospective studies or prospective studies or prospective study or retrospective study).sh.
39	exp case control studies/ or exp case control studies/ or exp cohort studies/
40	(cohort adj (study or studies)).mp.
41	((cohort or cross sectional or epidemiologic$ or follow?up or follow up or observational) adj (study or studies)).tw.
42	(case control or cohort analy$ or cross sectional or longitudinal or retrospective).tw.
43	case$.pt.
44	or/38-43
45	and/37,44
46	remove duplicates from 45
47	(empiric$ and review$).mp,pt,dt. or (data collection or health statistics or health survey$1 or psychological report$1 or report$1 or statistics).sh.
48	limit 37 to (2260 research methods & experimental design or "0400 empirical study") [Limit n valid in: CINAHL,EMBASE,Ovid MEDLINE(R); records were retained]
49	limit 37 to (2200 psychometrics & statistics & methodology or 2240 statistics & mathematics) [Limit not valid in: CINAHL,EMBASE,Ovid MEDLINE(R); records were retained]
50	limit 37 to (report or research or research instrument or research term definition or short surv [Limit not valid in: CINAHL,EMBASE,Ovid MEDLINE(R),PsycINFO; records were retained]
51	or/48-50
52	37 and (47 or (51 and review$.mp,pt,dt.))

53	remove duplicates from 52
54	limit 37 to "0400 empirical study" [Limit not valid in: CINAHL,EMBASE,Ovid MEDLINE(R); records were retained] CINAHL - Cumulative Index to Nursing & Allied Health Literature <1982 to September Week 3 2006> EMBASE <1980 to 2006 Week 37> (9543) Ovid MEDLINE(R) <1966 to September Week 2 2006> (11566) PsycINFO <1806 to September Week 3 2006> (2745)
55	53 and 54
56	from 55 keep 3625-3708
57	37 and (or/47,56)
58	remove duplicates from 57
59	from 58 keep 1-515

1

Search: ADHD – Diagnosis Q1.3, 1.4, 1.5, 1.6	
Interface: OVID	**Databases**: CINAHL, EMBASE, MEDLINE, PSYCINFO
1	(attention deficit$ or attention disturbance or disruptive behavior).sh.
2	adhd.tw.
3	addh.tw.
4	ad hd.tw.
5	ad??hd.tw.
6	((adult$ or child$) adj2 add$1).tw.
7	(attenti$ adj3 deficit$).tw.
8	hyperactiv$.mp.
9	(hyper adj1 activ$).tw.
10	hyperkin$.mp.
11	(hyper adj1 kin$).tw.
12	hkd.tw.
13	(minimal adj1 brain).tw.
14	(brain dysfunction and (ritalin or methylphenidate)).mp.
15	((child$ or adult$) adj3 (disrupt$ or attention$ or inattent$ or impulsiv$ or overactiv$)).tw.
16	or/1-15
17	comorbid$.mp.

18	((dysfunction$ or function$) adj2 (change$ or executive$ or deficit$ or impair$)).tw.
19	(neuropsychopatholog$ or psychopatholog$ or pathophysiolog$).mp.
20	prevalen$.mp. and (diagnos$.mp. or di.fs.)
21	((neuropsychological test$ or psychiatric status rating scales or psychological test$ or psychometrics or mental status schedule or mental test or neuropsychological assessment or psychometry or rating scale$ or scales or test$).sh. or (DSM-IV and ICD-10).tw.) and (diagnos$.mp. or di.fs.)
22	"Diagnostic and Statistical Manual"/ or "Diagnostic and Statistical Manual of Mental Disorders"/
23	(affective symptoms or behavioral symptoms or clinical feature or symptom or symptoms).sh.
24	attention deficit disorder/ss or attention deficit disorder with hyperactivity/ss or hyperkinesis/ss or hyperkinesia/ss
25	(attention deficit disorder/di or attention deficit disorder with hyperactivity/di or hyperkinesis/di or hyperkinesia/di) and symptom$.mp.
26	((adhd or attention deficit$ or hyperactiv$ or hyperkin$ or detect$ or diagnos$ or identif$ or pattern$ or recogni$ or warning$) adj2 (signs or symptom$)).tw.
27	(clinical adj (feature$ or characteristic$) adj2 (adhd or attention deficit$ or hyperactiv$ or hyperkines$)).tw.
28	(symptom$ adj3 (impulsiv$ or inattenti$ or overactiv$)).tw.
29	or/17-28
30	persistence.mp. and (age factors or age of onset or aging).sh.
31	(persist$ adj3 (adhd or attention deficit$ or hyperactiv$ or hyperkin$ or minimal brain$ or age or aging or adulthood)).tw.
32	(age$ adj3 (decline$ or less$ or reduc$)).tw.
33	or/30-32
34	attention deficit disorder/rf or attention deficit disorder with hyperactivity/rf or hyperkinesis/rf or hyperkinesia/rf
35	(prediction or predictive$).sh.
36	((predict$ or development$) adj3 (adhd or attention deficit or hyperactiv$ or hyperkin$ or minimal brain)).tw.
37	(trajector$ adj2 (development$ or symptom$)).tw.
38	"age of onset".sh. and (rf or di).fs.
39	or/34-38

40	(environment or home environment or social environment or genetic$ or heredity).sh.
41	((continuity or change$) adj3 symptom$).tw.
42	((environment$ or gene or genes or genetics or heredit$ or heritabl$ or social environment) adj3 (symptom$ or adhd or attention deficit$ or hyperactiv$ or hyperkin$ or minimal brain$)).tw.
43	or/40-42
44	(cognition or cognitive ability or mental performance or neuropsychology or neuropsychological test$ or psychometric$).sh. and di.fs.
45	((neurocognitiv$ or neuropsychological$) adj2 (performance$ or measure$ or test$) adj10 diagnos$).tw.
46	or/44-45
47	(familial disease or family or family characteristics or relatives).sh.
48	(famil$ adj2 (subform$ or subtype$ or antisocial$ or psychopatholog$)).tw.
49	((subform$ or subtype$) adj2 (adhd or attention deficit or hyperactiv$ or hyperkin$ or minimal brain)).tw.
50	or/47-49
51	("Diagnostic and Statistical Manual"/ or "Diagnostic and Statistical Manual of Mental Disorders"/) and (validity or validation$ or reproducibility or results).sh.
52	(dsm-iv adj5 valid$).tw.
53	or/51-52
54	(disease course or genetic heterogeinity or symptom chronology).sh.
55	((course adj2 (clinical or disease$ or disorder$ or progressive or longitudinal or naturalistic or recurrent)) or disease progression or symptom chronology).tw.
56	risk$.mp. or attention deficit disorder/rf or attention deficit disorder with hyperactivity/rf or hyperkinesis/rf or hyperkinesia/rf
57	or/54-56
58	or/33,39,43,46,50,53,57
59	(environment$ or genetic$ or genome$ or heredit$ or molecular genetic$ or social environment).sh.
60	attention deficit disorder/ge or attention deficit disorder with hyperactivity/ge or hyperkinesis/ge or hyperkinesia/ge
61	((environment$ or gene or genes or genetic$ or genome$ or heredit$ or heritabl$ or environment$ or sibling$) adj5 (adhd or attention deficit$ or hyperactiv$ or hyperkin$ or minimal brain)).tw.

62	or/59-61
63	exp magnetic resonance imaging/ or exp nuclear magnetic resonance imaging/
64	(magnetic resonance imag$ or magneti? transfer imag$ or ((mr or nmr) adj imag$) or mri$1).tw.
65	(positron-emission tomography or positron emission tomography or tomography, emission-computed).sh.
66	((positron adj2 tomograph$) or (pet adj2 scan$)).tw.
67	exp computer assisted tomography/ or exp tomography, x-ray computed/
68	((comput$ adj2 tomograph$) or cat scan$).tw.
69	(single photon emission computer tomography or tomography, emission-computed, single-photon).sh.
70	(single photon emission comput$ tomograph$ or spect$1).tw.
71	exp electroencephalography/ or exp electroencephalogram/
72	((brain adj (activity or wave or electric activit$)) or eeg$1 or electr$ encephalogram).tw.
73	neuroimag$.mp.
74	or/63-73
75	(familial disease or family or family background or family characteristics or family life or hereditiy or relatives).sh.
76	(environment or environmental factor$ or environmental stress or family environment$ or home environment or social environment or environmental exposure).sh.
77	((family or families or heredit$ or heritabl$) adj3 (adversity or contribut$ or effect$ or factor$ or influence$)).tw.
78	(environment$ adj3 (adversity or contribut$ or effect$ or factor$ or influence$)).tw.
79	(education$ adj3 (adversity or contribut$ or effect$ or factor$ or influence$)).tw.
80	or/75-79
81	or/62,74,80
82	or/29,58,81

1
2

Search: ADHD RCTs	
Interface: OVID	**Databases**: Medline, Embase, CINAHL,

	PsycINFO)
	1. Guideline topic search filter
1	(attenti$ or disrupt$ or impulsiv$ or inattenti$).sh.
2	((attenti$ or disrupt$) adj3 (adolescen$ or adult$ or behav$ or child$ or class or classes or classroom$ or condition$ or difficult$ or disorder$ or learn$ or people or person$ or poor or problem$ or process$ or youngster$)).tw.
3	disruptive$.tw,it,tm.
4	impulsiv$.tw.
5	inattentiv$.tw.
6	adhd.tw.
7	addh.tw.
8	ad hd.tw.
9	ad??hd.tw.
10	(attenti$ adj3 deficit$).tw.
11	hyperactiv$.mp.
12	(hyper adj1 activ$).tw.
13	hyperkin$.mp.
14	(hyper adj1 kin$).tw.
15	hkd.tw.
16	overactiv$.tw. not overactive bladder$.ti.
17	(over adj1 activ$).tw. not overactive bladder$.ti.
18	(minimal adj1 brain).tw.
19	or/1-18
	2. Randomised controlled trial search filter
20	exp clinical trials/ or exp clinical trial/ or exp controlled clinical trials/
21	exp crossover procedure/ or exp cross over studies/ or exp crossover design/
22	exp double blind procedure/ or exp double blind method/ or exp double blind studies/ or exp single blind procedure/ or exp single blind method/ or exp single blind studies/
23	exp random allocation/ or exp randomization/ or exp random assignment/ or exp random sample/ or exp random sampling/
24	exp randomized controlled trials/ or exp randomized controlled trial/
25	(clinical adj2 trial$).tw.

26	(crossover or cross over).tw.
27	(((single$ or doubl$ or trebl$ or tripl$) adj5 (blind$ or mask$ or dummy)) or (singleblind$ or doubleblind$ or trebleblind$)).tw.
28	(placebo$ or random$).mp.
29	(clinical trial$ or random$).pt. or (random$ or clinical control trial).sd.
30	animals/ not (animals/ and human$.mp.)
31	animal$/ not (animal$/ and human$/)
32	(animal not (animal and human)).po.
33	(or/20-29) not (or/30-32)
34	case study/
35	abstract report/ or letter/
36	case report.tw.
37	letter.pt.
38	historical article.pt.
39	review$.pt.
40	33 not (or/34-39)
41	and/19,40
42	remove duplicates from 42

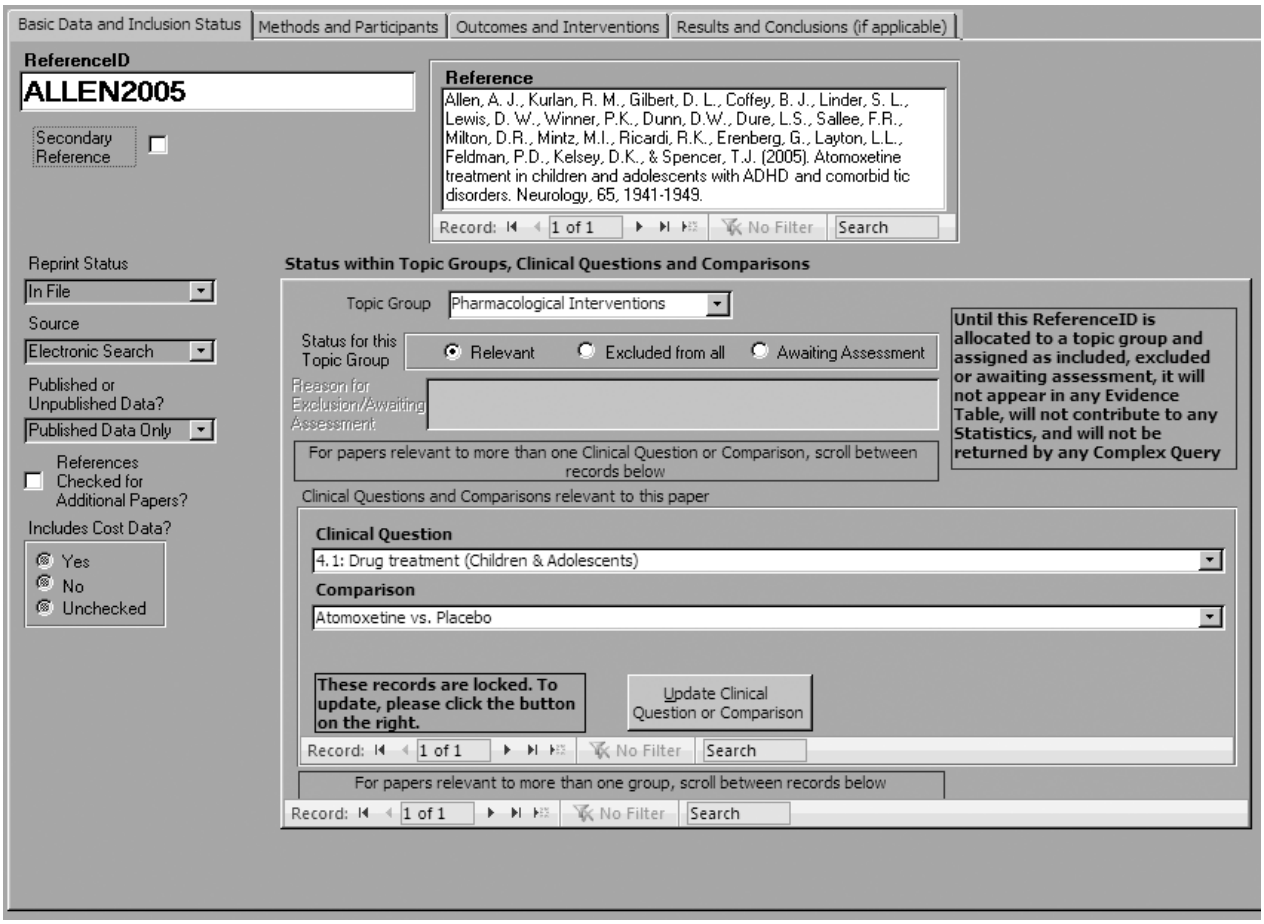
1
2

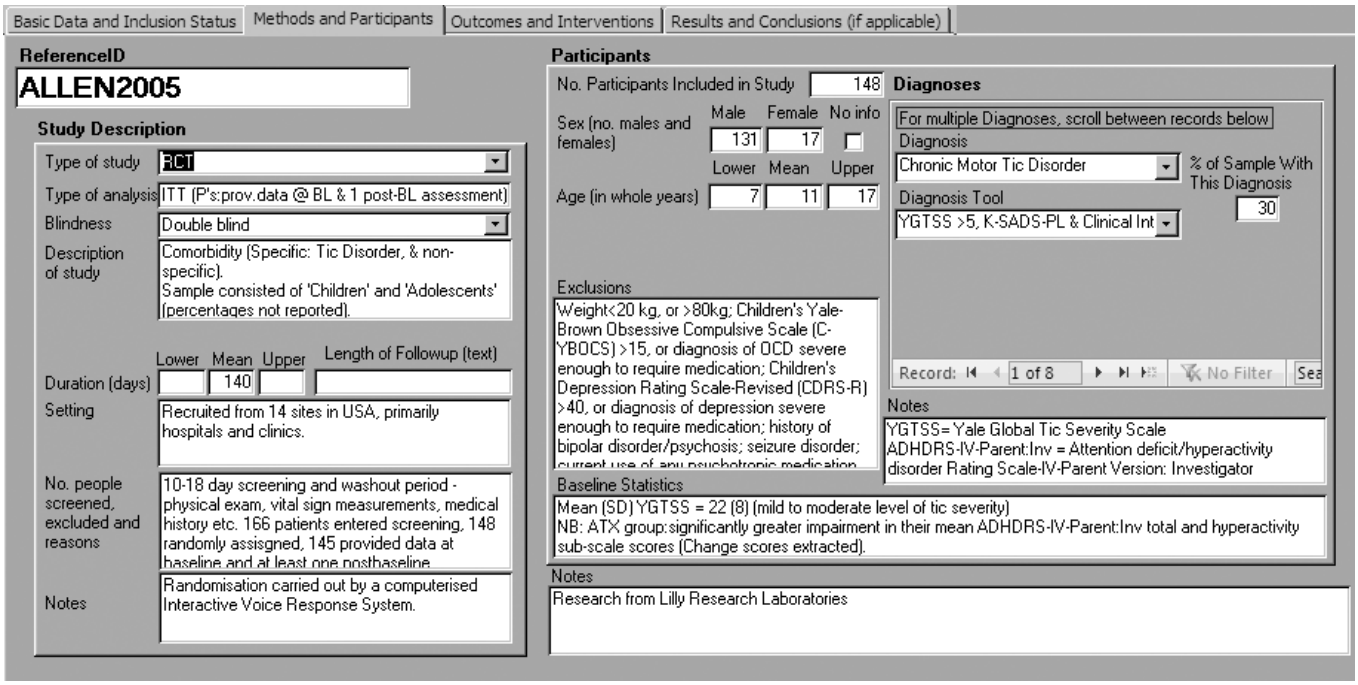
Search: ADHD Systematic reviews	
Interface: OVID	**Databases**: Medline, Embase, CINAHL, PsycINFO, CDSR, DARE
	1. Guideline topic search filter
1	(attenti$ or disrupt$ or impulsiv$ or inattenti$).sh.
2	((attenti$ or disrupt$) adj3 (adolescen$ or adult$ or behav$ or child$ or class or classes or classroom$ or condition$ or difficult$ or disorder$ or learn$ or people or person$ or poor or problem$ or process$ or youngster$)).tw.
3	disruptive$.tw,it,tm.
4	impulsiv$.tw.
5	inattentiv$.tw.
6	adhd.tw.
7	addh.tw.

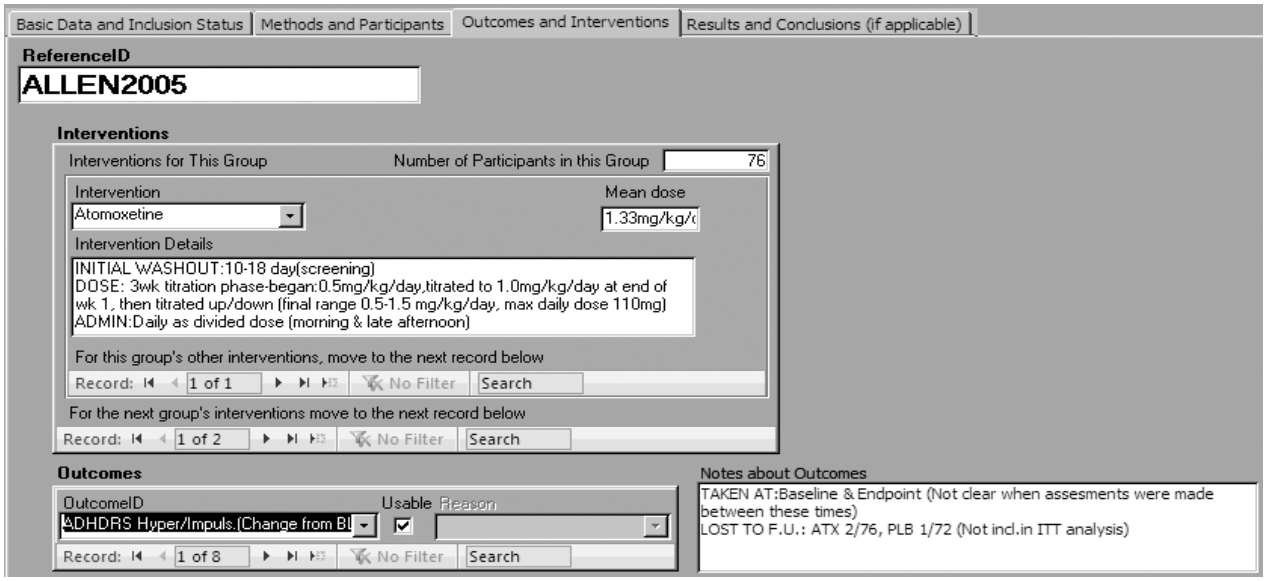
8	ad hd.tw.
9	ad??hd.tw.
10	(attenti$ adj3 deficit$).tw.
11	hyperactiv$.mp.
12	(hyper adj1 activ$).tw.
13	hyperkin$.mp.
14	(hyper adj1 kin$).tw.
15	hkd.tw.
16	overactiv$.tw. not overactive bladder$.ti.
17	(over adj1 activ$).tw. not overactive bladder$.ti.
18	(minimal adj1 brain).tw.
19	or/1-18
	2. Systematic review search filter
20	exp meta analysis/ or exp systematic review/ or exp literature review/ or exp literature searching/ or exp cochrane library/ or exp review literature/
21	((systematic or quantitative or methodologic$) adj5 (overview$ or review$)).mp.
22	(metaanaly$ or meta analy$).mp.
23	(research adj (review$ or integration)).mp.
24	reference list$.ab.
25	bibliograph$.ab.
26	published studies.ab.
27	relevant journals.ab.
28	selection criteria.ab.
29	(data adj (extraction or synthesis)).ab.
30	(handsearch$ or ((hand or manual) adj search$)).ti,ab.
31	(mantel haenszel or peto or dersimonian or der simonian).ti,ab.
32	(fixed effect$ or random effect$).ti,ab.
33	((bids or cochrane or index medicus or isi citation or psyclit or psychlit or scisearch or science citation or (web adj2 science)) and review$).mp.
34	(systematic$ or meta$).pt.
35	or/20-34
36	and/19,35

1

1 Appendix 9: Clinical study information database






Basic Data and Inclusion Status
Methods and Participants
Outcomes and Interventions
Results and Conclusions (if applicable)
ReferenceID
ALLEN2005
Interventions
Interventions for This Group
Number of Participants in this Group
76
Intervention
Atomoxetine
Mean dose
1.33mg/kg/
Intervention Details
INITIAL WASHOUT:10-18 day(screening)
DOSE: 3wk titration phase-began:0.5mg/kg/day,titrated to 1.0mg/kg/day at end of wk 1, then titrated up/down (final range 0.5-1.5 mg/kg/day, max daily dose 110mg)
ADMIN:Daily as divided dose (morning & late afternoon)
For this group's other interventions, move to the next record below
Record: 1 of 1
No Filter
Search
For the next group's interventions move to the next record below
Record: 1 of 2
No Filter
Search
Outcomes
OutcomeID
Usable
Reason
ADHDRS Hyper/Impuls.(Change from Bl
Record: 1 of 8
No Filter
Search
Notes about Outcomes
TAKEN AT:Baseline & Endpoint (Not clear when assesments were made between these times)
LOST TO F.U.: ATX 2/76, PLB 1/72 (Not incl.in ITT analysis)

Appendix 10: Quality checklists for diagnostic studies, clinical studies and reviews

The methodological quality of each study was evaluated using dimensions adapted from SIGN (SIGN, 2001). SIGN originally adapted its quality criteria from checklists developed in Australia (Liddel et al., 1996). Both groups reportedly undertook extensive development and validation procedures when creating their quality criteria. For information about how to use these checklists please see (*The Guidelines Manual*[5]).

Quality Checklist for a Systematic Review or Meta-Analysis			
Study ID:			
Guideline topic:		Key question no:	
Checklist completed by:			
SECTION 1: INTERNAL VALIDITY			
In a well-conducted systematic review:		In this study this criterion is: *(Circle one option for each question)*	
1.1	The study addresses an appropriate and clearly focused question.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.2	A description of the methodology used is included.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.3	The literature search is sufficiently rigorous to identify all the relevant studies.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.4	Study quality is assessed and taken into account.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.5	There are enough similarities between the studies selected to make combining them reasonable.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
SECTION 2: OVERALL ASSESSMENT OF THE STUDY			
2.1	How well was the study done to minimise bias? *Code* ++, + *or* –		

[5] Available from: www.nice.org.uk

1
2

Quality Checklist for an RCT			
Study ID:			
Guideline topic:		Key question no:	
Checklist completed by:			
SECTION 1: INTERNAL VALIDITY			
In a well-conducted RCT study:		**In this study this criterion is: (Circle one option for each question)**	
1.1	The study addresses an appropriate and clearly focused question.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.2	The assignment of subjects to treatment groups is randomised.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.3	An adequate concealment method is used.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.4	Subjects and investigators are kept 'blind' about treatment allocation.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.5	The treatment and control groups are similar at the start of the trial.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.6	The only difference between groups is the treatment under investigation.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.7	All relevant outcomes are measured in a standard, valid and reliable way.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.8	What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?		

1.9	All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention-to-treat analysis).	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.10	Where the study is carried out at more than one site, results are comparable for all sites.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
SECTION 2: OVERALL ASSESSMENT OF THE STUDY			
2.1	How well was the study done to minimise bias? *Code ++, + or –*		

1
2

Quality Checklist for a Cohort Study*			
Study ID:		Relevant questions:	
Guideline topic:			
Checklist completed by:			
SECTION 1: INTERNAL VALIDITY			
In a well conducted cohort study:		**In this study the criterion is: (*Circle one option for each question)***	
1.1	The study addresses an appropriate and clearly focused question.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
SELECTION OF SUBJECTS			
1.2	The two groups being studied are selected from source populations that are comparable in all respects other than the factor under investigation.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.3	The study indicates how many of the people asked to take part did so, in each of the groups being studied.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.4	The likelihood that some eligible subjects might have the outcome at the time of enrolment is assessed and taken into account in the analysis.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.5	What percentage of individuals or clusters recruited into each arm of the		

	study dropped out before the study was completed?		
1.6	Comparison is made between full participants and those lost to follow-up, by exposure status.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
ASSESSMENT			
1.7	The outcomes are clearly defined.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.8	The assessment of outcome is made blind to exposure status.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.9	Where blinding was not possible, there is some recognition that knowledge of exposure status could have influenced the assessment of outcome.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.10	The measure of assessment of exposure is reliable.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.11	Evidence from other sources is used to demonstrate that the method of outcome assessment is valid and reliable.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.12	Exposure level or prognostic factor is assessed more than once.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
CONFOUNDING			
1.13	The main potential confounders are identified and taken into account in the design and analysis.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
STATISTICAL ANALYSIS			
1.14	Have confidence intervals been provided?		
SECTION 2: OVERALL ASSESSMENT OF THE STUDY			
2.1	How well was the study done to minimise the risk of bias or confounding, and to establish a causal relationship between exposure and		

	effect? *Code ++, + or –*	

*A cohort study can be defined as a retrospective or prospective follow-up study. Groups of individuals are defined on the basis of the presence or absence of exposure to a suspected risk factor or intervention. This checklist is not appropriate for assessing uncontrolled studies (for example, a case series where there is no comparison [control] group of patients).

Quality Checklist for an RCT			
Study ID			
Guideline topic		Key question no:	
Checklist completed by:			
SECTION 1: INTERNAL VALIDITY			
In a well conducted diagnostic study:		**In this study the criterion is: (*Circle one option for each question)***	
1.1	The nature of the test being studied is clearly specified.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.2	The test is compared with an appropriate gold standard.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.3	Where no gold standard exists, a validated reference standard is used as a comparator.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.4	Patients for testing are selected wither as a consecutive series or randomly, from a clearly defined study population.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.5	The test and gold standard are measured independently (blind) of each other.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.6	The test and gold standard are applied as close together in time as possible.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable

1.7	Results are reported for all patients that are entered into the study.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
ASSESSMENT			
1.8	A pre-diagnosis is made and reported.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
SECTION 2: OVERALL ASSESSMENT OF THE STUDY			
2.1	**How reliable are the conclusions of this study?** ***Code ++, + or –***		
2.2	Is the spectrum of patients assessed in this study comparable with the patient group targeted by this guideline in terms of the proportion with the disease, or the proportion with severe versus mild disease?		

1
2

Appendix 11: Search strategies for the identification of health economics evidence

Search strategies for the identification of health economics and quality-of-life studies.

1 General search filters (see Appendix 8)

2 Health economics and auality-of-life search filters

a. MEDLINE, EMBASE, PsycINFO, CINAHL — Ovid interface

1 exp "costs and cost analysis"/ or "health care costs"/
2 exp health resource allocation/ or exp health resource utilization/
3 exp economics/ or exp economic aspect/ or exp health economics/
4 exp value of life/
5 (burden adj5 (disease or illness)).tw.
6 (cost$ or economic$ or expenditure$ or price$1 or pricing or pharmacoeconomic$).tw.
7 (budget$ or fiscal or funding or financial or finance$).tw.
8 (resource adj5 (allocation$ or utilit$)).tw.
9 or/1-8
10 (value adj5 money).tw.
11 exp quality of life/
12 (quality$ adj5 (life or survival)).tw.
13 (health status or QOL or well being or wellbeing).tw.
14 or/9-13

Details of additional searches undertaken to support the development of this guideline are available on request.

Appendix 12: Quality checklist for full economic evaluations

Author: **Date:**

Title:

	Study design	Yes	No	NA
1	The research question is stated	❑	❑	
2	The viewpoint(s) of the analysis are clearly stated	❑	❑	
3	The alternatives being compared are relevant	❑	❑	
4	The rationale for choosing the alternative programmes or interventions compared is stated	❑	❑	
5	The alternatives being compared are clearly described	❑	❑	
6	The form of economic evaluation used is justified in relation to the question addressed	❑	❑	
	Data collection			
1	The source of effectiveness data used is stated	❑	❑	
2	Details of the design and results of the effectiveness study are given	❑	❑	❑
3	The primary outcome measure(s) for the economic evaluation are clearly stated	❑	❑	
4	Methods to value health states and other benefits are stated	❑	❑	
5	Details of the subjects from whom valuations were obtained are given	❑	❑	
6	Indirect costs (if included) are reported separately	❑	❑	❑
7	Quantities of resources are reported separately from their unit costs	❑	❑	
8	Methods for the estimation of quantities and unit costs are described	❑	❑	
9	Currency and price data are recorded	❑	❑	
10	Details of currency of price adjustments for inflation or currency conversion are given	❑	❑	❑
11	Details of any models used are given	❑	❑	❑
12	The choice of model used and the key parameters on which it is based are justified	❑	❑	❑
	Analysis and interpretation of results			
1	Time horizon of costs and benefits is stated	❑	❑	
2	The discount rate(s) is stated	❑	❑	❑
3	The choice of rate(s) is justified	❑	❑	❑

4	An explanation is given if costs or benefits are not discounted	❑	❑	❑
5	Details of statistical tests and confidence intervals are given for stochastic data	❑	❑	❑
6	The approach to sensitivity analysis is given	❑	❑	
7	The choice of variables for sensitivity analysis is given	❑	❑	
8	The ranges over which the variables are varied are stated	❑	❑	
9	Relevant alternatives are compared	❑	❑	
10	Incremental analysis is reported	❑	❑	❑
11	Major outcomes are presented in a disaggregated as well as aggregated form	❑	❑	
12	The answer to the study question is given	❑	❑	
13	Conclusions follow from the data reported	❑	❑	
14	Conclusions are accompanied by the appropriate caveats	❑	❑	

1

Appendix 13: Data extraction form for economic studies

Reviewer: **Date of Review:**

Authors:

Publication Date:

Title:

Country:

Language:

Economic study design:

- ❑ CEA
- ❑ CBA
- ❑ CUA
- ❑ CMA
- ❑ CCA
- ❑ CA

Modelling:

- ❑ No
- ❑ Yes

Source of data for effect size measure(s):

	❑ Meta-analysis
❑ RCT	❑ RCT
❑ Quasi experimental study	❑ Quasi experimental study
❑ Cohort study	❑ Cohort study
❑ Mirror image (before-after) study	❑ Mirror image (before-after) study
	❑ Expert opinion

Comments _____

Primary outcome measure(s) (please list):

_____

Interventions compared (please describe):

Treatment: _____

Comparator: _____

Setting (please describe):

_____

_____

Patient population characteristics (please describe):

_____

_____

_____

Perspective of analysis:

❑ Societal ❑ Other: _____

❑ Patient and family

❑ Health care system

❑ Health care provider

❑ Third party payer

Time frame of analysis: _____

Cost data:

❑ Primary ❑ Secondary

If secondary please specify: _____

Costs included:

Direct medical	Direct non-medical	Lost productivity
❑ direct treatment	❑ social care	❑ income forgone due to illness
❑ inpatient	❑ social benefits	❑ income forgone due to death
❑ outpatient	❑ travel costs	❑ income forgone by caregiver
❑ day care	❑ caregiver out-of-pocket	
❑ community health care	❑ criminal justice	
❑ medication	❑ training of staff	

Or

❑ staff

❑ medication

❑ consumables

❑ overhead

❑ capital equipment

❑ real estate Others: _____

Currency: _____ **Year of costing:** _____

Was discounting used?

❑ Yes, for benefits and costs ❑ Yes, but only for costs ❑ No

Discount rate used for costs: _____

Discount rate used for benefits: _____

Result(s):

_____

_____

_____

_____

Comments, limitations of the study:

_____

_____

_____

Quality checklist score (Yes/NA/All): ……/……/……

1

Appendix 14: Evidence tables for economic studies

Study and country	Intervention details	Study population Study design Data sources	Study Type	Costs: description and values Outcomes: description and values	Results: Cost-effectiveness	Comments Internal validity (Yes/No/NA)
Donnelly et al., 2004 Australia	Interventions: MPH DEX Comparator: Standard practice (contact with health services but no medication)	Australian children aged 4-17 years who seek care for ADHD in 2000 but do not receive stimulants (N = 21,000) Decision-analytic modelling Source of clinical effectiveness data: meta-analysis of RCTs Source of resource use and measure of severity of ADHD: National Survey of Mental Health and Wellbeing Source of unit costs: national sources	Cost-utility analysis	Costs: healthcare costs • Drug acquisition costs • Healthcare professional contacts (GPs, paediatricians, psychiatrists) Mean incremental cost versus standard practice (N = 21,000): MPH: $1.7million DEX: $7million Primary outcome: DALYs averted Mean % of years lived with disability avoided with intervention versus standard practice (N = 21,000): MPH: 25 DEX: 23	MPH versus standard practice: $15,000/DALY saved (95% CI: $9,100 to $22,000) DEX versus standard practice: $4,100/DALY saved (95% CI: DEX dominant to $14,000) DEX dominated MPH (equally effective but cheaper)	Perspective: health care sector (overall government and patient) Currency: Aus $ Cost year: 2000 DALYs generated using previously published disability weights and the "survey severity method" Time horizon: one year Discounting: not needed Internal validity: 25/4/6
Gilmore and Milne, 2001 UK	Intervention: MPH Comparator: No treatment (placebo)	Children aged 6-12 years with hyperkinetic disorder Decision-analytic modelling Source of clinical effectiveness data: literature review Resource use estimates: expert opinion	Cost-utility analysis	Costs: healthcare costs • Drug acquisition costs • Outpatient clinic costs Mean cost per 100 children: MPH: £51,930; Placebo: 0 Primary outcome: QALYs Mean QALYs per 100 children: MPH: 94.06; Placebo: 88.4	MPH versus placebo: £9,177/QALY Range of ICER in sensitivity analysis: from £5,782 to £29,049/QALY	Perspective: NHS Currency: UK £ Cost year: 1997 QALYs generated using the Index of Health Related Quality of Life (IHRQL) Time horizon: one year Discounting: not needed Internal validity: 28/1/6

		Source of unit costs: national sources and local trust tariffs				
King et al., 2006 UK	Interventions: MPH-IR MPH-MR-8hrs MPH-MR-12hrs ATX DEX Plus all the above medications combined with behavioural therapy Comparator: No treatment (placebo) Strategies assessed: 37 strategies in total, consisting of 18 possible sequences of 3 active treatments, 18 respective sequences of combination therapies, plus no treatment	Children aged 6 years with ADHD Decision-analytic modelling Source of clinical effectiveness data: systematic literature review and meta-analysis; mixed treatment comparison model Source of resource use estimates: expert opinion Source of unit costs: national sources	Cost-utility analysis	Costs: healthcare costs • Drug acquisition costs • Healthcare professional contacts (psychiatrists, paediatricians, GPs) • Laboratory testing Mean cost per child: Active treatment sequences: ranging from £1,098 (DEX-[MPH-IR]-ATX) to £1,563 (ATX-[MPH-MR-12hrs]-DEX) No treatment: £1,223 Primary outcome: QALYs Mean QALYs per child: Active treatment sequences: ranging from 0.8273 ([MPH-MR-8hrs]-ATX-DEX) to 0.8289 (DEX-[MPH-IR]-ATX) No treatment: 0.7727	Analysis including sequences of medication alone plus no treatment: DEX-[MPH-IR]-ATX was dominant (remained in most scenarios explored) Probabilistic analysis: DEX-[MPH-IR]-ATX most likely cost-effective option for willingness to pay between 0 and £60,000/QALY Sub-analysis including Combo strategies: all therapies except two were ruled out by dominance; of the two remaining: Combo (DEX-ATX-[MPH-MR-8hrs]) versus DEX-[MPH-IR]-ATX: £1,241,570/QALY	Perspective: NHS and Personal Social Services Currency: UK £ Cost year: 2003 QALYs based on EQ-5D questionnaires (Coghill et al., 2004) Time horizon: one year (secondary analysis: 12 years) Discounting: only in secondary analysis, 6% in costs and 1.5% in benefits; not needed in the primary analysis Internal validity: 26/4/5
Lord and Paisley, 2000 UK	Intervention: Combination therapy: MPH and Behavioural Therapy (Combo)	Children with ADHD Decision-analytic modelling Source of clinical effectiveness	Cost-effectiveness analysis	Costs: healthcare costs • Drug acquisition costs • Costs of pharmacotherapist (BT costs omitted - common in 2 arms)	Combo versus BT: £1,596/SMD Range of ICER in sensitivity analysis:	Perspective: NHS Currency: UK £ Cost year: 1999 Time horizon: 14 months Discounting: not needed

	Comparator: Behavioural Therapy (BT)	data: the MTA study Source of resource use estimates: expert opinion Source of unit costs: national sources		Incremental cost of Combo versus BT: £750 Primary outcome: Standardised mean difference (SMD) in the SNAP-IV score SMD of Combo versus BT: 0.47	from £694 to £4,545/SMD	Internal validity: 26/1/8
The MTA Cooperative study Jensen et al., 2005 Foster et al., 2007 US	Intervention: Medication management (Med) Intensive behavioural treatment (BT) Combination therapy (Combo) Comparator: Community care, including some medication (CC)	Children aged 7-9.9 years with ADHD combined type (ADHD-all) Source of clinical effectiveness and resource use data: six-site RCT (N=579) Source of unit costs: national sources	Cost-effectiveness analysis	Costs: healthcare costs • Drug acquisition costs • Healthcare professional contacts (psychiatrists, psychologists, paediatricians) Teacher and teachers' aides costs Mean cost per child (ADHD-all): Med: $1,180; BT: $6,988; Combo: $8,827; CC: $1,071 Primary outcome: *Jensen et al.*: proportion of "normalised" children; normalisation defined by a score 0 or 1 on the SNAP scale Proportion of normalised children in ADHD-all: Med: 56%; BT: 34%; Combo: 68%; CC: 25% *Foster et al.*: change on Columbia Impairment Scale (CIS) effect size (ES)	*Jensen et al.*: ADHD-all: BT dominated by Med Med versus CC: $360 per normalised child Combo versus Med: $55,253 per normalised child *Foster et al.*: Results presented as Cost Effectiveness Acceptability Curves for ADHD-all and ADHD with and without coexisting conditions ADHD-all: Med cost-effective at willingness-to-pay (WTP) up to roughly $55,000 per CIS ES; at higher WTP, Combo cost-effective. Pure ADHD: Med cost-effective at any WTP ADHD-internalising disorder: Med cost-	Perspective: 3rd party payer Currency: US$ Cost year: 2000 Time horizon: 14 months Discounting: not needed Internal validity: 22/4/9

				Mean change on CIS ES (per child with pure ADHD without coexisting conditions): Med: -0.92; BT: -0.70; Combo: -0.86; CC: -0.60	effective at low WTP; BT cost-effective at higher WTP ADHD-externalising disorder: Med cost-effective at low WTP; Combo cost-effective at higher WTP ADHD-both internalising and externalising disorders: Med cost-effective at low WTP; results unclear at high WTP	
Narayan and Hay, 2004 US	Intervention: MPH IR AMP/DEX mixed salts Comparator: No treatment	Males aged 9 years, weighing 28kg, with uncomplicated ADHD Decision-analytic modelling Source of clinical effectiveness data: literature review Source of costs: literature review and national sources	Cost-utility analysis	Costs: healthcare costs (drugs, outpatient visits, lab-tests), school administration costs, out-of-pocket expenses Mean cost per child: MPH IR: $3,053; AMP/DEX: $3,000 No treatment: $994 Primary outcome: QALYs Mean QALYs per child: MPH IR: 0.838; AMP/DEX: 0.889 No treatment: 0.798	MPH dominated by AMP/DEX AMP/DEX versus no treatment: $21,957/QALY One-way sensitivity analysis: compliance is the major driver of the results	Perspective: stated as societal but indirect costs not included Currency: US$ Cost year: 2003 QALYs generated using the Index of Health Related Quality of Life (IHRQL) Time horizon: one year Discounting: not needed Internal validity: 23/6/6
Zupancic et al., 1998 Canada	Intervention: MPH DEX Pemoline (PEM) Psychological therapy (PSYCH) Combination of MPH and PSYCH	Males aged 9 years, weighing 28kg, with ADHD Decision-analytic modelling Source of clinical effectiveness data: systematic literature review and meta-analysis	Cost-effectiveness analysis	Costs: direct healthcare costs • Drug acquisition costs • Laboratory testing costs • Healthcare professional contacts (GPs, paediatricians, psychiatrists, psychologists) • Costs of parent and teacher training	MPH dominated all strategies except PEM; result remained through most sensitivity analyses MPH versus no treatment: $64 per	Perspective: 3rd party payer (ministry of health) Currency: Can$ Cost year: 1997 Time horizon: one year Discounting: not needed Internal validity: 27/0/8

	(COMBO) <u>Comparator:</u> No active treatment (No treat)	Source of resource use estimates: published survey and expert opinion Source of unit costs: national sources		• Cost of toxic hepatitis caused by PEM Mean cost per child: No treat: $128; MPH: $559; DEX: $566; PEM: $829; PSYCH: £1,946; COMBO: $2,505 <u>Primary outcome:</u> Change in the Conners Teacher Rating Scale Score (CTRS) Mean change in CTRS score per child: No treat: 0; MPH: 6.7; DEX: 4.7; PEM: 7.8; PSYCH: 0.3; COMBO: 3.8	point change in CTRS score PEM versus MPH: $246 per unit change in CTRS score	

Appendix 15: Focus group study of children and young people's experience of psychostimulant medication

The perceptions, knowledge and attitude toward stimulant medication for ADHD: A focus group study of children and young people diagnosed with ADHD

Dr Ilina Singh
London School of Economics and Political Science

Sinead Keenan
London School of Economics and Political Science

Dr Alex Mears
Healthcare Commission

7 December 2007

INTRODUCTION

Stimulant medication is a widespread and generally supported treatment for Attention Deficit Hyperactivity Disorder (ADHD). While the benefits are well-recognised, so are the negative side effects (Kutcher et al, 2004; DuPaul & Barkley, 1990). In addition to understanding the clinical and cost effectiveness aspects of the use of these interventions, an important function of developing this guideline is capturing the voice of the service user; this is particularly pertinent where the user is a young person.

In order to capture a sufficient breadth of context and depth of understanding it was decided to use a qualitative methodology, the focus group. The following sections contain an in-depth consideration of the use of this methodology with young people as participants, a comparison of quantitative and qualitative methodologies, a review of the little literature available on young people's experience of medication for ADHD, supplemented by a broader consideration of young people's experiences of medication for other conditions.

It is important to understand that the current research investigated the perceptions, knowledge of and attitude to stimulant medication for ADHD as a primary focus, rather than a broader consideration of the diagnostic process and use of other interventions. The latter are peripherally considered, however, both in the following review of literature and in the experimental phase.

Using qualitative research methods in young people

The use of qualitative methods with young people has been recognised as a valuable route to a closer understanding of children's perspectives of their illness experience (Woodgate, 2000a). These methods tend to yield information that is more of a reflection of the perspectives of the child participants, rather than those of the adult researchers (Woodgate, 2000a). There are, however, considerations attached to the use of these techniques in young people, over and above those inherent with this kind of data collection. Curtin (2001) highlights the need to examine perceptions of children's competence, consider the inequality of power between the child participants and the adult participants, and bridge the generational differences in communication styles. There is also a need to consider the reconciliation between the requirements of the sponsors of the research, and the ideals of participation (Hill et al, 1996). Ireland & Holloway (1996) also raise the asymmetrical relationship between researcher and participants. They go on to consider the difficulties relating to access to participants, as well as ethical and developmental issues. They highlight the requirement for adequate safeguards and an awareness of the potential hazards. Kortesluoma et al (2003) assert that there is very little guidance available for conducting this kind of research, the empirical and conceptual foundation for child interviewing is not very clear. The method chosen should suit both the purpose and context.

The literature together forms a narrative that has a clear message- extra care is required both in the design and execution of data collection methods to ensure that information gathered are robust and useable, and that all ethical considerations relating to the vulnerable participant group are met. Much of what has been written describes the potential hazards around interviewing young people. While our chosen focus group methodology shares many of these, some are lessened (i.e. the power inequality), although there are others that must be taken into consideration which are extensions of generic focus group issues. These are not considered in the literature, so have been taken into account by the research team through extrapolation of knowledge from both arenas.

In order to ensure that competing needs of the research sponsors and ethical consideration were reconciled, our research proposal was reviewed by the Guideline Development Group, a nationally sanctioned ethics committee and local R&D committees. The research team undertaking the focus groups were experienced both in qualitative methodologies and working with young people, and carefully researched the issues described above prior to data collection.

Young people's experience of stimulant medication

As highlighted above, the importance of the service user's voice has been recognised in the methodology for this guideline. It is important, when

preparing for a focus group, to understand whatever previous research has contributed to the knowledge of the subject area, to give a structure to the issues to be considered, and to identify what gaps in knowledge exist to give focus to the investigation.

However, as pointed out by Kendall et al (2003): "Rarely are children's and adolescent's perspectives heard in regard to ADHD" (p. 114). In recognition of the paucity of research in this field, Kendall and colleagues (2003) collected qualitative data from 39 children and adolescents with a diagnosis of ADHD regarding their perceptions and experiences of living with the disorder. Their findings showed that taking pills was a common theme. Both positive and negative aspects of pill-taking were mentioned. For example, many of the children spoke of how much the medication helped them in terms of controlling their hyperactivity, increasing their concentration, improving their grades and helping them to be better behaved. When children were asked what helped the most with managing their ADHD, the majority reported that it was the medicine.

However participants also mentioned negative aspects of pill-taking, e.g. pills tasting bad and side effects including stomach-aches and headaches. Significantly, what was of more concern to the participants was the stigma associated with taking pills to manage their behaviour. Children mentioned not wanting anybody to know that they took pills for fear of being laughed at. A number of participants also talked about not wanting to take medication because they did not like the change it made in them. According to one participant: "I don't like it. I just want to be myself. My Mom makes me take it so I can focus…but I just want to be myself". Other comments included: "It just like changes me…it makes me awful, like this way…It's like, I don't like to play that much anymore" and "Ritalin. I don't take it anymore. I didn't like how I felt on it. I felt real depressed on it."

Recent research has investigated potentially mitigating factors. Meaux et al (2006) conducted qualitative interviews to explore the factors contributing to whether or not children/adolescents continue to use prescription stimulant medications as they progress through developmental stages. Although this research was conducted with college students (n=15), their reflections on taking medications as children are revealing.

The data revealed a "trade-off" between the positive and negative effects of the medication. Participants unanimously confirmed that stimulant medications improved their concentration and focus. The greatest benefits mentioned by participants were being able to study longer, completing more school work, and improving reading comprehension. However, all of the participants described negative physiological and psychological side effects of stimulant medication. Several felt the medication made them less sociable: "It made me feel like I didn't have friends. I didn't ever really play that much"

(p.220). Others described medication as "taking away from the person I am". Interestingly, participants who were diagnosed with ADHD later and began taking stimulant medications later were more positive and insightful in their perception of general social effects to those who were diagnosed in early elementary school.

Talking about their experiences and feelings about having to take medication during the school day evoked strong emotions. The sense of stigma was reiterated in this study, with most participants describing the frustration, anger, sadness, and embarrassment of having to leave their classroom to receive medication. The authors comment how medication may in fact make children with ADHD more aware of their differences and difficulties, leading to decreased initiative and feelings of self-worth. In some cases the feeling of being different eventually led them to stop taking their medications.

While participants who were diagnosed in elementary school seemed to have their self-identity defined by ADHD and viewed medication as "changing who they were", participants who were diagnosed later described themselves as having "strong personalities" and viewed medication as a means to manage the challenges of ADHD. This comparison should be treated with caution however given the limited sample size. Meaux and colleagues conclude that higher levels of education about prescription medication and more careful management are required to reduce side effects and minimise the risks of misuse.

The "trade-off" between the positive and negative dimensions of stimulant medications has also been echoed in other studies. Of 102 participants surveyed, Efron et al (1998) found that most children in their study viewed medication effects favourably although a substantial proportion experienced their medication adversely. Side-effects were found to be the main determinant of children's perceptions of negative impact. In a study of mother and child perceptions of stimulant medication, McNeal et al (2000) found that mothers perceived the medication to be more beneficial than did the children. Of note, children's views about the benefits of medication became more positive as their concern increased over the problems associated with the condition.

One other piece of research directly gathered data on young people's knowledge of and attitude to stimulant medication. However this study is considerably dated (conducted by Baxley et al in 1978) and concerned the views of participants with 'hyperactive child syndrome' (a diagnostic category preceding ADHD). The researchers found that the young people were generally knowledgeable about their medication, yet had a mixed attitude to having to take it, and associated not taking it with certain negative consequences. Many of the issues raised in this study and those outlined above are explored further in the current research.

Self-perception in young people with ADHD

A number of papers consider the issue of self-perception among hyperactive children, from differing perspectives. While this is not directly relevant to our methodology, it provides valuable background about young people with ADHD. What follows is a chronology of this research.

Hoza et al (1993) found that there was no difference between young people with ADHD and those without in comparisons of self-perceived competence and global self-worth (when internalising symptomology was taken into account). Further, they found that while the ADHD diagnosed children showed higher scores on the Children's Depression Inventory, this difference was not significant when behaviour, school and social problems were excluded. Self-perceptions may be used to mediate performance in challenging academic and social situations. In another study, Dumas et al (1999) showed that children with ADHD perceive themselves as less competent in all areas of self perception tested (scholastic competence, social acceptance, behavioural conduct) apart from athletic competence. This would seem to directly contradict Hoza's findings 6 years earlier.

Krueger and Kendall (2001) found that an ADHD adolescent's sense of self is distorted, and that the development of self has been disrupted due to the neurobiology of the ADHD and the environmental factors associated with the parenting of a difficult child. Significantly, it was found that adolescents defined themselves in terms of their ADHD traits and symptoms and did not perceive themselves as being distinct from the disorder. In other words, their experience of ADHD was intrinsically related to their identity. Therapeutic interventions to address self-function are recommended to aid the stabilisation of the self.

Adding a further dimension, Frame et al (2003) showed that participation in a school-based, nurse led support group was associated significantly with increases in scores on 4 self-perception sub-scales (social acceptance, athletic competence, physical appearance and global self-worth). Hoza et al (2004) found that children with ADHD are more likely to over-estimate their competence in comparison with an adult's assessment. Barber et al (2005), in contrast, with Hoza's 1993 study, found that children with ADHD had lower self-perception scores than those without the condition. This is attributed to the cumulative effect of years of low self-esteem and negative self-perception. They suggest that support groups and behavioural training may be a route to improving self-esteem and self-perception. There appears to be a disparity between these findings, particularly between Hoza and Barber and Dumas. This is likely to be due to different methodological and analysis techniques, but is not of direct relevance to current work.

Other papers investigated the effect of medication on aspects of performance. Medication versus placebo was found to increase correspondence between participant's self-evaluations and performance of a task, although generally effort or ability were significantly more likely to be attributed as the cause (Millich et al, 1989). This finding was confirmed by Pelham et al (2002), who additionally found that medication improved behaviour (this was not related to expectancy), and that failure was attributed to the task difficulty and the effects of medication.

Young people's experience of medication for other conditions

Since the theoretical background relating to children's experience of medication for ADHD is less prolific, it was felt to be advisable to widen the consideration of literature to include young people's experience of medication for other conditions. It was felt that the issues of stigma, labelling and difference would be common or at least similar to that experienced by children prescribed stimulants for ADHD. A study by McElearney et al (2005) compared the knowledge and perceptions of young people with ADHD or epilepsy of their respective medications. More of the stimulant group (40% v 32.5%) categorised themselves as non-compliant. There was a significant difference between the 2 groups in regard to confiding in friends about their medication. A greater number of the epilepsy group (55% v 32.5%) reported they would tell a friend about their medication, indicating perhaps that ADHD is a more stigmatising illness than epilepsy.

More generally, Riis et al (2007) found that healthy young people were more reluctant to take any medication that would alter fundamental traits (such as social comfort) than to take those that improve non-fundemental traits (e.g. concentration ability). Implications for ADHD stimulant medication are clear, although research would need to specifically test this hypothesis in that group to ensure that confounding factors do not reduce, remove or even reverse the observed effect. Buston and Wood (2000) found that young people with asthma would not comply with their medication regime because they felt it was ineffective, due to a denial of their condition, inconvenience, fear of side effects, embarrassment or laziness. This is in spite of a belief in the importance of the medication, usually following a negative experience of non-compliance. Barriers exist, however, leading to lack of compliance. This paper shows that the relationship between compliance drivers and non-compliance drivers is complex, and will be investigated during the current study.

Summary

The literature considered above gives a useful if far from comprehensive view of young people with ADHD and their relationship with prescribed medication. This is a poorly researched and therefore little understood area, and there is a clear need for the current research, especially in the context of the forthcoming NICE Guideline.

METHOD

Sample

The sample consisted of 16 children (14 boys and 2 girls) who ranged in age from 9 to 15 years old. All participants were attending state schools and with the exception of one child who was of mixed race, all the children were white. 50% of the children were living in two-parent homes, and 37% of children lived in single-mother homes. Two children lived with their father; and one child lived with his grandmother. Educational achievement and type of employment were used as indicators of socio-economic status (CITE).[6] A majority of parents had completed O-levels; one parent had attended university. 72% of parents' job types ranged from semi-skilled to skilled work. A majority of mothers did not report having employment.

Child participants had all been diagnosed with ADHD and all were taking stimulant medication. Participants were recruited from clinics at 3 hospitals: Richmond Royal Hospital, London; The Maudsley Hospital, London; and Queen's Medical Centre, Nottingham.

Data Collection

Semi-structured focus groups were used to collect data about how children and adolescents experience stimulant medication. Allowing children to describe their experiences through qualitative interviews has been found to be both reliable and valid (Deatrick & Faux, 1991; Sorensen, 1992). Furthermore, there is compelling evidence to suggest that children are competent research participants (Singh, 2007). Children's competence as research participants is supported by the literature on children's capacity and competence as patients. Children have been found to be capable of understanding the complexities of their condition; they have the capacity to give informed consent to invasive treatments, to contribute to deliberations over treatment strategies, and, in the case of diabetic children, to take responsibility for administering their own treatment (Alderson et al, 2006; Bluebond-Langner et al, 2005).

13 children were interviewed as part of a series of focus groups. 3 children were interviewed one-to-one, either because they were unable to attend the focus groups or because of a preference to be interviewed individually. Participants were interviewed in a room based at the hospital clinic. Interviews lasted approximately one hour. Written informed consent was obtained from one parent and also from the participant. Parents were also asked to complete a basic demographic questionnaire.

Focus group methodology

Focus groups are a widely used method in qualitative health research. They are often used when the research aim is to gather information in a little-

[6] Data was only available on mothers. Fathers' educational achievement and job types would be more reliable indicators of socio-economic status.

understood or under-researched area. Focus groups elicit a range of experiences, opinions and feelings about a topic (Krueger & Casey, 2000). The interaction in focus groups can result in enhanced disclosure, as participants challenge each other's perceptions and opinions. Focus groups with children are less commonly used in social science health research; however, market research with children, including market research around health and well being, more commonly uses a focus group approach (eg Caruana & Vassallo, 2003). Focus groups with children provide access to children's own language and concepts, and encourage elaboration of children's own concerns and agendas. The collective nature of focus group discussion is often said to provide "more than the sum of its parts" (Wilkinson, 1998). Interactive data result in enhanced disclosure, better understanding of participants' own agendas, the production of more elaborated accounts, and the opportunity to observe the co-construction of meaning in action. Focus groups are, then, an ideal method for exploring people's own meanings and understandings of health and illness

Interviews

Interviews were conducted in a conversational style and included a standard set of open-ended questions (see appendix 1 for the complete topic guide). The first half of the interview involved posing broad questions that were followed by more specific probe questions. Principle areas of investigation are listed below:

Figure 1: Principle areas of investigation

children's understanding of ADHD diagnosis and behaviours
children's perceptions of how tablets helped them (or not)
children's experiences of stigma
children's experiences of non-drug interventions for ADHD behaviours
impact of tablets on children's perceptions of personal agency
children's experiences of psychiatric services

The second half of the interview involved a set of games and a vignette which provided children with the opportunity to elaborate their experiences and perceptions of medication in more creative and imaginative ways. The primary aims in this section of the interview were to:

a. contextualize children's perceptions of tablets within their perceptions/understandings/experiences of other means of improving behaviour

b. elicit ideas from children about resources that could help them have more positive experiences of ADHD diagnosis and medication

The following methods were used in the second half of the interview (see appendix 1 for further elaboration).

1. Children were asked to compare how the experience of taking tablets was similar to, or different from, doing other things that were commonly considered good for them (figure 2).

Figure 2: How do tablets compare?

Let's imagine there are other things you could do that helped you with your behaviour. How are these the same as, or different from, taking your tablets? Which would you rather be doing? Piano lessons Vitamins Eating green vegetables Brain implant

2.Children were asked to respond to a vignette that elicited their ideas about what sorts to things can help a child's behaviour (figure 3)

Figure 3: Interventions Vignette

Your favourite sports hero/heroine drops by one night wanting advice from you. He/she has a won who is having difficulty with his behaviour, especially his attention, focus, concentration. The doctor thinks the child has ADHD. Your sports hero wants to know what kinds of things he/she can do to help the child's behaviour get better. Let's make a list of things we know that can help this child.

3.Children were asked to think up and discuss an invention that could help children with ADHD.

4.Children were asked to rank order a list of items that described common concerns voiced by school-age children. Each item was written on a separate card, and children were asked to put the cards in order of what they worried about most, to what they worried about least. The list included the following items:

Global warming
Having ADHD
Taking tablets
Exams
Homework
friendships

Global warming and exams were included on the list because these concerns were found to be significant sources of anxiety in a recent large cohort study of UK school-age children (Alexander & Hargreaves, 2007)

Data Analysis

All interviews were digitally recorded and transcribed. All interviews analysed using rigorous qualitative coding practices that meet established

criteria of validity and relevance to qualitative health research (Mays & Pope 2000). Focus groups were coded using content analysis. The coding process captured the data on two analytic levels: individual concepts were coded first, then these concepts were grouped together under higher order themes. Systematic coding meant that it was possible to code at both the individual level and at the group level. Group level data were represented in the frequency with which concepts and themes were expressed by group members. Transcript excerpts elucidated the meaning of codes.

A coding frame was drawn up by the lead author (IS) and validated within a coding team. The coding team applied the same codes to a transcript in order to discuss their definition and validity. This discussion resulted in refinements to the structure of categories and sub-categories, as well as refinements to individual codes. The coding team was able to reach agreement on the validity of a majority of codes.

RESULTS

I. ADHD Behaviours

Throughout the interviews and focus groups, children identified a broad range of behaviours as symptoms of ADHD (figure 4). This range maps on to the symptoms outlined in DSM-IV and ICD-10. The most frequently discussed types of behaviours were impulsiveness, physical aggression, and hyperactivity. Children discussed impulsiveness in terms of *an inability to restrain themselves from verbal or physical reactions*. Impulsiveness frequently overlapped with physical aggression, which children discussed as *punching, kicking, pulling hair, usually of other children, but also sometimes of adults.* Anger was an important motivating emotion in these activities, but children also frequently reported feeling regret for their actions immediately afterwards. Hyperactivity was discussed in strong terms by children, including *going mental, mad, beserk, nuts*. Children felt these types of behaviours to be particularly annoying to others.

Behaviours identified as symptomatic of ADHD were also frequently discussed in terms of their positive dimensions. Hyperactivity especially was *fun, feels good,* and *lets off steam*. Children felt *powerful* when acting aggressively and hyper; in some cases, children thought these behaviours gave them increased credibility with peers. Peers were thought to fear how out-of-control and overwhelming children with ADHD could be. Children were able to perceive the tension between their experiences of the more negative and more positive aspects of their ADHD symptomatic behaviours. The majority of participants were not disturbed by this tension.

Figure 4: ADHD behaviours and their qualities

Behaviours associated with ADHD	Qualities of ADHD behaviours

Hyperactivity	Out of control
Difficulty concentrating	Overwhelming
Difficulty with organization	Angry
Physical impulsiveness	Frustrating
Verbal impulsiveness	Powerful
Physical aggression	Fun
Verbal aggression	A release
Disruptive	Sad
Difficulty making friends	Difficult
Difficulty learning	
Inability to sit still	
Frustration	
Poor at sports	
Good at sports	

II. Tablets: Perception of impacts

Children discussed a range of ways in which their tablets helped them (see figure 5. Tablets were discussed primarily in terms of their impact on social behaviour, and less in terms of their impact on school work and school-related functioning. The positive effects of the tablets on behaviour were reported most clearly and consistently by children with aggression problems (see textbox 1). They reported that tablets helped them not to feel *angry;* the tablets helped to *calm* them down, and to *think first* before acting out. Children felt that these positive effects had an associated positive impact on their ability to make and retain *friendships.*

The most salient impact of tablets in the classroom context was their perceived effect on *disruptive behaviour.* Many children reported that tablets helped them to be *less disruptive* in the classroom. *Disruptiveness* was discussed both in terms of verbal disruptiveness (*I'm always talking when I shouldn't be*); and physical disruptiveness (*I can't sit still*). Most groups had to be encouraged to identify other ways in which tablets might be having an impact on school work and school-related functioning. Children thought that tablets had a positive effect on their ability to focus and to concentrate on work. This positive impact overlapped with children's improved ability to contain their physical and verbal energies *(I can sit there and do my work better*). Children also reported that aspects of their school work, such as writing and maths, had improved as a result of tablets. Some children reported receiving better marks in school and on standardized tests as a result of taking tablets.

Textbox 1: Perceived impact of tablets on anger

Male child:

It's like a wall between the rest of my body and my anger, and it's like a thousand to one against – with my anger. And I can't – just can't control it

until I've took my tablets or until I get home…

However, discussion of the positive impacts of tablets on school work was frequently associated with individual and collective disagreement as to the validity of a particular impact. For example, some children felt that tablets had a positive impact on reading, writing and maths; and others did not. The degree of effects on school work and school-related functioning was also debated. For example, some children felt that tablets did improve their focus and concentration on school work, but they also still reported having significant trouble in this area.

Figure 5 Areas in which tablets help

concentration	writing
impulsiveness	reading
physical aggression	maths
peer relationships	homework
relationship with teacher	behaviour towards teacher
performance on tests	self-confidence
school marks	self-esteem
relationship with parents	
relationship with siblings	

III. Attitudes toward tablets

i. Basic knowledge about tablets

Children's knowledge of the name of their tablets and frequency of dosing was generally good. Most children were able to identify these. Children's knowledge of their dosage level was weaker, and was often expressed in terms of how many tablets they had to take in one day. A few children identified their tablets as "stimulants" and discussed stimulants as *real drugs*. Most children, but not all, understood that their tablets had a primary impact on the brain.

ii. Expressed attitudes

Generally, children had positive attitudes toward their medication for ADHD (see figure 6). Most children felt taking this medication was *necessary* for them, and it had become a *normal* part of their lives. They resisted alternatives to medication largely due to an unwillingness to experiment with something different; children felt their tablets were *familiar, relatively easy to take, and safe*. When asked to consider how a list of non-medical means of improving behaviour (see Section IV.ii) might match up against tablets in terms of efficacy, all children felt that tablets were the most efficacious form of treatment for ADHD behaviours. They also felt that tablets were an *essential*

part of treatments that incorporated non-medical means of improving behaviour.

Children did not report having strong anxieties about taking medication. When asked to rank a list of stressors from least to most anxiety-provoking, tablets were consistently at or near the bottom (see Textbox 2).

Textbox 2: Contextualizing the burden of ADHD diagnosis and medication

Here are some things children worry about. (Stressors were written on individual cards). Can you line them up for me in order of the things you worry about most, to the things you worry about least. You can line them up and then see if it's right. If not you can discuss and re-arrange things.

Global warming
Having ADHD
Taking tablets
Exams
Homework
friendships

In the context of this generally positive attitude, more negative reactions to medication were also frequently expressed. The most frequently expressed reaction was also the most difficult for children to explain: a feeling that tablets were *annoying*. Participants appeared to have a shared understanding of this experience of tablets, even though the experience was difficult to communicate to others. The annoying nature of tablets was most often related to the *need to take them*. It was unclear whether it was the pragmatics of taking tablets (eg, daily dosing, remembering to take tablets; taste of tablets); the requirement of taking them (eg not having a choice); or the more existential meaning of the need for tablets (eg having a mental disorder, being "different") that was most distressing to children. All these dimensions were inherent to varying degrees in the expressed experiences of tablets being annoying.

Figure 6: Expressed attitudes toward tablets

normal	bad tasting
easy	annoying
ok-tasting	change a person
known risks	
familiar	
best alternative	
essential	
necessary	

iii. Relationship of tablets to sense of self

Almost all children believed that they needed to be on their medication for ADHD. Perceptions of the need for tablets ranged from medium to high. If a child raised a question about his/her need for medication, other children would frequently challenge the child's view. Understanding of how long it was necessary to stay on medication was not as frequently shared. Some children felt that they would *grow out of ADHD*; others felt it was a *life-long illness*. Some children referenced the fact that adult ADHD was now a recognized disorder. Most children felt it would become possible to cope with ADHD behaviours without the help of medication. Older children were more likely than younger children to question the need for life-long medication, and more likely than younger children to talk about a desire to come off medication in the near future.

Children tended to have a continuous, rather than a dichotomous, sense of themselves on and off tablets. Only a few children expressed feeling that they were *a different person* on and off medication; eg being a *Jekyll and Hyde*. On further probing, such initial dichotomous statements were amended into continuous self-descriptions.

Most children expressed ambivalent self-conceptions on an off medication. For example, some children felt they were *more fun* off medication; but these same children knew that when they were more *free* they were also potentially *more annoying* to others and more *out of control*. Some children described themselves as *more normal* off medication, which was a positive self-description. However, they also described their normal selves as *beserk* and *mental*, which was *fun* in certain situations, but *horrible* in others. Children had a good understanding of the context-bound nature of how their behaviours would be interpreted. Their evaluations of their own behaviours as well as their evaluations of the need for tablets were strongly associated with their understanding of context.

iv. Experience of side-effects

The most commonly discussed side-effects of tablets were problems with appetite and sleep. A few children had experienced *acting like a zombie* on certain medications and/or at certain dosage levels. For most children side effects were not expressed as severe problems, even if in some cases, children reported getting extremely little sleep. In the context of the group discussion, side-effects were reported with a degree of authority and even pride, which may have mitigated against fuller discussion of how problematic these experiences actually were.

v. Compliance

Compliance with medication was reported to be generally good, especially amongst the younger children. Older children were more likely to have

experimented with not taking their medication to see whether anyone would notice, and to see how well they themselves could control their behaviours. Other reasons for not taking medication were related to medication being *annoying*. Some children said that sometimes they just *couldn't be bothered* to take their medication. A majority of children in this study were responsible for remembering to take their medication. Younger children were more likely to forget to take their medication, and to need assistance with the responsibility of remembering to take it. A majority of children took medication all the time. A few children reported taking drug holidays at weekends and school holidays. A few children felt they had the option to stop taking tablets if they wanted to.

Children's compliance with medication was apparently tacitly monitored by their peer group. Children reported relatively frequent occurrences of friends asking if they had taken their medication – either as a reaction when the index child was exhibiting problematic behaviours; or as an encouragement to forgo medication (when friends thought that medication had inhibiting effects that made the index child less fun to be with).

IV. Alternatives to medication

i. Experience of non-drug interventions

Few children reported experiences of non-drug interventions that were memorable or productive in their view. Some children received additional *support in the school day*; three children reported having received *counselling*. Two children reported that counselling was helpful to him. A majority of parents of child participants were currently, or had previously, experimented with a range of non-drug interventions, including *Omega 3s, removal of E-numbers in the diet, IQ vitamins, low sugar/caffeine diet*. Children tended to be aware of these interventions but expressed no strong opinions about them. Several children reported that they had begun sports programs that helped *release energy*, and made them *feel good*. These programs included boxing and football.

ii. Children's ideas for non-drug interventions

In response to a vignette, children were asked to brainstorm means of helping a child with ADHD symptoms manage his/her behaviour (textbox 3).

Textbox 3: Interventions Vignette

Your favourite sports hero/heroine drops by one night wanting advice from you. He/she has a won who is having difficulty with his behaviour, especially his attention, focus, concentration. The doctor thinks the child has ADHD. Your sports hero wants to know what kinds of things he/she can do to help the child's behaviour get better. Let's make a list of things we know that can help this child.

Children came up with answers easily and there was agreement within and across groups as to the efficacy of the proposed methods. The most frequently mentioned methods were *playing sports*; *drawing/doodling; and stress balls*. Specific sports included boxing and football, as mentioned above. Two children mentioned a *punching bag*. One child said *fighting* was helpful, by which he may have meant boxing. Less frequently mentioned non-drug methods of managing behaviour were *reading, watching television,* and *playing computer games.*

When asked to compare the probable effectiveness of non-drug methods with the effectiveness of tablets, none of the participants felt non-drug methods were more effective than drug intervention. All participants felt that non-drug methods would be most effective if used in conjunction with medication.

iii. Inventions for ADHD children

All groups and individuals were asked to think of something they would want to invent, to help children with ADHD (textbox 4).

Textbox 4: Inventions Probe

Let's imagine you are an inventor and wanted to create a way to help children with ADHD. What might you invent?

Several children discussed alternative drug delivery systems, including *better tasting drugs*; *less frequently administered drugs*; and drug *dosing on demand*. This last was described by one participant as a "scratch dot" which could be scratched in the moment that the drug was needed, to deliver an immediate dose for an hour or two. The desire for a drug that had a short-term, targeted effect was also associated with a desire for a drug that didn't have pervasive effects: *I wish it only affected the parts of me that need it*. However, other children reported being glad that they only needed to take medication once a day, and were happier knowing that *it's always working in me*.

Another major category of response to this question was desire for a means of communicating to others what it was *like to have ADHD*. Proposed methods of communication included a *book about kids with ADHD*; and a *video about ADHD* (see textbox 5).

Textbox 5: Interactive ADHD video game

Male child: [I would invent] a video game where you actually took a picture of yourself and then put it into the game. And then you actually were this character running round, doing stuff that children do in a day so then these people could actually play on it… people who haven't got this thing [ADHD] that we've got can actually have a go and see what our life is like and., so they would actually know how we feel. So then they'll learn not to treat us in a way that's different to everybody else… You can have, like, other characters that have been nasty to you without your tablets. You could have a level without your tablets and with, so then they'd know the difference with your tablets and without.

V. Agency

(Agency is defined as the degree to which an individual feels he/she can affect behaviours, people, circumstances and/or events)

i. Personal agency over behaviours

All children in this study reported feeling that their behaviours were problematic to some degree. No children attributed these problematic behaviours solely to their ADHD diagnosis or to a lack of tablets. Frequently, when an individual child made such attributions he/she would be challenged by the group. All children admitted using their *diagnosis as an excuse* for their behaviours at some point. Children felt that tablets helped them with their behaviours as outlined above; however, no child reported feeling that tablets entirely resolved their problematic behaviours. Children generally reported *feeling responsible* for *management of their behaviours*, and felt that *tablets assisted* them to some degree with *self-management*.

ii. Agency over definition of behaviours

Agency over definition of their behaviours was more problematic for many children. In general, children did not report feeling that they had a voice in how their behaviours were classified and defined. They agreed that some of their behaviours were problematic, and referred to *my ADHD*, but many children were aware of the *contextual nature of the interpretation of behaviours*. The contextual nature of interpretation of behaviours only conferred agency on a child in situations when peer-generated social codes had more moral authority than adult-generated behavioural prohibitions. One frequently mentioned example of such a situation was bullying that involved denigration or disrespect for a child's family. In such circumstances there was general agreement amongst participants that aggressive retaliation was socially and morally justified. Children sometimes used their ADHD and/or lack of tablets as an excuse for their behaviour following the fight. This can be seen as a strategic use of a particular interpretation of their behaviour. Children defined this sort of retaliation in moral terms, even if the impulsive, aggressive behaviours were also indicative of clinical symptoms. Children

rarely reported feeling regret over their behaviours following such incidents (see Textbox 6).

Textbox 6: Moral dimensions of aggressive impulses

Male child: …Sometimes I play basketball and I don't take my tablets and I might get into a fight and then I might do something really dumb… I don't necessarily like to fight.
When I take my tablets I can't fight for my whole life. When I take them they make me, like, so calm I won't do anything… [Another time someone said] "Hopefully when your sister's born she'll be born with Down's Syndrome because you're spastic." I got so angry so then in school I just got him and then I didn't stop punching him until he – until I, like, smashed up his nose and stuff because I got so angry because I could take anything that comes in if they say it to me, but about my family I can't take it.

Lack of agency in the definition of their behaviours was most frequently experienced in the classroom. Children felt that teachers were unfairly *focused on their behaviour*, assuming that it would be more problematic than that of other children. Children felt this was a result of having a diagnosis of ADHD. Some children felt *watched by teachers* who were evaluating whether or not their behaviours were a sign that they had forgotten to take their medication. Children also experienced teachers as being able to define their behaviours according to the *needs of teachers*, rather than the needs of children. For example, some children felt that teachers attributed behaviours to ADHD as a way of *explaining behaviours away*. This was contrasted with teachers assessing the ways in which children with ADHD might be helped through *structural changes in the classroom and/or the school day.*

iii. Agency over the future

Children generally felt that they would be able to *exercise choices* with regard to their future, although they also tended to *acknowledge their limitations*. Many children were concerned about whether they would *need to keep taking their tablets as adolescents and adults.* All children in this study felt that this decision would eventually be their own decision to make.

VI. Stigma

i. stigma associated with tablets

Experiences of stigma related to directly to medication were less frequently expressed than experiences of stigma related more generally to ADHD diagnosis and behavioural symptoms. Tablet-related experiences of stigma had an impact on children's sense of self in that these experiences often involved *name-calling* and *bullying*, eg. "druggie"; "tablet boy" etc (see textbox 7). Children reported *feeling bad*

about being called names and they generally associated experiences of stigma with feelings of *low self-confidence* and *low self-esteem.* Children frequently got into fights as a result of being verbally bullied.

Children *felt exposed* by the need to take tablets, especially if they needed to take tablets during the school day. The need to take tablets made them *feel different* in a negative way.

Textbox 7: Bullying and retaliation related to tablets

Male child: Someone says, "Oh, you're a druggie addict," so I just smacked him one.
Interviewer: A drug addict?
2nd male child: I get that. I get that. I did. A boy came up… "Why are you on drugs?" I said, "They're not drugs. Even if they were drugs, I wouldn't bring them into school. I'd probably have them at home."
1st male speaker: So I says – he says – "Why are you a drug addict?" I says, "I'm not." He says, "Yes you are." So I just smacked him one and he went, "No you're not," went off crying.

ii. Stigma associated with ADHD behaviours and diagnosis

In general, stigma associated with ADHD behaviours and diagnosis was expressed as the primary experience of stigma. Two participants kept their diagnosis secret from friends and members of the extended family. All children reported feeling that their ADHD behaviours gave them *bad reputations* with peers, teachers and parents of peers. There was general agreement that children with ADHD were thought to be *dumb*. A majority of children reported being *called names* and *bullied* about their ADHD behaviours and/or ADHD diagnosis and need for tablets.

Children reported that the *negative assumptions of others* about them were especially burdensome. They felt they received *negative differential treatment* because of their diagnosis. Both girls in the study (in separate groups) reported feeling that teachers *ignored them* completely because of their ADHD diagnosis. They felt the teachers had *given up* on them. In general children felt there was a *lack of empathy* and a *lack of understanding* of children with ADHD. They felt peers and teachers were *unkind*; and they reported experiences of feeling *different* and *isolated*.

iii. Protections against stigma

All children in this study reported having *close friendships* that helped to protect them from bullying. In several cases, friends who knew about the index child's ADHD diagnosis would *come to the rescue* of the index child in a fight that resulted from bullying. The rescue often manifested as an effort to get the index child to *stop and to think* about what he/she was doing. Other times friends would simply *drag* the index child *away* from the situation (see textbox 8).

ADHD diagnosis could be turned around to serve as a protection in situations that arose as a result of stigma. For example, friends would use the ADHD diagnosis to frighten off a name-calling bully; eg *he told them I had ADHD and I was crazy*. Frequently, ADHD was used as *an excuse* following a fight; eg. *I couldn't stop because of my ADHD*. Almost all children in the study acknowledged using ADHD as an excuse to get out of situations like this.

Textbox 8: Peer protection and ADHD as an excuse

Male child: ... If someone starts on me and I know I'm going to start on them. And they know to ask --- and then my friends will help – come in and back me up. Otherwise I get them on the floor and I knee them in the back… My friends will say, "He's got ADHD."
2nd male child: I kept butting this boy in the head… You can't help it.
Interviewer: Is that what you say? But do you believe that?
1st male child: No, oh…
2nd male child: No I just use it.
Interviewer: You're using it as an excuse then?
3rd male child: Sometimes.

VII. Discussion

Children who participated in this study had a generally positive experience of tablets. This does not mean that they liked being on medication; rather that they were willing to put up with the "annoying" dimensions of taking medication in return for the perceived benefits. Medication was not viewed as a panacea; children had reasonable understanding and expectations of their medication. Individually and collectively children associated their tablets primarily with helping to improve their social behaviours, and, consequently, their relationships with peers. While improvements in school work and school functioning were often noted, these received less attention than improvements in social behaviour. Similarly, side effects of medication were commonly experienced in this group of children, particularly appetite suppression and insomnia. However, side effects did not make up a major theme of children's discussions individually or collectively. All children interviewed felt that they needed to be on their tablets; older children were

more likely to be looking ahead to a time when they could manage without tablets.

Children had varied experiences of both formal and informal non-drug interventions aimed at helping them with their ADHD symptoms. With the exception of sports, particularly boxing, few of these interventions were thought to be very effective. All children in the study believed medication to be the most effective available treatment for their ADHD symptoms. However, children also understood that ADHD diagnosis and effective drug treatment did not mean that they were absolved of responsibility or of agency in their behaviours.

One of the most strongly stated, and most resonant, desires communicated by this group of children was for better public understanding of ADHD. Children felt this would create empathy for their situations and relieve them of some of the stigma of negative assumptions attached to ADHD diagnoses. Experiences of stigma due to ADHD behaviours and diagnosis were common; experiences of stigma related directly to ADHD medication were less frequently expressed by children in this study. Experiences of stigma, such as bullying, name-calling, negative assumptions, and differential treatment were distressing to children, and negatively affected their self-evaluations, self-esteem and self-confidence. Close friendships were an important protective factor against the initiation and/or continuation of fights that arose as a result of the child with ADHD being bullied. These friendships were mentioned as or more often as medication, as factors that helped children to restrain their impulse to fight and/or to continue fighting.

Findings in this study are similar to other recent qualitative findings (Singh, 2007a, b) that do not find strong support for concerns that children taking stimulant medication for ADHD are ethically compromised. A major ethical concern has been that stimulant medication potentially endangers children's agency (eg President's Council on Bioethics, 2003). However, children in this study expressed a significant degree of agency over their behaviours. A frequent topic of discussion amongst boys in particular, was the moral dimension of the decision to fight, or not to fight. Certain instigating comments (eg about a boy's family) made it morally problematic not to fight the name-caller, even if it was socially inappropriate to fight on the playground. Children expressed a significant trust in their personal agency when discussing a process of making moral assessments of situations and choosing and judging their behaviour according to these assessments.

Similarly, concerns that taking medication could confer significant stigma on children (eg Conrad, 2006) were not supported by this study. Children did report experiences of stigma as a direct result of taking tablets; however, experiences of stigma as a result of ADHD diagnosis and symptomatic behaviours was far more frequently expressed. Feelings of being different and

feeling alienated were also stronger around diagnosis and ADHD behaviours, than around the need for medication. To the extent that medication helps to alleviate some ADHD symptoms, and helps to foster peer relationships, it would appear that the social benefits of medication outweigh the social burdens.

In view of the distress many children experienced in relation to ADHD diagnosis, ADHD behaviours and tablets, it is troubling that only one child in this study viewed their clinical encounters within child psychiatry services as having a therapeutic component. While no child had any strong complaints about services; several children reported not being able to get in to see a clinician; and feeling that they would like more time with a psychiatrist. Some children felt that clinicians didn't really care about them. A majority of children felt appointments were routine and boring, and that appointments were primarily for medication checks and scripts.

Sport, especially boxing, is clearly considered therapeutic by boys with ADHD, especially those with aggression problems (Singh, 2007). Many children in this study reported being kept inside during lunch time as punishment for their disruptive behaviours. This is counter-productive for this group of children, as they need to "let off steam" in order to better manage their behaviours. Clinical work with children, families and schools could emphasize and encourage the positive aspects of sport for this group of children.

There are few qualitative studies involving children with ADHD, and even fewer studies that attempt an in-depth investigation of children's experiences of medication. The controversial nature of ADHD diagnosis and drug intervention for young children has the potential for fueling unproductive polemic debates about the safety, efficacy and/or validity of medication for young children. In view of this background, it is important to attempt to contextualize the discussions with children in this study. One means of contextualization is to examine the relative significance of matters discussed with children in this study. How much do children worry about their ADHD diagnoses and their tablets, when compared to other things children reportedly worry a great deal about?

ADHD and medication were important aspects of this group of children's lives. All children reported various daily reminders of the burden of mental disorder and the need to take medication. However, when compared to a list of other stressors, "ADHD diagnosis" and "taking tablets" were not what children in this study reported they were worrying about most. Younger children worried most about friendships and global warming, while older children worried most about exams and friendships. While friendships and academic performance are often problematic for children with ADHD, these concerns are not uniquely related to having ADHD. A large cohort of UK

children identify these concerns as their primary sources of anxiety (Alexander & Hargreaves, 2007). In the present study, ADHD diagnosis was ranked as more worrying than taking tablets for ADHD by almost all children. Results from this study therefore consistently suggest that children have relatively more positive experiences of medication, as compared to more negative experiences of ADHD diagnosis and behavioural symptoms.

VIII. Limitations

This study is based on focus groups and a small number of individual interviews with 16 UK children. While all interviews and the analysis were intensive, systematic and rigorous, findings have within-group validity, and should be generalized with caution. The importance of certain themes may have been amplified by the particular dynamics of groups made up largely of young boys, who gave honest answers to questions, but also wished to impress each other and the interviewer. In addition, this study, as is the case for many studies in psychiatry, may have attracted a group of children with a certain range of experiences with ADHD diagnosis and medication. Selection bias cannot be ruled out as a factor in these findings. Only two girls participated in the study (12%), and both girls were teenagers. Therefore the analysis is heavily skewed towards boys' experiences of ADHD diagnosis and medication. This study does not adequately capture experiences that might be unique to girls with ADHD.

References

Alderson, P., Sutcliffe, K. & Curtis, K. (2006). Children's consent to medical treatment. *Hastings Centre Report, 36*, 25-34.

Alexander, R. & Hargreaves, L. (2007). *Community Soundings: the Primary Review regional witness sessions*. Cambridge: University of Cambridge Faculty of Education.

Bailey, S. (2006) ADHD - what's in a name? Paper presented at the British Education Research Association Conference, Warwick, England, September 6-9, 2006. http://www.leeds.ac.uk/educol/documents/157738.htm [accessed June 2008]

Barber, S., Grubbs, L., & Cottrell, B. (2005). Self-perception in children with attention deficit/hyperactivity disorder. *J Pediatr Nurs, 20*(4), 235-245.

Baxley, G. B., Turner, P. F., & Greenwold, W. E. (1978). Hyperactive Children's Knowledge and Attitudes Concerning Drug Treatment. *Journal of Pediatric Psychology, 3*(4), 172-176.

Bluebond-Langner, M., DeCicco, A. & Belasco, J. (2005). Involving children with life-shortening illnesses in decisions about participation in clinical research: a proposal for shuttle diplomacy and negotiation. In Kodish,

E. (ed.) *Ethics and Research with Children,* pp 323–344. Oxford, UK: Oxford University Press

Buston, K. & Wood, S. (2000). Non-compliance amongst adolescents with asthma: listening to what they tell us about self-management. *Family Practice, 17(2),* 134-138.

Caruana, A. & Vassallo, R. (2003). Children's perception of their influence over purchases: the role of parental communication patterns. *Journal of Consumer Marketing, 20*(1), 55-66(12).

Conrad, P. (2006). *Identifying Hyperactive Children: The Medicalization of Deviant Behavior*. London: Ashgate.

Curtin, C. (2001). Eliciting children's voices in qualitative research. *Am J Occup Ther, 55*(3), 295-302.

Deatrick, J.A. & Faux, S.A. (1991). Conducting qualitative studies with children and adolescents. In Morse J.M. (ed.). *Qualitative Nursing Research: A Contemporary Dialogue*, pp185-203. Newbury Park, CA: Sage.

Dumas, D., & Pelletier, L. (1999). A study of self-perception in hyperactive children. *MCN: The American Journal of Maternal/Child Nursing, 24*(1), 12-19.

DuPaul, G. J. & Barkley, R. A. (1990). Medication Therapy. In *Attention-Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment* (ed. R. A. Barkley), New York: Guilford Press.

Efron, D., Jarman, F., & Barker, M. (1998). Child and parent perceptions of stimulant medication treatment in attention deficit hyperactivity disorder. *Journal of Paediatrics and Child Health, 34*(3), 288-292.

Frame, K., Kelly, L., & Bayley, E. (2003). Increasing Perceptions of Self-Worth in Preadolescents Diagnosed with ADHD. *Journal of Nursing Scholarship, 35*(3), 225-229.

Hill, M., Laybourn, A., & Borland, M. (1996). Engaging with primary-aged children about their emotions and well-being: methodological considerations. *Children and Society, 10*, 129-144.

Hoza, B., Pelham, W. E., Milich, R., Pillow, D., & McBride, K. (1993). The self-perceptions and attributions of attention deficit hyperactivity disordered and nonreferred boys. *J Abnorm Child Psychol, 21*(3), 271-286.

Hoza, B., Gerdes, A. C., Hinshaw, S. P., Arnold, L. E., Pelham, W. E., Jr., Molina, B. S., et al. (2004). Self-perceptions of competence in children with ADHD and comparison children. *J Consult Clin Psychol, 72*(3), 382-391.

Ireland, L., & Holloway, I. (1996). Qualitative Health Research with Children. *Children & Society, 10*(2), 155-164

Kendall, J. (1997). The use of qualitative methods in the study of wellness in children with attention deficit hyperactivity disorder. *J Child Adolesc Psychiatr Nurs, 10*(4), 27-38.

Kendall, J., Hatton, D., Beckett, A., & Leo, M. (2003). Children's accounts of attention-deficit/hyperactivity disorder. *ANS Adv Nurs Sci, 26*(2), 114-130.

Kortesluoma, R. L., Hentinen, M., & Nikkonen, M. (2003). Conducting a qualitative child interview: methodological considerations. *J Adv Nurs, 42*(5), 434-441.

Krueger, R.A. & Casey, M.A. (2000). *Focus Groups: A Practical Guide to Applied Research*. London: Sage.

Krueger, M., & Kendall, J. (2001). Descriptions of self: an exploratory study of adolescents with ADHD. *J Child Adolesc Psychiatr Nurs, 14*(2), 61-72.

Kutcher, S., Aman, M., Brooks, S.J., Buitelaar, J., van Daalen, E., Fegert, J., et al. (2004). International consensus statement on attention-deficit/hyperactivity disorder (ADHD) and disruptive behaviour disorders (DBDs): Clinical implications and treatment practice suggestions. *European Neuropsychopharmacology, 14,* 11–28.

McElearney, C., Fitzpatrick, C., Farrell, N., King, M., & Lynch, B. (2005). Stimulant medication in ADHD: what do children and their parents say? *Irish journal of psychological medicine, 22*(1), 5-9.

McNeal, R. E., Roberts, M. C., & Barone, V. J. (2000). Mothers' and Children's Perceptions of Medication for Children with Attention-Deficit Hyperactivity Disorder. *Child Psychiatry and Human Development, 30*(3), 173-187.

Meaux, J., Hester, C., Smith, B., & Shoptaw, A. (2006). Stimulant Medications: A Trade-off? The Lived Experience of Adolescents With ADHD. *Journal for Specialists in Pediatric Nursing, 11*(4), 214-226.

Milich, R., Licht, B. G., Murphy, D. A., & Pelham, W. E. (1989). Attention-deficit hyperactivity disordered boys' evaluations of and attributions for task performance on medication versus placebo. *J Abnorm Psychol, 98*(3), 280-284.

Pelham, W. E., Hoza, B., Pillow, D. R., Gnagy, E. M., Kipp, H. L., Greiner, A. R., et al. (2002). Effects of methylphenidate and expectancy on children with ADHD: behavior, academic performance, and attributions in a summer treatment program and regular classroom settings. *J Consult Clin Psychol, 70*(2), 320-335.

President's Council on Bioethics. (2003). *Beyond Therapy: Biotechnology and the pursuit of happiness*. Washington, DC: James Bennett Pty, Ltd.

Singh, I. (2007a). Clinical implications of ethical concepts: moral self-understandings in children taking methylphenidate for ADHD. *Clin Child Psychol Psychiatry, 12*, 167–182.

Singh, I. (2007b). Capacity and competence in children as research participants. *EMBO Reports*, *8*, 35-39.

Sorensen, E. (1992). Qualitative research with children as informants. Paper presented at Western Institute of Nursing, San Diego, CA. Abstract in *Communicating Nursing Research, 25,* 328.

Volkow, N.D., Fowler, J.S., Wang, G., Ding, Y., and Gatley, S.J. (2002). Mechanism of action of methylphenidate: insights from PET imaging studies. *Journal of Attention Disorder, 6*, Supplement 1, S31–S43.

Wilkinson, S. (1998). Focus Groups in Health Research: Exploring the Meanings of Health and Illness. *Journal of Health Psychology, 3*(3), 329-348.

Woodgate, R. (2000a). Part I: an introduction to conducting qualitative research in children with cancer. *J Pediatr Oncol Nurs, 17*(4), 192-206.

Appendix to focus group study

FOCUS GROUPS TOPIC GUIDE

Welcome
Names
Why we are here:

To talk about your experiences with tablets for ADHD

We are here to learn from you. Your job is important: what you say to us today will help doctors all over the UK better understand how to help children with ADHD.

There are NO right or wrong answers.

No reason to feel embarrassed – everyone here is friendly and wants to hear from you.

The RULES:
YOU ARE THE EXPERTS
DON'T INTERRUPT OTHERS
SPEAK LOUDLY AND CLEARLY
(explain that this is for good politeness and for good quality recording!)

Questions:

I.

1. So, what is ADHD?

2. Why do you think you need to be taking tablets for ADHD?

PROBE: TYPES OF BEHAVIORS

3. In what ways do you think the tablets have helped you?

PROBE: behaviour, school work, social life, self-esteem

4. Have the tablets caused you any problems?

PROBE: stigma, alienation, side-effects, shame

5. Does anyone else know you have ADHD or take tablets for ADHD?
6. Other than taking tablets, do you get any special help from teachers or other doctors?

PROBE: educational help, counselling, psychotherapy, have parents received any help?

7. Do you think you need to take tablets?

PROBE: Experimentation with not taking meds? Efforts to discontinue meds? For how long do you believe you will need to take these tablets? What other sorts of things help you with your behaviour?

8. What would happen if you said you didn't want to take your tablets anymore right now?

9. What's it like going to see the doctor who gives you the script for your tablets?

PROBE: comfort level, interaction, anxiety

II. GAMES:

A. Let's imagine there are other things you could do that helped you with your behaviour. How are these the same as, or different from, taking your tablets? Which would you rather be taking? (PROBE EACH ITEM)

a. piano lessons
b. vitamins
c. eating green vegetables
d. brain implant

B. VIGNETTE.

Your favourite sports hero/heroine rings your house one night wanting advice from you. This person has a son who is having the sorts of difficulties a child with ADHD has. The sports hero wants to know what kinds of things he/she can do, to help his child.

1. Let's make a list of all the things we know that can help a child's behaviour.

PROBE: Have you tried this? What's it like?

2. Can you line up all these ways of helping, from the thing that you think is best to the thing you think is worst?
    - In what ways are these best and worst? Eg. most effective, least effective; nicest to take; least nice to take, etc.
    - Where do tablets fit into this list?

C. Let's imagine you are an inventor and wanted to create a way to help children with ADHD. What might you invent?

D. Here are some things children worry about. Can you line them up for me in order of the things you worry about most, to the things you worry about least. You can line them up and then see if it's right. If not you can re-arrange things!

Global warming
Having ADHD
Taking tablets
Exams
Homework
friendships

III. FINAL QUESTIONS

1. If there were more tablets that made it easier for you in other ways, for example, tablets to improve your memory, would you want to take them too?
2. Anything else you would want doctors, parents or other kids to know about taking tablets for ADHD?

Appendix 16: ADHD Consensus Conference

Part 1. Summaries of presentations provided by Consensus Conference speakers

The value and limitations of the concepts of ADHD and hyperkinetic disorder in guiding treatment - a clinician's perspective

Dr David Coghill
Senior Lecturer in Child and Adolescent Psychiatry, Division of Pathology and Neuroscience (Psychiatry), University of Dundee

The presentation will look at the value and limitation of ADHD as a concept and develop ideas by looking at the questions posed in the outline of the Position Statement.

To what extent do the phenomena of overactivity, inattentiveness and impulsiveness cluster into a particular disorder that can be distinguished from others and from normal variation?

Internal Validity
Inattention, overactivity and impulsivity are all continuous variables which appear to be complex characteristics distributed throughout the population with a fairly normal distribution; these are normally distributed characteristics which therefore blend into the normal. The distinction of what is and what is not normal has to be, by definition, arbitrary.

Factor analysis suggests that their distribution is not random but shows a strong coherence with each other and far less coherance with behaviours characteristic of other conditions such as phobia aggression or anxiety.

At what level, and in what circumstances do these become impairing for the person?

To some extent where to draw the line as to when symptoms and behaviour are impairing is arbitrary, as it is on a continuum. Symptoms must be related to impairment.

The key issue is, how do symptoms relate to impairment?

Impairment can be measured in several ways however the Children's Global Assessment Scale (C-GAS) provides a relatively simple and valid measure

Scored from 0 – 100 with 0 indicating the most severe impairment and 100 the most healthy and well functioning child

DSM-IV field trials used a Children's Global assessment Scale (C-GAS) score of ≤60 (which implies impairment requiring specific treatment) and determined the number of symptoms required to be present to reach this cut-off
Five symptoms of ADHD were required
To avoid false positives the numbers were increased to six or more symptoms of inattention or hyperactivity – impulsivity.

Problems occur with children whose impairment, due to their ADHD symptoms is really quite severe, but who technically do not meet the diagnostic criteria.

Impact of ADHD on overall functioning

An important part of ADHD impairment is its breadth including:

- Social, academic, interpersonal, family burden, self worth.
- What is particularly interesting as a clinician is how to reduce the functional impairments consequent to these symptoms and these comorbidities.

Impact of untreated and undertreated ADHD

Apart from on the individual themselves:

- Healthcare system - 50% increase in bike accidents, 33% increase in ER visits, 2–4 times more motor vehicle crashes.
- School and occupation - 46% expelled, 35% drop out and lower occupational status.
- Family - 3–5 times increase in parental divorce or separation and 2–4 x increase in sibling fights.
- Employer – increase in parental absenteeism and decrease in productivity.
- Society – there is twice the risk of substance misuse, at earlier onset and individuals are less likely to quit in adulthood.
- Children with ADHD are in the bottom five percent of children for their quality of life.

The clinical picture for the individual

The symptoms of inattention, hyperactivity and impulsivity combined with a number of psychiatric coexisting conditions such as ODD and CD lead to a number of psychosocial impairments across a number of domains: self, school (work) Home and social.

Is there is evidence for a characteristic pattern of developmental changes, or outcome(s)?

ADHD symptoms were designed for primary school children and an adult with ADHD is a child with ADHD who has gown up but continues to have problems. The symptoms experienced by theses groups will differ and the levels of symptoms and impairment may not necessarily change at the same rate. Although individuals may have symptoms throughout their life they may not demonstrate impairment until later in life.

In children the patterns of symptoms / behaviours is characterised by: motor hyperactivity, aggressiveness, a low levels of tolerance, impulsiveness, easily distracted. In adults the pattern is characterised by: inattentiveness, shifting activities, easily bored, impatient, restlessness.

There is a characteristic pattern of developmental changes. During the pre-school years the child may show some level of behavioural disturbance. Once at school academic, social and self esteem problems begin to manifest themselves. As an adolescent, additional issues surrounding smoking and injury begin to appear and by the time that the individual is of college age, a pattern of academic failure, occupational difficulties substance misuse, injury and self esteem is apparent. As an adult, relationship problems will also occur.

Is there a specific response to clinical, educational and/or other interventions?

Home and school based behavioural treatments and treatment with methylphenidate, dexamfetamine, atomoxetine and several other drugs reduce symptoms and improve functioning. However, treatment with other psychoactive medications such as the SSRIs or anti-psychotics does not have the same effect.

Is there evidence for a consistent heritability, neurobiological or other causality?

One of the arguments against ADHD is we do not know the cause. The causes of ADHD are multifactoral, leading to a common behavioural phenotype. Therefore to search for a cause is probably not something that is going to bear fruit.

ADHD aggregates in families with 3 to 5 times increased risk in first degree relatives and twin studies suggest considerable heritability with between 65 and 90% of the phenotypic variance explained by genetic factors. There are also associations with a range of environmental risks (mainly non-shared factors) such as pre and perinatal complications, low birth weight, prenatal

exposure to benzodiazepines, alcohol and nicotine and brain diseases and injuries.

Gene-environment interactions are likely to play a significant part. Genetic variations cause functional abnormalities in both dopaminergic and noradrenergic neurotransmission within frontostriatal pathways. This in turn leads to deficits in executive and reward related functioning and subsequently the behavioural manifestations of ADHD.

Finally in terms of response to medication, ADHD kids' memories were as poor on a memory task as elderly people with Alzheimer's, and reverted back to normal with one dose of medication.

The Value of the Concept of ADHD

- Reliability and validity well established
- Define a group of children with considerable impairment
  - They also define those with symptoms but no impairment
- These impairments touch not only the person with the diagnosis but also their family and community
- Define a group who have a high risk of suffering from a wide range of other difficulties
- Provides a starting point and an anchor from which clinicians can base their assessments
- Define a group who respond (and will benefit from) to treatment
- Define a group with disability currently under recognised and under treated in the UK
- Defines a group whose numbers are relatively stable across time and across cultures
- Do not assume pathophysiology where this is not warranted but have strong associations with a range of biological measures e.g. heritability, pathophysiology neuropsychology.
- The diagnoses are now almost universally used in research studies into the causes, associations and treatment of ADHD. This provides a strong link between scientific research and clinical practice.

The Limitations of the Concept of ADHD

- Can lead to dispute and misunderstanding as to which system is "correct"
- Categorical definition of a dimensional concept
  - Cut offs are arbitrary with a big impact on prevalence
- Inattentiveness symptoms are not adequately defined
- Defines a heterogeneous group
- Can be misused if impairment is not adequately considered
- The exclusion of comorbid forms within the ICD 10 criteria is not helpful when that is the picture of the case in front of you
- Can lead to difficulties in identifying those requiring treatment

  - E.g. those with subthreshold symptoms but considerable impairment.
- Research has tended to focus on pure ADHD cases with much less information of those with comorbidity
- Research has tended to concentrate on reduction in core symptoms rather than on the broader outcomes of impairment, quality of life and comorbidity
- Neither is adequate for understanding pre school or adult populations and have limitations with respect adolescents

The case for wider recognition of ADHD – from a paediatric perspective

Dr G D Kewley
Consultant Paediatrician/Physician, Director of Learning Assessment & Neurocare Centre, Horsham, West Sussex

1. Previous significant under-recognition of ADHD. As noted with concern by the author in 1998 (Kewley, 1998) there was continuing under-recognition of ADHD, because of i) persistent reliance on the **ICD-10 hyperkinetic terminology**; ii) psychosocial only causes were seen as being solely responsible for all children's behavioural problems; iii) the copious **myth and misinformation** and the **professional and societal ignorance** about ADHD, its nature and complications persisted, and iv) there were divisions between professional groups, **fixed professional beliefs**, theoretical standpoints and a tendency to **debate over the heads of the sufferers**. Despite the fact that ADHD was the **most referenced childhood condition** in the Index Medicus during the 70s and 80s (Cantwell, 1996), the above difficulties had meant that ADHD was not validated in the UK until the NICE report of 2000 (Lord & Paisley, 2000), was significantly under-recognised and was very slow to be considered as part of the provision of effective child, adolescent and adult mental health services. Although since 2000 there has been an improvement in recognition and validity of ADHD, all of the above problems persist and affect the recognition and provision of effective children's mental health services today. Clinical experience and review of international literature concluded that DSM-IV-R had been a much more effective way of providing effective services. The NICE 2000 report noted that medication usage, however, is but one means of reflecting the increased recognition and diagnosis of ADHD.

2. Guidelines. It was noted that over the past 8 years there has been a degree of convergence between the DSM-IVR and hyperkinetic (ICD-10) approaches to the diagnosis of ADHD (Swanson *et al*., 1998). The publications of the Eunithydes Group (Banachewski *et al*., 2006; Taylor *et al*., 2004) in recent years have led to a much more clinically relevant evidence-based approach. In

clinical practice it has become increasingly realistic to use European guidelines to guide patient management. Previously such guidelines had been more theoretical than practical and clinicians had tended to rely more on North American guidelines, such as the Texas Algorithms (Piliszka *et al*., 2000) and those from the American Association of Child & Adolescent Psychiatry. Recent European guidelines have been increasingly relevant in guiding audit and helping management patient care. However, there is still a need for guidelines for complex case management and for working between professional groups such as the youth justice system, social workers, substance misuse, etc. It was also clear that both paediatricians and child psychiatrists had a role in managing children and adolescents with ADHD.

3. Professional and societal recognition of the progression and life span issues of ADHD - relevance to guideline development. Many international studies have emphasised the long term difficulties of having untreated ADHD and the need for differing professional bodies to work together. For example the British Cohort Study (Brasset-Grundy & Butler, *date?*) in a 30 year prospective longitudinal study showed that people with childhood ADHD were significantly more likely to face a wide range of negative outcomes at age 30, spanning domains of education, economic status, housing, relationships, crime and health and that their adult lives were typified by social deprivation and adversity. This British study reflects a number of international studies.

Such long term studies confirm the vulnerability created by ADHD. They emphasise the need for wider recognition of ADHD in relation to criminal behaviour, school under-achievement and exclusion, special schooling provision, workplace issues, teenage pregnancies, motor vehicle accidents and gambling. Another related issue is that many older people, who were educated prior to the recognition of ADHD as a valid condition, still have ongoing, impairing symptomatology as late adolescents or adults.

4. One such subgroup of particular concern is those with long term difficulties of ADHD and related difficulties who have entered the youth justice system. The risk factors for such youths are having ADHD with associated early onset of disruptive behaviour disorder, substance use disorder and/or bipolar disorder.

There are many studies in the criminology literature, which tend to run in parallel to ADHD literature (Farrington, 1996; Moffitt *et al*., 1996). For example the UK National Epidemiologic Study in 1999 (Stephenson & Goodman, 2001) showed that **6**% of 5-10 year old boys have conduct disorder, a high percentage of which entered the youth justice system. Other studies show that up to 90% of those with early conduct disorder have coexisting ADHD (McArdle et al., 1995). Studies raise the possibility of effective medical treatment as part of an overall package of help. Many studies also show a

significantly high incidence of ADHD in the juvenile offender population (Rosler *et al.*, 2004). It would be helpful for guidelines to be established, not only with the medical profession but also with other professions such as the Youth Justice Board, social services, tertiary education, teenage pregnancy initiatives etc.

Approximately 200,000 youths enter the youth justice system annually (The Home Office, 2003). ASSETT mental health screening showed that up to 75% of such youths considered themselves to be excessively impulsive (Youth Justice Board, date?). Studies have also shown that re-offending rates can be **reduced** from approximately 60% **to 10%** with effective multimodal management including management of ADHD (McCallon, 2000). There is a strong case to be made for guidelines within education and the health profession that link much better with the youth justice and substance abuse services. Consideration is currently being given to whether or not responsibility for such youth could be with education and health rather than primarily with the Home Office and Youth Justice Board (Allen, *date*?).

5 Summary.

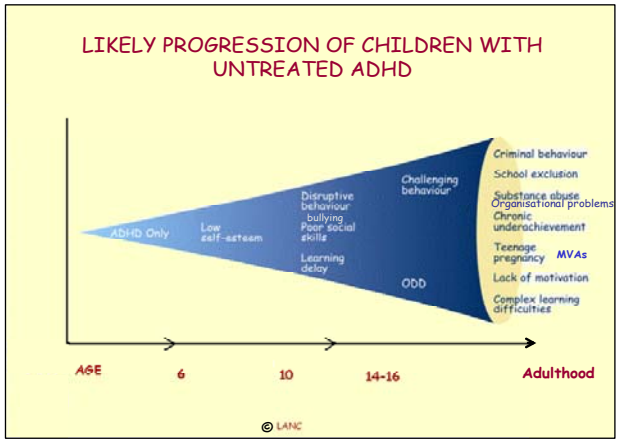
Despite greatly improved recognition of ADHD in recent years, it would appear it is still currently under-recognised both in terms of incidence, treatment and effective management, especially if DSM-IV-R criteria are to be used.

Paediatricians and child psychiatrists have a part to play in the diagnosis and management of the condition, as do many other professional groups.

Guidelines for the management of adult ADHD should also be developed.

Future guidelines, if they are to be more representative of children's mental health issues, and of the progression of ADHD, should be developed not only for the medical profession, as per the NICE guidelines, but also in conjunction with other service providers, such as education, youth justice and substance misuse services.

Broader recognition of the reality, the family impact, the chronic course and lifespan issues are essential re public policy development, as an issue of social reform and in the development of effective child, adolescent and adult mental health and educational services.



References

Kewley GD, (1998) Personal paper: Attention-Deficit/Hyperactivity Disorder is underdiagnosed and undertreated in Britain. *BMJ 23 May 1998 Vol 316,* pp 1594-1596.

Cantwell DP (1996), Attention Deficit Disorder: A Review of the Past 10 Years. *J.Am.Acad. Child Adolesc.Psychiatry* 35: 978-987.

Lord J, Paisley S. (2000) The Clinical Effectiveness and Cost-Effectiveness of Methylphenidate for Hyperactivity in Children. London: National Institute for Clinical Excellence, (ISBN: 1-84257-047-1 www.nice.org.uk)

Swanson, JA Sargeant, E Taylor, E J Sonuga-Barke, PS Jensen, DP Cantwell 'Hyperkineses and ADHD' *Lancet* 1998, 351, 429-433
Banaschewski T et al 'Long acting medications for hyperkinetic disorders: a systematic review and European treatment guideline' *Eur. Child Adolesc. Psychiatry* 2006, 1-19.

Taylor et al 'European Clinical Guidelines for Hyperkinetic Disorder - first upgrade' *European Child Adolesc. Psychiatry* 2004 13: 1-7.

Pliszka SR et al (2000) The Texas Children's Medication Algorithm Project: Report of the Texas Consensus Conference Panel on Medication Treatment of Childhood Attention-Deficit/Hyperactivity Disorder. Parts I & II *J. Am. Acad. Child Adolesc. Psychiat.* 39:7 908-927.

Brasset-Grundy A, Butler N 'Prevalence and adult outcomes of ADHD – evidence from a 30 year prospective longitudinal study'. *www.ioe.ac.uk/bedfordgroup*

Moffitt TE, Caspi A, Dickson N, Silva P, Stanton W (1996), Childhood-onset versus adolescent-onset antisocial conduct in males: Natural history from age 3 to 18. *Development & Psychopathology* 8:399-424.

Farrington DP (1996) Understanding and Preventing Youth Crime. Joseph Rowntree Foundation

Stephenson J, Goodman R. 'Association between behaviour at age 3 years and adult criminality'. *Bri.t J. Psychiatry* 2001 179: 197-202.

McArdle P, O'Brien G, Kolvin I (1995), Hyperactivity: Prevalence and Relationship with Conduct Disorder *Journ. Child Psychol. Psychiat.* 36:2, 279-303.

Rosler M et al 'Prevalence of ADHD and comorbid disorders in young male prison inmates' *Eur. Arch. Psychiatry Clin Neuroscience* 2004 254: 365-371.

'Youth Justice – The Next Steps' Home Office 2003.

ASSETT Mental Health Screen. Youth Justice Board

McCallon D, (2000). 'Diagnosing and treating ADHD in a men's prison' in DH Fishbein (Ed), *The science, treatment and prevention of antisocial behaviours: Application to the criminal justice system (pp 17.1-17.21).* Kingston, NJ: Civic research Institute.

Allen R. 'From punishment to problem solving – a new approach to children in trouble' *Crime and Society foundation 2006*. www.crimeandsociety.org.uk.

1.1 Concept of hyperkinetic disorder and ADHD and its treatment implications

Dr Paramala J Santosh
Clinical Lecturer in Child & Adolescent Psychiatry, Institute of Psychiatry

This presentation will look at Hyperkinetic Disorder and ADHD. If you are looking at the symptom counts in the DSM, you need a greater number of symptoms than in the ICD-10 in order to make a diagnosis. However an assumption that this means identifying fewer cases using DSM would be incorrect.

In Hyperkinetic Disorder filters are applied, starting with the exclusion of anxiety and depression. You also need pervasiveness (symptoms across two settings) and impairment. (DSM focuses impairment rather than symptoms across two settings).

Applying these filters mean that you will have a smaller number with Hyperkinetic Disorder as a diagnosis, as opposed to ADHD.

MTA Study

This study can be used to show how figures can change by just using different criteria, for example the percentage of children diagnosed would vary whether parent, teacher or combined reports were used. Impairment and how you rate it and at what degree of impairment you say "it is important and needs treatment" is relevant. Because it is a question of how you set the threshold and that changes the numbers very dramatically. Differences in rates of diagnoses can therefore be explained by the way in which diagnostic criteria are applied.

Summary of MTA Study

This study was looked at to see whether the use of hyperkinetic disorder versus ADHD has an influence in terms of outcomes and treatment. (One factor to consider when looking at this study is that the intensity of the treatments used may not be transferable to clinical settings)

The target population was children with a DSM-IV diagnosis of ADHD (combined type) plus a wide range of comorbid conditions and demographic characteristics. The study group was 579 and the treatment strategies used in the randomly allocated groups were:

- Behavioural management (Parent training, Child-focused, School based)

- Medication management (Methylphenidate, if titration unsuccessful open titration of dextroamphetamine, pemoline, Imipramine)
- Combined treatment
- Community care

The combined treatment that was having medication plus behavioural intervention was the best.

The next question to be asked was whether the the MTA findings of combined ADHD could be generalised to hyperkinetic disorder? Starting with the initial 579 children with the diagnosis of ADHD (combined type) 147 were excluded for Anxiety / Depression, of the remaining, once other filters were applied 145 had a diagnosis of HKD.

Hyperkinetic Disorder

One of the main findings was that if you had hyperkinetic disorder, then using stimulants would be a good option as you had a higher chance of responding to medication. Children with Hyperkinetic Disorder are prescribed stimulants; this will also be the case for children with ODD / CD (behavioural therapy is not used).

Anxiety and Depression

If you had anxiety and depression, it is the combined treatment that was important; not just the behavioural intervention, but behavioural plus medication would be better than medication alone.

Mild or Borderline ADHD

You could get the same response with either behavioural intervention or stimulant use. The treatment recommendation for 'Borderline' ADHD is behaviour therapy, then stimulants, if this is not effective the diagnosis is reviewed.

Non-Hyperkinetic Disorder

The one thing that stood out clearly in the data set was that inattention being reported in schools seemed to actually be a predicter that medication helped the inattention in school. Here medication should be a reasonable choice.

Health Economics

Medication usage was effective in terms of treatment and even the community care as usual was beneficial.

If you look at intensive behaviour therapy versus community care, then if you had a diagnosis of hyperkinetic disorder, it was almost costing twice as much as the ADHD construct.

If you had hyperkinetic disorder or hyperkinetic conduct disorder, the likelihood of the behavioural strategy alone working over the medication is going to be less cost effective.

Even the intensive behavioural strategy used in this study, was never better than medication.

What are practical applications of the MTA study in clinical practice?

Possible models include:

- Telephone-based Medication Monitoring and Stabilisation Clinic - CIPP
- 1 week MTA titration phase strategy
- Day patient observation with differing doses of stimulants
- Intense monitoring offered only when routine treatment fails
- Do these strategies matter when we now have long-acting drugs?

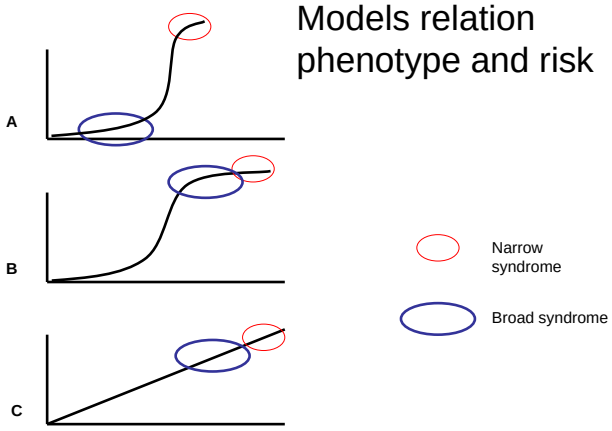
NICE guidelines should also be trying to look at how clinicians can be helped to do better clinical monitoring and titrating, as opposed to just deciding whether someone needs to receive a drug or not.

1.2 Predictive validity of broad versus narrow classification of hyperactivity

Dr Russell Schachar, MD, FRCP(C)
Department of Psychiatry, Neurosciences and Mental Health Research Institute, The Hospital for Sick Children, University of Toronto, Ontario, Canada

Address for correspondence: R. Schachar, The Hospital for Sick Children, 555 University Avenue, Toronto, ON, M5G 1X8, Canada, russell.schachar@sickkids.ca

At one extreme of the debate about the validity of the diagnosis of childhood hyperactivity are those who assert that the diagnosis is invalid no matter what criteria are applied (ref). More often, however, the question is framed around the appropriate breadth of the diagnosis. Some hold that only a narrowly defined syndrome such as Hyperkinetic Syndrome (HKD) as defined in the International Classification of Diseases-10 (ICD-10) has diagnostic validity and that a more broadly defined syndrome such as attention deficit hyperactivity disorder (ADHD) as defined in DSM-IV (ref) captures a group of children who either has no disorder whatsoever or a group who is similar to children with other and presumably more valid and clinically meaningful diagnoses such as conduct disorder (CD). Figure 1 shows several hypothetic functions relating severity of the phenotype on the y axis and accumulating underlying risk on the x axis. A narrowly defined diagnostic entity is shown in red; a broadly defined entity in blue.



In Model A, risk accumulates slowly without behavioral, cognitive or other manifestations until some threshold is exceeded. Beyond that threshold, the disorder is manifest and further risk does not substantially alter the phenotype. This is essentially the pathogen-disease model of disorder.

Model B shows a variation of the first function. At some level of the trait, there is a substantial increase in the expression of the disorder just as in model A. But in model B, the narrowly defined entity misses many individuals with risk who are captured by the broader criteria. The big difference between broad and narrow entities is prevalence although the narrow entity could show more risks depending on the slope of the function relating risk to symptoms over the hypothetical diagnostic threshold. According to this

model, both the broadly and the narrowly defined entities are different from unaffected individuals.

Model C shows a different function in which phenotypic expression increases linearly with increasing risk. There is no point at which there is a substantial and discontinuous increase in phenotypic expression with accumulating risk. Accordingly, a disorder defined narrowly by the presence of severe expression (the most symptomatic, the most impaired, those with the most evidence of some underlying pathogen or dysfunction) would differ in degree rather than in kind from a more broadly defined entity. Under these circumstances, there can be no easy solution to the classification problem. There will always be individuals who fall just below the boundary of the category and sub-threshold cases will differ only in degree from supra-threshold cases. Under these circumstances, factors other than validity of the defined entity will determine where the threshold is set. ICD-10 criteria are narrower than those for DSM in terms of pervasiveness, the range of symptoms required for criteria to be met (symptoms of inattention, hyperactivity *and* impulsiveness) and treatment of comorbidity.

We evaluated these models by assessing the predictive validity of HKD and ADHD in a sample of approximately 1000 consecutive referrals to a specialty clinic for attention, learning and behavior problems. First, we compared children who met criteria for HKD, ADHD-combined subtype (ADHD-C), ADHD-inattentive subtype (ADHD-IA), ADHD-hyperactive impulsive subtype (ADHD-HI) and controls on a range of clinical and cognitive characteristics. Then we excluded cases with any comorbid condition (conduct (CD) or oppositional disorder, generalized or separation anxiety disorder, reading disability) and compared HKD, ADHD, and control groups once again. Only one in ten cases that met criteria for ADHD also fulfilled criteria for HKD. The HKD group was more severe in that they exhibited a greater number of parent and teacher rated symptoms followed by the ADHD-C, ADHD-HI and ADHD-IA groups in descending order. Despite differences in symptoms severity and pervasiveness, HKD, ADHD-C, ADHD-IA, ADHD-HI differed little in teacher and parent rated impairment, exposure to psychosocial adversity (e.g., low socioeconomic status, single parent-headed homes, etc.), recurrence risk for ADHD in first degree family members, comorbidity (except for lower rate of CD in the ADHD-IA group), intelligence, reading scores, and measures of working memory (digit span backward) and inhibitory control (stop signal reaction time in the stop task). All of these groups had more deviant or extreme scores in each of these characteristics than did controls. After excluding comorbidity, HKD, ADHD and CD groups differed little in recurrence risk for ADHD in family members, exposure to psychosocial adversity, intelligence, digit span backwards, and reading performance; all three of these groups differed from controls. HKD was marked by more severe inhibitory control deficit than the ADHD, CD and control groups. The HKD, CD and ADHD groups were more impaired

according to parent and teacher ratings. In addition, parents rated the CD group as more impaired than the HKD and ADHD groups whereas teachers rated the HKD group as most impaired than the ADHD and CD groups.

In summary, these results support the predictive validity of both the narrowly (HKD, ICD-10) and the broadly (ADHD, DSM-IV) defined entities and rejects the hypothesis that either broadly or narrowly define hyperactivity or both are invalid clinical entities or nothing more than that which is predicted by their common comorbidities (Model A). There was only minimal evidence in these data for a quantitative increase in the severity of associated risks with increase in severity or pervasiveness (Model C). There was a trend for inhibitory control to be worse in HKD compare with ADHD-C, ADHD-HI, and ADHD-IA groups in that order. These results do not isolate a unique feature of childhood hyperactivity. In conclusion, the most clearly supported model is Model B which posits that both the broadly and the narrowly defined entities exceed the threshold for a valid diagnostic entity.

Finally, it should be recalled that in North America the small subgroup of narrowly defined HKD cases would all meet criteria for ADHD; the predictive validity of the later group will be more marked than was found in this study where HKD cases were separated from ADHD. By contrast, in the UK and other countries which follow ICD-10 diagnostic practice, at least nine of ten impaired children will not receive a diagnosis. More than half of these cases do not receive any other diagnosis and will therefore not receive a diagnosis commensurate with the seriousness of their disorder.

Social and cultural issues in ADHD diagnoses and psychostimulant treatment

Dr Ilina Singh
Wellcome Trust University Lecturer in Bioethics and Society, The London School of Economics and Political Science

Prof Nikolas Rose
Professor of Sociology, Convenor of Department of Sociology, The London School of Economics and Political Science

Presentation to the NICE ADHD Diagnosis Guideline Consensus Conference
17 October 2006

Reliable diagnosis rates for ADHD are difficult to find in any national context. It is also difficult to know the true epidemiology of ADHD in any national context, and prevalence rates vary widely, from 0.5% - 26% in the UK; and from 2% - 18 % in the US. There is however good systematic data on worldwide consumption of methylphenidate (and dexamphetamine), collected by the United Nations International Narcotics Control Board. There is also detailed data available from IMS Health.

Both these sources demonstrate an enormous variation in global consumption of methylphenidate. Average consumption rates have increased dramatically between 199-2003, averaging 5-7 fold increases. There are a wide variety of possible explanations for this variation, including (and not limited to) true epidemiological variation across countries in ADHD, the impact of national prescribing practices, medical training, parenting ideology, drug policies, health insurance, educational practices, teaching, and so forth. The bottom line is this: we don't know why this variation exists.

The global variation in stimulant drug consumption does point to the fact that social and cultural factors are key to understanding patterns and trends in ADHD diagnoses and psychostimulant treatment. This does **not** mean that ADHD may not also have an organic aetiology. Socio-cultural analysis can make an important contribution to identifying and evaluating key environmental factors that shape ADHD diagnosis and stimulant drug treatment patterns.

It is unclear which level of socio-cultural analysis would be most useful. Potential analyses cover a wide range of targets: from a macro-level study of by-nation variation in methylphenidate consumption, to a micro-level study of the beliefs and practices of individual teachers and psychiatrists in local settings.

Evidence of socio-cultural factors in ADHD diagnosis and treatment can inform the Guideline by providing understanding of the pathway to

diagnosis of ADHD, and the key consequences of diagnosis of ADHD for the child and family. This is particularly important now that ADHD is no longer understood as a disorder of childhood. There is little or no longterm data on the "career" of the ADHD patient. We need to understand more about this career in order to assess the risks and benefits of 1. a narrow versus wide diagnosis; and 2. recommendations of longterm drug treatment.

We also need to avoid mistakenly attributing to the child consequences of social situations and cultural forces. This means we must have better (objective, sound and uniform) diagnoses for ADHD. However, even if this can be realized, in the absence of a biological marker for ADHD, there will always be an inherent dilemma about whether to cast the ADHD net widely or narrowly (by supporting a wide or a narrowly constructed diagnostic guideline). The costs and benefits of either approach must be very carefully weighed.

Categorical models of attention deficit/hyperactivity disorder: a conceptual and empirical analysis

Prof Edmund Sonuga-Barke
Professor in Psychology, Convenor of the Developmental Brain Behaviour Unit, University of Southampton

Presentation to the NICE working group on Attention Deficit/Hyperactivity Disorder

In this presentation we explored the status of categorical models of Attention Deficit/Hyperactivity Disorder (ADHD) as they underpin current diagnostic formulations in the DSM-IV and the ICD-10 and anchor debate about future revisions of these manuals. The presentation draws on the ideas published in a published journal article (Sonuga-Barke, 1998). The presentation had three major elements. Part one involved a discussion of the defining role of diagnostic systems in clinical and scientific practice related to ADHD. We reviewed the historical development of the role of diagnostic systems and their political and economic foundations. Part two was a review of three major themes relating to categorical models of childhood disorder.

First - we discussed the inevitability of categorisation in clinical practice given the imperative to identify those individuals in need of intervention – i.e. clinicians are inevitably categorisers and so categorical diagnostic systems go with the grain of clinical practice. Furthermore, we highlight the social psychological basis of categorical models of disorder by arguing that clinicians, like other humans, when faced with challenge of understanding complex human behaviour, tend to use heuristic devices that involve inferring traits on the basis of behavioural observations and drawing categorical boundaries even when these are not obviously present.

Second, we examined the relationship between clinical categorization and science. Here we focused on the role that the values and assumptions inherent in categorical diagnostic systems and the way that influence scientific practice – the hypotheses that are tested and the methods that are used to test them. In assuming that disorders, such as ADHD, are discrete entities qualitatively different from the normal variation of behaviour we bias our search for categorical boundaries between normality and abnormality and over-interpret evidence in favour of the validity of conditions. However, there is a need for a bridge of common meaning between the "laboratory" and the "clinic" and categorical diagnostic models support this vital function.

Third, we considered the different ways that one could respond to this recognition of the role of assumptions in the scientific study of categorical models of disorder. After considering a number of options (including the

rejection of diagnostic approaches on the grounds that they are social constructions) we argued that Meehl's scientific realism whereby scientific assumptions are turned into specific testable hypotheses was the most valuable approach. The hypothesis that ADHD is a true category, or as Meehl calls it, a taxa, has not been tested sufficiently to date. However, genetics studies using DF analyses that look at the relationship between symptom severity and heritability do not support the taxa hypothesis of ADHD. More recent and more sophisticated studies using advanced taxanomic analyses also find no evidence for the existence of an ADHD taxa e.g., Haslem et al 2006; Frazer et al., 2007). It appears that ADHD is better modelled as a continuous trait rather than a discrete category.

We conclude by highlighting the dilemma between this empirical reality (that ADHD is better regarded as the extreme of normal variation rather than a distinct category) and the practical necessity and psychological inevitability that clinicians will make categorical decisions. We conclude by highlighting concerns over the transparency, communicability and implementability of a dimensional system for the diagnosis of ADHD while accepting that it may be a better model for science. Adopting such a model in future diagnostic formulations may run the risk of dismantling the bridge of meaning between clinic and lab – paradoxically inhibiting the process of diagnostic refinement and so the relevance of scientific findings to clinical practice.

References

Haslam N, Williams B, Prior M, Haslam R, Graetz B, Sawyer M. (2006). The latent structure of attention-deficit/hyperactivity disorder: a taxometric analysis. Australian New Zealand Journal of Psychiatry 40:639–647.

Frazier TW, Youngstrom EA, Naugle RI (2007). The latent structure of attention-deficit/hyperactivity disorder in a clinic-referred sample. Neuropsychology 21: 45-64.

Levy F, Hay DA, McStephen M, Wood C, Waldman I (1997). Attention-deficit hyperactivity disorder: A category or a continuum? Genetic analysis of a large-scale twin study
Journal of the American Academy of Child and Adolescent Psychiatry 36: 737-744.

Sonuga-Barke EJS (1998). Categorical model in child psychopathology; a conceptual and empirical analysis. Journal of Child Psychology & Psychiatry 39: 15-133.

Arguments against the use of the concept in clinical practice: including whether it should be used never or sparingly

Dr Sami Timimi
Consultant Child Psychiatrist, Lincolnshire Partnership NHS Trust

The main problem with current theory and practice in ADHD is the prevalence of the underlying assumption that ADHD is a genetic neurodevelopmental disorder and that clinicians have valid and reliable ways of identifying what behaviours are the result of such neurodevelopmental disabilities in any individual child. This narrow biomedical construction causes a polarisation of views and attitudes with proponents of this view claiming "there is no such disagreement [about ADHD being a valid disorder]- at least no more so than there is over whether smoking causes cancer, or whether a virus causes HIV/AIDS" (Barkley et al, 2002) whilst opponents claim "Its as simple as this: if no physical examination, lab test, X-ray, scan or biopsy shows an abnormality in your children, your child is normal" (Baughman,1998).

Current evidence does not support a simplistic view of ADHD type behaviours. Genetic studies have relied on poor standards of evidence (such as the disputed 'equal environment' assumption), and have failed to consistently replicate genetic associations, thus the null hypothesis stands- No genes exist for ADHD. Similarly neuro-imaging studies suffer from serious methodological failings and interpretive inadequacies, thus there are currently no neurological markers for ADHD (nor are there likely to be). Conceptual problems are endemic in ADHD these include: high co-morbidity, cross-cultural variations amongst raters and the rated, the behaviours are qualitatively common behaviours leading to large variations in prevalence, the gender distribution, and the circularity of construct (the behaviours define the disorder, the disorder defines the behaviours).

The most important implication of the dominance of biological theory in ADHD is that it has led to a rapid rise in the use of biological remedies as first line and often only treatment for those diagnosed with ADHD. This is problematic. Although stimulants have proven efficacy (up to 4 weeks), the long term outcome literature available does not support stimulants being effective in the long term (an important finding given that many end up on stimulants for many years). Current treatment protocols have come to rely too heavily on the MTA study (1999). However this had major methodological and interpretive flaws, with the 24 month follow up study (MTA, 2004) having less positive findings for medication, with children on medication experiencing significant side effects. Indeed William Pelham who was on the board of the MTA studies recently concluded "*No drug company in its literature mentions the fact that 40 years of research says there is no long-term benefit of medications. That is something parents need to know.*" (Quoted in Hearn, 2004). The literature on medication has exaggerated stimulants effectiveness and

minimized its risks (which include serious risks such as cardiac disease, psychosis and sudden death).

However, we still have the reality that many children and many families are struggling to understand and deal with a range of behavioural and educational problems that we currently call ADHD. Some appear to benefit from diagnosis and prescription of medication, but we must balance this with our social responsibility for public health.

Alternative and useful ways forward can be found through incorporating discourses and research from related fields such as philosophy and transcultural/anthropological psychiatry which can provide both theory and practice with conceptual and practical tools to engage with questions of values, ethics, diversity and the changing nature of the challenges and circumstances that children and families live in.

The implications of this line of thinking are many. For the purposes of guidelines in diagnosing ADHD this means that ADHD should *not* be viewed as neurodevelopmental, diagnosis should come under the remit of mental health *not* paediatrics, the diagnosis should be reserved for more serious cases that are not responding to a variety of currently available clinical approaches, and when a diagnosis is made this should *not* lead to a long term prescription.

References

Baughman, F.A. (1998) The totality of the ADD/ADHD fraud. *National Institutes of Health, Consensus Conference on ADHD.* Video available at http://www.adhdfraud.com.

Barkley, R. et al. (2002). International Consensus Statement on ADHD. *Clinical Child and Family Psychology Review*, *5,* 89–111.

Hearn, K. (2004) Here kiddie, kiddie. available at http://alternet.org/drugreporter/20594/ accessed 15 June 2005.

MTA Co-operative Group (1999) A 14 month randomized clinical trial of treatment strategies for attention deficit/hyperactivity disorder. *Archives of General Psychiatry*, *56*, 1073-1086.

MTA Co-operative Group (2004) National Institute of Mental Health Multimodal Treatment Study of ADHD follow-up: 24-month outcomes of treatment strategies for attention-deficit/hyperactivity disorder. *Pediatrics*, *113,* 754- 761.

Part 2: Draft diagnosis chapter (part 1) sent to peer reviewers

Part 1 - Validity of the ADHD diagnosis

1.1 Introduction

This guideline is applicable to people above the age of three and of all levels of intellectual ability who show symptoms of hyperactivity, impulsivity or inattention to a degree that impairs their academic progress, mental development, personal relationships, or physical or mental health. This includes people with ADHD whether or not they have other comorbid mental disorders or whether the ADHD symptoms result from genetic, physical environmental or social environmental causes. This chapter sets out to look at the issues of diagnostic categorisation and assessment that should trigger the use of this guideline. It is in two parts: part I addresses the validity of DSM-IV ADHD and ICD-10 hyperkinetic disorder as diagnostic categories; part 2 provides guidance for clinical practice.

1.2 The validity of ADHD as a diagnostic category

The Guideline Development Group (GDG) acknowledged at the outset that the use of the diagnosis of ADHD has been the subject of considerable controversy and debate and that the diagnosis itself has varied across time and place as diagnostic systems have evolved (Rhodes *et al*., 2006). Points of controversy identified by the GDG included the reasons for the wide variation in prevalence rates reported for ADHD and the nature of the aetiological risk factors for ADHD.

The GDG wished to evaluate evidence for the validity of the diagnostic category of ADHD and formulate a position statement. It was recognised that defining psychiatric disorders is a difficult process due to the overlapping nature of behavioural and psychiatric syndromes, the complexity of the aetiological processes and the lack of a 'gold standard' such as a biological test—in this regard ADHD is no different from other common psychiatric disorders. Furthermore, in keeping with other common behavioural disorders there is no clear distinction between the clinical condition and the normal variation in the general population (see Section A3). This is comparable to normal variation for medical traits such as hypertension and type II diabetes, as well as psychological problems such as anxiety. Controversial issues surround changing thresholds applied to the definition of illness as new knowledge and treatments are developed (Kessler *et al*., 2002) and the extent to which functioning within the 'normal cultural environment' should determine clinical thresholds (Sonuga-Barke, 1998; Rosenman, 2006). As a result of considering these issues, a central question for this chapter is to

delineate the level of ADHD symptoms and associated impairments required to trigger the use of this guideline.

It was recognised from the start that undertaking a systematic review of diagnostic categories is not a straightforward exercise for behavioural and psychiatric disorders because in most cases definitive diagnostic tests for the presence or absence of disorder do not exist. The relative lack of a validated reference standard (indicated by SIGN diagnostic study quality assessment, see Appendix A) means that the question of validity for the diagnosis of ADHD needs to draw on evidence from a wide range of sources. There is also potential for ascertainment bias particular in clinic-referred populations and considerable variation by clinical and demographic subgroups, disease prevalence and severity, and use of different behavioural and symptom measures (Whiting *et al*., 2004). The GDG wish to emphasise that psychiatric nosology is a dynamic and developing field and changes are to be expected over time as more data are accrued.

To ensure that a transparent, structured approach was taken, the GDG agreed to use one similar to the Washington University Diagnostic Criteria (Feighner *et al*., 1972). This approach involves setting out criteria for validating a particular disorder and seeing how far a particular set of phenomena are consistent with those criteria. Using these criteria as a framework, this chapter sets out to answer the following questions:

A: To what extent do the phenomena of hyperactivity, impulsivity and inattention, which define the current DSM-IV and ICD-10 criteria for ADHD and hyperkinetic disorder, cluster together in the general population and into a particular disorder that can be distinguished from other disorders and from normal variation?

B: Is the cluster of symptoms that defines ADHD associated with significant clinical and psychosocial impairments?

C: Is there evidence for a characteristic pattern of developmental changes, or outcomes associated with the symptoms, that define ADHD?

D: Is there consistent evidence of genetic, environmental or neurobiological risk factors associated with ADHD?

These questions were taken to relate to both DSM-IV ADHD and ICD-10 hyperkinetic disorder criteria. Hyperkinetic disorder is a more restricted definition of ADHD that forms a subset of the DSM-IV combined subtype of ADHD. The term 'hyperactivity' has been used in some studies to mean the cluster of hyperactive, impulsive and inattentive symptoms. In this guideline the term 'hyperactivity' is restricted to mean the combination of symptoms

that defines overactive behaviour and the term 'ADHD symptoms' is used to refer to the combination of hyperactive, impulsive and inattentive symptoms.

1.3 Methodology

A literature search was conducted for existing systematic reviews and meta-analyses on CINAHL, EMBASE, MEDLINE, PsycINFO. The initial search found 5,516 reviews of which 9 were relevant to the questions about ADHD and application of the Washington Diagnostic Criteria. Where insufficient evidence was found from previous systematic reviews, a search for primary studies was carried out (see Appendix B). We selected reviews for inclusion in this chapter if they met the SIGN quality assessment criteria for systematic reviews and cohort studies. For diagnostic and factor analytic studies we established a set of criteria approved by NICE (Appendix C).

In addition to the review of the literature, a consensus conference was held to bring together experts in the field who held a range of views and could address the concept of ADHD from different perspectives. This provided an opportunity to debate the key issues surrounding the use of this diagnostic category and thereby to assist the GDG with the task of deciding what should trigger the use of the guideline and for whom the guideline is intended. A summary of the consensus conference is provided in an Appendix to this chapter (Appendix D).

1.4 Reviewing the validity of the diagnosis: summary of the evidence

A: To what extent do the phenomena of hyperactivity, impulsivity and inattention, which define the current DSM-IV and ICD-10 criteria for ADHD and hyperkinetic disorder, cluster together in the general population and into a particular disorder that can be distinguished from other disorders and from normal variation?

The evidence addressing this issue is divided into three main questions:

(A1) Do the phenomena of hyperactivity, inattention and impulsivity cluster together?

(A2) Are ADHD symptoms distinguishable from other conditions?

(A3) Are the phenomena of hyperactivity, inattention and impulsivity distinguishable from the normal spectrum?

1.4.1 (A1) Do the phenomena of hyperactivity, inattention and impulsivity cluster together?

No evidence was found from the systematic search of reviews that was of direct relevance to this question. This is because, despite a large primary literature, few systematic reviews in this area have been undertaken. Therefore a systematic search of factor-analytic studies was carried out. Additional factor-analytic and cross-sectional studies were identified by the GDG (Appendix E). None of these studies met the SIGN inclusion criteria that requires an appropriate reference standard for diagnostic measures, but did meet the extension to the SIGN criteria approved for this review: the aim of the question was to evaluate whether the phenomena of hyperactivity, inattention and impulsivity cluster together in the population, rather than to assess the accuracy of diagnostic tests.

The inclusion criteria for factor-analytic studies were defined as follows: (i) that the study addresses an appropriate and clearly focused question and, (ii) that the sample population being studied was selected either as a consecutive series or randomly, from a clearly defined study population.

Evidence

Many factor analyses indicate a two-factor model; 'hyperactivity-impulsivity' and 'inattention'. This has been replicated in population-based studies (Lahey *et al*., 1994; Leviton *et al*., 1993; Wolraich *et al*., 1996) and clinical samples (Bauermeister *et al*., 1992; Lahey *et al*., 1988; Pelham *et al*., 1992). Single factor 'hyperactivity-impulsivity' is also supported by Dreger and colleagues (1964) early study where the factor 'hyperactivity' was defined as 'impulsive, excitable hyperactivity'. More recent factor analytic studies based on DSM-IV criteria support previous findings that the symptoms of inattention and hyperactivity-impulsivity are distinct symptom domains in children (Molina *et al*., 2001; Amador-Campus *et al*., 2005; Zuddas *et al*., 2006) and adolescents (Hudziak *et al*., 1998).

Looking specifically at children identified as having a behavioural problem Conners (1969) found 'hyperactivity' and 'inattention' as separate and distinct factors. The factor structure of adolescent self-report behavioural data was investigated by Conners and colleagues (1997) and found 6 factors including 'hyperactivity' and 'cognitive problems'. The 'hyperactivity' factor included characteristics such as being unable to sit still for very long, squirming and fidgeting and feeling restless inside when sitting still. The 'cognitive problems' factor consisted of having trouble keeping focused attention, having problems organising tasks and forgetting things that were learnt. Similar results were found in Conners' (1998) further study were attentional problems that overlap with the DSM-IV criteria for inattentive subtype of ADHD, with a similar overlap between the factor items and DMS-IV criteria for hyperactivity-impulsivity.

Some studies have identified three factors; 'hyperactivity' and 'impulsivity' as two distinct factors in addition to 'inattention' in both the general population (Gomez *et al*., 1999; Glutting *et al*., 2005) and clinical populations (Pillow *et al*., 1998). However, Gomez and colleagues (1999) showed that the model fit for the three-factor solution was only marginally better than the two-factor model. In the study of Pillow and colleagues (1998) of boys with ADHD, the impulsive and hyperactive symptoms formed a single factor when oppositional-defiant and conduct disorder items were also included in the factor analysis.

Werry and colleagues (1975), however, found that hyperactivity, impulsivity and inattention formed a single factor using both population control and 'hyperactive' samples.

Using a Latent Class Analysis (LCA) that identifies clusters of symptoms that group together, Hudziak and colleagues (1998) found that hyperactivity-impulsivity and inattention could exist as a 'combined' type latent class as well as separate hyperactive-impulsive and inattention latent classes. The latent classes map closely to the DSM-IV criteria, with DSM-IV combined type falling entirely within the severe combined type latent class. Individuals with the DSM-IV inattentive subtype fell either within the severe inattentive or the severe combined latent classes.

The clustering of hyperactivity, impulsivity and inattention appear to be stable across a number of countries. Ho and colleagues (1996) found separate robust dimensions for 'hyperactivity' (the combination of inattention and hyperactive-impulsive behaviour), 'antisocial' and 'neurotic' behaviour in a sample of 3,069 Chinese schoolboys. Correlations among different dimensions were similar to those reported in European and US samples. Taylor and Sandberg (1984) compared data from 437 English schoolchildren with published data from the US and New Zealand. They identified a factor of hyperactivity-inattention that was distinct from conduct disorder. The comparisons supported the view that English schoolchildren were similar to their contemporaries in the US and New Zealand with differences in prevalence rates between different countries accounted for by discrepancies in diagnostic practice.

In adult population samples a two-factor model has been identified (DuPaul *et al*., 2001; Smith & Johnson, 2000) as well as a three-factor model (Kooij *et al*., 2005). Glutting and colleagues (2005) assessed university students aged 17 to 22 using parent-rated information in addition to self-rated data. They reported slightly contrasting findings within each set of data; exploratory and confirmatory analysis showed that DSM-IV ADHD symptoms generated a three-factor model in the self-report data and a two-factor model in the parent-informant data.

Although most studies show separate factors for 'inattention' and 'hyperactivity-impulsivity', these are highly correlated in children (Gomez *et al*., 1999) and adult samples (Kooij *et al*., 2005).

There may be age-dependent changes in the factor structure. Bauermeister and colleagues (1992) found that there was a single 'attention/impulsivity-hyperactivity' factor in pre-school children, and separation into two factors in school-age children. Nearly all the studies of school-age children reported two factors. In contrast, the study from Glutting (2005) using college students aged 17 to 22 found three factors, with the separation of hyperactive and impulsive symptoms. Similarly Kooij and colleagues (2005) using adult samples identified three separate factors.

Summary

Factor-analytic studies indicate that ADHD symptoms cluster together in general population samples. The number of factors varies between studies, with most finding two correlated factors for hyperactivity-impulsivity and inattention; others find that hyperactivity and impulsivity can be distinguished and a few find one combined factor of all three domains. These findings have been observed in both population and clinical samples and in a number of different cultural settings. LCA in population samples detects clustering of symptoms into groups that are similar but not identical to DSM-IV criteria for ADHD.

1.4.2 (A2) Are ADHD symptoms distinguishable from other conditions?

No systematic reviews were identified in the literature that addressed this question. The GDG considered that the most important and controversial distinction to be made was between ADHD and oppositional-defiant and conduct disorders. These are also the most commonly reported comorbid problems in children and adolescents diagnosed with ADHD and define a set of behaviours that might be difficult to distinguish from ADHD. It was therefore decided to restrict a formal literature search to identify studies that indicate whether a distinction can be made between ADHD, oppositional-defiant and conduct problems. Additional references were identified by the GDG members (see Appendix F).

Evidence

1.4.2.1 ADHD and oppositional-defiant and conduct problems

Most of the studies using factor-analytic approaches for the analysis of ADHD symptoms report separate factors for hyperactivity-impulsivity, inattention and oppositional-defiant or conduct problems. These include most of the studies reviewed in the previous section on factor structure of ADHD symptoms (for example, Bauermeister *et al*., 1992; Connors *et al*., 1969;

Connors 1997; Ho *et al*., 1996; Pelham *et al*., 1992; Taylor *et al*., 1984; Werry *et al*., 1975; Wolraich *et al*., 1996). These studies are highly consistent in being able to separate oppositional-defiant and conduct problems from hyperactivity-impulsivity and inattention. Although the symptoms fall into separate dimensions there are significant correlations between the behavioural factors.

Frouke and colleagues (2005) conducted a diagnostic study of 2,230 Dutch pre-adolescents from the general population. LCA revealed that ADHD symptoms clustered together with symptoms of oppositional-defiant disorder and conduct disorder. A further study from the Netherlands of disruptive behaviour in 636 seven-year-old children (Pol *et al*., 2003) came to similar conclusions. LCA using the same data identified three main classes of children with: (i) high levels of ODD and ADHD, (ii) intermediate levels of ODD and ADHD with low levels of CP, (iii) low levels of all disruptive problems. No classes were identified with only ADHD, ODD or CP.

King and colleagues (2005) identified seven distinct groups using a cluster analysis that identified discrete groups: ADHD with inattention (ADHD-I), ADHD with hyperactivity-impulsivity (ADHD-H/I), ADHD with both hyperactivity/impulsivity and inattention (ADHD-C), ADHD-C with ODD, and ADHD-I with ODD. For both the inattentive symptoms and combined inattentive/hyperactive-impulsive symptoms they found clustering either with or without symptoms of ODD.

Latent dimension modelling by Ferguson and Horwood (1991) looking at children with ADHD and conduct disorder (CD) suggested that these could be seen as independent dimensions, although they are highly inter-correlated. However the two often occur independently of each other and only partially share aetiological factors.

ADHD can be a precursor of other problems. When ADHD and disruptive behavioural problems coexist the history usually suggests that symptoms of ADHD appear first before the development of disruptive behavioural problems. A follow-up of a community sample of children with ADHD symptoms but no oppositional behaviour between the ages of 7 and 17 revealed that children with ADHD symptoms could develop oppositional behaviour at a later stage, but that the reverse pathway from oppositional behaviour to ADHD was uncommon (Taylor *et al*., 1996).

Population twin studies find that symptoms of ADHD are distinct from but share overlapping familial and genetic influences with conduct problems (Thapar *et al*., 2001; Silberg *et al*., 1996; Nadder *et al*., 2002). Multivariate twin modelling suggests that while the genetic influences on conduct disorder are largely shared with those that influence ADHD, there are in addition important environmental factors that influence the risk for conduct problems

but not ADHD (Thapar *et al*., 2001). Nadder and colleagues (2002) conclude that the co-variation of ADHD and ODD/CD is the result of shared genetic influences with little influence from environmental factors. However there are substantial environmental influences on ODD/CD, especially when they are not accompanied by ADHD (Silberg *et al*., 1996; Eaves *et al*., 1997). The heritability of ADHD symptoms is also higher than that for ODD/CD symptoms in these studies.

1.4.2.2 ADHD and other co-occurring conditions

Population twin studies find that symptoms of ADHD are distinct from but share overlapping familial and genetic influences with other neurodevelopmental problems including reading difficulties (Gilger *et al*., 1992; Willcutt *et al*., 2000; Willcutt *et al*., 2007), impaired general cognitive ability (Kuntsi *et al*., 2004) and developmental coordination disorder (Martin *et al*., 2006).

ADHD is reported to co-occur with personality disorder in young offenders (Young *et al*., 2003). A prison survey found that 45% of incarcerated young adults had a previous history and persistence of ADHD symptoms (Rosler *et al*., 2004). The distinction between ADHD and personality disorder in adults raises important nosological questions and remains poorly investigated.

Dysthymia, depression and anxiety symptoms and disorders are frequently associated with ADHD in adults. In the US National Comorbidity Survey, adults with ADHD had increased rates of mood disorders, anxiety disorders, substance misuse disorders and impulse control disorders (Kessler *et al*., 2006).

Summary

In the majority of factor-analytic studies ADHD symptoms are found to represent separate but correlated factors from oppositional behaviour and conduct problems. When symptom clusters are considered, ADHD symptoms are often found to group together with oppositional behaviour. Longitudinal studies suggest that ADHD represents a separate condition that is a risk factor for the development of oppositional and conduct problems. Twin studies suggest overlapping genetic influences on ADHD and conduct problems but the genetic influences estimated by twin studies are greater for ADHD than ODD/CD and there are environmental influences on ODD/CD that do not act on ADHD. The correlation between ADHD and several neurodevelopmental traits (cognitive ability, reading ability, developmental coordination, and pervasive developmental disorders) is due largely to the effects of shared genetic influences. In adults, co-occurring symptoms, syndromes and disorders are frequently found to exist alongside the core

ADHD syndrome, but their distinction from ADHD and the reasons for high rates of co-occurrence are not well addressed in the current literature.

1.4.3 (A3) Are the phenomena of hyperactivity, inattention and impulsivity distinguishable from the normal spectrum?

No systematic reviews were identified that were of direct relevance to this question. The previous search for primary studies revealed two factor-analytic studies relevant to this question. Also, the GDG members identified further factor-analytic and genetic studies (see Appendix G).

Evidence

Many studies have found a strong correspondence between quantitative measures of ADHD and the categorical diagnosis (Biederman *et al*., 1993; Bird *et al*., 1987; Biederman *et al*., 1996; Boyle *et al*., 1997; Chen *et al*., 1994; Edelbrock *et al*., 1986). These studies show that children with ADHD appear to be at one extreme of a quantitative dimension and this on this quantitative dimension there is no obvious bi-modality that separates children with ADHD from non-ADHD children.

Twin studies using individual differences approaches (reviewed in Thapar *et al*., 1999; Faraone *et al*., 2005) and De Fries-Fulker extremes analysis (Gjone *et al*., 2006; Levy *et al*., 1997; Willcutt *et al*., 2000; Price *et al*., 2001) estimate similar heritability for ADHD symptoms from general population twin samples. These studies indicate that the genetic influences on ADHD are distributed throughout the population; there is no obvious threshold or cut-off between ADHD and the continuous distribution of symptoms in the population.

ADHD can be divided into multiple latent class groups distinguished on the basis of three symptom groupings: attention, hyperactivity-impulsivity and the combination of these two symptom domains. In addition, the symptom groups are separated on the basis of low, medium and high levels into distinct severity groups. Twin data from female adolescents in Missouri and children in Australia both found that a similar pattern of familial segregation for the latent classes suggesting that familial influences can distinguish between ADHD and the normal range of behaviour (Rasmussen *et al*., 2004). These data provide some evidence for the distinction of ADHD into inattentive, combined and hyperactive-impulsive subtypes and suggest that ADHD might be distinguishable from the normal range on the basis of familial risks to siblings.

Summary

Most analytic approaches are unable to make a clear distinction between the diagnosis of ADHD and the continuous distribution of ADHD symptoms in the general population. Twin studies suggest that familial and genetic influences on groups with extremely high ADHD symptom scores are the same as those that influence ADHD symptom levels throughout the general population. LCA can however be used to distinguish groups with high, moderate and low ADHD symptom levels and suggests that these groups might be distinguished on the basis of familial risk factors. The current literature does not address the difference in interpretation of the latent class and quantitative approaches. The GDG concluded that on the basis of current evidence, ADHD was similar to other common medical and psychiatric conditions that represent the extreme of dimensional traits such as hypertension, obesity, anxiety and depression.

1.4.4 B: Is the cluster of symptoms that defines ADHD associated with significant clinical and psychosocial impairments?

There were no systematic reviews that addressed this question. A search for cohort studies was carried out and additional primary studies were identified by the GDG members (see Appendix H).

Evidence

1.4.4.1 Academic difficulties

Follow-up studies of people diagnosed with ADHD in childhood have consistently indicated impairment in their academic functioning. Children and adolescents with ADHD have been shown to have greater impaired attention, less impulse control, greater off-task, restless and vocal behaviour (Fischer *et al*., 1990), poor reading skills (McGee *et al*., 1992) and speech and language problems (Hinshaw, 2002) when compared with healthy controls. These impairments often lead to grade retention (Hinshaw, 2002), to a lower probability of completing schooling when compared with children who do not have ADHD (Mannuzza *et al*., 1993), suggesting potential long-term ramifications for vocational, social and psychological functioning into adulthood (Biederman *et al*., 1996; Young *et al*., 2005; Wilson & Marcotte, 1996).

An important question about educational impairment of children with ADHD is whether this is determined primarily by the presence of high levels of ADHD symptoms or the association with co-occurring conditions such as conduct disorder. Wilson and Marcotte (1996) found that the presence of ADHD in adolescents increased the risk for lower academic performance and poorer social, emotional and adaptive functioning, but that the additional presence of conduct disorder further increased the risk for maladaptive

outcomes. In another study the association of conduct disorder with academic underachievement was found to be due to its comorbidity with ADHD (Frick *et al*., 1991).

1.4.4.2 Family difficulties

Impaired family relationships have been reported in families of children with ADHD. Follow-up studies indicate that mothers of children and adolescents with ADHD have more difficulty in child behaviour management practices and coping with their child's behaviour (August *et al*., 1998), and display higher rates of conflict behaviours, such as negative comments, social irritability, hostility and maladaptive levels of communication and involvement (August *et al*., 1998; Fletcher *et al*., 1996).

Family impairment also permeates the parent's lives. Parents of children with ADHD report having less time to meet their own needs, fewer close friendships, greater peer rejection, less time for family activities, which might lead to less family cohesion and a significant effect on the parent's emotional health (Bagwell *et al*., 2001).

1.4.4.3 Social difficulties

Girls with ADHD tend to have fewer friends (Blachman & Hinshaw, 2002) and greater problems with peers and the opposite sex (Young *et al*., 2005).

Hyperactive children with or without conduct problems have higher rates of problems with peers and higher rates of social problems because of lack of constructive social activities (Taylor *et al*., 1996). In a study by Ernhardt and Hinshaw (1994) it was reported that a diagnosis of ADHD significantly predicted peer rejection; however aggressive and non-compliant disruptive behaviours were important and accounted for 32% of the variance in peer rejection.

1.4.4.4 Antisocial behaviour

Antisocial behaviour is more prevalent in children and adolescents with ADHD than non-ADHD groups. Some studies show increased rates of antisocial acts (for example, drug misuse) in comparison to children who do not have ADHD (Barkley, 2004; Mannuzza *et al*., 1998).

Follow-up studies have also shown that people with high levels of ADHD symptoms had significantly higher juvenile and adult arrest rates (Satterfield & Schell, 1997). Young adults with a diagnosis of 'hyperactivity' in childhood were more likely to have a diagnosis of antisocial disorder than healthy controls (32% vs. 8%) and drug misuse (10% vs. 1%) at follow-up (Mannuzza *et al*., 1991).

ADHD is also a risk factor for psychiatric problems including persistent hyperactivity, violence, antisocial behaviours (Biederman *et al*., 1996; Taylor *et*

al., 1996), (Taylor *et al*., 1996), and antisocial personality disorder (Mannuzza *et al*., 1998).

In a prospective follow-up of 103 males diagnosed with ADHD, the presence of an antisocial or conduct disorder almost completely accounted for the increased risk for criminal activities. Mannuzza and colleagues (2002) reported that antisocial disorder was more prevalent in children with pervasive and school-only ADHD. However, Lee and Hinshaw (2004) reported that the predictive power of ADHD status to adolescent delinquency diminishes when key indices of childhood externalising behaviour related to ADHD are taken into account.

Boys with ADHD and high defiance ratings show significantly higher felony rates than healthy controls (Satterfield *et al*., 1994). However, ADHD diagnosed in childhood increases the risk of later antisocial behaviour even in the absence of comorbid ODD or CD. Mannuzza, 2004).

1.4.4.5 Other problems

A 10-year prospective study of young people with ADHD found that the lifetime prevalence for all categories of psychopathology were significantly greater in young adults with ADHD compared with controls. This included markedly elevated rates of antisocial, addictive, mood and anxiety disorders (Biederman *et al*., 2006).

Both cross-sectional epidemiological studies and follow-up studies of children with ADHD show increased rates of unemployment compared with controls (Biederman *et al*., 2006; Kessler *et al*., 2006; Barkley *et al*., 2006). Adults with ADHD were found to have significantly lower educational performance and attainment, with 32% failing to complete high school; they had been fired from more jobs and were rated by employers as showing a lower job performance (Barkley *et al*., 2006). The survey from Biederman (2006) showed that 33.9% of people with ADHD were employed full time vs. 59% of controls.

Summary

ADHD symptoms are associated with a range of impairments in social, academic, family, mental health and employment outcomes. Longitudinal studies indicate that ADHD symptoms specifically are associated with both current and future impairments; additional impairments also result from the presence of co-occurring conditions, in particular conduct problems. Adults with ADHD are found to have lower paid jobs and lower socioeconomic status. Impairment is an essential factor to be considered in the diagnosis of ADHD. While it is clear that the presence of high levels of ADHD symptoms is associated with impairment in multiple domains, it is not possible to delineate clearly a specific number of ADHD symptoms at which impairment arises.

1.4.5 C: Is there evidence for a characteristic pattern of developmental changes, or outcomes associated with the symptoms, that define ADHD?

The search for systematic reviews and meta-analyses identified one review that was of relevance to this question. Additional reviews and primary studies were identified by the GDG members (see Appendix I).

Evidence

There is evidence for continuity of ADHD symptoms over the lifespan. Faraone and colleagues (2006) analysed data from 32 follow-up studies of children with ADHD into adulthood. Where full criteria for ADHD were used approximately 15% of children were still diagnosed with ADHD at age 25. In addition, the meta-analysis found that approximately 65% of children by age 25 fulfilled the DSM-IV definition of ADHD 'in partial remission', indicating persistence of some symptoms of ADHD associated with continued clinically meaningful impairments.

Relative to controls, levels of overactivity and inattention are developmentally stable (Taylor *et al*., 1996). Longitudinal studies of children with ADHD show similar rates of ADHD in adolescence (Biederman *et al*., 1996; Faraone *et al*., 2002; Molina & Pelham, 2003).

Population twin studies have also addressed the stability of ADHD symptoms throughout childhood and adolescence. Rietveld (2004) reported that parent ratings of attentional problems were moderately stable from age three to seven, and greater stability from age seven to ten. They further showed that such stability appeared to be mediated largely by overlapping genetic influences such that most, but not all, genetic influences at one age influenced ADHD at another age. Price and colleagues (2005) reported similar findings with correlations around 0.5 between ADHD symptoms at ages two, three and four. This stability was estimated to be mediated 91% by genetic influences. Kuntsi and colleagues (2004) extended these data to age eight, and found similar moderate stability between the data for age two, three and four and the data for age eight. Larsson and colleagues (2004) completed a similar longitudinal twin study of eight- to 13- year olds and found fairly high stability between the two ages; they further concluded that this stability was due to shared genetic effects. Change in symptoms between childhood and adolescence was thought to be due to new genetic and environmental effects that become important in adolescence.

In adolescence and adult life, symptoms of ADHD begin to associate with other diagnoses that are seldom made in childhood. Adolescent substance misuse, in particular, seems to be more common in people with the diagnosis of ADHD (Wilens *et al*., 2003), though it is not yet clear whether it is the ADHD per se that generates the risk or the co-existent presence of antisocial

activities and peer groups. The mechanisms involved can include one or more of the following: first that individuals with ADHD may seek out highly stimulating or risky activities; second that individuals with ADHD are exposed to higher levels of psychosocial risks for development of substance use disorders, resulting from educational and social impairments, social exclusion and antisocial behaviour associated with ADHD. Third, that various substances, including cannabis, alcohol and stimulants can attenuate ADHD symptoms and are therefore sometimes used as a form of self-treatment.

Summary

There is evidence for the persistence of ADHD symptoms from early childhood through to adulthood. Longitudinal studies confirm that ADHD persists into adulthood but developmentally appropriate criteria have yet to be developed for ADHD in adults. Using child criteria, approximately 15% of children with ADHD retain the diagnosis by age 25 but a much larger proportion (65%) show persistence of symptoms with associated impairments. The profile of symptoms may alter with a relative persistence of inattentive symptoms compared with hyperactive-impulsive symptoms, however the evidence base for this conclusion is poor, using developmentally appropriate measures of hyperactivity-impulsivity in adults. There was no evidence to warrant a different diagnostic concept in childhood and in adulthood. Familial and genetic influences in ADHD symptoms appear to be stable through childhood and early adolescence, but there is a lack of data on the continuity of aetiological factors into adulthood.

1.4.6 D: Is there consistent evidence of genetic, environmental or neurobiological risk factors associated with ADHD?

The literature search identified seven systematic reviews and meta-analyses. GDG members identified additional reviews and primary studies (see Appendix J).

Evidence

Dickstein and colleagues (2006) completed a systematic meta-analysis of 16 neuroimaging studies that compared patterns of neural activity in children and adults with ADHD and healthy controls. Their results indicated a consistent pattern of reduced frontal activity (hypoactivity) in people with ADHD.

Willcutt and colleagues (2005) reviewed 83 studies that had administered executive functioning measures and found significant differences between ADHD and non-ADHD groups where the former showed executive function

deficits. The size of the difference between children with ADHD and unaffected controls while significant was moderate rather than large.

Differences in executive functioning between ADHD and non-ADHD groups have also been reported in adults (Hervey *et al*., 2004; Boonstra *et al*., 2005; Schoelin *et al*., 2005; Woods *et al*., 2005). The results of studies of ADHD in adults suggest a wide variety of general and specific performance on cognitive-experimental tasks that are similar to those seen in children. The review from Hervey and colleagues (2004) did not point to a domain-specific neuropsychological deficit, but rather multiple domains revealed some degree of impairment on at least a subset of the tests considered within each domain. The interpretation of these studies remains controversial but most authorities agree that both executive and non-executive processes are disrupted in people with ADHD. Recently it has emerged that the strongest and most consistent association with ADHD is for intra-individual variability (Klein *et al*., 2006).

A systematic meta-analysis of molecular genetic association for associated markers in or near to the dopamine D4 (DRD4), dopamine D5 (DRD5) and dopamine transporter (DAT1) genes, found strong evidence for the association of DRD4 and DRD5 but not DAT1 (Li *et al*., 2006).

A systematic review of 20 population twin studies found an average heritability estimate of 76%. In most cases, heritability in these studies is estimated from the difference in the correlations for ADHD symptoms between identical and non-identical twin pairs, as reported by parents and teachers: with the correlation for identical twin pairs in the region of 60-90% and for non-identical twin pairs being half or less half of this figure in most studies (Faraone, 2005). Under the equal environment assumption for the two types of twin pairs heritability can be estimated as twice the difference in the two sets of correlations. Although some people question the assumption of 'equal environment' for identical and non-identical twins, this does not impact on the question of validity since the high twin correlations observed in these studies indicates that ADHD symptoms are highly familial. The equal environment assumption impacts on estimates of the proportion of the familial risk that is due to genes or equal environments (for example, Horwitz *et al*., 2003). It should also be recognised that high heritability does not exclude the important role of environment acting through gene-environment interactions (Moffitt *et al*., 2005).

Linnet and colleagues (2003) completed a systematic review of the evidence for association between prenatal exposure to nicotine, alcohol, caffeine and psychosocial stress. They concluded that exposure to tobacco smoke in utero is associated with an increased risk for ADHD. In contrast contradictory findings were found for the risk from prenatal maternal use of alcohol and no conclusions could be drawn from the use of caffeine. Studies of psychosocial

stress indicated possible but inconsistent evidence for an association with ADHD.

Summary

There is consistent evidence of familial influences on ADHD symptoms in the general population. Under the equal environment assumption these familial influences are thought to be largely genetic in origin. Environmental measures associated with ADHD have been identified, the most certain being the association with maternal use of tobacco during pregnancy. It is not known whether these environmental risks represent direct or indirect risks through correlated environmental or genetic factors. Specific genetic variants that are associated with a small increase in the risk for ADHD have been identified in the dopamine D4 and close to the dopamine D5 receptor genes. Analysis of ADHD versus non-ADHD groups has identified consistent changes in brain function and performance on neurocognitive tests; however differences from controls are not universal, do not characterise all children and adults with a clinical diagnosis of ADHD, and do not usually establish causality in individual cases.

1.5 Limitations

In line with methodology agreed with NICE the approach adopted was initially to identify all available systematic reviews and meta-analytic studies that related to the questions on validity of the diagnosis. While this was possible for much of the neurobiological and genetic and environmental data there were few systematic reviews in other areas such as the factor- or cluster-analytic studies. Where systematic reviews were not available for these studies of ADHD symptoms and studies that investigate the differentiation of ADHD from oppositional and conduct problems, systematic reviews of the primary literature were conducted. For other sub-questions addressed in this section the systematic evidence was supplemented with expert opinion, drawing on evidence known to members of the GDG. The lack of specific reference standards for the diagnosis of ADHD led to an adaptation of the SIGN criteria (see Appendix A) to ensure sufficient quality of the data used to derive recommendations for this guideline.

When considering the Feigner criteria for validity of a psychiatric disorder, the question of whether there are specific responses to clinical, educational and other interventions for ADHD was excluded, since the data to answer this question was very limited. For example it was not possible to identify studies that investigated the effects of stimulant treatments in disorders other than ADHD and there were limited published data on the effects of stimulants in people who do not ADHD. A paper that did not meet the quality control criteria for the evidence sections of this chapter, investigated the response to dexamphetamine and placebo in a group of 14 pre-pubertal

boys who did not fulfil criteria for ADHD (Rapoport, 1978). When amphetamine was given, the group showed a marked decrease in motor activity and reaction time and improved performance on cognitive tests. The very small numbers used in this study and lack of further similar studies means that considerable caution must be taken in drawing firm conclusions. Nevertheless, the similarity of the response observed in children without ADHD to that reported in children with ADHD provides further evidence that the aetiological mechanisms that give rise to ADHD are similar to those that influence levels of ADHD symptoms through the population. However the key difference from treatment of people with ADHD is that the 'behavioural symptoms' that responded to medication were not causing impairment in the children in this study.

1.6 Position statement on validity of ADHD

Hyperactivity, inattention and impulsivity cluster together both in children and in adults and can be recognised as distinct from other symptom clusters, although they frequently co-occur alongside other symptom clusters.

Symptoms of ADHD appear to be on a continuum in the general population.

ADHD is distinguished from the normal range partly by the number and severity of symptoms and partly by the association with significant levels of impairment.

The importance of evaluating impairment and the difficulty in establishing recognised thresholds on the basis of symptom counts alone needs to be addressed. It is not possible to determine a specific number of symptoms at which impairment arises.

There is evidence for psychological, social and educational impairments in both children and adults with ADHD.

ADHD symptoms persist from childhood through to adulthood. In a significant minority, the diagnosis persists and in the majority, sub-clinical symptoms continue to be detectable.

In adults the profile of symptoms may alter with a relative persistence of inattentive symptoms compared to hyperactive-impulsive symptoms.

There is evidence of both genetic and environmental influences in the aetiology of ADHD. It is not known the extent to which there is diversity in the aetiology of the disorder.

Contemporary research suggests that environmental risks are likely to interact with genetic factors, but there is currently limited direct evidence to support this view.

There is evidence of genetic associations with specific genes, environmental risks and neurobiological changes in groups of children with ADHD. However no neurobiological, genetic or environmental measure is sufficiently predictive to be used as a diagnostic test.

The diagnosis remains a description of behavioural presentation and can only rarely be linked to specific neurobiological or environmental causes in individual cases.

Hyperkinetic disorder (ICD-10) is a narrower and more severe subtype of DSM-IV combined type ADHD. It defines a more pervasive and generally more impairing form of the disorder. Both concepts are useful (Santosh *et al*., 2005).

There was no evidence of a need to apply a different concept of ADHD to children and adults. However age-related changes in the presentation are recognised.

All current assessment methods have their limitations. There is evidence of the need for flexibility and for a consideration of levels of impairment in assessments and when deriving appropriate diagnoses.

1.7 Consensus conference

In addition to a review of published evidence on the question of validity, a consensus conference was held to bring together experts in the field with a range of views, in order to debate the key issues of the use of ADHD as a diagnostic category. The aim was to provide a range of contemporary perspectives that would assist the GDG with the task of deciding what should trigger the use of the guideline and for whom the guideline is intended (see Methods Chapter x). The speakers delivered a 15-minute presentation addressing the key questions relating to the validity of the ADHD diagnosis set out by the GDG followed by questioning from the GDG members and a subsequent discussion of the presentation among members of the GDG.. Each presenter was subsequently asked to provide a summary of their presentation and these are also presented in Appendix A.

1.7.1 Discussion on consensus conference presentation

Different presenters brought their own perspectives and this contributed to highlight the importance of a multi-disciplinary approach to the diagnosis

and treatment of children with ADHD. The conference did not consider diagnosis and treatment of adults with ADHD. Here some of the issues that were raised, and the areas of controversy arising from differences in the perception of the different speakers at the consensus conference, are discussed.

The evidence presented at the consensus conference indicated that there was a high degree of unanimity across presenters (coming from a wide range of perspectives) about the fact that there is a group of people who could be seen as having distinct and impairing difficulties and who should trigger the use of this guideline. While recognition of a particular group was agreed upon, uncertainty about the breadth of diagnosis was discussed, namely, whether the use of a narrow (ICD-10 hyperkinetic disorder) versus a broad (DSM-IV ADHD) diagnosis should be used. The problems of using a narrow diagnosis are: (i) the under-recognition of people that are in need of help and, (ii) the lack of connection with the research literature, which is based mainly on broader definitions such as DSM-IV. It was established that the main differences between people falling into narrow or broad diagnoses are the breadth of symptoms (requirement for both inattentive, and impulsive-overactive behaviour versus only one domain being sufficient), more or less stringent criteria for situational pervasiveness and the requirement for no major coexisting conditions (apart from oppositional defiant or conduct disorder under ICD-10). Both groups present similar problems of impairment. Overall there was general agreement that both the use of broad (DSM-IV) ADHD diagnosis and narrow hyperkinetic disorder criteria were useful.

One of the major issues of controversy in the UK setting is the very high and variable prevalence rates reported in the literature. For example, recent prevalence figures range from 6.8 to 15.8 for DSM-IV ADHD (Faraone *et al.*, 2003) while the British Child and Mental Health Survey reported a prevalence of 3.6% in male children and less than 1% in female (Ford *et al.*, 2003). Reasons for this are discussed in Faraone and colleagues (2003) who conclude that prevalence rates derived from symptoms counts alone, or from ratings in one setting, were higher than those that took into account functional impairment. For example Wolraich and colleagues (1998) estimated prevalence to be 16.1% on the basis of symptom counts, but 6.8% when functional impairment was taken into account. A study in the UK that specifically addressed the role of impairment found that among seven- to eight-year-olds 11.1% had the ADHD syndrome based on symptom count alone (McArdle *et al.*, 2004). In contrast, 6.7% had ADHD with Children Global Assessment Scale scores (CGAS: measuring impairment) less than 71 and 4.2% with CGAS scores less than 61. When pervasiveness included both parent and teacher reported ADHD and the presence of psychosocial impairment prevalence fell lower to 1.4%. The literature on prevalence therefore indicates that the rate of ADHD is sensitive to the degree of impairment associated with the symptom criteria and the degree to which the disorder shows situational pervasiveness.

All the speakers acknowledged the importance of functional impairments in relation to diagnosis. In other words, that diagnostic thresholds should be based on pragmatic grounds such as impairment and the need for treatment. However, there was also agreement that defining suitable thresholds for impairment is difficult due to the breadth of areas in which people with ADHD can be impaired. The level and types of behaviour that define the normal range remain a contentious issue.

On considering when this guideline would be triggered, the GDG concluded that it would be difficult to be prescriptive for any individual case, but that measurement of impairment linked to the symptoms of ADHD is a key component of the decision. Significant problems can arise at various levels, including personal distress from symptoms of the disorder, difficulties in forming stable social relationships and emotional bonds, difficulties with education and long-term risk for negative outcomes such as emotional problems, antisocial behaviour and addiction disorders. The group concluded that treatment response should take into account the severity of the disorder in terms of clinical and functional impairments and evidence should be looked for on the impact of severity of the disorder on treatment response. Overall this is an area in which further research is required to investigate both the short- and long-term outcomes of ADHD and its relation to severity of the condition.

One of the areas of controversy highlighted in the consensus conference was the degree of impairment and severity of ADHD needed to trigger the diagnosis, and related to this, treatment with medication. There is concern in some quarters that the diagnosis automatically leads to treatment with medication and this is not always desirable when the breadth of the definition includes people who might gain substantial benefit from education or psychosocial interventions alone. However even the most ardent supporters of non-medical interventions in ADHD recognised the importance of medical treatment in the most severe cases. In this context the participants in the consensus conference made an important contribution by raising the question of suitable thresholds for 'significant impairments associated with ADHD symptoms' and hence the proportion of children fulfilling criteria for the disorder and triggering use of the guideline.

One conclusion is that the acceptable thresholds for impairment are largely driven by the contemporary societal view of what is an acceptable level of deviation from the norm and level of impairment that requires treatment. However the GDG did not consider that the diagnosis should be reserved only for the most serious cases, since the broader concept of ADHD is important in triggering educational and behavioural approaches in addition to medical approaches. The GDG concluded that defining appropriate thresholds of impairment associated with the disorder was important, but

that treatment implications might be different for individuals falling above or below particular thresholds.

Confirmatory factor-analytic studies clarify that ADHD symptoms represent a distinct set of symptoms and behaviours that co-vary together in both clinical and control populations. However these cross-sectional studies are far less informative than longitudinal studies that can clarify the predictive outcomes of early ADHD. There are however a few studies that provide suitable data on the relative outcomes of ADHD and other disruptive disorder such as ODD, which are important in delineating specificity in the outcomes related to ADHD. The available evidence suggests that when considering the link between ADHD and conduct problems, ADHD comes first and conduct problems develop later. In contrast there is no evidence that conduct problems in the absence of ADHD lead to the later development of ADHD. The small amount of suitable longitudinal outcome studies highlights an important area for future research.

The consensus conference also raised questions about the interpretation of family, twin and adoption studies and the relative contributions between genetic and environmental influences indicated by these studies. The argument against genetic influences is not strong unless one questions the conventional interpretation of twin data. But it is non-controversial that parent and teacher ratings of ADHD symptoms/behaviours show MZ correlations around 70-80% and DZ correlations around 20-40%; numerous studies replicate this. The usual interpretation of these findings is that the difference in MZ and DZ correlations are mainly the result of genetic influences. The alternative argument that the equal environment assumption is incorrect leads to the conclusion that familial influences are important, but not necessarily genetic. Either way, it is non-controversial that ADHD is familial and this in itself is strong evidence that the construct is sufficiently delineated to show such clear familial effects; that is, that the level of ADHD symptoms in one child strongly predicts the level of ADHD symptoms in his or her siblings. Interestingly there are limited data from twin studies using ADHD cases (for example, concordance rates for the clinical disorder), so the literature mainly uses extremes analysis of rating scale data. Similarly there is a lack of twin data in adult populations.

The GDG agreed that polarised positions in this debate are not helpful since the contemporary understanding of complex behavioural disorders emphasise the importance of interactions between genes and environments. The GDG wish to stress that the role of important genetic influences does not exclude an important role for environmental influences since individual differences in genetic risk factors are likely to alter the sensitivity of an individual to environmental risks. In this event, reducing environmental risk would be expected to reduce the risk for ADHD. Furthermore, the extent to which there are genetic influences has no direct bearing on the choice of

treatment approaches since both medical and psychosocial interventions (or a combination of the two) could be important in improving treatment outcomes.

1.8 Evidence summary

ADHD should be considered a valid clinical disorder that can be distinguished from co-occurring disorders and the normal spectrum

ADHD is distinguished from the normal spectrum by the co-occurrence of ADHD symptoms with significant clinical, psychosocial and educational impairments. These impairments should be enduring and occur across multiple settings.

Hyperkinetic disorder is a valid diagnosis that identifies a sub-group of people with ADHD with severe impairment in multiple domains.

ADHD commonly persists throughout childhood and into adult life where it continues to cause considerable psychiatric morbidity.

The quality of the evidence included in this review was variable and lacked any 'gold standard' because no diagnostic tests for ADHD have been developed or tested. In the absence of a gold standard for the validity of diagnosis of ADHD or hyperkinetic disorder a lower level of evidence was included in this review.

Although the quality of individual studies included in this review was variable, evidence consistently showed that children and adults with ADHD had associated impairments.

1.9 Clinical practice recommendations

1.9.1.1 For the diagnosis of ADHD or hyperkinetic disorder to be made, and for this guideline to be considered appropriate, the following criteria should be met:

1. Symptoms of ADHD (DSM-IV) or hyperkinetic disorder (ICD-10) should be sufficient to reach a formal diagnosis in DSM-IV or ICD-10.

2. ADHD should be considered in all age groups (children, adolescents and adults), with symptom criteria adjusted for age appropriate changes in behaviour.

3. The level of impairment resulting from symptoms of hyperactivity and or inattention should be:

- at least moderately clinically significant on the basis of interview and or direct observation in multiple settings, and

- pervasive (occur in all important settings) including social, familial educational and or occupational settings.

1.9.1.2 In determining the clinical significance of impairments resulting from the symptoms of ADHD in children, the views of the child should be taken into account, wherever this is possible.

1.9.1.3 The diagnosis of ADHD should only be made by specialist psychiatrists or paediatricians following a full assessment of the child, adolescent or adult; including all relevant settings.

1.9.1.4 After making a diagnosis of ADHD or hyperkinetic disorder subsequent assessment and treatment should follow the guideline recommendations.

Part 3: Diagnosis position statement (part 1 validity) peer reviewer consultation table

Stakeholder
PR – Peer Reviewer
CC – Participant in Consensus Conference

No	Type	Stakeholder	Section	Comments	Reference suggested & reason for inclusion/exclusion	Actions
20	CC	David Coghill	1.1	The document uses both the DSM IV term of ADHD and ICD 10 hyperkinetic disorder. It also however uses ADHD as an umbrella term. The GDG should agree on a nomenclature and clarify this at the beginning of the document something along the lines of "we will use the terms ADHD (DSM IV) and Hyperkinetic disorder (ICD 10) when talking about the specific diagnostic categories, however when discussing the general disorder we will use ADHD as an umbrella term" (others have chosen to use AD/HKD as the umbrella. To this could be added the paragraph on "hyperactivity" in the last paragraph in section 1.2.	No reference suggested.	Comment addressed, see section 5.2 'ADHD and Hyperkinetic Disorder'.
78	PR	Jonathan Leo	1.1	Just because we can diagnose a trait does not mean it is a disease. Your title could leave some people with the mistaken impression that if you can identify a trait and label it, that it can then be called a disease. The validity of the diagnosis – whether you can reliably identify it in some children – is an interesting question, but in this document it is simply a distraction from the main question. The essential question for the NICE committee should be: Is the disease concept of ADHD valid? With that in mind section 1.4 1, 1.4.2, 1.4.2.1, and 1.4.2.2 have little relevance. The most important section, which most of my comments address, is 1.4.6.	No reference suggested.	Comment addressed, see sections 5.3 and 5.10.
42	PR	David Cottrell	1.1	This comment may be redundant as definitions may come earlier in the	No reference	Comment addressed,

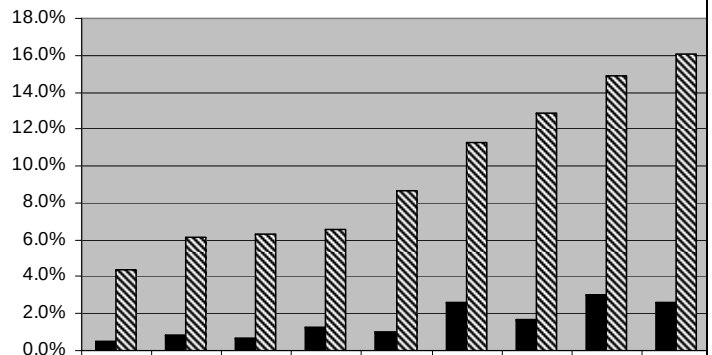
				guide but reading this section in isolation I wanted to see a clearer definition of ADHD and HK disorder a\t the beginning of the chapter.	suggested.	see section 5.2 'ADHD and Hyperkinetic Disorder'.
21	CC	David Coghill	1.2	Overall I feel this section needs considerable rewriting as it does not flow at all well. As such does not do justice to the rest of the document which is essentially well written and organised. I have made some suggestions in the text.	No reference suggested.	Comment addressed, see sections 5.1 to 5.4.
50	PR	Stephen Faraone	1.2	You might note that the methodology used to create the Washington University Diagnostic Criteria has been widely accepted and that similar approaches have been used to validate categories for the Research Diagnostic Criteria, the DSM and the ICD criteria (when relevant validating data have been available). My point is that your choice of the WDC is far from arbitrary as there is some consensus as to what the "rules of evidence" should be for asserting the validity of a psychiatric disorder. The intellectual foundation for all these criteria relies heavily on the concept of "construct validity" so well articulated by Paul Meehl decades ago.	No reference suggested.	Comment addressed, see section 5.4.
22	CC	David Coghill	1.2 para 2	"Furthermore, in keeping with other common behavioural disorders there is no clear distinction between the clinical condition and the normal variation in the general population" The meaning of this sentence is rather unclear. I think it is confusing (or maybe confounding?) symptoms and impairment and to do with the precise words used. There is a continuity of symptoms between those with the disorder and the population. However those with the clinical condition have both high levels of symptoms and impairment leading to a clearer "distinction" between the two. Whilst this may seem trivial the actual sentence is contrary to the conclusions and will be picked up by those who wish to point out that NICE says "there is no clear distinction between the clinical condition and the normal variation in the general population" without clarifying the context of the quotation.	No reference suggested.	Comment addressed, see sections 5.3 (third paragraph) and 5.5.3.
80	PR	Jonathan Leo	1.3	I think that somehow you need to mention that your literature review was very selective and systematically ignored review articles that were critical of the ADHD diagnosis. As you are aware of both the controversy surrounding the diagnosis and those authors who have addressed the problem, I am assuming that it was a conscious decision to ignore one side of the debate. There is a large body of literature that sees forces other than biology as the	References suggested: Gale (2006) Ritalin requests often deemed inappropriate. *Medscape*.	References included in the NICE guideline as evidence (found by systematic searches or identified by GDG members) have to

				source for the dramatic rise in the diagnosis of ADHD. This literature comes from wide and varied sources and is representative of a large segment of the main stream media and academia. Since one reason that NICE is taking on this difficult task is because the ADHD diagnosis is controversial, it does not make sense to simply ignore critical publications. Just summarizing the reviews from main stream psychiatry journals does not give a balanced view, especially when one considers that it is extremely difficult to get anything published in a psychiatry journal or medical journal that is critical of the ADHD diagnosis. You even acknowledge that in one section of the document that, because there was limited data, "…the systematic evidence was supplemented with expert opinion, drawing on evidence known to members of the GDG." By selectively choosing data in support of a particular point of view it suggests that your conclusions were made first, and the studies were then subsequently chosen to support your conclusion, and not the other way around, that a group of non-partisan academics analyzed all the data and then came to a conclusion. As just one example of how the debate is framed in academic journals, in 2002, a group of scientists published the International Consensus Statement on ADHD. The consensus statement had several surprising and remarkable declarations such as: "Numerous studies of twins demonstrate that family environment makes no significant separate contribution to these traits" (Which runs counter to the NICE document). "One gene has recently been reliably demonstrated to be associated with this disorder….," "neuroimaging studies of groups with ADHD also demonstrate relatively smaller areas of brain matter," "Most neurological studies find that as a group those with ADHD have less brain activity…" When a group of academicians sent a Letter to the Editor of *Child and Family Psychology Reviews* about the Consensus Statement, the editor responded that the letter could be published, but only if Dr. Barkley, the lead author of the Consensus Statement, was given the courtesy of having the last chance to respond. However, this was not a courtesy initially granted to the academicians critical of the rising diagnosis of ADHD, who Barkley and his	Paper excluded: relevant to use of Ritalin, not validity of ADHD; not peer reviewed.	meet quality assessment criteria. This is explained in Chapter 3 Methodology. Comments addressed, see section 5.9 for limitations of references included and last two paragraphs for use of stimulants. The use of drug treatment (recommendations) is addressed in Chapter 9 Pharmacology.

				co-authors compared to members of the flat-earth society. Thus, the authors of the Consensus Statement were given a second chance to cite evidence in support of the biological basis of ADHD, yet rather than cite several specific articles; they instead mentioned that there were hundreds and hundreds of articles. However, good science is not determined by how high the papers can be stacked but by the quality of the papers. To paint those concerned about the rising use of stimulants as somehow on the fringe, shows how isolated academicians can become from the general public. For the GDG to not acknowledge anyone critical of the diagnosis in their own review puts the GDG in the same category as the Consensus authors. Does NICE want to be in the same category? Nowhere in the GDG document is there a discussion about the ethics of giving a performance enhancing drug to improve academic success in school - a major reason the drug is used in the first place. For instance, take the announcement about a recent survey, "Results of a survey of physicians suggest that parents often request a 'behavioral drug,' such as Ritalin, with the goal of enhancing their child's academic performance *rather than treating an illness*." (Gale, 2006, Italics added). The headlines expressed surprise at this practice, yet the practice of prescribing stimulants to improve academic performance is exactly why these medications are prescribed in the first place, and, it is fully sanctioned by the medical community. According to Joseph Biederman, "If a child is brilliant but is doing OK in school, that child may need treatment, which would result in performing brilliantly in school" (Gale, 2006). *In fact, no official organization that supports the use of stimulants has ever said that using stimulants to improve academic performance is inappropriate. Even the GDG has not said this is inappropriate. Is it?*		
82	PR	Jonathan Leo	1.4	In your framing of the question, you ask if environmental factors are associated with ADHD. You then address one review covering the evidence of prenatal exposure to drugs. Again you have systematically ignored a large body of evidence. Perhaps this section is the biggest flaw in your document. Any academic reading this discussion will have a hard time taking your seriously if you cannot think of a single environmental influence coming from the home or school environments that contributes to ADHD. Either you need to comment on this research or explain why you are ignoring it. For instance, a recent study showed that children from divorced families are twice as likely to be diagnosed with ADHD. (CMAJ, Strohschein,	References suggested: Strohschein (2007) Prevalence of methylphenidate use among Canadian children following parental divorce. *CMAJ*, 176(12):1711-4. Paper included.	Comment addressed, see section 5.8.

				2007). And prior studies have shown that children from single family homes are more likely to be diagnosed with ADHD. For more information I have attached two tables and a discussion from Dr. Nicky Hart at UCLA who addresses the differences in the ADHD diagnosis across the socioeconomic strata in England and Wales. The data will appear in a forthcoming book: ADHD and Health Inequality The statistical evidence generated by the British government as part of its policy making function runs against the impression that ADHD is best thought of as a bio-medical phenomenon. The social distribution of the disorder follows the contours of the class mortality gradient. In other words, it fits the classic profile of health inequality: low prevalence at the top, and high prevalence at the bottom of the social hierarchy. Children exhibiting the symptoms of emotional and conduct disorders, and those afflicted with the troubling symptoms of attention deficit and hyperactivity disorder are much more likely to be poor, to be raised by single and / or unemployed parents, to grow up in neighbourhoods scarred by the signs of under-privilege and to be exposed to stressful life events and social relationships in their early lives. Figure 1 displays the class gradient of psychiatric morbidity as a whole in British children. The rate is around 4% among children in families where the main breadwinners are employed in higher professional occupations(e.g lawyers, doctors, professors). It is 4 times higher (16%) in families where parents are either (chronically unemployed or have never worked at all.	Hart (in press) Health inequality in ADHD. McMillan Paper excluded: not peer-reviewed.	

Figure 1: Social Class & Mental Health in Childhood England & Wales 2004

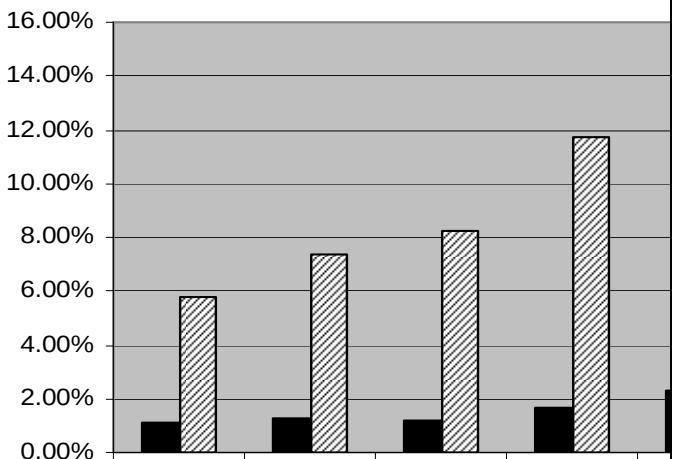


	Higher profs	Higher managerial	Lower managerial/prof	Small employers & self-	Lower supervisory &	Intermediate occups	Semi-routine	Routine occups	Never worked/ long-
Hyperkinetic disorder	0.5%	0.8%	0.7%	1.3%	1.0%	2.6%	1.7%	3.0%	2.6%
Any mental disorder	4.4%	6.1%	6.3%	6.6%	8.7%	11.3%	12.9%	14.9%	16.1%

Source: DH 2004

This group includes single parent families headed by young women with no labour market experience prior to becoming mothers. The rate of ADHD British style (hyperkinetic disorder) follows the same course. It increases from 0.5% in professional families to 2.6 % in households with no attachment to the labor market, a 5 fold increase. In between these two poles of social privilege and under-privilege, the risk of mental disorder is around 6% in other middle class strata before 'jumping' to more than 8% in the lower supervisory/ technical occupations, from this point onwards, it rises steadily on each successive downward rung of the social hierarchy . If we take the lower supervisory occupational category in figure 3, as the division between the middle (white collar) and working class (blue collar) strata of British society (containing respectively 56 and 44 percent of the

				population), we can conclude that social class is strongly associated with children's mental well being. Working class kids face a much higher probability of experiencing the symptoms of mental disorder in all its forms than their peers in middle class homes, hyperkinetic disorder is no exception. The occupational class gradient of ADHD can be translated to another variable representing the social and economic geography of health inequality. This variable is based on the ACORN classification which uses the census characteristics of the area where a child lives (the postal code) to summarize its salient social characteristics. Figure 4, classifies the same sample of children by the quality of their living environment. In a literal sense this variable represents the social and economic environment of daily life and therefore the differential opportunities for physical and intellectual development in childhood.		

				Figure 4: Health Inequality in Childhood and the Social Geography of Disadvantage  Wealthy achievers | Urban prosperity | Comfortably off | Moderate means | p Hyperkinetic disorder: 1.10% | 1.30% | 1.20% | 1.70% Any mental disorder: 5.80% | 7.40% | 8.20% | 11.70% Once again, we find the social gradient so typical in the health inequality research literature. The symptoms of childhood psychiatric morbidity in areas populated by wealthy families are only half the rate of areas where families with moderate means make their homes. The gap is even wider between the most advantaged and the least disadvantaged neighborhoods and it apples to all mental as well as hyperkinetic disorder.		
23	CC	David Coghill	1.4	I do not think that the whole issues of impairment is dealt with well in this	No references	Comment addressed,

			general	section. It makes a significant appearance in the discussion of consensus conference and in the recommendations however it does not read as if it was critically appraised and considered by the GDG. I think this needs to be remedied within 1.4	suggested.	see section 5.6.
43	PR	David Cottrell	1.4.1	First para after sub heading `Evidence'. I have a problem with the use of the word `symptom in this chapter. The issue of the diagnostic validity is a contentious one as illustrated by the lengths the GDG have gone in consulting widely. `Symptom' implies an illness or disorder about which someone is complaining. Question A in 1.2, repeated at the start of 1.4, and question A1 at the start of 1.4.1 are careful in using the neutral term `phenomena' to describe the behaviours of interest. This seems appropriate given that the whole point of this chapter is to reach conclusions about whether ADHD is or is not a useful construct. To then use the word `symptom' seems to suggest that the issue is already decided. Its use may be appropriate when referring to clinical samples but the use at the end of this paragraph relates to a study where the sample is unclear  This usage recurs in 1.4.1 and throughout the chapter. For example 1.4.3 has `phenomena' in the title but then refers to `continuous distribution of symptoms in the population' in para 3. I will not list all examples here, and as stated above, symptom' may be appropriate for research on clinical samples but I think language could be used more carefully and would advocate a word search of the document and consideration on each occasion of the word `symptom' whether it is in fact the best word available.	No references suggested.	Comment addressed, see section 5.2 'Symptoms'
71	CC	Sami Timimi	1.4.1	(A1) Do the phenomena of hyperactivity, inattention and impulsivity cluster together? the GDG concludes "The number of factors varies between studies, with most finding two correlated factors for hyperactivity-impulsivity and inattention; others find that hyperactivity and impulsivity can be distinguished and a few find one combined factor of all three domains" suggesting little consistency in the literature.	No references suggested.	Comment addressed, see sections 5.5.1 and 5.10.
24	CC	David Coghill	1.4.1 evidence section (should be 1.4.1.1	This section would be easier to read if it started with a comment along the lines of "There was strong evidence for clustering of symptoms in both population and clinical samples. Evidence for 1, 2 and 3 factor models was found with most evidence supporting a two factor model. "	No references suggested.	Comment addressed, see section 5.5.1 'Summary'.

			?)			
25	CC	David Coghill	1.4.1 summary	The possibility of different patterns across different age ranges should be mentioned in the summary	No references suggested.	Comment addressed, see section 5.5.1 'Summary'.
44	PR	David Cottrell	1.4.2	First para, definitions again – it might be helpful to briefly define `oppositional defiant and conduct problems', perhaps in a box? I confess to being unsure what these are myself. Are `conduct problems' the same as conduct disorder, if so why not use a term with an agreed definition. If not we need a definition. The terms oppositional defiant problems, conduct problems, ODD (without ever being given in full), conduct disorder and `disruptive behavioural problems' are all used in section 1.4.2.1	No references suggested.	Comment addressed, see sections 5.2 'Oppositional defiant disorder (ODD) and conduct disorder (CD)'.
72	CC	Sami Timimi	1.4.2	(A2) Are ADHD symptoms distinguishable from other conditions? It is noted that "Frouke and colleagues (2005) conducted a diagnostic study of 2,230 Dutch pre-adolescents from the general population. LCA revealed that ADHD symptoms clustered together with symptoms of oppositional-defiant disorder and conduct disorder. A further study from the Netherlands of disruptive behaviour in 636 seven-year-old children (Pol *et al*., 2003) came to similar conclusions" and "Multivariate twin modelling suggests that while the genetic influences on conduct disorder are largely shared with those that influence ADHD" and "ADHD is reported to co-occur with personality disorder in young offenders (Young *et al*., 2003)" and "Dysthymia, depression and anxiety symptoms and disorders are frequently associated with ADHD in adults." The GDG's own evidence is suggesting high levels of co-morbidity raising doubts about the specificity of ADHD symptoms. The GDG use a 'get out of jail card' by concluding that this is because "Longitudinal studies suggest that ADHD represents a separate condition that is a risk factor for the development of oppositional and conduct problems." However, only one reference is cited in support of this (and this was in a study in which the chair of the GDG is the lead author).	No references suggested.	Comment addressed, see section 5.5.2 'Summary' (third paragraph).
62	PR	Anita Thapar	1.4.2.1	"there are in addition environmental factors that influence the risk for conduct problems but not ADHD" Suggest delete "but not ADHD" Twin studies show important E contribution	No references suggested.	Comment addressed, see section 5.8.2.
63	PR	Anita Thapar	1.4.2.1	"The heritability of ADHD symptoms is also higher than that for ODD/CD symptoms in these studies"	No references suggested.	Comment addressed, see section 5.8.2.

				Suggest delete that sentence. It is not scientifically sensible to compare heritability estimates as they are population specific Also some of the most genetic syndromes (e.g. in general medicine) can show lower heritability estimates		
29	CC	David Coghill	1.4.2.1 and summary for 1.4.2	pervasive developmental disorders are mentioned in the summary but not in the main body of the text. If there is info re PDD it should be discussed, if there is not this also should be mentioned.	No references suggested.	Comment addressed, see section 5.5.2 'Summary'.
26	CC	David Coghill	1.4.2.1 para 2	This paragraph should make it clearer that these studies disagree with those cited in para 1 by attaching a statement to that effect before giving the evidence (it is interesting that these are the only two studies in this section with n reported	No references suggested.	Comment addressed, see section 5.5.2 'ADHD and oppositional defiant and conduct problems'.
27	CC	David Coghill	1.4.2.1 para 2	What is CP ?	No references suggested.	Typing mistake, now reads 'CD' for conduct disorder.
28	CC	David Coghill	1.4.2.1 para 4	However the two often occur independently of each other and only partially share aetiological factors. Should read However the two often occurred independently of each other and only partially shared aetiological factors. As it is citing the finding of the study not a general finding.	No references suggested.	Comment addressed, see section 5.5.2 'Summary'.
7	PR	Margaret Alsop	1.4.2.2	Due to our involvement within many working and commissioning groups, it has been highlighted by Youth Offending Teams (YOTS), Probation Services, Prisons, Young Offenders Institutes, Police, YISP, (Youth Inclusion Support Programmes) Connexions Services, Young People's Supported Housing, Housing Advice, Young People leaving Care, Drug Advisory Teams, Legal profession such as magistrates/judges that there is now a high percentage of individuals with ADHD or suspected ADHD reaching these services. According to the Cambridgeshire study in 1995, 90 per cent of recidivist juvenile offenders had a conduct disorder at age seven. Young offenders now responsible for about a third of all the criminal convictions. A Youth Justice Board survey showed that the number of criminal offences committed by young people is probably far higher than the conviction rates suggest.	References suggested: Cambridgeshire study (1995) Asked reviewer for full reference, no response.	Comment taken into consideration, see sections 5.5.2 'ADHD and oppositional defiant and conduct problems', 'ADHD and other co-occurring conditions' and 5.6 'Antisocial behaviour'.

64	PR	Anita Thapar	1.4.2.2	"overlapping genetic influences on ADHD and conduct problems but the genetic influences estimated by twin studies are greater for ADHD than ODD/CD…. Delete part of sentence "but the genetic influences estimated by twin studies are greater for ADHD than ODD/CD" See above for reason.	No references suggested.	Comment addressed, see section 5.5.2 'Summary'.
30	CC	David Coghill	1.4.3	I feel this section should preceed the current 1.4..2 as it would seem logical to sat does adhd separate from normality and if so does it separate from other disorders.	No references suggested.	The sequence used follows the Washington Diagnostic Criteria sequence.
31	CC	David Coghill	1.4.3	It should be made clearer that in the factor approaches can only deal with the symptom level. It does not take into account the whole issue of impairment. Impairment is discussed in some depth in section 1.7.1 but I feel that it should be discussed or at least better acknowledged in section 1.4. Again a failure to do so will lead to misuse of isolated sections of the guidance out of context and could lead to misunderstandings.	No references suggested.	Comment addressed, see section 5.5.3 'Summary' (last paragraph).
51	PR	Stephen Faraone	1.4.3	I agree with the comments in this section. But one point is missing. I think that the studies which show ADHD to be an extreme of a quantitative trait have typically defined ADHD based on symptom criteria alone. Their results may have been different if impairment criteria were used to define disorder status.	No references suggested.	Comment addressed, see section 5.5.3 'Summary' (last paragraph).
65	PR	Anita Thapar	1.4.3	"high ADHD symptom scores are the same as those that influence ADHD symptom levels…" DF analysis can't distinguish this-shows that the magnitude of the heritability estimate is the same for high as for "normal range" Suggest reword to "high ADHD symptoms scores are of the same magnitude as those that influence ADHD symptom levels…"	No references suggested.	Comment addressed, see section 5.5.3.
73	CC	Sami Timimi	1.4.3	(A3) Are the phenomena of hyperactivity, inattention and impulsivity distinguishable from the normal spectrum? it is stated that "These studies show that children with ADHD appear to be at one extreme of a quantitative dimension and on this quantitative dimension there is no obvious bi-modality that separates children with ADHD from non-ADHD children." it	No references suggested.	Comment addressed, see section 5.5.3 'Summary'.

				is also noted that "there is no obvious threshold or cut-off between ADHD and the continuous distribution of symptoms in the population." In the introduction to the document it is stated that "in keeping with other common behavioural disorders there is no clear distinction between the clinical condition and the normal variation in the general population" The GDG conclude that "Most analytic approaches are unable to make a clear distinction between the diagnosis of ADHD and the continuous distribution of ADHD symptoms in the general population" in other words the answer to question 1.4.3 is, according to the evidence presented, "no".		
74	CC	Sami Timimi	1.4.4	Is the cluster of symptoms that defines ADHD associated with significant clinical and psychosocial impairments? The GDG provides evidence that is consistent with ADHD being associated with significant impairment. However what is not properly addressed is the nature of this association and direction of causality. For example with regards academic difficulties it is noted that "These impairments often lead to grade retention (Hinshaw, 2002), to a lower probability of completing schooling when compared with children who do not have ADHD (Mannuzza *et al*., 1993)" This association could be mediated by a third factor, such as lowered self-esteem, boy-unfriendly school curricula, frustration, learning difficulties etc. that leads to both ADHD symptoms and poor school performance. In family difficulties it is mentioned that "Follow-up studies indicate that mothers of children and adolescents with ADHD have more difficulty in child behaviour management practices and coping with their child's behaviour (August *et al*., 1998), and display higher rates of conflict behaviours, such as negative comments, social irritability, hostility and maladaptive levels of communication and involvement (August *et al*., 1998; Fletcher *et al*., 1996). Family impairment also permeates the parent's lives. Parents of children with ADHD report having less time to meet their own needs, fewer close friendships, greater peer rejection, less time for family activities, which might lead to less family cohesion and a significant effect on the parent's emotional health (Bagwell *et al*., 2001)." A vast repertoire of attachment studies also suggest that this association might well indicate important causal factors for ADHD symptoms (i.e. theses family difficulties cause rather than are caused by ADHD, or more likely interact in varying degrees and combinations depending on the family and individual). With regard anti-social behaviour the GDG note "In a prospective follow-up of 103 males diagnosed with ADHD, the presence of an antisocial or conduct disorder almost completely	References suggested: Attachment studies Asked reviewer for full references, no response.	Comment addressed, see sections 5.6 and 5.11.

				accounted for the increased risk for criminal activities" and "Lee and Hinshaw (2004) reported that the predictive power of ADHD status to adolescent delinquency diminishes when key indices of childhood externalising behaviour related to ADHD are taken into account". Finally, discussion of long term outcome is difficult to interpret given that no information is provided by the GDG on the relationship of outcome to other factors known to be associated with poorer outcome such as social class, IQ, co-morbid diagnoses and so on.		
32	CC	David Coghill	1.4.4 and 1.4.5	I think that the substance misuse issues should be considered in 1.4.4 rather than 1.4.5. This section should also comment on the interactions between early treatment with stimulants and later occurring substance misuse and include nicotine as a drug of misuse that attenuates adhd symptoms.	No references suggested.	Comment addressed, see section 5.6.
8	PR	Margaret Alsop	1.4.4.2	Whilst we agree in principle, our own personal experiences and that of having worked with and supported many families for over a decade through the ADHD Support Group, there is clear indications that parents are still being subjected to accusations of 'poor parenting'. As parents, not only are we dealing with the family members needs, that of siblings but with professional bodies such as health, education and social care in which to access an appropriate multi-agency, multi-disciplinary service for the ADHD family member, no one body taking responsibility in which to meet the needs of those with ADHD or that of family members. Such dealings may lead to conflict between parent carers and service providers, therefore having an impact on service delivery. A high percentage of parents and family members living with ADHD may be accessing mental health services for that of their own needs.	No references suggested.	Comment taken into consideration.
45	PR	David Cottrell	1.4.4.2	The other parts of 1.4.4 address the potential confounding influence of co-morbid conduct disorder, this is not mentioned in this section on family difficulties.	No references suggested.	Comment addressed, see section 5.6 'Family difficulties'.
9	PR	Margaret Alsop	1.4.4.3	Could it be that by the time the ADHD child is a teenager they may feel that they are somehow different to their friends, but may not understand why? To the ADHD adolescent, they often think that there is some kind of secret code going on between others. This ever widening void is being caused by their inability to learn the code of social cues-those nuances of physical expression and movement that carry half of any conversation and convey personal attitude, varying emotions and defence (or lack of it) between other	References suggested: Cross Cutting Review of Children at Risk (2002) Paper excluded: Not specific to ADHD, not	See section 5.6.

				conversing group of people. The ADHD adolescent may have a two way body language problem involving interpreting others and giving the right signals in return. They may try and copy those around them, without being aware of the subtle complexities or of what is or is not socially acceptable. 'Too many children fail to achieve their full potential and face involvement in crime, poor health, early unwanted pregnancies, substance misuse or under-achievement in education because services fail to spot the emerging risks or to intervene early enough to co-ordinate the support necessary. We know that factors such as poverty, failure at school, mental health, family problems or antisocial behaviour can each be possible indicators of future problems'. (Cross Cutting Review of Children at Risk for the 2002 Spending Review).	peer reviewed.	
10	PR	Margaret Alsop	1.4.4.5	Adults with ADHD we have found may have a criminal record of some sort, this highly impacting on their accessing appropriate adult educational programmes, many with no educational qualifications, (under- achieving academically) poor record of school attendances or exclusions from education, all of which are contributing factors and play a major role in their employment or future employment status. Multi-agency working to include occupational therapists during transitional services would perhaps contribute towards meeting the needs of those with ADHD and working alongside future employers.	No references suggested.	Comment addressed, see section 5.6 'Adolescent and adult problems'.
52	PR	Stephen Faraone	1.4.4.5	You might also mention the data showing ADHD patients to be at high risk for traffic citations and traffic accidents. You could also mention their increased health care utilization.	References suggested: Risk for traffic accidents. Asked reviewer for full references, no response.	Comment addressed, see section 5.6 'Adolescent and adult problems'.
11	PR	Margaret Alsop	1.4.5	Many children accessing CAMHS or Paediatric services may do so until aged 16-17yrs. A high percentage of this group may not be referred onto the adult community mental health teams, therefore a child who has received a multi-agency as well as a medicinal approach to treatments for ADHD may well end up in that 'grey area' of their not accessing the appropriate health care and treatments could all be contributing factors to their possibly of their self-medicating on other substances.	No references suggested.	Comment taken into consideration. For recommendations on this matter refer to the NICE guideline.
46	PR	David Cottrell	1.4.5	First para after sub heading `Summary', line 10 – is `appropriate' correct?	No references	Comment addressed,

				Earlier you say the evidence is poor and that developmentally appropriate criteria have yet to be developed. I suspect this should be `inappropriate'	suggested.	see section 5.7.2.
53	PR	Stephen Faraone	1.4.5	In the summary, the following sentence is not clear and should be re-worded: "The profile of symptoms may alter with a relative persistence of inattentive symptoms compared with hyperactive-impulsive symptoms, however the evidence base for this conclusion is poor, using developmentally appropriate measures of hyperactivity-impulsivity in adults."	No references suggested.	Comment addressed, see section 5.7.2.
54	PR	Stephen Faraone	1.4.5	The summary states: "There was no evidence to warrant a different diagnostic concept in childhood and in adulthood." This seems a bit too strong. The DSM itself allows for a different diagnostic concept: 1) the category of in partial remission can be used for adults; 2) a subjective feeling of restlessness can be diagnostic of motor hyperactivity. Russ Barkley's new book (and some of his prior work) suggests that the current ADHD symptoms are not developmentally sensitive and there have been some initiatives to re-write the ADHD rating scale (e.g., work by Spencer and Adler) so that the questions are more relevant to adults. Also, I think that the greater reduction of hyperactive-impulsive vs. inattentive symptoms is more strongly supported than you suggest. But these are all, for sure, debatable points.	References suggested: Barkley's book Paper excluded: not peer-reviewed.	Comment addressed, see section 5.7.2.
55	PR	Stephen Faraone	1.4.5	I don't understand the statement "…there is a lack of data on the continuity of aetiological factors into adulthood." Given that many of the known risk factors for ADHD occur very early in development (eg., genes, fetal toxic exposures), why would we think their effects turn off during adulthood. I think you mean that we know little about which risk factors modify the course of ADHD through adolescence into adulthood. Probably a re-wording is needed.	No references suggested.	Comment addressed, see section 5.7.2.
75	CC	Sami Timimi	1.4.5	Is there evidence for a characteristic pattern of developmental changes, or outcomes associated with the symptoms, that define ADHD? It is noted that "Faraone and colleagues (2006) analysed data from 32 follow-up studies of children with ADHD into adulthood. Where full criteria for ADHD were used approximately 15% of children were still diagnosed with ADHD at age 25" This is the only systematic review identified outside of point 1.4.6 (where 7 were identified). This finding seems to suggest that 'characteristic' outcomes for those diagnosed with ADHD is far from established. Later the	No references suggested.	Comment addressed, see section 5.7.2.

				GDG speculate as to why rates of substance abuse is higher in those with ADHD symptoms (is this a 'characteristic' outcome?) stating "The mechanisms involved can include one or more of the following: first that individuals with ADHD may seek out highly stimulating or risky activities; second that individuals with ADHD are exposed to higher levels of psychosocial risks for development of substance use disorders, resulting from educational and social impairments, social exclusion and antisocial behaviour associated with ADHD. Third, that various substances, including cannabis, alcohol and stimulants can attenuate ADHD symptoms and are therefore sometimes used as a form of self-treatment." Whilst it is unclear why the GDG felt the need to speculate (without evidential references) on this issue, narrow linear biomedical paradigms seems to have allowed them to overlook fairly basic scientific issues. The relationship between ADHD and substance misuse that they are referring to is an association, and thus a third (or more) factor may be responsible for both the substance misuse and ADHD symptoms (such as low self-esteem, family conflict, learning difficulties, co-morbid conditions etc.) making the required criteria of 'characteristic' difficult to establish.		
33	CC	David Coghill	1.4.5 summary	Using child criteria, approximately 15% of children with ADHD retain the diagnosis by age 25 but a much larger proportion (65%) show persistence of symptoms with associated impairments. Could read . Using child criteria, approximately 15% of children with ADHD retain the diagnosis by age 25 but a much larger proportion (65%) show some persistence of symptoms with significant associated impairments.	No references suggested.	Comment addressed, see section 5.7.2.
35	CC	David Coghill	1.4.6	Also the whole issue of heterogeneity at all levels of analysis needs to be discussed as this is central to the whole issue of what is ADHD …. I guess the current conclusion would be something like here are a group of symptoms hold together pretty well that that can be distinguished from normal and other disorders that cause impairment but seem to be the end point (behavioural phenotypic expression) of a wide range of different causal pathways. This would assist the discussion of diversity in section 1.6	No references suggested.	Comment addressed, see section 5.8.
47	PR	David Cottrell	1.4.6	Could/ should you define executive function for a lay readership?	No references suggested.	Comment addressed, see section 5.8.1.
56	PR	Stephen Faraone	1.4.6	I suggest you include the following: Valera EM, Faraone SV, Murray KE, Seidman LJ: Meta-analysis of structural imaging findings in attention-	References suggested:	Comment addressed, see section 5.8.1

				deficit/hyperactivity disorder. Biol Psychiatry 2007; 61(12):1361-9.	Valera (2007) Meta-Analysis of Structural Imaging Findings in Attention-Deficit/Hyperactivity Disorder, *Biol Psychiatry*, 61:1361–1369 Paper included	'Neuroimaging studies'
57	PR	Stephen Faraone	1.4.6	A more thorough review of the molecular genetics literature would implicate other genes but that is not essential to make your point. If you'd like to improve the review of environmental risk factors, you could consult: Banerjee TD, Middleton F, Faraone SV: Environmental risk factors for attention-deficit hyperactivity disorder. Acta Paediatr 2007; 96(9):1269-74.	References suggested: Banerjee (2007) Environmental risk factors for attention-deficit hyperactivity disorder. *Acta Paediatr*, 96(9):1269-74 Paper excluded: Review (no systematic search).	Comment taken into consideration.
66	PR	Anita Thapar	1.4.6	(Li et al, 2006) There have actually been a number of meta-analyses Most but not all have found the same as Li et al. Might want to mention at least that there have been several The point of contention is DAT where most meta-analyses have found no association but some notably have e.g. Weiss S, Tzavara ET, Davis RJ, Nomikos GG, Michael McIntosh J, Giros B, Martres MP. Functional alterations of nicotinic neurotransmission in dopamine transporter knock-out mice. Neuropharmacology. 2007 Jun;52(7):1496-508. Epub 2007 Feb 24.	References suggested: Weiss (2007) Functional alterations of nicotinic neurotransmission in dopamine transporter knock-out mice. Neuropharmacology, 52(7):1496-508. Paper excluded: Only studies on humans considered.	Comment taken into consideration.
67	PR	Anita Thapar	1.4.6	"acting through gene-environment interactions" Add "and gene-environment correlations (Jaffee & Price, 2007) Jaffee SR, Price TS. Gene-environment correlations: a review of the evidence and implications for	References suggested: Jaffee (2007) Gene-environment	Comment taken into consideration, see section 5.13.

				prevention of mental illness. Mol Psychiatry. 2007 May;12(5):432-42. Epub 2007 Jan 16. Review.	correlations: a review of the evidence and implications for prevention of mental illness. *Mol Psychiatry*, 12(5):432-42 Paper excluded: Review (no systematic search).	
68	PR	Anita Thapar	1.4.6	Literature on prenatal stress? Few studies now on this and ADHD even though not covered by Linnet study. Talge NM, Neal C, Glover V; Early Stress, Translational Research and Prevention Science Network: Fetal and Neonatal Experience on Child and Adolescent Mental Health. Antenatal maternal stress and long-term effects on child neurodevelopment: how and why? J Child Psychol Psychiatry. 2007 Mar-Apr;48(3-4):245-61. Review.	References suggested: Talge (2007) Antenatal maternal stress and long-term effects on child neurodevelopment: how and why? J *Child Psychol Psychiatry*, 48(3-4):245-61. Paper included	Comment addressed, see section 5.8.1 'Physical environmental risks'.
76	CC	Sami Timimi	1.4.6	Is there consistent evidence of genetic, environmental or neurobiological risk factors associated with ADHD? The GDG concludes "Specific genetic variants that are associated with a *small* increase in the risk for ADHD have been identified in the dopamine D4 and close to the dopamine D5 receptor genes. Analysis of ADHD versus non-ADHD groups has identified consistent changes in brain function and performance on neurocognitive tests; however differences from controls *are not universal, do not characterise all children and adults with a clinical diagnosis of ADHD, and do not usually establish causality in individual cases.*" [my ilatics] The GDG were provided with several papers providing a critical evaluation of research in this area. None were cited in this document. The GDG after reviewing the evidence and mentioning that "The quality of the evidence included in this review was variable and lacked any 'gold standard'" go on to recommend that ADHD is valid and to make a diagnosis the following criteria should be met: "Symptoms of ADHD (DSM-IV) or hyperkinetic disorder (ICD-10) should be sufficient to reach a formal	No specific references suggested.	Comment addressed, see section 5.9.

				diagnosis in DSM-IV or ICD-10. ADHD should be considered in all age groups (children, adolescents and adults), with symptom criteria adjusted for age appropriate changes in behaviour. The level of impairment resulting from symptoms of hyperactivity and or inattention should be at least moderately clinically significant on the basis of interview and or direct observation in multiple settings, and pervasive (occur in all important settings) including social, familial educational and or occupational settings." This is essentially no different to current DSM-IV criteria and one wonders what the point of this expensive, time consuming exercise was if this is the best the GDG can come up with, particularly when the GDG provide little guidance as to how a clinician is to interpret words like 'moderately', and 'significant'. Given that the chair of the group is well publicised for believing that ADHD is under-diagnosed in the UK, and that using DSM-IV criteria gives prevalence rates of between 3-7%, this guideline is likely to result in an increase of ADHD diagnosis. Given these potentially far reaching implications for children and adults in this country and the tenuous evidential support in the document, the basis for the GDG's conclusions must be questioned. The GDG state that "It was recognised that defining psychiatric disorders is a difficult process due to the overlapping nature of behavioural and psychiatric syndromes, the complexity of the aetiological processes and the lack of a 'gold standard' such as a biological test—in this regard ADHD is no different from other common psychiatric disorders. Furthermore, in keeping with other common behavioural disorders there is no clear distinction between the clinical condition and the normal variation in the general population". The phrase 'two wrongs don't make a right' came to mind on reading this. A get out clause that because other psychiatric diagnoses are problematic constructs (and there is a large literature that attests to this), it is acceptable for a lowering of standards and evidential basis with which to evaluate ADHD, is a circular argument to excuse poor science and insufficient rigour. The GDG state that "Furthermore, in keeping with other common behavioural disorders there is no clear distinction between the clinical condition and the normal variation in the general population (see Section A3). This is comparable to normal variation for medical traits such as hypertension and type II diabetes" Such a spurious analogy reveals the extent to which the GDG have ignored one of the most important differences		

				between physical states and psychiatric ones – meaning. 120/80 BP means the same whether it is measured in New York or New Delhi and reflects a physical state (universalism). Further, the pathophysiological processes resulting from high Blood Pressure are known and independent of the meaning any culture ascribes to symptoms (essentialism). This is not the case for behavioural presentations such as ADHD, which has varying interpretations and meanings, just as beliefs about what is a 'normal childhood' and 'normal child development' varies enormously over time and between cultures. It is of concern that the GDG seems unaware of the diverse literature (from disciplines such as transcultural psychiatry and psychology, philosophy, anthropology, and sociology) criticising the inappropriate use of univeralist and essentialist models (drawn from the biomedical paradigm) in multicultural societies. This is considered a very basic error. Such an approach leads to institutional racism as it assumes that the beliefs and practices about children and childhood drawn from a narrow Western biomedical paradigm is the standard through which to judge those cultures who have differing beliefs and practices with regards their paradigms for understanding the nature of childhood, childhood problems and child care and rearing. This replicates the dynamics of colonialism and such attitudes being promoted for our institutional practices are simply unacceptable in modern multicultural Britain. The most disappointing aspect of the document is the missed opportunity for a more erudite approach to the question of diagnosis. Given the poor quality of the document it is likely that the current GDG simply does not have the objectivity, knowledge, or sophistication to produce an evidence-based, ethical, and progressive review and set of guidelines that could help curtail bad practice, but more importantly provide guidelines that take practice beyond current simplistic paradigms to make it fit for the realities of multi-cultural 21st century Britain. Psychiatry has been increasingly grasping the complexity that comes from a territory that sits at the meeting point of many disciplines' discourses. Medicine too has increasingly grasped these cross-disciplinary perspectives leading to growth of practices such as narrative medicine and values based medicine to try and encompass the subjective, cultural, social, political, economic and psychological influences on physical health and medical treatment. In this respect psychiatry should be providing a lead for the rest of medicine as we increasingly move away from redundant dualistic conceptualisations such as mind/body, nature/nurture, and		

				universal/relative and toward accepting multiplicity in a way that reflects the diverse nature of the client group we wish to assist. Engagement with these issues would lead to an ability to examine validity of ADHD from a number of angles, recognising that there are many different approaches to this question that reflect different values and aims. For example, in addition to scientific validity, there are considerations of pragmatics, utility, administrative, consistency, relevance, coherence, precision, fecundity, epistemic, ethical, ontological, and so on. Using these multiple positions would enable greater transparency and openness to the novel and more flexible guidelines that have greater likelihood of enabling more appropriate engagement with the diverse issues clients with ADHD symptoms present with. It is clear to this author at least, that the current GDG is simply not up to that task.		
81	PR	Jonathan Leo	1.4.6	Comments on D4, D5, DAT1 Regarding your citation of specific genes involved in ADHD. The evidence is mixed at best. And furthermore any connection would only be an association not a cause. Regarding D4 (DRD4) you state there is strong evidence for an association but this is not representative of the scientific literature. According to Willcutt (who you cite earlier): "Similar to the results for DAT1, however, this result [DRD4] was not replicated in all samples and does not appear to be necessary or sufficient to cause ADHD. Moreover, the association with ADHD is much stronger in case-control comparisons than in family-based designs, suggesting that some significant results may be due to differences in gene frequencies in the populations from which the ADHD and comparison samples were drawn" (Faraone et al., 2001). In a detailed 2006 survey of the evidence in support of DRD4, DAT1, and other candidate genes, Waldman and Gizer (p. 421) concluded, "It should be clear…that for each [ADHD] candidate genes studied, there is a mixed picture of positive and negative findings." Or as Willcutt stated: "For 14 of the 27 candidate genes a significant association with ADHD has been reported in at least one study; however, virtually all of these results have been replicated inconsistently or await independent replication (Table 2). Moreover, each of these genes appears to account for a relatively small proportion of the variance in ADHD symptoms (e.g., Faraone, Doyle, Mick, & Biederman, 2001), suggesting that none are likely to be necessary or sufficient to cause ADHD." Or as Faraone has stated (2005, p. 1319) with regard to genome wide scans, "The handful of genome wide scans that have	References suggested: Waldman (2006) Asked reviewer for full reference, no response. Baumeister & Hawkins (2001) Asked reviewer for full reference, no response. Giedd (2001) Asked reviewer for full reference, no response. Sowell (2003) Asked reviewer for full reference, no response. Castellanos (2002) Asked reviewer for full reference, no response. Pliszka (2006)	Comment addressed, see Appendix 17.1 'Study characteristics – Diagnosis' for information on funding of studies included, see section 5.8 'Neuroimaging studies' for discussion of genetic studies.

				been conducted thus far show divergent findings and are, therefore, not conclusive." Regarding your summary of the genetic studies it would be more straightforward to say, "At this point in time no genes for ADHD have yet been identified." In advertisements for ADHD the supposed genetic basis for ADHD is often used to justify medical treatment. However, left unsaid in these same advertisements, is that a presumed genetic defect is in no way a necessary prerequisite to prescribe stimulants. As of now, the medical community finds it entirely acceptable to prescribe medication for psychological stress brought on by environmental stressors. One needs to look no further than foster care programs which medicate an inordinate number of children. Presumably the common factor in these children is not their genetic makeup but their common environmental triggers. Although ADHD is considered a genetic defect, looking for a common gene in foster home children to explain their behaviour would seem to be a fruitless effort. Conversely, the results of a survey of environmental stressors in their lives would probably be very fruitful. The diagnosis and medication of children in foster homes is perhaps the best example of how, genes and biology aside, it is an acceptable practice to medicate children whose behaviour is explained by the environment. "Although some people question the assumption of the equal environment assumption for identical and non-identical twins this does not impact on the question of validity since the high twin correlations observed in these studies indicates that ADHD symptoms are highly familial." This is a very confusing sentence as it mixes up "familial" with "genetic." It appears to be written by someone who does not understand the genetic studies. The claim that high MZ concordance shows that ADHD is "familial" is erroneous. MZ concordance for speaking Italian is 100%, but does this mean speaking Italian is a genetic trait? The EEA does not just have an *impact* on estimates of genetic factors - if it is false then the twin method is deeply flawed. "There is consistent evidence of familial influences on ADHD symptoms in the general population. Under the equal environment assumption these familial influences are thought to be largely genetic in origin. "	*Am J Psychiatry*, 163:1033–1043 Paper included Smith (2006) *Am J Psychiatry*, 163:1033–1043 Paper to be included Tamm (2006) *Am J Psychiatry*, 163:1033–1043 Paper to be included Casey & Durston (2006) *Am J Psychiatry*, 163:1033–1043 Paper excluded: not peer reviewed (editorial). Volkow (2007) Asked reviewer for full reference, no response. Carey (2005) Can Brain Scans See Depression? *The New York Times* Paper excluded: not peer reviewed; opinion paper.	

				This is very problematic and should be reworded. The EEA pertains only to the twin method and not to family studies In addition, the document does not provide any citations that the EEA, which is counter intuitive, is correct. The NICE document also makes the assumption that if it is genetic then it must be a disease. However, a host of other traits have also been investigated and these studies have determined that MZs have a higher concordance than DZs. For instance, twin studies have shown a heritability for loneliness (Boomsma et al. 2005), the frequency of orgasm in women (Daewood et al., 2005), the results of the United States 2004 presidential election (Alford et al. 2005), perfectionism (Tozzi et al., 2004), and breakfast eating patterns (Keski-Rahkonen et al., 2004) (Cited in Joseph 2008). In 1990, Bouchard stated: "For almost every behavioural trait so far investigated, from reaction time to religiosity an important fraction of the variation among people turns out to be associated with genetic variation. This fact need no longer be subject to debate." Yet, if all our traits have a genetic basis then the genetic evidence of a trait does not automatically lead to "it's a disease" declarations. What many ADHD researchers seem to be saying is, that by implicating genetics in the behavioural trait of attention, this is somehow evidence of a disease. If Bouchard is correct, and all our traits have a strong basis in genetics, then can individuals exhibiting extremes of other traits also fall into the diseased category? The slippery-slope analogy seems almost too obvious to mention here, and might seem trite, however this appears to be exactly the trap that the child psychiatry profession has fallen into regarding other conditions, for instance child-onset bipolar disorder. The NICE statement on ADHD should not be seen with blinders on, as their statements about what constitutes a "disease" will surely be revisited in the years ahead as they face other instances where traits can be classified as a disease in need of medication. NICE's foray into ADHD is only the beginning. 1.4.6 Dickstein and colleagues completed a systematic meta-analysis of 16 neuroimaging studies that compared patterns of neuro activity in children and adults with ADHD and controls. The GDG's position would be stronger if indeed there was a biological marker for ADHD, however to cite the Dickstein paper will be seen as a desperate grasp for evidence. Like much of the ADHD neuroimaging research, on the surface the Dickstein paper might appear to make the case that there is a visible organic pathology in the brains of children diagnosed with ADHD, however a more in-depth view of the		

				study reveals problems of experimental design that have plagued this entire body of research. The Dickstein paper is a meta-analysis of 16 ADHD imaging studies. Out of these sixteen studies, four were used for a comparison of ADHD non-medicated to controls – the most important comparison. Interestingly, Dickstein et al. do not mention that two out these four studies used the same ADHD subjects – the two studies were separate papers but came from the same research group. This is fairly obvious from reading the two studies, and was confirmed in an email to the lead author. E-mails to the corresponding author of the Dickstein paper asking for clarification have gone unanswered. Double counting subjects is problematic for a meta-analysis, especially since Dickstein et al. did not mention it in their paper. Furthermore, even in the Dickstein analysis for the most important comparison in the study which was the non-medicated ADHD to controls the majority of the differences were for the most part not significant. It seems highly problematic for the NICE review to not mention this in their review. Although positive findings on neuroimaging studies of psychiatric disorders, including ADHD, are usually given wide coverage in scientific publications and the mass media, the fact remains that this body of research has not provided support for a specific "biological basis" of ADHD. This is well noted by Baumeister and Hawkins (2001) who report, "inconsistencies among studies raise questions about the reliability of the findings" (p. 2). Writing, for instance, about the tendency for studies to find decreases in the size and activity of the frontal lobes, Baumeister and Hawkins summarize that: Even in this instance, however, the data are not compelling. The number of independent replications is small, and the validity of reported effects is compromised by a lack of statistical rigor. For example, several of the major functional imaging studies failed to employ standard statistical controls for multiple comparisons. This means that many of the reported findings are almost certainly spurious. Moreover, considering the likely existence of bias toward reporting and publishing positive results, the literature probably overestimates the occurrence of significant differences between subjects with ADHD and control subjects (p. 8, references omitted). In addition, virtually all researchers in this field acknowledge that no brain scan can currently detect anomalies in any given individual diagnosed with a primary mental disorder, nor can it help clinicians to confirm such a diagnose. For example, in his authoritative *Handbook of Brain Imaging*,		

				Bremmer (2005) states: Unfortunately, we are not at a point where brain imaging can be used routinely for the diagnosis of psychiatric conditions. ... We still do not understand the patho-physiology or mechanisms of response to treatment for most of these disorders…Most studies of psychiatric patients have found that even when a particular finding characterized a patient group, there remained as many as a third of patients who scored in the range of the control subjects. (pp. 33-35). Similarly, in the case of ADHD, Giedd et al. (2001) conclude unequivocally that: If a child has no symptoms of ADHD but a brain scan consistent with what is found in groups of ADHD, treatment for ADHD is not indicated. Therefore, at the time of this writing, clinical history remains the gold standard of ADHD diagnosis. (p. 45). The Dickstein paper was funded by NIMH. Of interest to the NICE reviewers might be the 2003 paper by Sowell et al., also funded by NIMH. The Sowell study, involving 27 ADHD and 46 normal control subjects, reported that ADHD children had smaller frontal lobes compared to the control subjects, but overall the ADHD subjects had more cortical grey matter (Sowell, Thompson, Welcome, Henkenius, Toga, and Petersen 2003). This study's significance derives not necessarily from this result, but—as with several previous ADHD neuroimaging studies—from important comparisons that researchers could have made, but *did not*. One reason for bringing this study to your attention is because of your own acknowledgment in your previous reports about other conditions and treatments (the SSRIs for instance) that seeing the published data is not the same as seeing all the data, because the pharmaceutical companies do not publish all their studies. The same holds true for research into basic science topics, although in this case it is government funded organizations that will not release data. As in an earlier, similar paper by Castellanos et al. (2002), some of the ADHD subjects in the Sowell study were apparently medication-naïve. I say "apparently" because specific descriptions were not provided: "15 of the 27 patients were taking stimulant medication at the time of imaging" (p. 1705). It is unclear how to categorize the remaining twelve patients. Did they have a		

				history of medication use prior to the start of the study, and then stop taking their medication for 48 hours, or some other arbitrary time period before imaging. It is surprising that a study published in *Lancet* could be so vague about one of the most important variables in the study. Conclusions based on a comparison of normal control subjects to medication-naïve ADHD subjects would be very different than conclusions based on a comparison of control subjects to ADHD subjects with varying durations of medication exposure or undergoing abrupt withdrawal. The issue becomes considerably more muddled and confusing due to a brief concluding discussion by Sowell et al. (2003) of the potential role of stimulant medication on their findings. The authors first appropriately acknowledged that, since 55% of their ADHD children were taking stimulants, "the effects of stimulant drugs could have confounded our findings of abnormal brain morphology in children with [ADHD]" (p. 1705). The simplest way to properly evaluate this confounding effect would have been to compare the 15 medicated ADHD children with the 12 unmedicated ADHD children. However, Sowell et al. chose to not make that comparison: "We did not directly compare brain morphology across groups of patients on and off drugs because the sample size was considerably compromised when taking lifetime history of stimulant drugs into account" (p.1705). The authors further explained that this comparison, between unmedicated and medicated, is not needed because a prior study by Castellanos et al. (2002) suggested that medications do not affect brain size. Sowell et al.'s methodological choice, and its justification, is both unconvincing and puzzling. First, although one can sympathize with their judgement that "taking lifetime history of stimulant medication into account" compromised their sample size, this judgement ignores that for thirty years ADHD neuroimaging researchers have deemed it perfectly acceptable to compare ADHD subjects and normal controls *regardless of medication history*. Indeed, virtually all the studies that Sowell et al. cite to contextualize their own study and interpret their results exemplify this practice. Thus it is difficult to see why Sowell et al. would feel that they should not compare medicated and unmedicated ADHD subjects. Clearly, just as they acknowledged limitations to their main study results, Sowell et al. could have reported the results of the more specific comparison with an acknowledgement of the appropriate limitations. Second, Sowell et al. cite Castellanos et al. to support the methodological choice of not comparing		

				medicated and unmedicated ADHD subjects. But, third and most important, Sowell et al.'s data appear directly relevant to either support or refute the conclusions that Castellanos et al (2002) drew from their comparison. In fact, the results of the Castellanos et al.'s comparison of brain volumes of medicated and unmedicated ADHD children were deemed worthy of a major press release by the NIMH concerning stimulant drugs' effects on developing brains, yet the same comparison in the Sowell et al. study was considered insignificant and not even reportable. Sowell et al. would not supply the information about the most important comparison in the study, and a subsequent Freedom of Information Act Request to NIMH to release the information was denied. This was in spite of the fact that on their own web site NIMH encourages their grant recipients to share data. One could say that NIMH's actions speak louder than their words. Given their own interest in the subject, possibly the NICE reviewers could request the data? In June 2006, the *American Journal of Psychiatry* published three articles (Pliszka et al., 2006; Smith, Taylor, Brammer, Toone, & Rubia, 2006; Tamm, Menon, & Reiss, 2006) and an accompanying editorial about functional magnetic resonance imaging (Casey & Durston, 2006). The three studies conducted scans of children's brains during a specified task, and, importantly, all three studies had a group of medication-naïve ADHD children. However, when considered together, the three studies implicated an inordinate number of different brain regions, with little replication of the regions between studies. In brief, Smith et al. (2006) implicated the frontal, parietal, and temporal lobes, along with the striatum. Pliszka et al. (2006) implicated the anterior cingulate cortex and the left ventrolateral prefrontal cortex. Tamm et al. (2006) implicated the parietal lobes, the right precuneus, and the thalamus. One could almost ask: What area of the brain is not implicated? The accompanying editorial by Casey and Durston (2006) acknowledges these disparate findings, yet instead of looking at them as problematic for the ADHD neuroimaging field, , Casey and Durston attempt to place the disparate findings within a theoretical construct that cognitive deficits in ADHD are due to a deficit in inhibitory control. They state: "Identification of core processes involved in a disorder can move a field from a disparate set of data-driven findings to a more theoretically coherent collection of studies" (p. 957). Does Casey and Durston's model provide a solid base for ADHD		

				researchers to move forward, or is their explanation of these "disparate findings" an attempt at salvaging a lack of reproducibility within the ADHD neuroimaging field? The model as proposed by Casey and Durston is that, "basic learning systems are important in signaling top-down systems to adjust behaviour when predicted outcomes are violated." This appears to be little more than a very general statement about learning. As a general statement it is hard to argue with it, because it is so broad and all-encompassing that it makes room for almost every conceivable finding. But it does little to explain how upwards of 10-15% of the population has a disease. One test for whether a theory is too broad, is to ask: What empirical findings would negate the theory? Casey and Durston have not proposed any findings that would negate their theory, and, indeed, it is hard to imagine any that would negate it. For instance, in Figure 1 their article, Casey and Durston hypothesize the involvement of the prefrontal cortex, the basal ganglia, the parietal cortex, and the cerebellum in ADHD. Yet none of the three accompanying studies even suggested that the cerebellum was involved. Bringing the cerebeullum into the picture without elaboration is also problematic because as Furman notes: " …of the five studies that examined total cerebellar volume, four are listed as showing an association of ADHD with decreased volumne, while three do not." And, missing from Casey and Durston's schematic is the thalamus, which one study did implicate. Moreover, two of the studies were contradictory: Pliszka et al. found greater activity in ADHD subjects than controls in the inferior prefrontal cortex (p. 1059), while Smith et al. found less activity (underactiviation) in the mesial and front-parietal-temporal brain regions during the go/no go and switch tasks for the ADHD children. Yet, interestingly, while the imaging data for the ADHD children differed in these two studies, there was no difference in performance on the specified tasks between the ADHD children and controls. None of these issues are raised by Casey and Durston, and we are unsure how they could be fitted into the proposed model. Perhaps the most significant aspect of putting forth such a highly theoretical model of ADHD is that Casey and Durston are implicitly acknowledging that the more practical aspect of developing an imaging scan as a diagnostic tool is becoming more and more unlikely. A recent study by *Volkow et al. (2007)* utilized PET and compared dopamine transporter levels in 20 never medicated adults to 25 controls, and found that		

				Dopamine transporter levels were not positively correlated with the disease. In the NICE document, to your credit, you have few positive statements about this research, but on the other hand you do not come right out and acknowledge this. For instance, Volkow, in much more direct terms than NICE, has commented: "…it should be noted that the imaging studies are still not definitive because of the discrepancies in the findings…" The necessary and definitive test to confirm the suggestion that ADHD children have a neuroanatomic pathology consists of using an appropriate brain scan to detect a difference between a "typical" unmedicated ADHD child as found in the classroom, and a "normal" child. There is virtual unanimity that this cannot be accomplished at present. Experiments with highly selective patient and control groups are, at best, only preliminary studies, and the findings of these studies must be called into question. Ruling out the effects of psychotropic medication is merely one of the tasks confronting researchers conducting neuroimaging research with ADHD patients. Even if the field accomplishes this task, however, several other important tasks remain. One of these will involve trying to make sense of findings of brain abnormalities or differences among some individuals diagnosed with ADHD. In October 2005, for example, the *New York Times* published an article by Benedict Carey entitled "Can Brain Scans See Depression?" It contained interviews with prominent psychiatrists and child psychiatrists, many of whom have authored ADHD imaging papers. The *Times* article was notable for both its candor and frank assessment of the psychiatric neuroimaging field: "Yet, for a variety of reasons, the hopes and claims for brain imaging in psychiatry have far outpaced the science, experts say." And in the words of Paul Wolpe, a professor of psychiatry and sociology: "The thing for people to understand is that right now the only thing imaging can tell you is whether you have a brain tumor." A recent imaging study found a difference between the brains of conservatives and liberals. Does this difference equate to a disease?		
34	CC	David Coghill	1.4.6 evidence	I think this section would read better if it were re ordered to deal with causal factors i.e. genetic, environmental and then mediating factors. In addition to the mediating factors already discussed (functional imaging, neuropsychology) structurasl imaging and neurophysiology should be added). The neuropsychology section stresses executive functions to strongly (although these are the most well studied other functions like delay aversion	References suggested: Sonuga-Barke Asked reviewer for full reference, no response. Tannok & Smith	Comment taken into consideration, see section 5.8.

				(sonuga barke), timing (Tannock, smith), non executive memory (Rhodes and Coghill) and as noted variability also contribute – and may actually prove to be more important than exec functions) On the other hand the statement "Recently it has emerged that the strongest and most consistent association with ADHD is for intra-individual variability (Klein *et al.*, 2006). " is way to strong as it relies on only one study. It would be possible to make a similar argument could be made for a range of different neuropsychological functions based on other comparative studies.	Asked reviewer for full reference, no response. Rhodes & Coghill Asked reviewer for full reference, no response.	
36	CC	David Coghill	1.5	Whilst there are not many child studies where healthy kids or kids with other disorders have been given methylphenidate or dexamphetamine there are many such adult studies. My understanding is that these support the notion that these stimulants in these doses work the same in healthy people as they do in those with problems.	No references suggested.	Comment addressed, see section 5.9 (third paragraph).
58	PR	Stephen Faraone	1.5	You state: "When considering the Feigner criteria for validity of a psychiatric disorder, the question of whether there are specific responses to clinical, educational and other interventions for ADHD was excluded, since the data to answer this question was very limited." I don't have the Feighner criteria in front of me but I thought that the idea was that the disorder showed a "characteristic" response to treatment rather than a "specific" response. For example, the fact the SSRIs treat depression, OCD and other anxiety disorders does not challenge the validity of any of these disorders.	No references suggested.	Comment addressed, see section 5.8.
84	PR	Jonathan Leo	1.5	Limitations. When discussing the effect of stimulants on people not diagnosed with ADHD, regarding the Rapoport study, you state, "there were limited published data on the effects of stimulants in people who do not have ADHD." This is an incredible statement as it seems to be saying that we do not know the effect of stimulants on normal people? Underlying any discussion of ADHD, (except for possibly the NICE document) and what every neuroscience researcher is aware of, is the understanding that the most straightforward experiment in all of neuroscience is the one seeking to determine if stimulant medication works, at least if one defines 'works' as a short-term improvement in attention span. Whether the subjects are male or female, whether they are preschoolers or geriatrics, whether they are diagnosed with ADHD or not, and whether the medication is provided by a doctor or a friend, it has been known for 75 years that stimulants improve	No references suggested.	Comment addressed, see section 5.9.

				anyone's and everyone's ability to pay attention. The GDG sidesteps the issue of the fact that the stimulants such as methylphenidate (Ritalin) have a universal effect by stating that they are going to discuss the treatment of ADHD in a subsequent document. (However, even this is problematic because the document brings up the Rapoport study at one point). Talking about treatment with stimulants in a future document is fine, but this does not justify, in the current document, while it might be convenient, ignoring the universal effect of the stimulants on the CNS – as this does relate to the disease concept Unfortunately much of press still falls back on so-called "paradoxical effect" that sees stimulants only effecting ADHD children. Rapoport's study shows this is false. Coffee drinkers also know this is false. Apparently one of the few organizations to not acknowledged this fact is the GDG. Also regarding the Rapoport study, you state, "The very small numbers used in this study and lack of further similar studies means that considerable caution must be taken in drawing firm conclusions." Again, your double standard is evident. The NICE review suggests "considerable caution" when drawing conclusions about a study looking at the effect of amphetamines on the normal brain. Yet, just one page before in the review, there seems to be no hesitation or "caution" in your interpretation of the genetic studies, which have not discovered any ADHD genes, or the imaging studies, which are unable to distinguish ADHD children from controls.		
13	PR	Margaret Alsop	1.6	It is felt that the evidence submitted by parents, carers and others caring for an individual diagnosed as having ADHD is clear evidence on the validity of ADHD. There seems to be clear indication that the evidence submitted by professionals and those within the GDG that echoes that of parents, carers and individuals themselves.	No references suggested.	Comment taken into consideration.
37	CC	David Coghill	1.6	The comment that "In adults the profile of symptoms may alter with a relative persistence of inattentive symptoms compared to hyperactive-impulsive symptoms." Does not really match up with the evidence described in section 1.4.5 where it is suggested that evidence for this is weak and that relative to controls levels of overactivity stay high. Here would be a good place to dispel this notion of a true reduction in overactivity problems as one of the adhd myths.	No references suggested.	Comment taken into consideration.
38	CC	David Coghill	1.6	"There was no evidence of a need to apply a different concept of ADHD to	No references	Comment addressed,

				children and adults. However age-related changes in the presentation are recognised." Could be expanded to add There was no evidence of a need to apply a different concept of ADHD to children and adults. However age-related changes in the presentation are recognised. These changes are not yet reflected within the various diagnostic criteria.	suggested.	see section 5.12.
83	PR	Jonathan Leo	1.6	Position Statement on the Validity of ADHD. "There is evidence of both genetic and environmental influences in the aetiology of ADHD. ….Contemporary research suggests that environmental risks are likely to interact with genetic factors…." Why is that whenever environmental influences are brought up that you feel the need to drop genetics into the discussion? When you say "contemporary research suggests that environmental risks are likely to interact with genetic factors" what recent research are you referring to? You are making it sound like the ADHD genetic researchers have recently uncovered this startling fact. However, the fact that genes interact with the environment has been known for years. According to Robert Sapolsky, "Genes influence behaviour, the environment influences behaviour, and genes and environment interact – this view is one of the great scientific clichés of the 20th century." Commenting on the usefulness of the "vulnerability - stress theory of mental disorders" that any potential harmful environmental influences only operate on those with faulty genes, Mary Boyle points out that the theory is an important mechanism for managing the potential threat posed to biological psychiatrists whenever non-biological conditions are implicated in the etiology of psychological stress: The usefulness of the hypothesis lies partly in its lack of specificity - since the nature of the claimed vulnerability has never been discovered, anything can count as an instance of it. Its usefulness also lies in its seeming reasonableness (who could deny that biological and psychological or social factors interact?) and its inclusiveness (it encompasses both the biological and social - surely better than focusing on only one?) while at the same time it firmly maintains the primacy of biology, not least through word order, and potentially de-emphasizes the environment by making it look as if the	No references suggested.	Comment taken into consideration.

				"stress" part of the vulnerability-stress model consists of ordinary stresses which most of us would cope with, but which overwhelm only "vulnerable" people. We are thus excused from examining too closely either the events themselves or their meaning to the "vulnerable" person (Boyle, 2002). Your document seems to be the perfect example of what Boyle is referring to. You maintain the primacy of biology with your wording, but as Boyle points out, the driving force behind your wording is not "contemporary research," that has discovered an ADHD gene, but is the contrast between the genetic studies, that have failed to find a specific ADHD gene or even a gene of modest effect, and studies implicating environmental factors. If you had discovered a gene, then you would not be talking about the vulnerability-stress hypothesis. Again, take the example of foster care homes where an inordinate number of children are diagnosed with ADHD (and other conditions). Clearly this data points to environmental influences on ADHD – no matter what genes a child is born with. As the data from Nicky Hart shows, there appears to be a strong role for socioeconomic stratat. If we follow your logic, then the increased prevalence of children with smaller brains and less electrical activity (according to the current concept of ADHD) in the lower socioeconomic strata must be qualified with the statement that, their smaller brains are due to faulty genes being influenced by the environment.		
88	PR	Jonathan Leo	1.6	Position Statement on Validity of ADHD. "ADHD is distinguished from the normal range partly by the number and severity of symptoms and partly by the association with significant levels of impairment." Your statement points out why the diagnosis varies so much from one country to another, from one doctor's practice to another, from one school to another, and from one household to another. Take the 2004 guidelines on the diagnosis of ADHD from the American Academy of Pediatricians. Take item #2 on their questionnaire as an example: 2) Six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level: *Hyperactivity* a) Often fidgets with hands or feet or squirms in seat	No references suggested.	Comment taken into consideration.

				b) Often leaves seat in classroom or in other situations in which remaining seated is expected c) Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness) d) Often has difficulty playing or engaging in leisure activities quietly e) Is often "on the go" or often acts as if "driven by a motor" f) Often talks excessively Note that every item on the list uses the term "often," a very unscientific term. How does one quantify "often." Since "often" is in the eye of the beholder and can vary from one doctor's office to the next it is easy to see how this document has little teeth to it. Apparently as long as one adult decides that the child "often" fidgets, then the child can be labelled and medicated. It is easy to see how a parent who does not get a diagnosis from one doctor can simply go to another doctor with different ideas about what "often" means. As an example of how the general public sees through a document like this take this example provided by the late Kevin McCready (2002): In an episode of "The Sopranos," the popular and critically acclaimed HBO series about a New Jersey mobster and his family, the primary character, Tony Soprano, is called into a meeting with school officials, including the school psychologist. Tony is told that his son has been determined to "have" ADHD. He asks how this has been determined and is told there is a set of criteria, which the psychologist then begins to itemize. The third criterion on the list is "tends to fidget." The poorly educated, psychologically unsophisticated, working class gangster looks at directly at the psychologist ….and asks simply in his earthy "jersey" accent: "What constitutes a fidget?" There may be little to admire about a man who makes his living illegally, but at least he 'gets it." It is easy to see how guidelines that use the word "often" mean very little. Is NICE going to develop more stringent guidelines?		
39	CC	David Coghill	1.7.1	The term "medical treatment" should be replaced by "pharmacological treatment" or "drug treatment"	No references suggested.	Comment addressed, see section 5.12.

59	PR	Stephen Faraone	1.7.1	I don't understand the following sentence: "The group concluded that treatment response should take into account the severity of the disorder in terms of clinical and functional impairments and evidence should be looked for on the impact of severity of the disorder on treatment response."	No references suggested.	Comment addressed, see section 5.13.1.
69	PR	Anita Thapar	1.7.1	"The argument against genetic influences is not strong unless one questions the conventional interpretation of twin data" and continuing paragraph: Contribution of genetic influences doesn't rest purely on twin studies of ADHD. There have been 5 adoption studies all showing familial clustering due to genetic influences. (refer to any review on ADHD genetics) Thapar A, Langley K, Owen MJ, O'donovan MC. Advances in genetic findings on attention deficit hyperactivity disorder. Psychol Med. 2007 May 17;:1-12; Khan SA, Faraone SV. The genetics of ADHD: a literature review of 2005. Curr Psychiatry Rep. 2006 Oct;8(5):393-7. Review.	References suggested: Thapar (2007) Advances in genetic findings on attention deficit hyperactivity disorder. *Psychological Medicine*, 1-12. Paper excluded: Review (no systematic search). Khan (2006) The genetics of ADHD: a literature review of 2005. *Current Psychiatry Reports*, 8(5): 393-397. Paper excluded: Review (no systematic search) Thapar (2007) Genetic basis of ADHD Paper excluded: Review (no systematic search) References of individual studies were hand searched and those meeting the quality assessment criteria were included	Comment addressed, see section 5.8 and throughout the chapter.

					[Sprich et al., 2000].	
85	PR	Jonathan Leo	1.7.1	"The level and types of behaviour that define the normal range remain a contentious issue." The current GDG believes that children with ADHD have an organic brain deficiency, resulting from a genetic defect that in the future, once the technology is available, will be detected by a brain scan. However nowhere in the document has NICE answered the controversial question of: How many children have this defect? The obvious problem being that as the percentage of children taking Ritalin escalates, the harder it is to make the case that they have a disease. If, as in some school districts, upwards of 17% of the boys are prescribed Ritalin, this would suggest that the boundaries for normalcy have become narrower. As often happens after statistics documenting the increasing use of stimulants for younger and younger children make the headlines, many of the opinion leaders in the psychiatry community state that there is a problem with "over-prescribing" or "misdiagnosis," yet none of these leaders, or any of the major psychiatric organizations, have issued guidelines on how to identify this large group of "misdiagnosed" children, nor have they clarified what they consider to be improper uses of prescribed stimulant medication (Johnson, 2006; Nakamura, 2002). No matter where NICE draws the line between normal and ADHD, whether it classifies 2%, 5% or 7% as having the disease, there will, by definition, be children who are inappropriately taking stimulant medication. Based on what criteria will NICE decide who these children misdiagnosed children are? For instance, if according to NICE 7% of British children have ADHD then what if 10% are taking medication? How will doctors identify the 3% of misdiagnosed children? The dilemma for medical professionals who want to go beyond simply talking about misdiagnosed children and to actually identifying these children is that, without an objective biological marker demarcating the line between the "correctly" and "incorrectly" diagnosed, the sole criterion for determining the appropriateness of stimulant treatment comes down to: Are the adults in the child's life satisfied with the medication's effect? Presumably there are not many parents unhappy with the medication's effects, who still continue to medicate their children. None of the medical professionals who talk about misdiagnosis have ever elaborated on how they plan to tell all these parents of misdiagnosed children that they should not be medicating their children, even though the medication is doing exactly what	References suggested: Johnson (2006) Study: ADHD drugs send thousands to ERs. Paper excluded: not peer reviewed. Nakamura (2002) Attention Deficit/Hyperactivity Disorders: Are Children Being Overmedicated? NIMH Paper excluded: not peer reviewed; opinion paper. Case study & editor comments Pediatrics (1999) Asked reviewer for full reference, no response.	Comments taken into consideration.

				the medical community says it should be doing. As an example of the forces at work in the diagnosis of an individual child with ADHD, take a case study in the journal, *Pediatrics*. In 1999, the editors elicited commentaries from several prominent physicians about the case of a teenage boy who had been taking Ritalin for several years. The editors saw the boy's scenario as an interesting case, worthy of commentary from a group of prominent child psychiatrists. But in an ironic twist of fate, they have unintentionally provided a much more interesting case study. From a sociological point of view the subject of the case was not the boy, but, instead, was the doctors and the editors. The case provides an excellent example of: 1) how a major determination in the diagnosis of ADHD is adult satisfaction, 2) how the medical community fully supports the use of stimulant medication as a performance enhancing drug, 3) how the same mindset that approves of using one psychotropic drug easily leads to the use of multiple medications, and 4) how the main stream medical journals have given little attention to the ethical implications of controlling and altering children to meet the demands of our contemporary educational/cultural system. The 15-year old boy announced to his parents and his pediatrician that he wanted to stop taking his medication: "I don't need it…I'm fine…I don't see why I should take it." He purposefully did not take the medication for a few weeks and he said he could not tell the difference…. However, his parents observed that his test results, when off the medication, were below his standard scores…. They also noted that he was more distractible and less attentive when doing his homework during that time (Cohen & Leo, 2002). As stated by the physicians, the most important variable in determining whether this boy should keep taking his medication was the parental satisfaction with the medication, and the subsequent commentaries all focused on how to convince the boy to continue taking his medication. The boy's wishes were not something to be listened to, but rather something to be managed, whether through dialogue or with another medication. As an example of polypharmaceuticals for children one of the commentators even suggested that the boy's reluctance to keep taking his Ritalin suggested this was a sign that he needed another medication. Thus the boy, who wants go off his one medication, would instead get two medications. None of the		

				commentators in the *Pediatrics* article contemplated that the boy's wishes might be legitimate, but more importantly, as a sign of how one sided the issue has become in the medical community, *the editors* did not give space to a single commentator who questioned the ethics of giving a medication to improve grades. As an example of who the experts in America are diagnosing with ADHD take this example from the Department of Psychiatry at New York University: "Sarah chooses to sit in the back of the classroom and much of the time she's doodling in her notebook or staring out of the window. She seldom completes assignments and often forgets to bring the right book to class. Her desk is a mess and she generally can't find what she is looking for. Then she gets weepy and says that nobody understands her." This fourteen-year old girl is crying out "Please Understand Me." The New York University experts' response is to label her with ADHD. Medication will surely follow. Examples like this and the others I have cited, which come from those who strongly believe that ADHD is biological, are just more examples of how little science is involved in the ADHD diagnosis.		
86	PR	Jonathan Leo	1.7.1	"The GDG wish to stress that the role of important genetic influences does not exclude an important role for environmental influences since individual differences in genetic risk factors are likely to alter the sensitivity of an individual to environmental risks" This is confusing because earlier in the document the only environmental influences that you mentioned were prenatal exposure to drugs such as nicotine. What environmental influences are you referring to here? "Furthermore, the extent to which there are genetic influences has no direct bearing on the choice of treatment approaches since both medical and psychosocial interventions could be important in improving treatment outcomes." Lets be honest here, the idea that ADHD is due to genetics is one of the most common reasons cited by the pharmaceutical companies and the psychiatric profession as evidence that ADHD is a biological disease – like diabetes. And diseases are treated with medications. Your statement is is even going against much of modern day psychiatry. According to Nancy Andreasen, in *The Broken Brain*, the biological model of mental illness can be summed up as follows: "1) The major psychiatric illnesses are diseases, 2) These diseases are caused principally by biological factors and most of these reside in the brain,..and 4) The treatment of these diseases emphasizes the use of somatic therapies." As another example of this type of thinking, take the recent comments by	References suggested: Andreasen (1984) The Broken Brain Paper excluded: book (not peer-reviewed). Faraone *Science* Asked reviewer for full reference, no response. Brown (2003) New attention to ADHD genes. *Science* Paper excluded: not peer reviewed. Hartmann (1996) Asked reviewer for full reference, no response.	Comments taken into consideration.

				Stephen Faraone in *Science*. In a discussion of "ADHD genes" he stated: "My hope is that once we've discovered those genes, we'll be able to do a prospective study of kids at high versus low genetic risk. That's when you'll see environmental factors at work." But certainly one can still see environmental factors at work in children without knowing their genotype. Yet, even more confusing is Faraone's next comment. According to the reporter, "Eventually, he (Faraone) adds, environmental changes could play an important role in treating some ADHD patients" (Brown, 2003, p. 160). Eventually? Why do we need to wait? Why not implement the changes right now? Changing the environment is exactly what many people opposed to stimulants have been saying for years. Faraone's take on the etiology of ADHD is strikingly similar to Thom Hartman's view. Both believe that ADHD is a biological, hereditary trait (Hartmann, 1996). Where they differ is that Faraone, and other biological psychiatrists, see these children as dysfunctional, with a genetic defect in need of medication. The other group sees the children as having different genes, at one end of the spectrum, and that what is needed is a different environment (Hartmann, 1996). One purpose of the genetic studies, which the pharmaceutical companies, and the psychiatry profession, have propagated, is to imply that, because it's genetic that drugs are needed. For instance, Faraone states: "Many parents are reluctant for their children to take psychotropic medication and others find it difficult to maintain the prescribed regimes. These problems are mitigated by discussing the genetic etiology of ADHD…"(Faraone, 1996, p. 598). If you are going to acknowledge that knowing about genetics has nothing to do with treatment than you should be ready to answer the general public and politicians when they ask: Then why are you doing this research? If knowing about genetics has no benefit to the patient, then one possibility for this line of research is to justify current practices. If ADHD does not have a strong genetic influence then giving a medication would be seen as very problematic, and would call into question the entire practice of medicating children with stimulants. If I were you I would delete this line about genetics and treatment.		
60	PR	Stephen Faraone	1.8	You state "The quality of the evidence included in this review was variable and lacked any 'gold standard' because no diagnostic tests for ADHD have been developed or tested." I suggest you be clear what you mean by "gold standard." I think you mean a laboratory test of some sort. Although I'm probably in the minority, I think that the DSM-IV diagnosis of ADHD as	No reference suggested.	Comment addressed, see section 5.3.

				made by a competent health professional is a pretty good gold standard inasmuch as it is reproducible with high reliability and has clinical implications. The inter-rater reliability of the ADHD diagnosis is not much worse than, for example, many accepted "gold standard" diagnoses made by radiologists.		
89	PR	Jonathan Leo	1.8	Evidence Summary In your summary, after 22 pages of discussion about the evidence, you do not cite any direct evidence that ADHD results from a biological, hereditary defect. However you do not come right out and acknowledge this lack of evidence. The 1998 National Institutes of Health conference was much more direct when it said, "there are no data to indicate that ADHD is due to a brain malfunction."	No references suggested.	Comment addressed, see section 5.14.
87	PR	Jonathan Leo	1.9	"ADHD should be considered in all age groups (children adolescents, and adults), with symptom criteria adjusted for age appropriate changes in behaviour. " And also in 1. 6, "There was no evidence of a need to apply a different concept of ADHD to children and adults." There is an important point to be mentioned here that the NICE document ignores. Allowing adults, who can make their own decisions, to take stimulants is one matter, however it is an entirely separate matter when it comes to children. The ethical questions surrounding the use of Ritalin are becoming more significant as once-medicated children are now reaching adulthood. According to a recent survey in the *LA Times*, a significant number of these adults are deciding to discontinue their medication (Healy, 2006b). The *Times* article quotes a 27-year old girl who reflects back on the years she was medicated, "It was kind of weirdly amazing….You get excited about monotonous work, honestly. Like, translating Spanish becomes totally fun …The thing is, it works. But why are we forcing people to be in that position that they should like something that they wouldn't ordinarily" (Healy, 2006a). In just three short sentences this 27-year old girl goes right to the heart of the ethical dilemma of stimulant medication: Is it right to medicate people so that they do well in school. How is it that a lay person can go right to the heart of the issue while a committee of physicians with years of training can produce a document that ignores this key point? Why are questions like this not raised by academicians in medical journals, or by the GDG?	Healy (2006) The Ritalin kids grow up: Many of the ADD generation say no to meds. LA Times Paper excluded: not peer reviewed; relevant to treatment not validity.	Comment taken into consideration.
40	CC	David Coghill	1.9.1.1	I felt that these were rather weakly described and a bit "fluffy" for want of a	No references	Comment addressed,

				better word. It is really saying you should use the diagnostic criteria, you should actually count the symptoms you should be clear about impairment and you should consider ADHD diagnosis in all ages. I think it just needs some re wording to make it snappier. Also it could benefit from starting off with a *very* clear and strong statement saying that the diagnostic categories of ADHD and hyperkinetic disorder are considered valid and should be used. This is a very important message to clinicians, the public, the government (the press) etc.	suggested.	see sections 5.14 and 5.15.
48	PR	David Cottrell	1.9.1.1	Will you be able to operationally define `moderately clinically significant' impairment?	No references suggested.	Comment addressed, see section 5.15.2 'C) How should impairment be judged?'
1	CC	Edmund Sonuga-Barke	General	This seems a very accurate and sensible document.	No references suggested.	Comment taken into consideration.
2	CC	Russell Schachar	General	I read the document with great interest and think that it is a solid contribution to the ongoing debate about ADHD/HKD. Given that the document is based on a review of reviews, it is not altogether easy to judge how the summary statements were reached, but they look appropriate.	No references suggested.	Comment taken into consideration.
3	CC	Geoff Kewley	General	I felt the review was a reasonable summary of discussion and have nothing else to add.	No references suggested.	Comment taken into consideration.
4	PR	Margaret Alsop	General	We are concerned with processes preceding and following diagnosis rather than diagnosis. The concept of ADHD is multi-faceted, therefore no individual discipline is likely to be competent to identify, assess and intervene alone. As such diagnosis becomes mechanical feature in a holistic process involving a range of professionals. A child psychiatrist or paediatrician should normally make the formal diagnosis. However, a diagnosis should only be considered valid if it is made on the basis of evidence that a particular agency is pertinent, that agency should be involved as appropriate. Medical practitioners also have a significant role to play in diagnosis and assessment in order to rule out physical factors which may lead to the symptoms similar to those of ADHD.	No references suggested.	Comment addressed, see section 5.15.
5	PR	Margaret Alsop	General	If these guidelines are intended to be accessible to professionals and parents from a range of disciplines who might first identify, or have concerns about, problems that may or may not result in an ADHD diagnosis. Their first efforts are likely to be of a broadly psychosocial nature (i.e.	References suggested: Cooper (1997) Asked reviewer for full	Comment taken into consideration.

				behavioural/cognitive and educational interventions). Currently different professionals use different terminology to describe the phenomenon of ADHD (e.g. hyperkinetic disorder, behavioural problems). The use of different terms is not helpful to professionals, children, young people, adults or their families: therefore an attempt should be made in this document to be consistent in the use of terms that have been selected for their clarity and acceptability to a wide range of professionals. There are significant differences, sometimes of an idealogical nature between different professional groups (Cooper, 1997; Hughes, 1999; Maras & Redmayne 1997). These differences can be exaggerated through training and practice and are often reflected in different professional perceptions and views of ADHD. Differences can sometimes result in confusion, misunderstandings and conflict and may have an adverse influence on the effectiveness of multi-disciplinary/agency working. However, there is also much common ground among professionals, especially in terms of sought after outcomes of intervention. ADHD by its very nature demands a multi-agency response, and provide an opportunity for medical, educational, psychological, social care and other professionals to work together.	reference, no response. Hughes (1999) Asked reviewer for full reference, no response. Maras & Redmayne (1997) Asked reviewer for full reference, no response.	
6	PR	Margaret Alsop	General	We note that there is no reference made in relation to Transition between CAMHS into the Adult CMHT. There is clear evidence to indicate that a high percentage of those diagnosed as ADHD within childhood will not have any appropriate transitional plan in place, therefore it is important that an appropriate multi-agency response for transitional arrangements are identified. (Social Exclusion Unit – Transitions Young Adults with Complex Needs)	No references suggested.	Comment addressed, see NICE guideline 'Transition to adult services'.
12	PR	Margaret Alsop	General	The following statistics provides an overview of the numbers of children facing particular risk factors out of a total population of children in England of 12 million: A In 2000, 2.7 million children lived in low B Up to 75,000 children may be missing from school rolls C Around 10 per cent of children aged 5 to 15 have a mental disorder of sufficient severity to cause them distress or to have considerable effect on the way they live and 20 per cent of children suffer from mental health problems D 1 in 9 children run away from home for at least a night E 1 in 10 families in England and Wales report incidences of domestic	No references suggested.	Comment taken into consideration.

				violence in a year F In 2000 there were 91,400 conceptions to girls aged under 20 G At the end of September 2001 there were approximately 5,400 households with children in Bed and Breakfast accommodation H There are approximately 300,000 children with disabilities in England, 110,000 of these are severely disabled. I 26,800 Children and young people are on the child protection register J 58,900 Children and young people are in public care K 11,000 Young people aged 15-20 are in young offenders institutions. Our concerns being, how many of these include those with ADHD or possible ADHD? *Figures released by the Children's and Young Persons Unit on 6th September 2002. www.cypu.gov.uk*		
14	PR	Margaret Alsop	General	That the assessment, diagnosis and treatment for ADHD should be delivered throughout the Lifespan, services delivery should be multi-agency, multi-model and incorporate professionals from many services such as: Health, Education, Social Care, Behaviour Support, Parenting Programmes, Adult Community Mental Health, Community Care, Prison Health Care providers, Housing, Employment agencies and those within the Criminal Justice System. Our belief is that the term EBD (Emotional and Behavioural Difficulties) should not be used in relation to service delivery for those already diagnosed as having ADHD. Within many services the term used for those with ADHD is described as having EBD, therefore access to a full multi-agency approach may not be forthcoming. We understand that this request may be out of the remit of the GDG and NICE but would still therefore like to request it for inclusion and consideration.	No references suggested.	Comment taken into consideration.
15	PR	Margaret Alsop	General	Not being qualified nor trained in medicine, I do not consider it appropriate for contributions from non – medically trained individuals to be included. I can only go on experiences as a parent carer of a young adult (25yrs) his having been un-medicated for the first 14 years of his life and as to how medications have now turned his life around and made him feel totally inclusive to society and not another statistic within our penal system or another fatality of drug abuse/overdose.	No references suggested.	Comment taken into consideration.
16	PR	Margaret Alsop	General	It is felt that the assessments for ADHD in children should be conducted through a 'Core diagnostic' team, this way it is multi-agency, multi-model and will rule out/include any other underlying difficulties such as ASD, LD,	No references suggested.	Comment addressed, see section 5.15.

				Dyslexia, etc, etc. During my own experiences, those diagnosed ADHD as children have received a dual diagnosis of ADHD and ASD in later adolescence or adulthood.		
17	CC	David Coghill	General	In general I very much agree with the way that the issues are addressed and the conclusions reached. Overall this is a well structured document and reaches some clear conclusions. I think that the sample comment given above applies to this document and that *"The guideline highlights throughout the document where there are gaps in the evidence to support clinical practice. Although these areas are in the main text of the document, it would be helpful if there could be an additional section at the end of each chapter with areas where further research would be helpful. This would support the research agenda and maximise resources"*	No references suggested.	Comment taken into consideration.
18	CC	David Coghill	General	Will the appendices detailing the literature be in tabular form showing sample size etc? As it would be very helpful to be able to see this information.	No references suggested.	Comment addressed, see Appendix 17.1 'Study characteristics – Diagnosis'.
19	CC	David Coghill	General	I have marked up minor comments on wording etc in the document itself	No references suggested.	Comments taken into consideration.
41	PR	David Cottrell	General	I found this to be a well written and coherent account of diagnostic validity issues. Given the potentially diverse readership of NICE guidelines and the complexity of the literature I thought the language clear and the research explained well. The questions to be addressed and the methods used arte set out clearly towards the end of section 1.3 and in 1.3. The methods are appropriate for the questions asked. My comments are largely about the use of language and presentation. I have no substantive disagreement with case that is presented.	No references suggested.	Comments taken into consideration.
49	PR	David Cottrell	General	1.2, para 3, line8 – I think this should be `particularly' but the whole sentence is clumsily worded and obscures meaning 1.4.1, second para after sub heading `Evidence' – the final sentence is not grammatical and again obscures meaning 1.4.3, first para after sub heading `evidence', line 5 – presumably `that on this' not `this on this' 1.5, second para, line 7 - `… who do not ADHD.' does not make sense 1.7.1, first sentence is ungrammatical There are other minor typos in the document but those above have the potential to distort the meaning of the text	No references suggested.	Comment addressed, see section 5.3.

61	PR	Stephen Faraone	General	The following article should be of interest to you: Faraone SV: The scientific foundation for understanding attention-deficit/hyperactivity disorder as a valid psychiatric disorder. Eur Child Adolesc Psychiatry 2005; 14(1):1-10	References suggested: Farone (2005) The scientific foundation for understanding attention-deficit/hyperactivity disorder as a valid psychiatric disorder. *Eur Child Adolesc Psychiatry*, 14(1):1-10 Paper excluded: opinion paper.	Comment taken into consideration.
70	CC	Sami Timimi	General	I wish to make the following points on the above document: The document states in its introduction that "The Guideline Development Group (GDG) acknowledged at the outset that the use of the diagnosis of ADHD has been the subject of considerable controversy and debate" and "The relative lack of a validated reference standard (indicated by SIGN diagnostic study quality assessment, see Appendix A) means that the question of validity for the diagnosis of ADHD needs to draw on evidence from a *wide range of sources*" [my italics]. Despite this the subsequent discussion of the evidence included no references drawn from authors who are critical of the concept of ADHD, despite the group being provided with a number of scientific reviews from such authors. The references included repeatedly cited research by a small number of researchers and research groups (including from the chair of the group) known to be supporters of the concept of ADHD. This suggests that the document lacks balance and is ideologically biased toward literature that confirms the majority of GDG members' views. Many members of the GDG have previously written papers or otherwise collaborated with the chair of this group. The fact that there is not one academic/practitioner who is able to represent the other side of this debate is reflected in the one-sided document the GDG has produced. It is my opinion that the conflict of interest in this group is to an extent that is unacceptable given the importance of their task. It isn't clear why the GDG decided to use the Washington University	No references suggested.	Comment addressed, see sections 5.3 and 5.9.

				Diagnostic Criteria beyond the unexplained "ensure that a transparent, structured approach was taken" nor is it evident whether any other systematic approach or framework was considered. However, even with these criteria, the interpretation of the GDG that the evidence they present is sufficient to support the validity of ADHD using these criteria is open to question:		
77	CC	Sami Timimi	General	There is clear evidence in the document that the GDG has displayed unacceptable bias in its preferred paradigm for analysing the literature, in its selection of literature and in its interpretation of the literature they selected. The fact that most of the academic members of the GDG have previously published papers with the chair of the group and that the group does not include any members with a more critical stance, strengthens the impression that the levels of bias result from conflicts of interest that are seriously unethical. The conclusions are thus not valid and could lead to serious deficiencies in practice and provide poor protection for patients, possibly exposing many more children to significant harm. The document should not be accepted. The GDG should be dismantled, a new chair appointed and a new GDG convened with a more equitable balance of opinion reflected in its membership.	No references suggested.	Comment addressed, see sections 5.3 and 5.9, as well as Chapter 3 Methods.
79	PR	Jonathan Leo	General	Take a trait – any trait, either physical or behavioural. Given normal biological variability, if the trait is measured and subsequently plotted on a graph there will be a spectrum. Some are tall and some are short, some have long legs and some have short legs, or some have a longer attention span than others. Variability of a trait is not proof of a disease. Take a drug's effect. There are certain drugs that have an effect on human traits. Alli, a new diet drug, will help people lose weight – no matter what their weight to begin with. There are also drugs that have an effect on an individual's behaviour, no matter what their behaviour to begin with. Take the stimulants, for example: Response to a drug with a universal effect, like the stimulants, is not proof of a disease. (See the GDG comments page 17 section 1.5 limitations). These are the two most common reasons cited as evidence for a biological basis of ADHD. The dilemma for NICE is to go beyond this. As it is stands now, NICE's conclusion that the ADHD diagnosis is valid is primarily based on the flawed premise that variability of a trait is proof of a disease. Even your own "Evidence Summary," basically says it is a trait, which in your opinion should be called a disease, at one end	No references suggested.	Comment taken into consideration.

				of the spectrum. In the summary you do not (or cannot) cite a single scientific study or even an area of study confirming that ADHD is primarily a problem of biology. If traits can be called diseases then where does this stop? A recent Op-Ed article in the New York Times addresses the problem of pathologizing traits: It may seem baffling, even bizarre, that ordinary shyness could assume the dimension of a mental disease. But if a youngster is reserved, the odds are high that a psychiatrist will diagnose social anxiety disorder and recommend treatment. How much credence should we give the diagnosis? Shyness is so common among American children that 42 percent exhibit it. And, according to one major study, the trait increases with age. By the time they reach college, up to 51 percent of men and 43 percent of women describe themselves as shy or introverted. Among graduate students, half of men and 48 percent of women do. Psychiatrists say that at least one in eight of these people needs medical attention (Lane, September 23, 2007). In the future will NICE have a committee deciding if "Is Shyness a valid diagnosis?" According to the logic of the current document that identifying a trait is somehow proof of a disease the answer would appear to be "Yes."		
90	PR	Jonathan Leo	General	Conclusion: The NICE document provides no new insight into the diagnosis of ADHD. It has systematically ignored one side of the debate and has simply summarized the views of those involved with the ongoing medication of children. The flaws are neither subtle nor minor, nor can they be rectified with editing. The entire approach of the panel is flawed. I am not privy to the makeup of the panel but it appears that the panel had no members with a broad societal view of the ADHD diagnosis – if it did, then they were ignored. In all your discussions you seem to have one standard for biology and one for the environment. Marginal imaging studies, that compared medicated ADHD children to controls, and genetic studies, which have not found an ADHD gene, are given credence, while you cannot even cite a study linking the environment to ADHD. The other side of the debate, that variability of a trait, and the universal effect of stimulants, are not good evidence for justifying the belief that, upwards of 10% to 15% to of the world's children have an organic brain defect, is simply not presented. Likewise the ethics surrounding the diagnosis are ignored in the NICE document. If the NICE statement on ADHD is approved no one should be surprised when five years from now more British children are	No references suggested.	Comment taken into consideration.

				being prescribed stimulants. In no way should the current NICE document be considered a fair and all encompassing view of the ADHD phenomena. On the surface, it is a document couched in the language of science, but when one looks deeper at the scientific studies there is little evidence to support the disease concept of ADHD.		

Margaret Alsop
Executive Director, Dorset ADHD Support Group

Dr David Coghill
Senior Lecturer in Child and Adolescent Psychiatry, Division of Pathology and Neuroscience (Psychiatry), University of Dundee

Prof David Cottrell
Professor of Child & Adolescent Psychiatry, Associate Professor of Psychology, University of Leeds

Dr Stephen Faraone
Professor of Psychiatry and of Neuroscience and Physiology, SUNY Upstate Medical University

Dr Geoff Kewley
Consultant Paediatrician/Physician, Director of Learning Assessment & Neurocare Centre, Horsham, West Sussex

Dr Jonathan Leo
Associate Professor of Anatomy, Western University of Health Sciences, CA

Dr Russell Schachar

Department of Psychiatry, Neurosciences and Mental Health Research Institute, The Hospital for Sick Children, University of Toronto, Ontario, Canada

Prof Edmund Sonuga-Barke
Professor in Psychology, Convenor of the Developmental Brain Behaviour Unit, University of Southampton

Prof Anita Thapar
Professor, Department of Psychological Medicine, Cardiff University School of Medicine

Dr Sami Timimi
Consultant Child Psychiatrist, Lincolnshire Partnership NHS Trust

Appendix 17: Study characteristics tables (separate files)

Appendix 18: Clinical evidence forest plots (separate files)

Appendix 19: GRADE evidence profiles (to be completed for CD-ROM)

2 References

Abikoff, H., Hechtman, L., Klein, R. G., *et al.* (2004) Symptomatic improvement in children with ADHD treated with long-term methylphenidate and multimodal psychosocial treatment. *Journal of the American Academy of Child and Adolescent Psychiatry, 43,* 802-811.

Achenbach, T. M. & Rescorla, L. A. (2001) *Manual for the ASEBA School-age Forms and Profiles.* Burlington: University of Vermont, Research Center for Children, Youth, and Families.

Achenbach, T.M, Dumenci, L. & Rescorla, L.A. (2003) DSM-oriented and empirically based approaches to constructing scales from the same item pools. *Journal of Clinical Child and Adolescent Psychology, 32,* 328-340.

Adey, P., Hewitt, G., Hewitt, J., *et al.* (2004) *The Professional Development of Teachers: Practice and Theory.* London: Kluwer Academic Publishers.

Adler, L., Dietrich, A., Reimherr, F.W., *et al.* (2006) Safety and tolerability of once versus twice daily atomoxetine in adults with ADHD. *Annals of Clinical Psychiatry, 18,* 107-113.

Adler L.A., Sutton V.K., Moore R.J., *et al*. (2006) Quality of life assessment in adult patients with attention-deficit/hyperactivity disorder treated with atomoxetine. *Journal of Clinical Psychopharmacology, 26,* 648-652.

AGREE Collaboration (2003) Development and validation of an international appraisal instrument for assessing the quality of clinical practice guidelines: the AGREE project. *Quality and Safety in Health Care, 12,* 18-23.

Alderson, P., Sutcliffe, K. & Curtis, K. (2006) Children's consent to medical treatment. *Hastings Centre Report, 36*, 25-34.

Alderson, R. M., Rapport, M. D. & Kofler, M. J. (2007) Attention-deficit/hyperactivity disorder and behavioral inhibition: a meta-analytic review of the stop-signal paradigm. *Journal of Abnormal Child Psychology, 35,* 745-758.

Alexander, R. & Hargreaves, L. (2007) *Community Soundings: the Primary Review Regional Witness Sessions*. Cambridge: University of Cambridge Faculty of Education.

Allen, A. J., Kurlan, R. M., Gilbert, D. L., *et al.* (2005) Atomoxetine treatment in children and adolescents with ADHD and comorbid tic disorders. *Neurology, 65,* 1941-1949.

Amador-Campos, J.A., Forns-Santacana, M., Martorell-Balanzo, B., *et al.* (2005) Confirmatory factor analysis of parents' and teachers ratings of DSM-IV symptoms of attention deficit hyperactivity disorder in a Spanish sample. *Psychological Reports, 97,* 847-860.

Aman, M.G., Mitchell, E.A. & Turbott, S.H. (1987) The effects of essential fatty acid supplementation by Efamol in hyperactive children. *Journal of Abnormal Psychology, 15,* 75-90.

American Academy of Child and Adolescent Psychiatry (2007) Practice Parameter for the assessment and treatment of children and adolescents with Attention Deficit/Hyperactivity Disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 46,* 894-921.

American Psychiatric Association (1994) *Diagnostic and Statistical Manual of Mental Disorders* (4th edn). Washington, DC: American Psychiatric Association.

American Psychiatric Association (2000) *Diagnostic and Statistical Manual of Mental Disorders: Text Revision* (4th edn, text revision). Washington, DC: American Psychiatric Association.

Antrop, I., Roeyers, H., Van Oost, P., *et al.* (2000) Stimulation seeking and hyperactivity in children with ADHD. *The Journal of Child Psychology and Psychiatry, 41,* 225-232.

Antshel, K. M. & Remer, R. (2003) Social skills training in children with attention deficit hyperactivity disorder: a randomized-controlled clinical trial. *Journal of Clinical Child and Adolescent Psychology, 32,* 153-165.

Applegate, B., Lahey, B.B., Hart E.L., *et al.* (1997) Validity of the age-of-onset criterion for ADHD: a report from the DSM-IV field trials. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 1211-1221.

Armstrong, F. (2003) *Spaced Out: Policy, Difference and the Challenge of Inclusive Education.* London: Kluwer.

Arnold, L.E., Kleykamp, D., Votolato, N.A., *et al.* (1989) Gamma-linolenic acid for attention-deficit hyperactivity disorder: placebo-controlled comparison to D-amphetamine. *Biological Psychiatry, 25,* 222-228.

Arnold, L. E., Elliot, M., Sachs, L., *et al.* (2003) Effects of ethnicity on treatment attendance, stimulant response/dose, and 14-month outcome in ADHD. *Journal of Consulting and Clinical Psychology, 71,* 713-727.

Altshuler, D. & Daly, M. (2007) Guilt beyond a reasonable doubt. *Nature Genetics, 39*, 813-815.

Aubrey, C., Godfrey, R. & Manigan, S. (2007) *Overcoming Barriers to Learning: How do we include young children with moderate learning difficulty?* Paper presented at the 12th Biennial Conference for Research on Learning and Instruction, Budapest August 2007.

August, G.J. Braswell, L. & Thuras, P. (1998) Diagnostic stability of ADHD in a community sample of school-aged children screened for disruptive behavior. *Journal of Abnormal Child Psychology, 26*, 345-356.

Bagwell, C.L., Molina, B.S.G., Pelham, W.E., *et al.* (2001) Attention-deficit hyperactivity disorder and problems in peer relations: predictions from childhood to adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 1285-1292.

Bambinski, L.M., Hartsough, C.S. & Lambert, N.M. (1999) Childhood conduct problems, hyperactivity-impulsivity, and inattention as predictors of adult criminal activity. *The Journal of Child Psychology and Psychiatry, 40*, 347-355.

Barbaresi, W.J. & Olsen, R.D. (1998) An ADHD educational intervention for elementary
schoolteachers: a pilot study. *Journal of Developmental and Behavioral Pediatrics, 19,* 94-100.

Barbaresi W.J., Katusic S.K., Colligan R.C., *et al.* (2007) Long-term school outcomes for children with attention-deficit/hyperactivity disorder: a population-based perspective. *Journal of Developmental and Behavioral Pediatrics, 28,* 265-273.

Barkley R.A. (1990) *Attention Deficit Disorder: A Handbook for Diagnosis and Treatment*. New York: Guilford Press.

Barkley, R.A. (1997) *ADHD and the Nature of Self-Control*. New York: Guilford Press.

Barkley, R. A. & Cox, D. (2007) A review of driving risks and impairments associated with attention-deficit/hyperactivity disorder and the effects of stimulant medication on driving performance. *Journal of Safety Research*, *38,* 113-128.

Barkley R.A. & Murphy K.R. (1998) *Attention-Deficit Hyperactivity Disorder: a Clinical Workbook* (2nd edn). New York: Guilford Press

Barkley, R.A., Fischer, M., Edelbrock, C.S., *et al.* (1990) The adolescent outcome of hyperactive children diagnosed by research criteria: I. An 8 year old prospective follow up study. *Journal of the American Academy of Child and Adolescent Psychiatry, 29,* 546-557.

Barkley, R.A., Shelton, T.L., Crosswait, C., *et al.* (2000) Multi-method psycho-educational intervention for preschool children with disruptive behavior: preliminary results at post-treatment. *The Journal of Child Psychology and Psychiatry, 41,* 319-332.

Barkley, R.A., Fischer, M., Smallish, L., *et al.* (2004)Young adult follow-up of hyperactive children: antisocial activities and drug use. *The Journal of Child Psychology and Psychiatry, 45,* 195-211.

Barkley, R.A., Fischer, M., Smallish, L., *et al.* (2006) Young adult outcomes of hyperactive children: adaptive functioning in major life activities. *Journal of the American Academy of Child and Adolescent Psychiatry, 45,* 192-202.

Bauermeister, J.J., Alegria, M., Bird, H.R., *et al.* (1992) Are attention-hyperactivity deficits unidimensional or multidimensional syndromes? Empirical findings from a community survey. *Journal of the American Academy of Child and Adolescent Psychiatry, 31,* 423-431.

Bauermeister, J., Matos, M., Reina, G., *et al.* (2005) Comparison of the DSM-IV combined and inattentive types of ADHD in a school-based sample of Latino/Hispanic children. *Journal of Child Psychology and Psychiatry*, 46, 166-179.

Bauman, A. (2007) Stigmatization, social distance and exclusion because of mental illness: the individual with mental illness as a 'stranger'. *International Review of Psychiatry, 19,* 131-135.

Benjamin, S., Nind, M., Hall, K., *et al.* (2003) Moments of inclusion and exclusion: pupils negotiating classroom contexts. *British Journal of Sociology of Education, 24,* 547-558.

Berlin, J.A. (2001) Does blinding of readers affect the results of meta-analyses? *Lancet, 350*, 185-186.

Berwid, O.G., Curko Kera, E.A., Marks, D.J., *et al.* (2005) Sustained attention and response inhibition in young children at risk for attention deficit/hyperactivity disorder. *Journal of Child Psychology and Psychiatry, 46,* 1219-1229.

Biederman, J. & Faraone, S.V. (2006) The effects of attention-deficit / hyperactivity disorder on employment and household income. *MedGenMed. Medscape General Medicine, 8,* 12 [Published online].

Biederman, J., Faraone, S.V., Doyle, A., *et al.* (1993) Convergence of the child behavior checklist with structured interview-based psychiatric diagnoses of ADHD children with and without comorbidity. *The Journal of Child Psychology and Psychiatry, 34,* 1241-1251.

Biederman, J., Milberger, S., Faraone, S. V., *et al.* (1995) Family-environment risk factors for attention-deficit hyperactivity disorder: a test of Rutter's indicators of adversity. *Archives of General Psychiatry, 52,* 464-470.

Biederman, J., Faraone, S., Milberger, S., *et al.* (1996) A prospective 4-year follow-up study of attention-deficit hyperactivity and related disorders. *Archives of General Psychiatry, 53,* 437-446.

Biederman, J., Swanson, J.M., Wigal, S.B., *et al.* (2005) Efficacy and safety of modafinil film-coated tablets in children and adolescents with attention-deficit/hyperactivity disorder: results of a randomized, double-blind, placebo-controlled, flexible-dose study. *Pediatrics, 116,* e777-e784.

Biederman, J., Mick, E., Surman, C., *et al.* (2006a) A randomized, placebo-controlled trial of OROS methylphenidate in adults with attention-deficit/hyperactivity disorder. *Biological Psychiatry, 59,* 829-835.

Biederman, J., Petty, C., Fried, R., *et al.* (2006b) Impact of psychometrically defined deficits of executive functioning in adults with attention deficit hyperactivity disorder. *American Journal of Psychiatry, 163,* 1730-1738.

Biederman, J., Swanson, J.M., Wigal, S.B., *et al.* (2006c) A comparison of once-daily and divided doses of modafinil in children with attention-deficit/hyperactivity disorder: a randomised, double-blind, and placebo-controlled study. *Journal of Clinical Psychiatry, 67,* 727-735.

Birnbaum H.G., Kessler R.C., Lowe S.W., *et al.* (2005) Costs of attention deficit-hyperactivity disorder (ADHD) in the US: excess costs of persons with ADHD and their family members in 2000. *Current Medical Research and Opinion, 21,* 195-206.

Blachman, D.R. & Hinshaw, S.P. (2002) Patterns of friendship among girls with and without attention-deficit / hyperactivity disorder. *Journal of Abnormal Child Psychology, 30,* 625-640.

Bloomquist, M.L., August, G.J. & Ostrander, R. (1991) Effects of a school-based cognitive-behavioral intervention for ADHD children. *Journal of Abnormal Child Psychology, 19,* 591-605.

Bluebond-Langner, M., DeCicco, A. & Belasco, J. (2005) Involving children with life-shortening illnesses in decisions about participation in clinical research: a proposal for shuttle diplomacy and negotiation. In *Ethics and Research with Children* (ed. E. Kodish), pp. 323–344. Oxford: Oxford University Press

Bohnstedt, B. N., Kronenberger, W. G., Dunn, D. W., *et al.* (2005) Investigator ratings of ADHD symptoms during a randomized, placebo-controlled trial of atomoxetine: a comparison of parents and teachers as informants. *Journal of Attention Disorders, 8,* 153-159.

Boonstra, A.M., Oosterlaan, J., Sergent, J.A., *et al.* (2005) Executive functioning in adult ADHD: a meta-analytic review. *Psychological Medicine, 35,* 1097-1108.

Bor, W., Sanders, M. R. & Markie-Dadds, C. (2002) The effects of the Triple P-Positive Parenting Program on preschool children with co-occurring disruptive behavior and attentional/hyperactive difficulties. *Journal of Abnormal Child Psychology, 30,* 571-587.

Botting, N., Powls, A., Cooke, R.W.I., *et al.* (1997) Attention deficit hyperactivity disorders and other psychiatric outcomes in very low birth weight children at 12 years. *The Journal of Child Psychology and Psychiatry, 38,* 931-941.

Boyle, M.H, Offord, D.R., Racine, Y.A., *et al.* (1997) Adequacy of interviews vs. checklists for classifying childhood psychiatric disorder based on parent reports. *Archives of General Psychiatry, 54,* 793-799.

Bramham, J., Young, S., Bickerdike, A., *et al.* (2008) Evaluation of group cognitive behavioural therapy for adults with ADHD. *Journal of Attention Disorders,* in press.

Braswell, L., August, G.J., Bloomquist, M.L., *et al.* (1997) School-based secondary prevention for children with disruptive behavior: initial outcomes. *Journal of Abnormal Child Psychology, 25,* 197-208.

Brazier, J. & Roberts, J. (2004) The estimation of a preference-based measure of health from the SF-12. *Medical Care, 42,* 851-859.

Brazier, J., Usherwood, T., Harper, R., *et al.* (1998) Deriving a preference-based single index from the UK SF-36 Health Survey. *Journal of Clinical Epidemiology, 51,* 1115-1128.

British Medical Association, the Royal Pharmaceutical Society of Great Britain, the Royal College of Paediatrics and Child Health, *et al.* (2005) *BNF for Children.* London: BMJ Pub.Group.

British Medical Association & the Royal Pharmaceutical Society of Great Britain (2007) *British National Formulary (BNF)* 54. London: British Medical Association & Royal Pharmaceutical Society for Great Britain.

Brookes, K-J., Mill J., Guindalini, C., *et al.* (2006) A common haplotype of the dopamine transporter gene associated with attention deficit hyperactivity disorder and interacting with maternal use of alcohol during pregnancy. *Archives of General Psychiatry, 63,* 74-81.

Brown, G.L., Hunt, R.D., Ebert, M.H., *et al.* (1979) Plasma levels of d-amphetamine in hyperactive children. *Psychopharmacology, 62,* 133-140.

Brown, R.T., Wynne, M.E. & Slimmer, L.W. (1984) Attention deficit disorder and the effect of methylphenidate on attention, behavioral, and cardiovascular functioning. *Journal of Clinical Psychiatry, 45,* 473-476.

Brown, R.T., Borden, K.A. & Clingerman, S.R. (1985a) Adherence to methylphenidate therapy in a pediatric population: a preliminary investigation. *Psychopharmacology Bulletin, 21,* 28-35.

Brown, R. T., Wynne, M. E. & Medenis, R. (1985b) Methylphenidate and cognitive therapy: a comparison of treatment approaches with hyperactive boys. *Journal of Abnormal Child Psychology, 13,* 69-87.

Brown, R.T., Perwein, A., Faries, D.E., *et al.* (2006) Atomoxetine in the management of children with ADHD: effects on quality of life and school functioning. *Clinical Pediatrics, 45,* 819-827.

Brown, T.E. (1996) *Brown Attention-Deficit Disorder Scales.* San Antonio, Texas: The Psychological Corporation, Harcourt Brace & Company.

Brown, T.E. (2001) *Brown Attention-Deficit Disorder Scales for Children.* San Antonio, Texas: The Psychological Corporation, Harcourt Brace & Company.

Buhrmester, D., Whalen, C. K., Henker, B., *et al.* (1992) Prosocial behaviour in hyperactive boys: effects of stimulant medication in comparison with normal boys. *Journal of Abnormal Child Psychology, 20,* 103-121.

Burd, L., Klug, M.G., Coumbe, M.J., *et al.* (2003a) Children and adolescents with attention deficit-hyperactivity disorder: 1. Prevalence and cost of care. *Journal of Child Neurology, 18,* 555-561.

Burd, L., Klug, M.G., Coumbe, M.J., *et al.* (2003b) The attention-deficit hyperactivity disorder paradox: 2. Phenotypic variability in prevalence and cost of comorbidity. *Journal of Child Neurology 18,* 653-660.

Burgess, I. (2002) Service innovations: attention-deficit hyperactivity disorder: development of a multi-professional integrated care pathway. *Psychiatric Bulletin*, 26, 148-151.

Bussing, R., Gary, F.A., Leon, C.E., *et al.* (2002) General classroom teachers' information and perceptions of attention deficit hyperactivity disorder. *Behavioral Disorders, 27,* 327-339.

Butter, H.J., Lapierre, Y., Firestone, P. *et al.* (1983) A comparative study of the efficacy of ACTH4-9 analogue, methylphenidate, and placebo on attention deficit disorder with hyperkinesis. *Journal of Clinical Psychopharmacology, 3,* 226-230.

Camp, B. & Bash, M.A. (1981) *Think Aloud: Increasing Social and Cognitive Skills - A Problem-Solving Program for Children: Primary Level.* Champaign, Illinois: Research Press.

Canino,G., Shrout, P.E., Rubio-Stipec, M., *et al.* (2004) The DSM-IV rates of child and adolescent disorders in Puerto Rico: prevalence, correlates, service use, and the effects of impairment. *Archives of General Psychiatry, 61,* 85-93.

Carter, C.M., Urbanowitz, M., Hemsley, R., *et al.* (1993) Effects of a food diet in attention deficit disorder. *Archives of Disease in Childhood, 69,* 564-568.

Caruana, A. & Vassallo, R. (2003) Children's perception of their influence over purchases: the role of parental communication patterns. *Journal of Consumer Marketing, 20,* 55-66.

Casat, C.D., Pleasants, D.Z. & Fleet, J.V.W. (1987) A double-blind trial of bupropion in children with attention deficit disorder. *Psychopharmacology Bulletin, 23,* 120-121.

Castellanos, F.X., Giedd, J.N., Elia, J., *et al.* (1997) Controlled stimulant treatment of ADHD and comorbid Tourette's syndrome: Effects of stimulant and dose. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 589-596.

Chan, E., Zhan, C., Homer, C.J. (2002) Health care use and costs for children with attention-deficit/hyperactivity disorder: national estimates from the medical expenditure panel survey. *Archives of Pediatrics and Adolescent Medicine 156,* 504-511.

Chen, W.J., Faraone, S.V., Biederman, J., *et al.* (1994) Diagnostic accuracy of the child behavior checklist scales for attention-deficit hyperactivity disorder: a receiver-operating characteristic analysis. *Journal of Consulting and Clinical Psychology, 62,* 1017-1025.

Cochrane Collaboration (2005) Review Manager (RevMan) [computer program]. Version 4.2.5 for Windows. Oxford: The Cochrane Collaboration. .

Coghill, D., Spende, Q., Barton, J., *et al.* (2004) *Measuring Quality of Life in Children with Attention-Deficit-Hyperactivity Disorder in the UK.* Poster presented at 16th World Congress of the International Association for Child and Adolescent Psychiatry and Allied Professions (IACAPAP), 22-26 August 2004, Berlin, Germany.

Coghill, D., Spiel, G., Baldursson, G., *et al.* (2006) Which factors impact on clinician-rated impairment in children with ADHD? *European Child and Adolescent Psychiatry, 13* (*Suppl. 1*), 117–129.

Compas, B.E., Benson, M., Boyer, M., *et al.* (2002) Problem-solving and problem-solving therapies. In *Child and Adolescent Psychiatry* (4th edn) (eds M. Rutter, & E. Taylor. Oxford: Blackwell Publishing.

Conners, C.K. (1969) A teacher rating scale for use in drug studies with children. *American Journal of Psychiatry, 126,* 884-888.

Conners, C.K. (1980) *Food additives and hyperactive children.* New York: Plenum, 1980.

Conners, C.K. (1997) *Conners Rating Scales-Revised (CRS-R)*. North Tonawanda, New York: Multi-Health Systems.

Conners, C.K. (1997) Conners' Rating Scales-Revised Technical Manual. North Tonawanda, New York: Multi-Health Systems.

Conners, C.K. & Taylor,E. (1980) Pemoline, methylphenidate, and placebo in children with minimal brain dysfunction. *Archives of General Psychiatry, 37,* 922-930.

Conners, C.K., Casat, C.D., Gualtieri, C.T., *et al.* (1996) Bupropion hydrochloride in attention deficit disorder with hyperactivity. *Journal of the American Academy of Child and Adolescent Psychiatry, 34,* 1314-1321.

Conners, C.K., Wells, K.C., Parker, J.D.A., *et al.* (1997) A new self-report scale for assessment of adolescent psychopathology: factor structure, reliability, validity and diagnostic sensitivity. *Journal of Abnormal Child Psychology, 25*, 6, 487-497.

Conners, C.K., Sitarenios, G., Parker, J.D.A., *et al.* (1998) Revision and restandardization of the Conners Teacher Rating Scale (CTRS-R): factor structure, reliability and criterion validity. J*ournal of Abnormal Child Psychology, 26,* 279-291.

Cooper, P. & Ideus, K. (1996) *Attention Deficit/Hyperactivity Disorder: A Practical Guide for Teachers.* London: David Fulton.

Corkum, P.V., McKinnon, M.M., Mullane, J.C. (2005) The effect of involving classroom teachers in a parent training program for families of children with ADHD. *Child and Family Behavior Therapy, 27,* 29-49.

Costello, A.J., Edelbrock, C.S., Kalas, R., *et al.* (1982) *NIMH Diagnostic Interview Schedule for Children.* Bethesda, Maryland: National Institute of Mental Health.

Couture, C., Royer, E., Dupuis, F. A., *et al.* (2003) Comparison of Quebec and British teachers' beliefs about, training in and experience with attention deficit hyperactivity disorder. *Emotional Behavioural Difficulties, 8,* 284-302.

Cuffe, S.P, Moore, C.G. & McKeown, R.E. (2005) Prevalence and correlates of ADHD symptoms in the national health interview survey. *Journal of Attention Disorders, 9,* 392-401

Cunningham, C. & Boyle, M. (2002) Preschoolers at risk for attention-deficit hyperactivity disorder and oppositional defiant disorder: family, parenting, and behavioural correlates. *Journal of Abnormal Child Psychology*, 30, 555-569.

Curtis, L., & Netten, A. (2006) *Unit Costs of Health and Social Care.* Canterbury: Personal Social Services Research Unit. Available from: http://www.pssru.ac.uk/

Curtis, D. F., Pisecco, S., Hamilton, R. J., *et al.* (2006) Teacher perceptions of classroom interventions for children with ADHD: a cross-cultural comparison of teachers in the United States and New Zealand. *School Psychology Quarterly*, *21,* 171-196.

Dahl, R., Pelham, W. & Wierson, M. (1991) The role of sleep disturbances in attention deficit disorder symptoms: a case study. *Journal of Pediatric Psychology*, *16,* 229-239.

Dall'Alba, G. & Sandberg, J. (2006) Unveiling professional development: a critical review of stage models. *Review of Education Research, 76,* 383-412.

Dalsgaard, S., Mortensen, P.B, Frydenberg, M., *et al.* (2002) Conduct problems, gender and the adult psychiatric outcome of children with attention-deficit hyperactive disorder. *British Journal of Psychiatry, 181,* 416-421.

Deatrick, J.A. & Faux, S.A. (1991) Conducting qualitative studies with children and adolescents. In *Qualitative Nursing Research: a Contemporary Dialogue* (ed J.M. Morse), pp.185-203. Newbury Park, California: Sage.

DeBar, L.L., Lynch, F.L., Boles, M. (2004) Healthcare use by children with attention deficit/hyperactivity disorder with and without psychiatric comorbidities. *Journal of Behavioral Health Services and Research, 31,* 312-323.

De Civita, M., Regier, D., Alamgir, A.H., *et al.* (2005) Evaluating health-related quality-of-life studies in paediatric populations: some conceptual, methodological and developmental considerations and recent applications. *Pharmacoeconomics, 23,* 659-685.

Deeks, J.J. (2002) Issues in the selection of a summary statistic for meta-analysis of clinical trials with binary outcomes. *Statistics in Medicine, 21*, 1575-1600.

Department for Education and Skills (2001) Special Educational Needs Code of Practice,
Reference dfes/581/2001.
http://publications.teachernet.gov.uk/eOrderingDownload/DfES%200581%20200MIG2228.pdf (accessed 27/04/07).

Department of Health (2004) *National Service Framework for Children, Young People and Maternity Services. The Mental Health and Psychological Well-being of Children and Young People.* London: HMSO.

De Ridder, A. & De Graeve, A. (2006) Healthcare use, social burden and costs of children with and without ADHD in Flanders, Belgium. *Clinical Drug Investigation, 26,* 75-90.

DerSimonian, R. & Laird, N. (1986) Meta-analysis in clinical trials. *Controlled Clinical Trials, 7*, 177-188.

DeShazo Barry, T., Lyman, R.D. & Grofer-Klinger, L. (2002) Academic underachievement and attention deficit/hyperactivity disorder: the negative impact of symptom severity on school performance. *Journal of School Psychology, 40,* 259–283.

Dexedrine Summary of Product Characteristics. http://emc.medicines.org.uk/ (accessed 18/08/2006)

Dickstein, S.G., Bannon, K., Castellanos, F.X., *et al.* (2006) The neural correlates of attention deficit hyperactivity disorder: an ALE meta-analysis. *The Journal of Child Psychology and Psychiatry, 47*, 1051-1062.

Dolan, P. (1997) Modelling valuations for EuroQol health states. *Medical Care, 35,* 1095-1108.

Donnelly, M., Haby, M.M., Carter, R. *et al.* (2004) Cost-effectiveness of dexamphetamine and methylphenidate for the treatment of childhood attention deficit hyperactivity disorder. *Australian and New Zealand Journal of Psychiatry, 38,* 592-601.

Döpfner, M., Breuter, D., Schürmann, S., et al. (2004) Effectiveness of an adaptive multimodal treatment in children with attention-deficit hyperactivity disorder – global outcome. *European Child and Adolescent Psychiatry, 13, Suppl. 1,* i117-i129.

Dreger, R.M., Lewis, P.M., Rich, T.A., *et al*. (1964) Behavioral classification project. Journal of Consulting Psychology, 28, 1, 1-13. Journal of the American Academy of Child & Adolescent Psychiatry, 31, 2, 210-218.

Dretzke, J., Frew, E., Davenport, C., *et al.* (2005) *The Effectiveness and Cost-Effectiveness of Parent Training/Education Programmes for the Treatment of Conduct Disorder, Including Oppositional Defiant Disorder, in Children*. Health Technology Assessment, 9. Tunbridge Wells: Gray Publishing.

Dreyfus, H.L. & Dreyfus,S.E. (1986) *A phenomenology of skill acquisition as a basis for a Merleau-Pontian non-representationalist cognitive science*. Unpublished manuscript, University of California, Berkley, Department of Philosophy.

Drummond, M.F. & Jefferson, T.O. (1996) Guidelines for authors and peer reviewers of economic submissions to the *British Medical Journal*. *British Medical Journal, 313,* 275–283.

Dulcan, M. & Popper, C.W. (1991) *Concise Guide to Child and Adolescent Psychiatry.* Washington: American Psychiatric Press Incorporated.

DuPaul, G.J. & Eckert, T.L. (1997) The effects of school-based interventions for attention deficit hyperactivity disorder: a meta analysis. *School Psychology Review, 26,* 5–27.

DuPaul, G.J., McGoey, K.E., Eckert, T.L. *et al.* (2001) Preschool children with attention deficit / hyperactivity disorder: impairments in behavioral, social, and school functioning. *Journal of the American Academy of Child andAdolescent Psychiatry, 40,* 508-515.

Eaves, L.J., Silberg, J.L., Meyer, J.M., *et al.* (1997) Genetics and developmental psychopathology: 2. The main effects of genes and environment on behavioral problems in the Virginia twin study of adolescent behavioral development. *The Journal of Child Psychology and Psychiatry, 38,* 965-980.

Eccles, M., Freemantle, N. & Mason, J. (1998) North of England evidence based guideline development project: methods of developing guidelines for efficient drug use in primary care. *British Medical Journal, 316*, 1232-1235.

Edelbrock, C. (1986) Behavioral ratings of children diagnosed for attention deficit disorder. *Psychiatric Annals, 16,* 36-40.

Edelbrock, C., Costello, A.J., Dulcan, M.K., *et al.* (1986) Parent-child agreement on child psychiatric symptoms assessed via structured interview. *Journal of Child Psychology and Psychiatry, 27,* 181-190.

Egger, J., Carter, C.M., Graham, P.J., *et al.* (1985) Controlled trial of oligoantigenic treatment in the hyperkinetic syndrome. *The Lancet, 1,* 540-545.

Epstein, J. N., Willoughby, M., Valencia, E. Y., *et al.* (2005) The role of children's ethnicity in the relationship between teacher ratings of attention-deficit/hyperactivity disorder and observed classroom behavior. *Journal of Consulting and Clinical Psychology*, 73, 424-434.

Ernhardt, D. & Hinshaw, S.P. (1994) Initial sociometric impressions of attention-deficit hyperactivity disorder and comparison boys: predictions from social behaviors and from nonbehavioral variables. *Journal of Consulting and Clinical Psychology, 62,* 833-842.

Eysenck, N.T. & Rachman, S.T. (1971) The application of learning theory to child psychiatry. In *Modern Perspectives in Child Psychiatry* (ed T.C. Howells), pp. 104-169. NewYork: Brunner/Mazel.

Famularo, R., Kinscherff, R. & Fenton, T. (1992) Psychiatric diagnoses of maltreated children: preliminary findings. *Journal of the American Academy of Child and Adolescent Psychiatry*, *31,* 863-867.

Faraone, S.V. (2005) The scientific foundation for understanding attention-deficit/hyperactivity disorder as a valid psychiatric disorder. *European Child and Adolescent Psychiatry, 14,* 1-10.

Faraone, S.V. & Biederman, J. (2005) What is the prevalence of adult ADHD? Results of a population screen of 966 adults. *Journal of Attention Disorders, 9,* 384-391.

Faraone, S., Biederman, J. & Monuteaux, M.C. (2002) Further evidence for the diagnostic continuity between child and adolescent ADHD. *Journal of Attention Disorders, 6,* 5-13.

Faraone, S. V., Sergeant, J., Gillberg, C., *et al.* (2003) The worldwide prevalence of ADHD: is it an American condition? *World Psychiatry, 2,* 104-113.

Faraone, S.V., Perlis, R.H., Doyle, A.E., *et al.* (2005) Molecular genetics of attention-deficit/ hyperactivity disorder. *Biological Psychiatry, 57,* 1313-1323.

Faraone, S.V., Biederman, J. & Mick, E. (2006) The age-dependent decline of attention deficit hyperactivity disorder: a meta-analysis of follow-up studies. *Psychological Medicine, 36,* 159-165.

Farrington, D. (1994) *Delinquency Prevention in the First Few Years of Life.* Plenary Address from 4th European Conference on Law and Psychology, Barcelona, Spain.

FDA (2008) FDA asks attention-deficit hyperactivity disorder (ADHD) drug manufacturers to develop patient medication guides. http://www.fda.gov/cder/drug/infopage/ADHD/default.htm. Accessed: January 2008.

FDA (2008) FDA alert for healthcare professionals: Adderall and Adderall XR (amphetamine). http://www.fda.gov/cder/drug/InfoSheets/HCP/AdderallHCPSheet.pdf. Accessed: January 2008.

Fehlings, D.L., Roberts, W., Humphries, T., *et al.* (1991) Attention deficit hyperactivity disorder: does cognitive behavioral therapy improve home behavior? *Journal of Developmental and Behavioral Pediatrics, 12,* 223-228.

Feighner, J.P, Robins, E., Guze, E.B., *et al.* (1972) Diagnostic criteria for use in psychiatric research. *Archives of General Psychiatry, 26,* 57-63.

Feldman, H., Cumrine, P., Handen, B.L., *et al.* (1989) Methylphenidate in children with seizures and attention-deficit disorder. *American Journal of Diseases in Children, 143,* 1081-1086.

Fennell, D. & Liberato, A. (2007) Learning to live with OCD: labelling, the self, and stigma. *Deviant Behavior, 28,* 305-331.

Ferguson, D.M., Horwood, L.J. & Lloyd, M. (1991) Confirmatory factor models of attention deficit and conduct disorder. *The Journal of Child Psychology and Psychiatry, 32,* 257-274.

Findling, R.L., Short, E.J. & Manos, M.J. (2001) Short-term cardiovascular effects of methylphenidate and Adderall. J*ournal of the American Academy of Child and Adolescent Psychiatry, 40,* 525-529.

Findling, R.L., Quinn, D., Hatch, S.J., *et al.* (2006) Comparison of the clinical efficacy of twice-daily Ritalin and once-daily Equasym XL with placebo in children with attention-deficit/hyperactivity disorder. *European Child and Adolescent Psychiatry, 15,* 450-459

Firestone, P., Kelly, M. J., Goodman, J. T., *et al.* (1981) Differential effects of parent training and stimulant medication with hyperactives: a progress report. *American Academy of Child Psychiatry, 20,* 135-147.

Firestone, P., Crowe, D., Goodman, J. T., *et al.* (1986) Vicissitudes of follow-up studies: differential effects of parent training and stimulant medication with hyperactives. *American Journal of Orthopsychiatry, 56,* 184-194.

Fischer, M., Barkley, R.A., Edelbrock, C.S., *et al.* (1990) The adolescent outcome of hyperactive children diagnosed by research criteria: II. Academic, attentional, and neuropsychological status. *Journal of Consulting and Clinical Psychology, 58,* 580-588.

Fischer, M., Barkley, R. A., Smallish, L., *et al.* (2007) Hyperactive children as young adults: driving abilities, safe driving behavior, and adverse driving outcomes. *Accident Analysis and Prevention*, *39,* 94-105.

Fletcher, K.E., Fischer, M., Barkley, R.A., *et al.* (1996) A sequential analysis of the mother-adolescent interactions of ADHD, ADHD / ODD, and normal teenagers during neutral and conflict discussions. *Journal of Abnormal Child Psychology, 24,* 271-297.

Fongay, P., Target, M., Cottrell, D., *et al.* (2002) *What Works for Whom? A Critical Review of Treatments for Children and Adolescents.* New York: Guilford Press.

Ford, T., Goodman, R., Meltzer, H. (2003) The British Child and Adolescent Mental Health Survey 1999: the prevalence of DSM-IV disorders. *Journal of the American Academy of Child and Adolescent Psychiatry,* 42, 1203-1211.

Ford T., Goodman R. & Meltzer H. (2004) The relative importance of child, family, school and neighbourhood correlates of childhood psychiatric disorder. *Social Psychiatry and Psychiatric Epidemiology, 39*, 487-496.

Fowler, M. & the National Education Committee (1992) *CH.A.D.D. Educator's Manual : an In-Depth Look at Attention Deficit Disorders from an Educational Perspective.* Plantation, Florida : CH.A.D.D.

Frazier, T.W., Youngstrom, E.A., Glutting, J.J., *et al.* (2007) ADHD and achievement: meta analysis of the child, adolescent, and adult literatures and a concomitant study with college students. *Journal of Learning Disabilities,* 40, 49–65.

Frick, P.J., Lahey, B.B., Kamphaus, R.W., *et al.* (1991) Academic underachievement and the disruptive behavior disorders. *Journal of Consulting and Clinical Psychology, 59,* 289-294.

Frouke, E.P.L., Ferdinand, R.F. & Oldehinkel, A.J. (2005) Classes of adolescents with disruptive behaviors in a general population sample. *Social Psychiatry and Psychiatric Epidemiology, 40,* 931-938.

Furukawa, T.A., Barbui, C., Cipriani, A., *et al.* (2006) Imputing missing standard deviations in meta-analyses can provide accurate results. *Journal of Clinical Epidemiology, 59*, 7-10.

Gadow, K.D., Sverd, J., Sprafkin, J., *et al.* (1999) Long-term methylphenidate therapy in children with comorbid attention-deficit hyperactivity disorder and chronic multiple tic disorder. *Archives of General Psychiatry, 56,* 337-338.

Galloway, D., Leo, E.L., Rogers, C., *et al.* (1995) Motivational styles in English and mathematics among children identified as having special educational needs. *British Journal of Eduactional Psychology, 65,* 477-487.

Gaub, M. & Carlson, C.L. (1997) Behavioural characteristics of DSM-IV ADHD subtypes in a school-based population. *Journal of Abnormal Child Psychology, 25,* 103-111.

Gerring, J.P., Brady, K.D., Chen, A., *et al.* (1998) Premorbid prevalence of ADHD and development of secondary ADHD after closed head injury. *Journal of the American Academy of Child and Adolescent Psychiatry, 37,* 647-654.

Gilger, J.W., Pennington, B.F. & DeFries, J.C. (1992) A twin study of the etiology of comorbidity: attention-deficit hyperactivity disorder and dyslexia. *Journal of the American Academy of Child and Adolescent Psychiatry, 31,* 343-348.

Gilmore, A. & Milne, R. (2001) Methylphenidate in children with hyperactivity: review and cost analysis. *Pharmacoepidemiology and Drug Safety, 10,* 85-94.

Gittelman-Klein, R., Klein, D.F., Abikoff, H., *et al.* (1976a) Relative efficacy of methylphenidate and behavior modification in hyperkinetic children: an interim report. *Journal of Abnormal Child Psychology, 4,* 361-379.

Gittelman-Klein, R., Klein, D.F., Katz, S., *et al.* (1976b) Comparative effects of methylphenidate and thioridazine in hyperkinetic children. I. Clinical results. *Archives of General Psychiatry, 33,* 1217-1231.

Gjone, H., Stevenson, J. & Sundet, J.M. (1996) Genetic influence on parent-reported attention-related problems in a Norwegian general population twin sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 588-596.

Glutting, J.J., Youngstrom, E.A. & Watkins, M.W. (2005) ADHD and college students: exploratory and confirmatory factor structures with student and parent data. *Psychological Assessment, 17,* 44-55.

Goffman, E. (1968a) *Asylums: Essays on the Social Situation of Mental Patients and other Inmates.* Harmondsworth: Penguin Books.

Goffman, E. (1968b) *Stigma: Notes on the Management of Spoiled Identity.* Harmondsworth: Penguin.

Gomez, R., Harvey, J., Quick, C., *et al.* (1999) DSM-IV AD/HD: confirmatory factor models, prevalence, and gender and age differences based on parent and teacher ratings of Australian primary school children. *The Journal of Child Psychology and Psychiatry, 40,* 265-274.

Gonzalez, L.O. & Sellers, E.W. (2002) The effects of a stress-management program on self-concept, locus of control, and the acquisition of coping skills in school-age children diagnosed with attention deficit hyperactivity disorder. *Journal of Child and Adolescent Psychiatric Nursing, 15,* 5-15.

Goodman, R. (1997) The strengths and difficulties questionnaire: a research note. *The Journal of Child Psychology and Psychiatry, 38,* 581-586.

Gowers, S., Thomas, S. & Deeley, S. (2004) Can primary schools contribute effectively to Tier I Child Mental Health Services? *Clinical Child Psychology and Psychiatry 9,* 419-425.

Grades of Recommendation Assessment, Development and Evaluation (GRADE) Working Group (2004) Grading quality of evidence and strength of recommendations. *British Medical Journal, 328,* 1490-1497.

Gray, J. & Sime, N. (1988) A report for the committee of inquiry into discipline in schools. In The Elton Report (1989). *Enquiry into Discipline in Schools.* London: HMSO

Greenberg, L.M., Deem, M.A. & McMahon, S. (1972) Effects of dextroaphetamine, chlorpromazine, and hydroxyzine on behavior and performance in hyperactive children. *American Journal of Psychiatry, 129,* 44-51.

Greenhill, L.L., Findling, R.L., Swanson, J.M., *et al.* (2002) A double-blind, placebo-controlled study of modified-release methylphenidate in children with attention-deficit/hyperactivity disorder. *Pediatrics, 109,* E39.

Greenhill, L.L., Biederman, J., Boellner, S.W., *et al.* (2006a) A randomised, double-blind, placebo-controlled study of modafinil film-coated tablets in children and adolescents with attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 45,* 503-511.

Greenhill, L.L., Muniz, R., Ball, R.R., *et al.* (2006b) Efficacy and safety of dexmethylphenidate extended-release capsules in children with attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 45,* 817-823.

Gudex, C., Dolan, P., Kind, P., *et al.* (1996) Health state valuations from the general public using the Visual Analogue Scale. *Quality of Life Research, 5,* 521-531.

Guevara, J.P. & Mandell, D.S. (2003) Costs associated with attention deficit hyperactivity disorder: overview and future projections. *Expert Review on Pharmacoeconomics and Outcomes Research, 3,* 201-210.

Guevara, J., Lozano, P., Wickizer, T., *et al.* (2001) Utilization and cost of health care services for children with attention-deficit/hyperactivity disorder. *Pediatrics, 108,* 71-78.

Hagerman, R.J. (1999) Psychopharmacological interventions in fragile x syndrome, fetal alcohol syndrome, Prader-Willi syndrome, Angelman syndrome, Smith-Magenis syndrome, and velocardiofacial syndrome. *Mental Retardation and Developmental Disabilities Research Reviews, 5,* 305-313

Hakkaart-van Roijen, L., Zwirs, B.W.C., Bouwmans, C., *et al.* (2007) Societal costs and quality of life of children suffering from attention deficient hyperactivity disorder (ADHD). *European Child and Adolescent Psychiatry 16,* 316-326.

Hartl, T., Duffany, S., Allen, G., *et al.* (2005) Relationships among compulsive hoarding, trauma, and attention-deficit/hyperactivity disorder. *Behaviour Research and Therapy*, 43, 269-276.

Hazell, P. L. & Stuart, J. E. (2003) A randomized controlled trial of clonidine added to psychostimulant medication for hyperactive and aggressive children. *Journal of the American Academy of Child and Adolescent Psychiatry, 42,* 886-894.

Heinrich, H., Gevensleben, H. & Strehl, U. (2006) Annotation: Neurofeedback - train your brain to train behaviour. *The Journal of Child Psychology and Psychiatry, 48,* 3-16.

Hemmer, S.A., Pasternak, J.F., Zecker, S.G., *et al.* (2001) Stimulant therapy and seizure risk in children with ADHD. *Pediatric Neurology, 24,* 99-102.

Hervey, A.S., Epstein, J.N. & Curry, J.F. (2004) Neuropsychology of adults with attention-deficit / hyperactivityy disorder: a meta-analytic review. *Neuropsychology, 18*, 485-503.

Higgins, J.P.T. & Thompson, S.G. (2002) Quantifying heterogeneity in a meta-analysis. *Statistics in Medicine, 21*, 1539-1558.

Hinshaw, S.P. (2002) Preadolescent girls with attention-deficit / hyperactivity disorder: I. Background characteristics, comorbidity, cognitive and social functioning, and parenting practices. J*ournal of Consulting and Clinical Psychology, 70,* 1086-1098.

Hinshaw, S. P. (2005) The stigmatization of mental illness in children and parents: developmental issues, family concerns, and research needs. *The Journal of Child Psychology and Psychiatry, 46,* 714-734.

Hirayama, S., Hamazaki, T. & Terasawa, K. (2004) Effect of docosahexaenoic acid-containing food administration on symptoms of attention-deficit/hyperactivity disorder - a placebo-controlled double-blind study. *European Journal of Clinical Nutrition, 58,* 467-473.

Ho, T.P., Leung, P.W.L., Luk, E.S.L., *et al.* (1996) Establishing the constructs of childhood behavioral disturbance in a Chinese population: a questionnaire study. *Journal of Abnormal Child Psychology, 24,* 417-431.

Hoath, F.E. & Sanders, M.R. (2002) A feasibility study of enhanced group Triple P - Positive Parenting Program for parents of children with attention-deficit/hyperactivity disorder. *Behaviour Change, 19,* 191-206.

Horwitz, A. V., Videon, T. M., Schmitz, M. F., *et al.* (2003) Rethinking twins and environments: possible social sources for assumed genetic influences in twin research. *Journal of Health and Social Behavior, 44,* 111-129.

House of Commons Education and Skills Committee (2006) *Special Educational Needs: Third Report of Session 2005-06,* Vol. 1. http://www.publications.parliament.uk/pa/cm200506/cmselect/cmeduski/478/478i.pdf

Hudziak, J., Heath, A.C., Madden, P.F., *et al* (1998) Latent class and factor analysis of DSM-IV ADHD: a twin study of female adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 37,* 848-857.

Hughes, L. & Cooper, P. (2006) *Understanding and Supporting Children with ADHD: Strategies for Teachers, Parents and other Professionals*. London: Paul Chapman.

Ialongo, N.S., Lopez, M., Horn, W.F., *et al.* (1994) Effects of psychostimulant medication on self-perceptions of competence, control, and mood in children with attention deficit hyperactivity disorder. *Journal of Clinical Child Psychology, 23,* 161-173.

The Information Centre (2006) *Prescription Cost Analysis England 2006.* The Information Centre, Prescribing Support Unit, NHS. Available on: http://www.ic.nhs.uk/webfiles/publications/pca2006/PCA_2006.pdf

Isaacs, D. (2006) Attention-deficit/hyperactivity disorder: are we medicating for social disadvantage? *Journal of Paediatrics and Child Health, 42,* 544-547.

Jacobs, B.W. (2002) Individual and group therapy. In *Child and Adolescent Psychiatry* (4th edn) (eds M. Rutter & E. Taylor), pp. 983-997. Oxford: Blackwell Publishing.

Jadad, A. R., Moore, R. A., Carroll, D., *et al* (1996) Assessing the quality of reports of randomised clinical trials: is blinding necessary? *Controlled Clinical Trials, 17*, 1-12.

Jaffee, S.R. & Price, T.S. (2007) Gene-environment correlations: a review of the evidence and implications for prevention of mental illness. *Molecular Psychiatry, 12,* 432- 442.

Jensen, P.S., Martin, D. & Cantwell, D.P. (1997) Comorbidity in ADHD: implications for research, practice, and DSM-V. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 1065-1079.

Jensen, P.S., Hinshaw, S.P., Kraemer, H.C., *et al.* (2001) ADHD comorbidity findings from the MTA study: comparing comorbid subgroups. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 147-158.

Jensen, P.S., Arnold, L.E., Swanson, J.M., *et al.* (2007) 3-year follow-up of the NIMH MTA study. *Journal of the American Academy of Child and Adolescent Psychiatry, 46,* 989-1002.

Jerome, L., Habinski, L. & Segal, A. (2006) Attention-deficit/hyperactivity disorder (ADHD) and driving risk: a review of the literature and a methodological critique. *Current Psychiatry Reports*, *8,* 416-426.

Johnston, C. & Mash, E.J. (2001) Families of children with attention-deficit/hyperactivity disorder: review and recommendations for future research. *Clinical Child and Family Psychology Review, 4,* 183-207.

Joyce, B. & Showers, B. (1980) Improving inservice training: the messages of research. *Educational Leadership, 37,* 379–385.

Kapalka, G.M. (2005) Avoiding repetitions reduces ADHD children's management problems in the classroom. *Emotional and Behavioural Difficulties, 10*, 269-279.

Kaplan, B.J., McNicol, J., Conte, R.A. *et al.* (1989) Dietary replacement in preschool-aged hyperactive boys. *Pediatrics, 83,* 7-17.

Keith, R. (1994) A*uditory Continuous Performance Test.* San Antonio, TX: Psychological Corporation

Kelleher, K.J., McInerny, T.K., Gardner, W.P., *et al.* (2000) Increasing identification of psychosocial problems: 1979-1996. *Pediatrics, 105,* 1313-1321.

Kelleher, K.J., Childs, G.E. & Harman, J.S. (2001) Healthcare costs for children with attention-deficit/hyperactivity disorder. *TEN: The Economics of Neuroscience, 3,* 60-63.

Kelsey, D.K., Sumner, C.R., Casat, C.D., *et al.* (2004) Once-daily atomoxetine treatment for children with attention-deficit/hyperactivity disorder, including an assessment of evening and morning behavior: a double-blind, placebo-controlled trial. *Pediatrics, 114,* e1-e8.

Kendall, J., Hatton, D., Beckett, A., *et al.* (2003) Children's accounts of attention deficit/hyperactivity disorder. *Advances in Nursing Science, 26,* 114-130.

Kendall, P. & Braswell, L. (1982) *Cognitive Behavioural Therapy for Impulsive Children.* New York: Guilford Press.

Kendall, P. & Finch, A. (1978) A cognitive-behavioural treatment for impulsivity: a group comparison study. *Journal of Consulting and Clinical Psychology, 46,* 110-118.

Kendall, P. & Wilcox, L. (1980) A cognitive-behavioural treatment for impulsivity: concrete versus conceptual training in non-self-controlled problem children. *Journal of Consulting and Clinical Psychology, 48,* 80-91.

Kessler, R.C., Adler, L., Ames,M., *et al.* (2005) The prevalence and effects of adult attention deficit/hyperactivity disorder on work performance in a nationally representative sample of workers. *Journal of Occupational and Environmental Medicine 47,* 565-572.

Kessler, R.C., Adler, L., Barkley, R., *et al.* (2006) The prevalence and correlates of adult ADHD in the United States: results from the national comorbidity survey replication. *American Journal of Psychiatry, 163,* 716-723

King, S., Waschbusch, D.A., Frankland, B.W. *et al.* (2005a) Taxonomic examination of ADHD and conduct problem comorbidity in elementary school children using cluster analyses. *Journal of Psychopathology and Behavioral Assessment, 27,* 77-88.

King, S., Griffin, S., Hodges, Z., *et al.* (2005b) Assessment Report: Attention Deficit Hyperactivity Disorder – Methylphenidate, Atomoxetine and Dexamfetamine (Review). http://www.nice.org.uk/guidance/index.jsp?action=download&o=33226. Accessed: January 2008.

King, S., Griffin, S., Hodges, Z., *et al.* (2006) *A Systematic Review and Economic Model of the Effectiveness and Cost-Effectiveness of Methylphenidate, Dexamfetamine and Atomoxetine for the Treatment of Attention Deficit Hyperactivity Disorder in Children and Adolescents*. Health Technology Assessment*, 10.* Tunbridge Wells: Gray Publishing.

Klein, C., Wendling, K., Huettner, P., *et al.* (2006) Intra-subject variability in attention-deficit hyperactivity disorder. *Biological Psychiatry, 60,* 1088-1097.

Klein, R. & Abikoff, H. (1997) Behavior therapy and methylphenidate in the treatment of children with ADHD. *Journal of Attention Disorders, 2,* 89-114.

Kollins, S., Greenhill, L., Swanson, J., *et al.* (2006) Rationale, design, and methods of the preschool ADHD treatment study (PATS). *Journal of the American Academy of Child and Adolescent Psychiatry, 45,* 1275-1283.

Kooij, J.J.S., Burger, H., Boonstra, A.M., *et al.* (2004) Efficacy and safety of methylphenidate in 45 adults with attention-deficit/hyperactivity disorder. A randomised placebo-controlled double-blind cross-over trial. *Psychological Medicine, 34*, 973-982.

Kooij, J.J., Buitelaar, J.K., Van Der Oord, E.J., *et al* (2005) Internal and external validity of attention-deficit hyperactivity disorder in a population-based sample of adults. *Psychological Medicine, 35,* 817–827.

Korkman, M., Kirk, U. & Kemp, S. (1998) *NEPSY: A Developmental Neuropsychological Assessment.* San Antonio, TX: Psychological Corporation

Krueger, R.A. & Casey, M.A. (2000) *Focus Groups: A Practical Guide to Applied Research.* London: Sage.

Kuntsi, J., Eley, T.C., Taylor, A., *et al.* (2004) Co-occurrence of ADHD and low IQ has genetic origins. *American Journal of Medical Genetics, 124B,* 41-47.

Kupietz, S.S., Winsberg, B.G., Richardson, E., *et al.* (1988) Effects of methylphenidate dosage in hyperactive reading-disabled children: I. Behavior and cognitive performance effects. *Journal of the American Academy of Child and Adolescent Psychiatry, 27,* 70-77.

Kurlan, R., Goetz, C.G., McDermott, M.P., *et al.* (2002) Treatment of ADHD in children with tics: a randomized controlled trial. *Neurology, 58,* 527-536.

Lahey, B.B., Pelham, W.E., Schaughency, E.A., *et al.* (1988) Dimensions and tpes of attention deficit disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 27,* 330–335.

Lahey, B.B., Applegate, K., McBurnett, J., *et al.* (1994) DSM-IV field trials for attention deficit hyperactivity disorder in children and adolescents. *American Journal of Psychiatry, 151,* 1673-1685.

Lahti, J., Raikkonen, K., Kajantie, E., *et al.* (2006) Small body size at birth and behavioural symptoms of ADHD in children aged five to six years. *Journal of Child Psychology and Psychiatry, 47,* 1167-1174.

Laing, A. & Aristides, M. (2005) *Attention Deficit Hyperactivity Disorder (ADHD) in Adults: SF-6D Utilities from SF-36 Scores in a Randomised trial*. Poster presented at 8th Annual European Congress of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), 6-8 November 2005, Florence, Italy

Lambert, N. (2005) The contribution of childhood ADHD, conduct problems, and stimulant treatment to adolescent and adult tobacco and psychoactive substance abuse. *Ethical Human Psychiatry and Psychology, 7,* 197-221.

Langley, K., Holmans, P. A., van den Bree, M. B., *et al.* (2007) Effects of low birth weight, maternal smoking in pregnancy and social class on the phenotypic manifestation of attention deficit hyperactivity disorder and associated antisocial behaviour: investigation in a clinical sample. *BMC Psychiatry, 7,* 26.

Larsson, J.O., Larsson, H. & Lichtenstein, P. (2004) Genetic and environmental contributions to stability and change of ADHD symptoms between 8 and 13 years of age: a longitudinal twin study. *Journal of the American Academy of Child and Adolescent Psychiatry, 43,* 1267-1275.

Lee, S.S. & Hinshaw, S.P. (2004) Severity of adolescent delinquency among boys with and without attention deficit hyperactivity disorder: predictions from early antisocial behavior and peer status. *Journal of Clinical Child and Adolescent Psychology, 33,* 705-716.

Leibson, C.L., Katusic, S.K., Barbaresi, W.J., *et al.* (2001) Use and costs of medical care for children and adolescents with and without attention-deficit/hyperactivity disorder. *The Journal of the American Medical Association, 285,* 60-66.

Lerer, R.J., Artner, J. & Lerer, M.P. (1979) Handwriting deficits in children with minimal brain dysfunction: effects of methylphenidate (Ritalin) and placebo. *Journal of Learning Disbabilities, 12,* 450-455.

Leviton, A., Guild-Wilson, M., Neff, R.K., *et al.* (1993) The Boston teacher questionnaire. 1. Definition of syndromes. *Journal of Child Neurology, 8,* 43-53.

Levy, F., Dumbrell, S., Hobbes, G., *et al.* (1978) Hyperkinesis and diet: a double-blind crossover trial with a tartrazine challenge. *The Medical Journal of Australia, 1,* 61-64.

Levy, F., Hay, D.A., McStephen, M., *et al.* (1997) Attention-deficit hyperactivity disorder: a category or a continuum? Genetic analysis of a large-scale twin study. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 737-744.

Li, D., Sham, P.C., Owen, M.J. *et al.* (2006) Meta-analysis shows significant association between dopamine system genes and attention deficit hyperactivity disorder (ADHD). *Human Molecular Genetics, 15,* 2276-2284.

Linnet, K.M., Dalsgaard, S., Obel, C., *et al.* (2003) Maternal lifestyle factors in pregnancy risk of attention deficit hyperactivity disorder and associated behaviors: review of the current evidence. *American Journal of Psychiatry, 160,* 1028-1040.

Lloyd, G., Stead, J. & Cohen, D. (eds) (2006) *Critical New Perspectives on ADHD*. London: Routledge.

Long, N., Rickert, V. I. & Ashcraft, E. W. (1993) Bibliotherapy as an adjunct to stimulant medication in the treatment of attention-deficit hyperactivity disorder. *Journal of Pediatric Health Care, 7,* 82-88.

Lord, J. & Paisley, S. (2000) *The Clinical Effectiveness and Cost-Effectiveness of Methylphenidate for Hyperactivity in Childhood, Version 2.* London: National Institute for Clinical Excellence.

Manly, T., Robertson, I.H., Anderson ,V. *et al.* (1998) *Test of Everyday Attention for Children.* Bury St Edmunds: Thames Valley Test Company.

Mannuzza, S., Klein, R.G., Bonagura, N., *et al.* (1991) Hyperactive boys almost grown up. *Archives of General Psychiatry, 48,* 77-83.

Mannuzza, S., Klein, R.G., Bessler, A., *et al.* (1993) Adult outcome of hyperactive boys. Educational achievement, occupational rank, and psychiatric status. *Archives of General Psychiatry, 50,* 565-576.

Mannuzza, S., Klein, R.G., Bessler, A., *et al.* (1998) Adult psychiatric status of hyperactive boys grown up. *American Journal of Psychiatry, 155,* 493-498.

Mannuzza, S., Klein, R.G. & Moulton, J.L. (2002) Young adult outcome of children with 'situational' hyperactivity: a prospective, controlled follow-up study. *Journal of Abnormal Child Psychology, 30,* 191-198.

Mannuzza, S., Klein, R.G., Abikoff, H., *et al.* (2004) Significance of childhood conduct problems to later development of conduct disorder among children with ADHD: a prospective follow-up study. *Journal of Abnormal Child Psyhcology, 32,* 565-573.

Markussen-Linnet, K., Dalsgaad, S., Obel, C., *et al.* (2003) Maternal lifestyle factors in pregnancy risk of attention deficit hyperactivity disorder and associated behaviours: review of the current evidence. *American Journal of Psychiatry, 160,* 1028-1040.

Marshall, R.M., Schafer, V.A., O'Donnell, L., *et al.* (1999) Arithmetic Disabilities and ADHD Subtypes: implications for DSM-IV. Journal of Learning Disabilities, 32, 239-247.

Martin, N.C., Piek, J.P. & Hay, D. (2006) DCD and ADHD: a genetic study of their shared aetiology. *Human Movement Science, 25,* 110-124.

Mattes, J.A. & Gittelman, R. (1981) Effects of artificial food colorings in children with hyperactive symptoms: a critical review and results of a controlled study. *Archives of General Psychiatry, 38,* 714-718.

Matza, L.S., Secnik, K., Rentz, A.M., *et al.* (2005) Assessment of health states utilities for attention-deficit/hyperactivity disorder in children using parent proxy report. *Quality of Life Research, 14,* 735-747.

Mautner, V.F., Kluwe, L., Thakker, S.D., *et al.* (2002) Treatment of ADHD in Neurofibromatosis type I. *Developmental Medicine and Child Neurology, 44,* 164-170.

Mays, N. & Pope, C. (2000) Qualitative research in health care: assessing quality in qualitative research. *British Medical Journal, 320,* 50-52.

McArdle, P., Prosser, J., Kolvin, I. (2004) Prevalence of psychiatric disorder: with and without psychosocial impairment. *European Child and Adolescent Psychiatry, 13*, 347-353.

McCann, D., Barrett, A., Cooper, A., *et al.* (2007) Food additives and hyperactive behaviour in 3-year-old and 8/9-year-old children in the community: a randomised, double-blind, placebo-controlled trial. *The Lancet* (online). Availbale at: http://www.thelancet.com/journals.

McElearney, C., Fitzpatrick, C., Farrell, N., *et al.* (2005) Stimulant medication in ADHD: what do children and their parents say? *Irish Journal of Psychological Medicine, 22,* 5-9.

McGee, R., Williams, S., Bradshaw, J., *et al.* (1985) The Rutter scale for completion by teachers: factor structure and relationships with cognitive abilities and family adversity for a sample of New Zealand children. *The Journal of Child Psychology and Psychiatry, 26,* 727-739.

McGee, R., Williams, S. & Feehan, M. (1992) Attention deficit disorder and age of onset of problem behaviors. *Journal of Abnormal Child Psychology, 20,* 487-502.

McGee, R., Prior, M., Williams, S., *et al.* (2002) The long-term significance of teacher-rated hyperactivity and reading ability in childhood: findings from two longitudinal studies. *The Journal of Child Psychology and Psychiatry, 43,* 1004-1017.

McLeer, S. V., Callaghan, M., Henry, D., *et al.* (1994) Psychiatric disorders in sexually abused children. *Journal of the American Academy of Child and Adolescent Psychiatry*, *33,* 313-319.

Meaux, J., Hester, C., Smith, B., *et al.* (2006) Stimulant medications: a trade-off? The lived experience of adolescents with ADHD. *Journal for Specialists in Pediatric Nursing, 11,* 214-226.

Meichenbaum, D. (1977) *Cognitive Behaviour Modification: An Integrative Approach.* New York: Plenum.

Meichenbaum, D. & Goodman J (1971) Training impulsive children to talk to themselves: a means of developing self-control. *Journal of Abnormal Psychology, 77,* 115-126.

Meo, A. & Parker, A. (2004) Teachers, teaching and educational exclusion: pupil referral units and pedagogic practice. *International Journal of Inclusive Education, 8,* 103-120.

Merrell, C. & Tymms, P. (2001) Inattention, hyperactivity and impulsiveness: their impact on academic achievement and progress. *British Journal of Educational Psychology, 71,* 43-56.

Merrell, C. & Tymms, P. (2002) *Working with Difficult Children in Years 1 and 2: A Guide for Teachers*. Durham: CEM Centre, University of Durham.

Merrell, C. & Tymms, P. (2005) Rasch analysis of inattentive, hyperactive and Impulsive behaviour in young children and the link with academic achievement. *Journal of Applied Measurement, 6,* 1-18.

Merrell, C. & Tymms, P. (2005) *A Longitudinal Study of the Achievements, Progress and Attitudes of Severely Inattentive, Hyperactive and Impulsive Young Children.* Paper presented at the Annual Conference of the British Educational Research Association, University of Glamorgan, September 2005.

MHRA Zyban (bupropion hydrochloride) - safety update. Available at: http://www.google.co.uk/search?hl=en&sa=X&oi=spell&resnum=0&ct=result&cd=1&q=bupropion+mhra+safety+update&spell=1. Accessed: April 2008

Michelson, D., Adler, L., Spencer, T., *et al.* (2003) Atomoxetine in adults with ADHD: two randomized, placebo-controlled studies. *Biological Psychiatry, 53,* 112-120.

Michelson, D., Faries, D., Wernicke, J., *et al.* (2001) Atomoxetine in the treatment of children and adolescents with attention-deficit/hyperactivity disorder: a randomized, placebo-controlled, dose-response study. *Pediatrics, 108,* E83.

Michelson, D., Allen, A. J., Busner, J., *et al.* (2002) Once-daily atomoxetine treatment for children and adolescents with attention deficit hyperactivity disorder: a randomized, placebo-controlled study. *American Journal of Psychiatry, 159,* 1896-1901.

Michelson, D., Buitelaar, J. K., Danckaerts, M., *et al.* (2004) Relapse prevention in pediatric patients with ADHD treated with atomoxetine: a randomized, double-blind, placebo-controlled study. *Journal of the American Academy of Child and Adolescent Psychiatry, 43,* 896-904.

Mick, E., Biederman, J., Faraone, S.V., *et al.* (2002) Case-control study of attention deficit hyperactivity disorder and maternal smoking, alcohol use and drug use during pregnancy. *American Journal of Child and Adolescent Psychiatry, 41,* 378-385.

Moffitt, T. E., Caspi, A. & Rutter, M. (2005) Strategy for investigating interactions between measured genes and measured environments. *Archives of General Psychiatry, 62,* 473-481.

Molina, B.S.G. & Pelham, W.E. (2003) Childhood predictors of adolescent substance use in a longitudinal study of children with ADHD. *Journal of Abnormal Psychology, 112,* 497-507.

Molina, B.S.G., Smith, B.H. & Pelham, W.E. (2001) Factor structure and criterion validity of secondary school teacher ratings of ADHD and ODD. *Journal of Abnormal Child Psychology, 29,* 71-82.

Molina, B.S.G., Flory, K., Hinshaw, S.P., *et al.* (2007) Delinquent behaviour and emerging substance use in MTA at 36 months: prevalence, course, and treatment effects. *Journal of the American Academy of Child and Adolescent Psychiatry, 46,* 1-11.

Mortimore, P., Sammons, P., Stoll, L., *et al.* (1988). *School Matters: The Junior Years.* Wells, Somerset: Open Books.

MTA Co-operative Group (1999a) A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56,* 1073-1086.

MTA Co-operative Group (1999b) Moderators and mediators of treatment response for children with attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56,* 1088-1096.

MTA Co-operative Group (2004a) National Institute of Mental Health multimodal treatment study of ADHD follow-up: 24-month outcomes of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56,* 1088-1096.

MTA Co-operative Group (2004b) National Institute of Mental Health multimodal treatment study of ADHD follow-up: changes in effectiveness and growth after the end of treatment. *Pediatrics, 113,* 762-769.

Muthukrishna, N. (2006) Inclusion and exclusion in school: experiences of children labelled 'ADHD' in South Africa. In *Critical New Perspectives on ADHD* (eds G. Lloyd, J. Stead & D. Cohen), pp. 96-114. Abingdon: Routledge.

Nadder, T.S., Rutter, M., Silberg, J.L., *et al.* (2002) Genetic effects on the variation and covariation of attention deficit-hyperactivity disorder (ADHA) and oppositional-defiant disorder / conduct disorder (ODD / CD) symptomatologies across informant and occasion of measurement. *Psychological Medicine, 32,* 39-53.

Narayan, S. & Hay, J. (2004) Cost effectiveness of methylphenidate versus AMP/DEX mixed salts for the first-line treatment of ADHD. *Expert Review of Pharmacoeconomics and Outcomes Research, 4,* 625-634.

National Institute for Clinical Excellence (2004) *Guide to the Methods of Technology Appraisal. National Institute for Clinical Excellence.* London: National Institute for Clinical Excellence. Available from: www.nice.org.uk

National Institute for Health and Clinical Excellence and Social Care Institute for Excellence (NICE) (2006a) *Parent-Training/Education Programmes in the Management of Children with Conduct Disorders.* Technology Appraisal 102. London: National Institute for Health and Clinical Excellence. Available at: www.nice.org.uk/TA102

National Institute for Health and Clinical Excellence (NICE) (2006b) *Methylphenidate, atomoxetine and dexamfetamine for the treatment of attention deficit hyperactivity disorder in children and adolescents. Technology Appraisal 98.* London, UK: National Institute for Health and Clinical Excellence. Available at: www.nice.org.uk/TA98

National Institute for Health and Clinical Excellence (NICE) (2006c) *The Guidelines Manual.* London: National Institute for Health and Clinical Excellence. Available from: www.nice.org.uk

National Institutes of Health (1998) *NIH Consensus Development Conference: Diagnosis and Treatment of Attention Deficit Hyperactivity Disorde*r, 16-18 November, William H. Natcher Conference Centre, National Institutes of Health, Bethesda, Maryland.

Neuman, R. J., Lobos, E., Reich, W., *et al.* (2007) Prenatal smoking exposure and dopaminergic genotypes interact to cause a severe ADHD subtype. *Biological Psychiatry*, *61*, 1320-1328.

Newcorn, J.H., Michelson, D., Kratochvil, C.J., *et al.,* (2006) Low-dose atomoxetine for maintenance treatment of attention-deficit/hyperactivity disorder. *Pediatrics, 118,* e1701-e1706.

Nussbaum, N.L., Grant, M.L., Roman, M.J., *et al.* (1990) Attention Deficit and the mediating effect of age on academic and behavioural variables. *Journal of Behavioural and Developmental Pediatrics, 11,* 22-26.

O'Connor, T. G., Heron, J., Golding, J., *et al.* (2002) Maternal antenatal anxiety and children's behavioural/emotional problems at 4 years. Report from the Avon Longitudinal Study of Parents and Children. *British Journal of Psychiatry, 180,* 502-508.

O'Connor, T. G., Heron, J., Golding, J., *et al*. (2003) Maternal antenatal anxiety and behavioural/emotional problems in children: a test of a programming hypothesis. *Journal of Child Psychology and Psychiatry, 44*, 1025-1036.

Office of Drug Safety (2006) Follow up review of AERS search identifying cases of sudden death occurring with drugs used for the treatment of attention deficit hyperactivity disorder (ADHD). Rockville, Maryland: US Food and Drug Administration. Available: www.fda.gov/ohrms/dockets/ac/06/briefing/2006-4210b_07_01_safetyreview.pdf

Office for National Statistics. (2007) *T 03: England and Wales; Estimated Resident Population by Single Year of Age and Sex; Mid-2006 Population Estimates.* London: Office for National Statistics. Available from: http://www.statistics.gov.uk/statbase/ssdataset.asp?vlnk=9659&More=Y

O'Shaughnessy, T., Lane, K., Gresham, F. *et al.* (2003) Children placed at risk for learning and behavioural difficulties: implementing a school-wide system of early identification and intervention. *Remedial and Special Education, 24,* 27–35.

Owens, E.B., Hinshaw, S.P., Kraemer, H.C., *et al.* (2003) Which treatment for whom for ADHD? Moderators of treatment response in the MTA. *Journal of Consulting and Clinical Psychology, 71,* 540-552.

Paloyelis, Y., Mehta, M.A., Kuntsi, J., *et al.* (2007) Functional MRI in ADHD: a systematic literature review. *Expert Review of Neurotherapeutics, 7,* 1337-1356.

Palumbo, D., Spencer, T., Lynch, J., *et al.* (2004) Emergence of tics in children with ADHD: impact of once-daily OROS methylphenidate therapy. *Journal of Child and Adolescent Psychopharmacology, 14,* 185-194.

Paterson, R., Douglas, C., Hallmayer, J., *et al.* (1999) A randomised, double-blind, placebo-controlled trial of dexamphetamine in adults with attention deficit hyperactivity disorder. *Australian and New Zealand Journal of Psychiatry, 33,* 494-502.

Pelhan, T. (2003) *1-2-3 Magic: Effective Discipline for Children 2-12.* Illinois: ParentMagic, Inc.

Pelham, W.E. & Murphy, H.A. (1986) Attention deficit and conduct disorder. In *Pharmacological and Behavioural Treatment: an Integrative Approach* (ed M. Hersen), pp. 108-148. New York: John Wiley & Sons.

Pelham, W.E. (1986) The effects of psychostimulant drugs on learning and academic achievement in children with attention-deficit hyperactivity disorders and learning disabilities. In *Psychological and Educational Perspectives on Learning Disabilities* (eds J. K. Torgesen & B. Wong) New York: Academic Press.

Pelham, W.E. & Gnagy, E.M. (1999) Psychosocial and combined treatments. *Mental Retardation and Developmental Disabilities Research Reviews, 5,* 225-236

Pelham, W.E., Gnagy, E.M., Greenslade, K.E., *et al.* (1992) Teacher ratings of DSM-III-R symptoms for the disruptive behavior disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, *31*, 210-218.

Pelham, W.E., Foster, E.M. & Robb, J.A. (2007) The economic impact of attention-deficit/hyperactivity disorder in children and adolescents. *Journal of Pediatric Psychology, 32,* 711-727.

Perring, C. (1997) Medicating children: the case of Ritalin. *Bioethics, 11,* 228-240.

Pfiffner, L. J. & McBurnett, K. (1997) Social skills training with parent generalization: treatment effects for children with attention deficit disorder. *Journal of Consulting and Clinical Psychology, 65,* 749-757.

Philbrick, D., Tymms, P. & Woodcock, S. (eds) (2004) *A Multi-Agency Approach to Difficulties Associated with Attention, Hyperactivity and Impulsiveness: Framework and Guidance 2004.* Durham: Durham County Council, NHS, CEM Centre.

Pillow, D.R., Pelham, W.E., Hoza, B., *et al.* (1998) Confirmatory factor analyses examining attention deficit hyperactivity disorder symptoms and other childhood disruptive behaviors. *Journal of Abnormal Child Psychology, 26,* 293-309.

Pineda, D.A., Lopera, F., Palacio, J.D., *et al.* (2003) Prevalence estimations of attention-deficit/hyperactivity disorder: differential diagnoses and comorbidities in a Colombian sample. *International Journal of Neuroscience, 113,* 49-71.

Pliszka, S.R., Browne, R.G., Olvera, R.L., *et al.* (2000) A double-blind, placebo-controlled study of Adderall and methylphenidate in the treatment of attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 39,* 619-626.

Poduska, J.M. (2000) Parents' perceptions of their first graders' need for mental health and educational services. *Journal of the American Academy of Child and Adolescent Psychiatry, 39,* 584-591.

Pliszka, S. R., Glahn, D. C., Semrud-Clikeman, M., *et al.* (2006) Neuroimaging of inhibitory control areas in children with attention deficit hyperactivity disorder who were treatment naive or in long-term treatment. *American Journal of Psychiatry, 163,* 1052-1060.

Power, T.J., Hess, L.E. & Bennett, D.S. (1995) The acceptability of interventions for attention-deficit hyperactivity disorder among elementary and middle school teachers. *Journal of Developmental and Behavioral Pediatrics, 16,* 238-43.

Pratt, T.C., Cullen, F.T., Blevins, K.R., *et al.* (2002) The relationship of attention deficit hyperactivity disorder to crime and delinquency: a meta-analysis. *International Journal of Police Science and Management, 4,* 344-360.

Price, T.S., Simonoff, E., Waldman, I., *et al.* (2001) Hyperactivity in preschool children is highly heritable. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 1362-1364.

Price, T.S., Simonoff, E., Asherson, P., *et al.* (2005) Continuity and change in preschool ADHD symptoms: longitudinal genetic analysis with contrast effects. *Behavior Genetics, 35,* 121-132.

Prosser, B. (2006) *ADHD: Who's Failing Who?* Sydney: Finch Publishing.

Psychogiou, L., Daley, D. M., Thompson, M. J., *et al.* (2007) Mothers' expressed emotion toward their school-aged sons. Associations with child and maternal symptoms of psychopathology. *European Child and Adolescent Psychiatry, 16,* 458-464.

Purdie, N., Hattie, J. & Carroll, A. (2002) A review of the research on interventions for attention deficit hyperactivity disorder: what works best? *Review of Educational Research, 72,* 61–99.

Rabinowitz, E. (2004) Recreation interventions for individuals with attention deficit hyperactivity disorder. *American Journal of Recreation Therapy, 3,* 31-35.

Ramsay, J.R. & Rostain, A.L.(2003) A cognitive therapy approach for adult attention deficit/hyperactivity disorder. *Journal of Cognitive Psychotherapy: An International Quarterly, 17,* 319-333.

Rapaport, J.L. (1978) Dextroamphetamine: cognitive and behavioral effects in normal prepubertal boys. *Science, 199,* 560-563.

Rasmussen, E.R., Neuman, R.J., Heath, A.C., *et al.* (2004) Familial clustering of latent class and DSM-IV defined attention-deficit / hyperactivity disorder (ADHD) subtypes. *The Journal of Child Psychology and Psychiatry, 45,* 589-598.

Read, J. (2007) Why promoting biological ideology increases prejudice against people labeled 'schizophrenic'. *Australian Psychologist, 42,* 118-128.

Reimer, B., D'Ambrosio, L. A., Coughlin, J. F., *et al* (2007) Task-induced fatigue and collisions in adult drivers with attention deficit hyperactivity disorder. *Traffic Injury Prevention, 8,* 290-299.

Reimherr, F.W., Hedges, D.W., Strong, R.E., *et al.* (2005) Bupropion SR in adults with ADHD: a short-term, placebo-controlled trial. *Neuropsychiatric Disease and Treatment, 1,* 245-251.

Reierson A *et al* . Autistic traits in a population-based ADHD twin sample, JCPP 2007 .

Reimer, B., D'Ambrosio, L. A., Coughlin, J. F., *et al.* (2007) Task-induced fatigue and collisions in adult drivers with attention deficit hyperactivity disorder. *Traffic Injury Prevention, 8,* 290-299.

Rey, J. M., Walter, G., Plapp, J. M., *et al* (2000) Family environment in attention deficit hyperactivity, oppositional defiant and conduct disorders. *Australian and New Zealand Journal of Psychiatry*, *34,* 453-457.

Rhodes, S. M., Coghill, D. R. & Matthews, K. (2006) Acute neuropsychological effects of methylphenidate in stimulant drug-naive boys with ADHD II--broader executive and non-executive domains. *Journal of Child Psychology and Psychiatry, 47,* 1184-1194.

Richardson, A. & Puri, B. (2002) A randomized double-blind, placebo-controlled study of the effects of supplementation with highly unsaturated fatty acids on ADHD-related symptoms in children with specific learning disabilities. *Progress in Neuro-Psychopharmacology and Biological Psychiatry, 26,* 233-239.

Richardson, E., Kupietz, S.S., Winsberg, B.G., *et al.* (1988) Effects of methylphenidate dosage in hyperactive reading-disabled children: II. Reading achievement. *Journal of the American Academy of Child and Adolescent Psychiatry, 27,* 78-87.

Rieppi, R., Greenhill, L.L., Ford, R.E., *et al.* (2002) Socioeconomic status as a moderator of ADHD treatment outcomes. *Journal of the American Academy of Child and Adolescent Psychiatry, 41,* 269-277.

Rietveld, M.J.H., Hudziak, J.J., Bartels, M., *et al.* (2004) Heritability of attention problems in children: longitudinal results from a study of twins, age 3 to 12. *The Journal of Child Psychology and Psychiatry, 45,* 577-588.

Risch, N. & Merikangas, K. (1996) The future of genetic studies of complex human diseases. *Science, 273,* 1516-1517.

Ritalin, Equasym, Concerta XL, Equasym XL Summary of Product Characteristics http://emc.medicines.org.uk/ (accessed 18/08/2006)

Robertson, I.H., Ward, T., Ridgeway, V., *et al.* (1994) *The Test of Everyday Attention.* Bury St Edmunds: Thames Valley Test Company.

Robins, L.N., Helzer, J.E., Croughan, J., *et al.* (1981) National Institute of Mental Health diagnostic interview schedule: its history, characteristics and validity. *Archives of General Psychiatry 38,* 381-389.

Rodriguez, A. & Bohlin, G. (2005) Are maternal smoking and stress during pregnancy related to ADHD symptoms in children? *Journal of Child Psychology and Psychiatry, 46,* 246-254.

Ronald, A., Simonoff, E., Kuntsi, J., *et al.* (2008) Evidence for overlapping genetic influences on autistic and ADHD behaviours in a community twin sample. *Journal of Child Psychology and Psychiatry, 49,* 535-542.

Rosenhan, D. (1973) On being sane in insane places. *Science, 179,* 250-258.

Rosler, M., Retz, W., Retz-Junginger, P., *et al.* (2004) Prevalence of attention deficit-/hyperactivity disorder (ADHD) and comorbid disorders in young male prison inmates. *European Archives of Psychiatry and Clinical Neuroscience, 254,* 365-371.

Rosvold, H.E., Mirsky, A.F., Sarason, I., *et al.* (1956) A continuous performance test of brain damage. *Journal of Consulting Psychology, 20,* 343-350.

Roy, P., Rutter, M. & Pickles, A. (2000) Institutional care: risk from family background or pattern of rearing? *The Journal of Child Psychology and Psychiatry, 41,* 139-149.

Rugino, T.A. & Samsock, T.C. (2003) Modafinil in children with attention-deficit hyperactivity disorder. *Pediatric Neurology, 29,* 136-142.

Rutter, M. & O'Connor, T. G. (2004) Are there biological programming effects for psychological development? Findings from a study of Romanian adoptees. *Developmental Psychology, 40,* 81-94.

Rutter, M., Cox, A., Tupling, C., *et al.* (1975) Attainment and adjustment in two geographical areas. I-the prevalence of psychiatric disorder. *British Journal of Psychiatry, 126,* 493-509.

Rutter, M., Colvert, E., Kreppner, J., *et al.* (2007) Early adolescent outcomes for institutionally-deprived and non-deprived adoptees. I: disinhibited attachment. *Journal of Child Psychology and Psychiatry, 48,* 17-30.

Rutter, M., Maughan, B., Mortimer, P., *et al.* (1979) *Fifteen Thousand Hours.* London: Open Books.

Safren, S.A., Otto, M.W., Sprich, S., *et al.* (2005) Cognitive-behavioral therapy for ADHD in medication-treated adults with continued symptoms. *Behaviour Research and Therapy, 43,* 831-842.

San Roman, P. (2007) Multi-agency assessment pathway approach to difficulties of attention/overactivity (including AD/HD): a community pilot. In *National ADHD Conference*. University of Edinburgh, UK.

Sanders, M.R., Mazzucchelli, T.G. & Studman, L. (2004) Stepping Stones Triple P – An evidence-based positive parenting program for families with a child who has a disability: its theoretical basis and development. *Journal of Intellectual and Developmental Disability, 29,* 1-19.

Santosh, P.J., Taylor, E., Swanson, J., *et al.* (2005) Refining the diagnoses of inattention and overactivity syndromes: a reanalysis of the multimodal treatment study of attention deficit hyperactivity disorder (ADHD) based on ICD-10 criteria for hyperkinetic disorder. *Clinical Neuroscience Research, 5,* 307-314.

Satterfield, J.H. & Dawson, M.E. (1971) Electrodermal correlates of hyperactivity in children. *Psychophysiology, 8,* 191.

Satterfield, J.H. & Schell, A. (1997) A prospective study of hyperactive boys with conduct problems and normal boys: adolescent and adult criminality. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 1726-1735.

Satterfield, J.H., Cantwell, D.P., Saul, R.E. *et al.* (1973) Response to stimulant drug treatment in hyperactive children: prediction from EEG and neurological findings. *Journal of Autism and Childhood Schizophrenia, 3,* 35-48.

Satterfield, J., Swanson, J., Schell, A. *et al.* (1994) Prediction of antisocial behavior in attention-deficit hyperactivity disorder boys from aggression / defiance scores. *Journal of the American Academy of Child and Adolescent Psychiatry, 33,* 185-190.

Sayal, K., Taylor, E., Beecham, J., *et al.* (2002) Pathways to care in children at risk of attention-deficit hyperactivity disorder. *The British Journal of Psychiatry 181,* 43-8.

Sayal, K., Taylor, E. & Beecham, J. (2003) Parental perception of problems and mental health service use for hyperactivity. *Journal of the American Academy of Child and Adolescent Psychiatry, 42,* 1410-1414.

Sayal, K., Goodman, R. & Ford, T. (2006a) Barriers to the identification of children with attention deficit/hyperactivity disorder. *The Journal of Child Psychology and Psychiatry 47,* 744-750.

Sayal, K., Hornsey, H., Warren, S. *et al.* (2006b) Identification of children at risk of attention deficit/hyperactivity disorder: a school-based intervention. *Social Psychiatry and Psychiatric Epidemiology, 41,* 806-813.

Schab, D.W. & Trinh, N.H.T. (2004) Do artificial food colors promote hyperactivity in children with hyperactive syndromes? A meta-analysis of double-blind placebocontrolled trials. *Journal of Developmental and Behavioral Pediatrics, 25,* 423-434.

Schacher, R. & Tannock, R. (2002) Syndromes of hyperactivity and attention deficit. In *Child and Adolescent Psychiatry* (4th edn) (eds M. Rutter & E. Taylor), pp. 399-418. Oxford: Blackwell Publishing.

Schachar, R.J., Tannock, R., Cunningham, C., *et al.* (1997) Behavioral, situational and temporal effects of treatment of ADHD with methylphenidate. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 754-763.

Scheff, T. (1975) Labelling mental illness. In *Mental Health Matters* (ed T.C. Heller), London: Macmillon.

Schlander, M. (2007) Impact of attention-deficit/hyperactivity disorder (ADHD) on prescription drug spending for children and adolescents: increasing relevance of health economic evidence. *Child and Adolescent Psychiatry and Mental Health, 1,* doi:10.1186/1753-2000-1-13

Schlander, M., Schwartz, O., Hakkart-van Roijen, L., et al. (2006a) *Cost-Effectiveness of Clinical Proven Treatment Strategies for Attention-Deficit/Hyperactivity Disorder (ADHD) in the United States, Germany, The Netherlands, Sweden, and United Kingdom.* Poster presented at 9th Annual European meeting of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), 29-31 October 2006, Copenhagen, Denmark

Schlander, M., Schwartz, O., Hakkart-van Roijen L, et al. (2006b) *Functional Impairment of Patients with Attention-Deficit/Hyperactivity Disorder (ADHD): An*

Alternative Cost-Effecitveness Analysis of Clinically Proven Treatment Strategies Based upon the NIMH MTA Study. Poster presented at 9th Annual European meeting of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), 29-31 October 2006, Copenhagen, Denmark

Schlander, M., Schwartz, O., Foster, E.M., *et al.* (2006c) *Cost-Effectiveness of Clinically Proven Treatment Strategies for Attention-Deficit/Hyperactivity Disorder (ADHD): Impact of Co-existing Conditions.* Poster presented at 9th Annual European meeting of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), 29-31 October 2006, Copenhagen, Denmark

Schwab-Stone, M., Fisher, P., Piacentini, J., *et al.* (1993) The Diagnostic Interview Schedule for Children-Revised Version (DISC-R): II. Test-retest reliability. *Journal of the American Academy of Child and Adolescent Psychiatry, 32,* 651-657.

Schwab-Stone, M., Fallon, T., Briggs, M., *et al.* (1994) Reliability of diagnostic reporting for children aged 6-11 years: a test-retest study of the Diagnostic Interview Schedule for Children-Revised. *American Journal Psychiatry, 151*, 1048-1054.

Schmidt, M.H., Mocks, P., Lay, B., *et al.* (1997) Does oligoantigenic diet influence hyperactive/conduct-disordered children: a controlled trial. *European Child and Adolescent Psychiatry, 6,* 88-95.

Schmitt, B. (1975) The minimal brain dysfunction myth. *American Journal of Diseases of Children, 129,* 1313-1318.

Schoechlin, C. & Engel, R.R. (2005) Neuropsychological performance in adult attention-deficit hyperactivity disorder: meta-analysis of empirical data. *Archives of Clinical Neuropsychology, 20,* 727-744.

Scott, S. (2002) Parent training programmes. In *Child and Adolescent Psychiatry* (4th edn) (eds M. Rutter & E. Taylor), pp. 949-967. Oxford: Blackwell Publishing.

Secnik, K., Swensen, A., Lage, M.J. (2005a) Comorbidities and costs of adult patients diagnosed with attention-deficit hyperactivity disorder. *Pharmacoeconomics, 23,* 93-102.

Secnik, K., Matza, L.S., Cottrell, S., *et al.* (2005b) Health state utilities for childhood attention-deficit/hyperactivity disorder based on parent preferences in the United Kingdom. *Medical Decision Making, 25,* 56-70.

Silberg, J., Rutter, M., Meyer, J., *et al.* (1996) Genetic and environmental influences on the covariation between hyperactivity and conduct disturbance in juvenile twins. *The Journal of Child Psychology and Psychiatry, 37,* 803-816.

Singh, I. (2003) Boys will be boys: fathers' perspectives on ADHD symptoms, diagnosis, and drug treatment. *Harvard Review of Psychiatry, 11,* 308-316.

Singh, I. (2004) Doing their jobs: mothering with ritalin in a culture of mother-blame. *Social Science and Medicine*, 59, 1193-1205.

Singh, I. (2005) Will the 'real boy' please behave: dosing dilemmas for parents of boys with ADHD. *The American Journal of Bioethics*, 5, 1-14.

Singh, I. (2007) Capacity and competence in children as research participants. *EMBO Reports*, *8*, 35-39.

Smith, E. V., Jr. & Johnson, B. D. (2000) Attention deficit hyperactivity disorder: scaling and standard setting using Rasch measurement. *Journal of Applied Pyschological Measurement, 1,* 3-24.

Sonuga-Barke, E. J. S. (1998) Categorical model in child psychopathology: a conceptual and empirical analysis. *Journal of Child Psychology and Psychiatry, 39,* 115-133.

Sonuga-Barke, E.J. (2003) The dual pathway model of AH/HD: an elaboration of neuron-developmental characteristics. *Neuroscience and Biobehavioural Reviews, 27,* 593-604.

Sonuga-Barke, E.J., Daley, D., Thompson, M., *et al.* (2001) Parent-based therapies for preschool attention-deficit/hyperactivity disorder: a randomized, controlled trial with a community sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 402-408.

Sorensen, E. (1992) Qualitative research with children as informants. *Communicating Nursing Research, 25,* 328.

Sparks, G.M. (1986) The effectiveness of alternative training activities in changing teaching practices. *American Educational Research Journal, 23,* 217–225.

Spencer, T.J., Biederman, J., Harding, M., *et al.* (1996) Growth deficits in ADHD children revisited: evidence for disorder-associated growth delays? *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 1460-1469.

Spencer, T., Heiligenstein, J. H., Biederman, J., *et al.* (2002) Results from 2 proof-of-concept, placebo-controlled studies of atomoxetine in children with attention-deficit/hyperactivity disorder. *Journal of Clinical Psychiatry*, 63, 1140-1147.

Spencer, T., Biederman, J., Wilens, T., *et al.* (2005) A large, double-blind, randomised clinical trial of methylphenidate in the treatment of adults with attention-deficit/hyperactivity disorder. *Biological Psychiatry, 57,* 456-463.

Sprague, R.L. & Werry, J.S. (1971) Methodology of psychopharmacological studies with the retarded. In *International Review of Research in Mental Retardation,* vol. 5. (ed N.R. Ellis), pp. 148-220. New York: Academic Press.

Sterman, M.B. (1996) Physiological origins and functional correlates of EEG-rhythmic activities: implications for self-regulation. *Biofeedback and Self-Regulation, 21,* 3-33.

Stevens, S. E., Sonuga-Barke, E. J., Kreppner, J. M., *et al*. (2008) Inattention/overactivity following early severe institutional deprivation: presentation and associations in early adolescence. *Journal of Abnormal Child Psychology, 36,* 385-398.

Stevens, L., Zhang, W., Peck, L., *et al.* (2003) EFA supplementation in children with inattention, hyperactivity, and other disruptive behaviors. *Lipids, 38,* 1007-1021.

Stevenson, C.S., Whitmont, S., Bornholt, L., *et al.* (2002) A cognitive remediation programme for adults with attention deficit hyperactivity disorder. *Australian and New Zealand Journal of Psychiatry, 36,* 610-616.

Stevenson, C.S., Stevenson, R.J. & Whitmont, S. (2003) A self-directed psychosocial intervention with minimal therapist contact for adults with Attention Deficit Hyperactivity Disorder. *Clinical Psychology and Psychotherapy, 10,* 93-101.

Stier, A., & Hinshaw, S. (2007) Explicit and implicit stigma against individuals with mental illness. *Australian Psychologist, 42,* 106-117.

Stoops, W. W., Glaser, P. E., Fillmore, M. T., *et al.* (2004) Reinforcing, subject-rated, performance and physiological effects of methylphenidate and d-amphetamine in stimulant abusing humans. *Journal of Psychopharmacology, 18,* 534-543.

Strattera Summary of Product Characteristics http://emc.medicines.org.uk/ (accessed 18/08/2006)

Swanson, J.M., McBurnett, K., Wigal, T., *et al.* (1993) Effect of stimulant medication on children with attention deficit hyperactivity disorder: a review of reviews. *Exceptional Children, 60,* 154-162.

Swanson, J.M., McBurnett, K., Christian, D.L., *et al.* (1995) Stimulant medication and treatment of children with ADHD. In *Advances in Clinical Child Psychology,* vol, 17 (eds T.H. Ollendick & R.J. Prinz), pp. 265-322. New York: Plenum Press.

Swanson, J.M., Kraemer, H.C., Hinshaw, S.P., *et al.* (2001) Clinical relevance of the primary findings of the MTA: success rates based on severity of ADHD and ODD symptoms at the end of treatment. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 168-179.

Swanson, J.M., Greenhill, L.L., Lopez, F.A., *et al.* (2006) Modafinil film-coated tablets in children and adolescents with attention-deficit/hyperactivity disorder: results of a randomised, double-blind, placebo-controlled, fixed-dose study followed by abrupt discontinuation. *Journal of Clinical Psychiatry, 67,* 137-147.

Swanson, J.M., Elliott, G.R., Greenhill, L.L. *et al.* (2007) Effects of stimulant medication on growth rates across 3 years in the MTA follow-up. *Journal of the American Academy of Child and Adolescent Psychiatry, 46,* 1014-1026.

Swensen, A.R., Birnbaum, H.G., Secnik, K., *et al.* (2003) Attention-deficit/hyperactivity disorder: increased costs for patients and their families. *Journal of the American Academy of Child and Adolescent Psychiatry, 42,* 1415-1423.

Talge, N.M, Neal, C. & Glover, V. (2007) Antenatal maternal stress and long-term effects on child neurodevelopment: how and why? *The Journal of Child Psychology and Psychiatry, 48,* 245-261.

Taylor, E.A. (1986) Childhood hyperactivity. *British Journal of Psychiatry, 149*, 562–573.

Taylor, E. & Sandberg, S. (1984) Hyperactive behavior in English schoolchildren: a questionnaire survey. *Journal of Abnormal Child Psychology, 12,* 143-156.

Taylor, E. & Sonuga-Barke, E. (2008) Disorders of attention and activity. In *Rutter's Child and Adolescent Psychiatry* (5th edn) (eds M. Rutter, E. Taylor, J.S. Stevenson *et al.*), London: Blackwell Publishing, in press.

Taylor, E., Chadwick, O., Heptinstall, E., *et al.* (1996) Hyperactivity and conduct problems as risk factors for adolescent development. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 1213-1226.

Taylor, E., Doepfner, M., Sergeant, J., *et al.* (2004) European clinical guidelines for hyperkinetic disorder – first upgrade. *Journal of European Child and Adolescent Psychiatry, 13, Suppl. 1,* 1-30.

Thapar, A., Harrington, R. & McGuffin, P. (2001) Examining the comorbidity of ADHD-related behaviours and conduct problems using a twin study design. *British Journal of Psychiatry, 179,* 224-229.

Thompson, A. L., Molina, B. S., Pelham, W., Jr., *et al.* (2007) Risky driving in adolescents and young adults with childhood ADHD. *Journal of Pediatric Psychology, 32,* 745-759.

Thorell, L. (2007) Do delay aversion and executive function deficits make distinct contributions to the functional impact of ADHD symptoms? A study of early academic skills deficits. *The Journal of Child Psychology and Psychiatry, 48,* 1061-1070.

Timimi, S. (2006) Why diagnosis of ADHD has increased so rapidly in the west: a cultural perspective. In *Rethinking ADHD* (eds S. Timimi & J. Lee) Hampshire: Palgrave MacMillan.

Toren, P., Eldar, S., Sela, B.A., *et al.* (1996) Zinc deficiency in attention deficit hyperactivity disorder. *Biological Psychiatry, 40,* 1308-1310.

Tutty, S., Gephart, H. & Wurzbacher, K. (2003) Enhancing behavioral and social skill functioning in children newly diagnosed with attention-deficit hyperactivity disorder in a pediatric setting. *Journal of Developmental and Behavioral Pediatrics, 24,* 51-57.

Tymms, P. & Merrel, C. (2006) The impact of screening and advice on inattentive, hyperactive and impulsive children. *European Journal of Special Needs Education, 21,* 321-337.

Urbano, F.J., Leznik, E. & Llinás, R.R. (2007) Modafinil enhances thalamocortical activity by increasing neuronal electrotonic coupling. Proceedings of the National Academy of Sciences of the United Sates of America, 104, 12554–12559.

Valera, E., Faraone, S., Murray, K., *et al.* (2007) Meta-analysis of structural imaging findings in attention-deficit/hyperactivity disorder. *Biological Psychiatry, 61,* 1361-1369.

Van den Bergh, B.R. & Marcoen, A. (2004) High antenatal maternal anxiety is related to ADHD symptoms, externalizing problems, and anxiety in 8- and 9-year-olds. *Child Development, 75,* 1085-1097.

Van den Hoofdakker, B.J., van der Veen-Mulders, L., Sytema, S., *et al.* (2007) Effectiveness of behavioural parent training for children with ADHD in routine clinical practice: a randomized controlled study. *Journal of the American Academy of Child and Adolescent Psychiatry, 46,* 1263-1271.

Van Lier, P.A.C., Verhulst, F.C., van der Ende, J., *et al.* (2003) Classes of disruptive behaviour in a sample of young elementary school children. The *Journal of Child Psychology and Psychiatry, 44,* 377-387.

Voigt, R.G., Llorente, A.M., Jensen, C.L., *et al.* (2001) A randomized, double-blind, placebo-controlled trial of docosahexaenoic acid supplementation in children with attention-deficit/hyperactivity disorder. *Journal of Pediatrics, 139,* 189-196.

Volkow, N.D, Wang G.J., Fowler J.S., *et al.* (1998) Dopamine transporter occupancies in the human brain induced by therapeutic doses of oral methylphenidate. *American Journal of Psychiatry, 155,* 1325-1331.

Volkow, N.D, Wang, G.J, Fowler, J.S., *et al*. (2004) Evidence that methylphenidate enhances the saliency of a mathematical task by increasing dopamine in the human brain. *American Journal of Psychiatry*, 161, 1173-1180.

Wallander, J.L., Schmitt, M. & Koot, H.M. (2001) Quality of life measurement in children and adolescents: issues, instruments, and applications. *Journal of Clinical Psychology, 57,* 571-585.

Walter, H.J., Gouze, K. & Lim, K.G. (2006) Teachers' beliefs about mental health needs in inner city elementary schools. *Journal of the American Academy of Child and Adolescent Psychiatry, 45,* 61-68.

Webster-Stratton, C. (1981) Videotape modeling: a method of parent education. *Journal of Clinical Child Psychology, 10,* 93-98.

Weiss, G. & Hechtman, L. T. (1993) *Hyperactive Children Grown Up: ADHD in Children, Adolescents and Adults* (2nd edn). New York: Guilford Press.

Weiss, G., Kruger, E., Danielson, U., *et al.* (1975) Effect of long-term treatment of hyperactive children with methylphenidate. *Canadian Medical Association Journal, 112,* 159-165.

Weiss, M. & Murray, C. (2003) Assessment and management of attention-deficit hyperactivity disorder in adults. *Canadian Medical Association Journal, 168,* 715-722.

Weiss, M., Tannock, R., Kratochvil, C., *et al.* (2005) A randomized, placebo-controlled study of once-daily atomoxetine in the school setting in children with ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry, 44,* 647-655.

Wells, K.C., Pelham, W.E., Kotkin, R.A., *et al.* (2000) Psychosocial treatment strategies in the MTA study: rationale, methods, and critical issues in design and implementation. *Journal of Abnormal Child Psychology, 28,* 483-505.

Wernicke, J.F., Faries, D., Girod, D., *et al.* (2003) Cardiovascular effects of atomoxetine in children, adolescents, and adults. *Drug Safety, 26,* 729-740.

Wernicke, J.F., Adler, L., Spencer, T., *et al.* (2004) Changes in symptoms and adverse events after discontinuation of atomoxetine in children and adults with attention deficit/hyperactivity disorder: a prospective, placebo-controlled assessment. *Journal of Clinical Psychopharmacology, 24,* 30-35.

Werry, J.S., Sprague, R.L. & Cohen, M.N. (1975) Conners' teacher rating scale for use in drug studies with children: an empirical study. *Journal of Abnormal Child Psychology, 3,* 217-229.

Whalen, C.K. & Henker, B. (1991) Therapies for hyperactive children: comparisons, combinations, and compromises. *Journal of Consulting and Clinical Psychology, 59,* 126-37.

Whalen, C.K., Henker, B., Collins, B.E., *et al.* (1979) A social ecology of hyperactive boys: medication effects in structured classroom environments. *Journal of Applied Behavior Analysis, 12,* 65-81.

Whiting, P.F., Rutjes, A.W.S., Reitsma, J.B., *et al.* (2004) Sources of variation and bias in studies of diagnostic accuracy: a systematic review. *Annals of Internal Medicine, 140,* 189-202.

Wilcutt, E., Doyle, A.E., Nigg, J.T., *et al.* (2005) Validity of the executive function theory of attention deficit/hyperactivity disorder: a meta-analytic review. *Biological Psychiatry, 57,* 1336-1346.

Wilens, T., McDermott, S., Biederman, J., *et al.* (1999) Cognitive therapy for adults with ADHD: a systematic chart review of 26 cases. *Journal of Cognitive Psychotherapy, 13,* 215-226.

Wilens, T.E., Spencer, T.J., Biederman, J., *et al.* (2001) A controlled clinical trial of bupropion for attention deficit hyperactivity disorder in adults. *American Journal of Psychiatry, 158,* 282-288.

Wilens, T.E., Faraone, S.V., Biederman, J., *et al.* (2003) Does stimulant therapy of attention-deficit / hyperactivity disorder beget later substance abuse? A meta-analytic review of the literature. *Pediatrics, 111,* 179-185.

Wilens, T.E., Haight, B.R., Horrigan, J.P., *et al.* (2005a) Bupropion XL in adults with attention-deficit/hyperactivity disorder: a randomised, placebo-controlled study. *Biological Psychiatry, 57,* 793-801.

Wilens, T., McBurnett, K., Stein, M., *et al.* (2005b) ADHD treatment with once-daily OROS methylphenidate: final results from a long-term open label study. *Journal of the American Academy of Child and Adolescent Psychiatry, 44,* 1015-1023.

Wilens, T.E., McBurnett, K., Bukstein, O., *et al.* (2006) Multisite controlled study of OROS methylphenidate in the treatment of adolescents with attention-deficit/hyperactivity disorder. *Archives of Pediatrics and Adolescent Medicine, 160,* 82-90.

Wilkinson, S. (1998) Focus groups in health research: exploring the meanings of health and illness. *Journal of Health Psychology, 3*, 329-348.

Willcutt, E.G., Pennington, B.F. & DeFries, J.C. (2000) Twin study of the etiology of comorbidity between reading disability and attention-deficit / hyperactivity disorder. *American Journal of Medical Geneticss, 96,* 293-301.

Willcutt, E.G., Pennington, B.F., Olsen, R.K., *et al.* (2007) Understanding comorbidity: a twin study of reading disability and attention-deficit / hyperactivity disorder. *American Journal of Medical Genetics, 144B,* 709-714 .

Williams, J.I., Cram, D.M., Tusig, F.T., *et al.* (1978) Relative effects of drugs and diet on hyperactive behaviors: an experimental study. *Pediatrics, 61,* 811-817.

Wilson, J.M. & Marcotte, A.C. (1996) Psychosocial adjustment and educational outcome in adolescents with a childhood diagnosis of attention deficit disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 579-587.

Wolraich, M.L., Hannah, J.N., Pinnock, T.Y., *et al.* (1996) Comparison of diagnostic criteria for attention-deficit-hyperactivity-disorder in a country-wide sample. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 319-324.

Wolraich, M. L., Hannah, J. N., Baumgaertel, A., *et al.* (1998) Examination of DSM-IV criteria for attention deficit/hyperactivity disorder in a county-wide sample. *Journal of Developmental and Behavioral Pediatrics, 19,* 162-168.

Wolraich, M., Lambert, E., Baumgaertel, A., *et al.* (2003) Teachers' screening for attention deficit/hyperactivity disorder: comparing multinational samples on teacher ratings of ADHD. *Journal of Abnormal Child Psychology, 31,* 445–455.

Wolraich, M.L., Lambert, E.W., Bickman, L., *et al.* (2004) Assessing the impact of parent and teacher agreement on diagnosing attention-deficit hyperactivity disorder. *Journal of Developmental and Behavioural Pediatrics, 25,* 41–47.

Woods, S.P., Lovejoy, D.W. & Ball, J.D. (2002) Neuropsychological characteristics of adults with ADHD: a comprehensive review of initial studies. *The Clinical Neuropsychologist, 16,* 12-34.

World Health Organization (1992) *The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines.* Geneva: WHO

Wright, P., Turner, C., Clay, D., *et al.* (2006) *The Participation of Children and Young People in Developing Social Care.* London: Social Care Institute for Excellence.

Young, S. (1999) Psychological therapy for adults with Attention Deficit Hyperactivity Disorder. *Counselling Psychology Quarterly, 12*, 183-190

Young, S. (2002) A model of psychotherapy for adults with ADHD. In *Clinical Interventions for Adult ADHD: A Comprehensive Approach* (eds S. Goldstein & A. Teeter). Orlando, FL: Harcourt Academic Press.

Young, S. (2007a) Psychological therapy for adults with attention deficit hyperactivity disorder. In *Handbook of Attention Deficit Hyperactive Disorder* (eds M. Fitzgerald, M. Bellgrove & M. Gill). Chichester, UK: John Wiley.

Young, S. (2007b) Forensic aspects of ADHD. In *Handbook of Attention Deficit Hyperactive Disorder* (eds M. Fitzgerald, M. Bellgrove & M. Gill). Chichester, UK: John Wiley.

Young, S. & Bramham, J. (2007) *ADHD in Adults: a Psychological Guide to Practice.* Chichester: John Wiley & Sons.

Young, S., Toone, B. & Tyson, C. (2003) Comorbidity and psychosocial profile of adults with attention deficit hyperactivity disorder. *Personality and Individual Differences, 35,* 743-755.

Young, S., Heptinstall, E., Sonuga-Barke, E.J.S., *et al.* (2005a) The adolescent outcome of hyperactive girls: self-report of psychosocial status. *The Journal of Child Psychology and Psychiatry, 46,* 255-262.

Young, S., Heptinstall, E., Sonuga-Barke, E.J.S., *et al.* (2005b) The adolescent outcome of hyperactive girls: interpersonal relationships and coping mechanisms. *European Child and Adolescent Psychiatry, 14,* 245-253.

Young, S., Bramham, J., Gray, K., *et al.* (2008a) The experience of receiving a diagnosis and treatment of ADHD in adulthood. A qualitative study of clinically referred patients using Interpretative Phenomenological Analysis. *Journal of Attention Disorders*.

Young, S., Bramham, J., & Gray, K. (2008b) The experience of receiving a diagnosis and treatment of ADHD in adulthood from a partner's perspective. A qualitative study of partners of clinically referred patients using Interpretative Phenomenological Analysis.

Zentall, S.S. (1993) Research on the educational implications of attention deficit hyperactivity disorder. *Exceptional Children, 60,* 143-153.

Zuddas, A., Marzocchi, G.M., Oosterlaan, J., *et al.* (2006) Factor structure and cultural factors of disruptive behavior disorders symptoms in Italian children. *European Psychiatry, 21,* 410-418.

Zupancic, J.A.F., Miller, A., Raina, P., *et al.* (1998) Economic evaluation of pharmaceutical and psychological/behavioural therapies for attention-deficit/hyperactivity disorder. In *A Review of Therapies for Attention Deficit/Hyperactivity Disorder* (eds A. Miller, S.K. Lee, P. Raina, *et al*.), pp. 132-162. Ottawa: Canadian Coordinating Office for Health Technology Assessment.