



**The Hong Kong Society of  
Child Neurology & Developmental Paediatrics**  
**香港兒童腦科及體智發展學會**

***Attention Deficit / Hyperactivity Disorder  
in Children  
2007 Position Paper***

**Working Party on AD/HD**

*Members*

Dr. Chan Chok Wan	President, The Hong Kong Society of Child Neurology & Developmental Paediatrics
Dr. Catherine Lam	Council Member, The Hong Kong Society of Child Neurology & Developmental Paediatrics
Mr. Joseph Lau	Senior Clinical Psychologist, Child Assessment Service, Department of Health
Professor Tatia Lee	Professor and Academic Director of Clinical Psychology Programme, University of Hong Kong
Professor Patrick Leung	Professor and Director of Graduate Studies in Clinical Psychology, Department of Psychology, The Chinese University of Hong Kong.
Dr. Stephenie Liu	Senior Medical Officer, Child Assessment Service, Department of Health
Professor Shiu Ling Po	Associate Professor, Department of Educational Psychology, The Chinese University of Hong Kong

## This paper was prepared in consultation with

Hong Kong Hospital Authority Child Psychiatry Service Working Group

Dr. LUK Shiu Luen

Adjunct Professor, Department of Psychiatry,  
Chinese University of Hong Kong; Past  
Associate Professor, Monash University & Director  
of Research of Maroondah Hospital CAMHS

Professor Ho Lok Sang

President of the Hong Kong Economic Association;  
Professor, Department of Economics & Director,  
Centre for Public Policy Studies, Lingnan University.

Professor Daniel Tan-Lei Shek

Professor Department of Social Work &  
Director, Quality of Life Centre,  
Hong Kong Institute of Asia-Pacific Studies,  
The Chinese University of Hong Kong

Dr. Lee Chi Chiu

Consultant Psychiatrist, Kwai Chung Hospital,  
Hospital Authority, Hong Kong

Professor Cheng Pui Wan

Assistant Professor, Department of Educational  
Psychology, The Chinese University of Hong Kong

# 21 March 2007 Draft Paper Consultation Forum

## Participants

Chan Chok Wan	President, HKCNDP
May Chan	Educational Psychologist, Society of Boys' Centres
Eva Chan	Educational Psychologist, TWGH
Chan Kwok Chiu	Paediatrician, AHNH
CB Chow	Paediatrician, CMC
Daphne Blomfield	Pathways Foundation
Daisy Lam	HKU Research Team
Cheng Pui Wan	Department of Educational Psychology, CUHK
Cheung Chiu Hung	Legislative Council Member
Chow Luk Ying Pui	Principal, HCS Memorial School
Ferrick Chu	Equal Opportunities Commission
Ho Lok Sang	Department of Economics, Lingnan University
Hung Chi Hong	HKASLD
Hung Wong Lai Ping	Principal, Caritas St. Joseph Secondary School
Hung See Fong	Child Psychiatry, KCH
Iris Keung	HK Association of Specific Learning Disabilities
Carol Kwong	Principal, HMW Secondary School
Kelly Lai	Child Psychiatry, AHNH
Catherine Lam	Developmental Paediatrician, HKCNDP
Joseph Lau	Clinical Psychology, Child Assessment Service
Clement Law	Chairman, HK Association for AD/HD
Lee Chi Chiu	Psychiatry, YMTCCP
Julie Lee	Chairperson, Parents' Association of Pre-school Handicapped Children
Tatia Lee	Department of Clinical Psychology, HKU
Cynthia Leung	HK Institution of Education
Justina Leung	Director, BGCA
Patrick Leung	Department of Clinical Psychology, CUHK
Leung Yiu Chung	Legislative Council Member
Alice Ling	School Social Work, HK Christian Service
Stephenie Liu	Developmental Paediatrician, HKCNDP
Leslie Lo	† Institute of Educational Research, CUHK

Luk Siu Luen	Child Psychiatry, CUHK
Flora Mo	Child Psychiatry, AHNH
Kathy Nicols	Chairperson, F.O.C.U.S.
Daniel Shek	Department of Social Work, CUHK
Shiu Ling Po	Department of Educational Psychology, CUHK
Sin Kuen Fung	HK Institution of Education
Cheryl So	Clinical Psychologist, Yaumatei Child Psychiatric Center
Cecilia Ting	Pathways Foundation
Heidi Tong	Department of Social Work & Social Administration, HKU
Lucia Tsang	Clinical Psychology, Child Assessment Service
Nancy Tsang	Director, Heep Hong Society
Tsang Sandra	Department of Social Work & Social Administration, HKU
Philomena Tse	Paediatrician
Tsui Kwing Wan	Paediatrics, AHNH
Eunice Wong	Paediatrician
Estella Woo	Paediatrician, Child Assessment Service
Winnie Yam	Paediatrician
Anna Yen	Social Work, Caritas St. Joseph Secondary School
Yu Chak Man	Paediatrician, Caritas Medical Hospital
Philip Yuen	Chief Officer (Rehab), HK Council of Social Service

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# *Attention Deficit/Hyperactivity Disorder (AD/HD)*

## *Executive summary*

### **Background**

Despite a vast body of research, knowledge and practice experience on AD/HD in many countries over the past decades, Hong Kong's awareness and support systems for persons with AD/HD have been mainly limited to the medical sector. More recently, students with behavioural problems are increasingly recognized as having in-child factors such as AD/HD that require specific identification and help. In Hong Kong's 2005 Rehabilitation Programme Plan Review, AD/HD was brought up as a distinct entity requiring multisectoral attention and resources, and was admitted into the Plan as a formal category of disability.

In response to a need to develop policies that provide effective and integrated systems of support, a Working Party on AD/HD was formed within HKCNDP (appendix 1) in November 2005 to lead deliberations on the subject. The group performed literature review, stock taking of local service systems and professional readiness, and drafted proposals to meet identified challenges. In-depth consultative input to the paper was obtained including from the field of child psychiatry, social work and health economics (appendix 2), and an open Forum was held with key-players and stake-holders on the draft paper (page 3). This final position paper will be issued to academic, professional, and practicing communities for reference, and to policy makers and administrators for further actions.

### **What is AD/HD?**

#### **Definition**

AD/HD is a condition with neurobiological origin that interferes with a person's ability to focus and sustain attention on a task, or inhibit impulsive behaviour. It is characterized by developmentally inappropriate attention skills and/or impulsivity and hyperactivity that are maladaptive, persistent and present across different settings, with onset of symptoms occurring before 7 years of age.

AD/HD is not a type of specific learning disability although these may occur in the same individual.

## **Etiology**

AD/HD is considered a generalized disorder of impulse control and performance monitoring. Converging neuropsychological neuroimaging and neurochemical studies have implicated fronto-striatal network abnormalities. Behavioural genetic studies support the view that AD/HD is at least partially familial and genetically mediated. Molecular genetic studies show evidence for dopamine D4 receptor (D4DR) gene, dopamine transporter (DAT1) gene, serotonin transporter (5-HTT) gene and dopamine D5 receptor (DRD5) gene to be strongly associated with AD/HD. A meta-analysis by Faraone, Doyle, & Mick et al. (2001) showed the association between DRD4 and ADHD is real but small in magnitude. In addition, environmental factors may play a role through biological compromising events during development of the nervous system or negative psychological factors. It is of note that negative parenting may conversely arise as a reaction to the difficult child as well as parents' own AD/HD and other emotional disorders. Emergence of oppositional defiant disorder (ODD) or conduct disorder (CD) may in part be a result of parental malpractices, but also of partly shared genetic liability of ODD/CD with AD/HD.

## **How common is AD/HD?**

Epidemiological reports on AD/HD vary with variations in diagnostic criteria. Prevalence rates for children are reported as around 3-7% in USA, 3% in China and 3-9% in other countries. Male to female ratio ranges from 2:1 to 9:1.

## **Management of AD/HD**

### **Diagnosis**

Symptoms of AD/HD are dimensional in nature, and the diagnosis of AD/HD hinges on careful developmental history taking that address the full range of symptomatology and current functioning over situational contexts in key domains of family functioning, peer relationships and academic function, and observation of behaviours as reported by adults or measured in home and clinic settings. Common comorbidities such as dyslexia and ODD have to be looked out for.

### **Management**

Current practice guidelines in management involve a multidisciplinary approach including medication and behavioural interventions. Stimulant medication has been shown to significantly improve symptoms of AD/HD. Behavioural modification programmes involve children, parents and teachers. Specific skills are used, and problematic behaviours are identified for intervention. Education programmes for parents are helpful for assisting them to develop appropriate skills for managing disruptive behaviours of their children. The Multimodal Treatment Study showed that children who received medical treatment alone or combined medical and behavioural treatment demonstrated a significantly greater improvement than those who just received behavioural treatment or routine community care.

The core symptoms of AD/HD may be the underlying causes of persistent academic problems such as failed grades and expulsions. Educational interventions include academic instructional strategies, behavioural interventions and classroom accommodations. Positive results occur with effective home and school collaboration.

Overall, an approach involving pharmacological, behavioural, educational, and social interventions in partnership with the family is currently the most efficacious and preferred treatment.

### **Costs to society**

The developmental impact of AD/HD ranges from short-term impairments to long-term sequelae to the individual and severe costs to the family and society. For the individual, there may be serious issues in social interactions and relationships, self-esteem, academic problems and failure, occupational difficulties, injury and accidents and substance abuse. In addition to higher direct medical costs for treatment of AD/HD, there are increased costs for treating comorbidities such as conduct and mood disorders, and costs related to accidents including those as a result of poor driving habits of persons with poor attention and impulse control. Economic burden is also incurred to schools because of increased need for school-based supportive or special education services, to the parents because of missed work for managing the child and its consequent implications to the parents' employers, to the society because of higher association of adults with AD/HD and criminality, and work loss in adults with AD/HD due to poor performance, and absence from work. Medication

treatment of AD/HD has been shown to be cost effective, as it is likely to reduce the overall economic burden of AD/HD by improving the child's function and reducing the direct and indirect costs to families and other third parties.

## **How does the condition apply to the Chinese population and Hong Kong?**

### **Local prevalence rate**

A prevalence rate of 6.1% was found in a large sample of local school boys (Leung 1996). In young adolescents, prevalence estimates are 5.7% for boys and 3.2% for girls. From the records of the Child Assessment Service of the Hong Kong Department of Health, the boys to girls ratio was 6-8 to 1 during the period 2003-2006.

### **Local Studies**

**Validity of AD/HD disorder in the Chinese population** (versus AD/HD being a culture-bound disorder of the Western culture) was studied. Factor analysis of teacher and parent questionnaires confirmed the presence of AD/HD behaviours separable from anti-social or neurotic/emotional factors, and positive association with external correlates including observed clinical features, higher exposure to biological risks during pre-, peri- and post-natal periods, history of other developmental delays and greater abnormal neurological findings. These correlations were not demonstrated in Chinese children with conduct disorder in whom social adversity was associated instead (Leung et al., 1996).

**Genetic studies of Chinese children** showed an association between the 2R allele of the DRD4 gene and AD/HD in Han Chinese children, where the 2R allele may be derived from the 7R allele and functions similarly to 7R. In the study, there was a biased transmission of the 2R allele from the parents to their AD/HD children (Leung et al., 2005).

**Neuroimaging studies of Chinese children in Hong Kong** using a voxel based MRI study showed restricted structural brain abnormalities localized to brain systems known to be necessary for attention and executive function (McAlonan G.M., 2007).

**Assessment tools** including the Conner's Teacher Rating Scale (1989) and the

Child Behaviour Checklist (CBCL) with its Teacher Report Form and Youth Self-Report were re-validated for use in Hong Kong (Leung et al., 2006).

**Intervention studies** include an Enhancement of Learning Behaviour Project through cooperation between schools, families and community in helping children with AD/HD (So, Leung & Hung, 2004), and a multi-modal intervention project consisting of medication, clinic based parent training, child training and consultation and liaison work with schools (Heung & Ho, 2003, Heung V., 2004).

## **What is the service situation in Hong Kong?**

### **Local Services**

#### **Governmental policies**

Local services have been managed largely separately within the medical, education and social sectors, although some liaison efforts have been made in some serious cases. AD/HD is recognized by the Education and Manpower Bureau in recent years as a category of special needs, while the Health & Welfare Bureau's rehabilitation programme incorporated AD/HD as a category of disability in 2007.

#### **Medical services**

Child assessment centres of DH and HA provide diagnostic and interim support services, while child and adolescent psychiatric services of HA provide diagnosis, treatment, long-term follow up and consultative support to other medical and educational settings. A proportion of children receive support from the private sector.

**Educational support** in mainstream schools may be provided with additional resources and professional backend support for students identified with AD/HD. Support for learning and behavioural management varies widely in nature and intensity between schools.

**Community programmes** on parent skills training for managing children with AD/HD are available. However the nature and effectiveness of these programmes have generally not been validated.

## **What are Hong Kong's challenges and proposals for future development?**

## **Medical Services**

### **Challenges**

Waiting time for Child & Adolescent Psychiatry services have reached 1-3 years recently. Manpower deficiencies, including child psychiatrists and paediatricians trained to manage children with AD/HD, are serious.

### **Proposals**

A 4-tier service model for division of labour among medical professionals is proposed.

Tier One: Non-mental health professionals.

Tier Two: Specialized teams with expertise in AD/HD management.

Tier Three: Child Psychiatry multidisciplinary teams.

Tier Four: In-patient psychiatric care teams.

These teams should work together through triage and mutual referrals as a coordinated network of support in the community and medical settings.

In-service training for workers at respective level and opening of posts in public service are needed urgently.

## **Educational Services**

### **Challenges**

Large class size limits the amount of individualized support that teachers could provide to students with AD/HD. Manpower issues include the lack of trained teachers and paraprofessionals (or teaching assistants) for helping students with AD/HD, and the lack of good-quality training provided to them.

### **Proposals**

Reduction of class size is a priority. Specific training should be organized systematically for teachers of AD/HD students. Paraprofessionals (teaching assistants) with adequate knowledge and skills about AD/HD should be employed in schools, and in-service training and support to school social workers and school guidance personnel on this subject should also be provided.

Coordinated services between teachers, paraprofessionals, social workers, educational psychologists, medical doctors, clinical psychologists and families are essential for supporting effective learning and behavioural management in schools. A senior member of the school should be designated to head the support team and coordinate various parties involved. School social workers and school guidance personnel could provide case work follow through within this system.

## **Social services**

### **Challenges**

It is argued that a family-based approach should be adopted (Shek & Tsang, 1993), and objective as well as subjective burdens borne by the parents or caregivers of these children should be seriously taken into account.

Unfortunately, even with the implementation of integrated family services in Hong Kong, the gap between rehabilitation and family service is still very wide. Parenting training programmes and family supportive services geared towards the needs of parents and family members remain grossly inadequate.

### **Proposals**

Resources should be directed to respective operators including community service providers and integrated family service centers. Pre-service, postgraduate and in-service social work training programmes needs to be enriched with respect to coverage of AD/HD management. Evidence based social work practices have to be developed and promoted for these children and families. Peer support and advocacy groups should be guided by professionals who understand their needs and by social workers familiar with peer support group work.

## **Service Coordination**

Multidisciplinary and multi-sectoral collaborations are vital to the treatment and rehabilitation of children with AD/HD. Affected children may be receiving medication by doctors, behavioural and emotional intervention programmes by psychologists and social workers, effective school management by teachers, teachers' aids and educational psychologists, while families may be receiving counseling and social group work attention. All parties should be familiar with the systems in place in order to function and advocate effectively for the needs of these individuals.

## **Professional training for management of children/students with AD/HD**

Recommendations made on pre-service, postgraduate and in-service training programmes for paediatricians and family doctors, child psychiatrists, clinical psychologists, educational psychologists, teachers, para-professionals and social workers are discussed in detail. A time framework of about ten years is envisaged to bring current deficiencies to a reasonable balance.

## **Public education and Research**

Public education is needed for recognition of the presence of children with AD/HD and their families, on accurate understanding of its nature and the community's service needs. Further research on the scientific and cultural aspects of the condition, as well as on effective interventions supported by evidence are critical for guiding policy and service development.

## **Conclusion**

The movement forward will rely on input and cooperation of multiple sectors and levels, with effective triage mechanisms and transitions between levels of care, delivered with understanding of the cultural and ecological context of the children and their families in Hong Kong. The presence of adequately trained professionals, effective programmes supported by available evidence base and partnerships with families in the natural community setting are essential. As for all complex conditions where biological differences, environment and culture interact towards outcome, systems of care have to be developed with parameters that can be followed and monitored