



R E A D I N G S

A SELECTION OF TEN CURRENT READINGS ON TOPICS RELATED TO
CHILDHOOD DEVELOPMENTAL SCREENING

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Some available as free full-text and some requiring payment

Selection of readings made by A/Prof Goh Lee Gan

READING 1 – DEVELOPMENTAL DELAY IDENTIFICATION AND MANAGEMENT AT PRIMARY CARE LEVEL

Choo YY(1), Agarwal P(1)(2), How CH(3)(4), Yeleswarapu SP(2). Developmental delay: identification and management at primary care level. Singapore Med J. 2019 Mar;60(3):119-123. PMID: 30997518

URL: doi: 10.11622/smedj.2019025 (Free full text).

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ABSTRACT

Developmental delays are common in childhood, occurring in 10-15 percent of preschool children. Global developmental delays are less common, occurring in one to three percent of preschool children. Developmental delays are identified during routine checks by the primary care physician or when the parent or preschool raises concerns. Assessment for developmental delay in primary care settings should include a general and systemic examination, including plotting growth centiles, hearing and vision assessment, baseline blood tests if deemed necessary, referral to a developmental paediatrician, and counselling the parents. It is important to follow up with the parents at the earliest opportunity to ensure that the referral has been activated. For children with mild developmental delays, in the absence of any red flags for development and no abnormal findings on clinical examination, advice on appropriate stimulation activities can be provided and a review conducted in three months' time.

READING 2 – ACCEPTABILITY AND SURVEILLANCE OF WEB-BASED DEVELOPMENTAL SURVEILLANCE PROGRAMS

Baker J(1), Kohlhoff J(2), Onobrakpor SI(3), Woolfenden S(4), Smith R(5), Knebel C(6), Eapen V(1). The Acceptability and Effectiveness of Web-Based Developmental Surveillance Programs: Rapid Review. JMIR Mhealth Uhealth. 2020 Apr 23;8(4):e16085. PMID: 32324149

URL: doi: 10.2196/16085 (Free full text).

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ABSTRACT

BACKGROUND: Web-based developmental surveillance programs may be an innovative solution to improving the early detection of childhood developmental difficulties, especially within disadvantaged populations.

OBJECTIVE: This review aimed to identify the acceptability and effectiveness of web-based developmental surveillance programs for children aged zero to six years.

RESULTS: In total, 20 studies were identified. Most papers implemented web-based versions of the Modified Checklist for Autism in Toddlers, Revised with Follow-Up screener for autism spectrum disorder or Parent Evaluation of Developmental Status screeners for broad developmental delay. Caregivers and practitioners indicated a preference for web-based screeners, primarily for user-friendliness, improved follow-up accuracy, time, and training efficiencies.

CONCLUSIONS: Although evidence is limited as to the necessity of web- versus face-to-face-based developmental screening, there are clear efficiencies in its use.

READING 3 – CHILDREN WITH DOWN SYNDROME – MULTIORGAN INVOLVEMENT AND MANAGEMENT

Lagan N(1)(2), Huggard D(1), Mc Grane F(1)(2), Leahy TR(3), Franklin O(4), Roche E(1)(5), Webb D(1)(6), O' Marcaigh A(7), Cox D(8), El-Khuffash A(9), Greally P(1)(10), Balfe J(1)(2), Molloy EJ(1)(2)(11). Multiorgan involvement and management in children with Down syndrome. Acta Paediatr. 2020 Jun;109(6):1096-1111. PMID: 31899550

URL: doi: 10.1111/apa.15153. Epub 2020 Jan 24 (Payment required).

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ABSTRACT

AIM: To review multiorgan involvement and management in children with Down syndrome (DS).

METHODS: A literature review of articles from 1980 to 2019 using the MEDLINE interface of PubMed was performed using the following search terms- [Down syndrome] or [Trisomy 21] AND [Cardiology] or [Respiratory] or [neurodevelopment] or [epilepsy] or [musculoskeletal] or [immune system] or [haematological] or [endocrine] or [gastrointestinal] or [ophthalmological] or [Ear Nose Throat] or [dermatology] or [renal].

RESULTS: Congenital heart disease particularly septal defects occur in over 60 percent of infants with DS and 5 to 34 percent of infants develop persistent pulmonary hypertension of the newborn irrespective of a diagnosis of congenital heart disease. Early recognition and management of aspiration, obstructive sleep apnoea and recurrent lower respiratory tract infections (LRTI) could reduce risk of developing pulmonary hypertension in later childhood. Children with DS have an increased risk of autistic spectrum disorder, attention deficit disorder and epilepsy particularly infantile spasms, which are associated with poor neurodevelopmental outcomes. Congenital anomalies of the gastrointestinal and renal system as well as autoimmune diseases, coeliac disease, arthropathy, thyroid dysfunction, type 2 diabetes mellitus and dermatological conditions are more common. Hearing and visual anomalies are also well recognised associations with DS (Table 1).

CONCLUSION: Children with DS are at an increased risk of multiorgan comorbidities. Organ-specific health surveillance may provide holistic care for the children and families with DS throughout childhood.

READING 4 – EARLY BEHAVIOURAL PROBLEMS AND AUTISTIC TRAITS – SUPPORT & SPECIFIC INTERVENTIONS PREVENT FULL MANIFESTATION OF ASD OR RELATED DISORDERS

Möricke E(1), Greven CU(2)(3)(4), Visser JC(3), Oosterling IJ(3), Buitelaar JK(2)(3), Rommelse NNJ(5)(3). Social-communicative and attention problems in infancy and toddlerhood as precursors of preschool autistic traits. *Atten Defic Hyperact Disord*. 2019 Mar;11(1):113-122. PMID: 30927236

URL: doi: 10.1007/s12402-018-00284-2 (Payment required). Epub 2019 Mar 29.

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ABSTRACT

This longitudinal study focused on early behavioural problems and autistic traits. In a stratified, population-derived sample of 119 children, mothers reported through questionnaires on externalising, internalising, and social-communicative characteristics of their child in infancy (14 months) and toddlerhood (37 months), and on autistic traits at preschool age (four to five years).

Children with consistently normal behaviour from infancy to toddlerhood showed lower autistic traits at preschool age than children with deviant behaviour on one or both time points. High autistic traits at preschool age were predominantly preceded by problems in interaction, communication, language, play, and affect in infancy and/or toddlerhood, but also by inattention in toddlerhood.

Adequate support and specific interventions in these domains are needed in an attempt to diminish further derailment of the child's behaviour and development, and to prevent the full manifestation of ASD or related disorders such as ADHD.

READING 5 – EARLIER MENTAL HEALTH INTERVENTION ROADMAP – A TRANSLATIONAL PARADIGM SHIFT

Wakschlag LS(1), Roberts MY(2), Flynn RM(1), Smith JD(3), Krogh-Jespersen S(1), Kaat AJ(1), Gray L(4), Walkup J(3), Marino BS(4), Norton ES(2), Davis MM(4). Future Directions for Early Childhood Prevention of Mental Disorders: A Road Map to Mental Health, Earlier. *J Clin Child Adolesc Psychol*. 2019 May-Jun;48(3):539-554. PMID: 30916591

URL: doi: 10.1080/15374416.2018.1561296 (Free full text). Epub 2019 Mar 27.

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ABSTRACT

Mental disorders are the predominant chronic diseases of youth, with substantial life span morbidity and mortality. A wealth of evidence demonstrates that the neurodevelopmental roots of common mental health problems are present in early childhood. Unfortunately, this has not been translated to systematic strategies for improving population-level mental health at this most malleable neurodevelopmental period.

We lay out a translational Mental Health, Earlier road map as a key future direction for prevention of mental disorder. This paradigm shift aims to reduce population attributable risk of mental disorder emanating from early life, by preventing, attenuating, or delaying onset/course of chronic psychopathology via the promotion of self-regulation in early childhood within large-scale health care delivery systems.

The Earlier Pillar rests on a "science of when to worry" that (a) optimises clinical assessment methods for characterising probabilistic clinical risk beginning in infancy via deliberate incorporation of neurodevelopmental heterogeneity, and (b) universal primary-care-based screening targeting patterns of dysregulated irritability as a robust transdiagnostic marker of vulnerability to life span mental health problems. The core of the Healthier Pillar is provision of low-intensity selective intervention promoting self-regulation for young children with developmentally atypical patterns of irritability within an implementation science framework in paediatric primary care to ensure highest population impact and sustainability.

These Mental Health, Earlier strategies hold much promise for transforming clinical outlooks and ensuring young children's mental health and well-being in a manner that reverberates throughout the life span.

READING 6 – SYMPTOMS OF FEEDING PROBLEMS IN PRETERM-BORN CHILDREN AT 6 MONTHS TO 7 YEARS

Park J(1), Thoyre SM(2), Pados BF(1), Gregas M(3). Symptoms of Feeding Problems in Preterm-born Children at 6 Months to 7 Years Old. J Pediatr Gastroenterol Nutr. 2019 Mar;68(3):416-421.

URL: doi: 10.1097/MPG.0000000000002229 (Payment required).

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ABSTRACT

OBJECTIVES: Describe symptoms of feeding problems in children born very preterm (<32 weeks gestation) and moderate to late preterm (32-37 weeks gestation) compared to children born full-term; explore the contribution of medical risk factors to problematic feeding symptoms.

METHODS: The sample included 57 very preterm, 199 moderate to late preterm, and 979 full-term born children ages six months to seven years. Symptoms of feeding problems were assessed using the Paediatric Eating Assessment Tool and compared between groups after accounting for the child's age and/or sex. With the sample of preterm children, we further analysed 11 medical factors as potential risk factors affecting a child's feeding symptoms: feeding problems in early infancy and conditions of oxygen requirement past 40 weeks of postmenstrual age, congenital heart disease, structural anomaly, genetic disorder, cerebral palsy, developmental delay, speech-language delay, sensory processing disorder, vision impairment, or symptoms of gastroesophageal reflux.

RESULTS: Compared to children born full-term, both very preterm and moderate to late preterm born children had significantly higher scores on the Paediatric Eating Assessment Tool total scale and all four subscales. More severe symptoms were noted in very preterm children, particularly in the areas of Physiologic Symptoms and Selective/Restrictive Eating. Among preterm children, all 11 medical factors were found to be associated significantly with increased symptoms of feeding problems.

CONCLUSION: Compared to children born full-term, preterm born children demonstrated greater symptoms of feeding problems regardless of their current age, suggesting children born preterm may require more careful monitoring of feeding throughout childhood.

READING 7 – EARLY PREGNANCY BMI AND PLACENTAL GROWTH FACTOR (PIGF) ASSOCIATED WITH HIGHER CHILD'S SKIN-FOLD THICKNESS (SST), BMI Z-SCORE, HIP CIRCUMFERENCE & BODY FAT PERCENTAGE (BFP)

Dalrymple KV(1), Thompson JMD(2), Begum S(1), Godfrey KM(3), Poston L(1), Seed PT(1), McCowan LME(4), Wall C(5), Shelling A(4), North R(6), Cutfield WS(7), Mitchell EA(2); SCOPE Consortium. Relationships of maternal body mass index and plasma biomarkers with childhood body mass index and adiposity at 6 years: The Children of SCOPE study. *Pediatr Obes.* 2019 Oct;14(10):e12537. PMID: 31232532

URL: doi: 10.1111/ijpo.12537 (Free full text). Epub 2019 Jun 24.

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ABSTRACT

BACKGROUND: Maternal obesity has been implicated in the origins of childhood obesity through a suboptimal environment in-utero. **OBJECTIVE:** We examined relationships of maternal early pregnancy body mass index (BMI), overweight/obesity, and plasma biomarkers of obesity, inflammation, insulin resistance, and placental function with measures of childhood BMI and adiposity. **METHODS:** BMI z-score, sum of skinfold thicknesses (SST), body fat percentage (BFP, by bioelectrical impedance), and waist, arm, and hip circumferences were measured in 1173 six-year-old children of nulliparous pregnant women in the Screening for Pregnancy Endpoints (SCOPE) study, New Zealand. Relationships of maternal early pregnancy (15 weeks' gestation) BMI and biomarkers with these childhood anthropometric measures were assessed by linear regression, with appropriate adjustment.

RESULTS: 28.1 percent of mothers were classified as overweight and 10.1 percent with obesity; compared with normal weight mothers, the BFP of their children were 5.3 percent higher (0.16 SD [95% CI, 0.04-0.29] $p = .01$) and 7.8 percent higher (0.27 [0.08-0.47] $p = .006$) with comparable values for BMI z-score and arm, waist, and hip circumferences. Early pregnancy maternal BMI and plasma placental growth factor (PIGF) were associated with higher child's SST, BMI z-score, hip circumference, and BFP. None of the metabolic or inflammatory maternal biomarkers were associated with childhood obesity.

CONCLUSION: In this contemporary large prospective cohort study with extensive maternal/childhood phenotyping and a high prevalence of maternal overweight/obesity, we found independent relationships of maternal early pregnancy BMI with childhood BMI and adiposity; similar associations were observed with PIGF, which may imply a role for placenta function in the developmental programming of childhood obesity risk.

READING 8 – SPONTANEOUS MOTILITY SEEMS TO BE A PROMISING MEASURE FOR EARLY ADHD DETECTION

Athanasiadou A(1), Buitelaar JK(2)(3), Brovedani P(4), Chorna O(5), Fulceri F(1), Guzzetta A(5), Scattoni ML(6). Early motor signs of attention-deficit hyperactivity disorder: a systematic review. *Eur Child Adolesc Psychiatry.* 2020 Jul;29(7):903-916. PMID: 30798414.

URL: doi: 10.1007/s00787-019-01298-5 (Free full text). Epub 2019 Feb 23.

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ABSTRACT

ADHD is a common neurodevelopmental disorder with onset of symptoms typically in early childhood. First signs of the disorder, including language delay, motor delay and temperament characteristics, may be evident as early as infancy.

The present review describes published evidence about early motor signs of either children with later symptoms of ADHD or a later diagnosis of the disorder.

Nine published cohort studies were included after a systematic search of related terms in PubMed and PsycInfo databases. Study eligibility criteria included: (1) report on early motor function or any motor-related signs; (2) the presence of a participants' assessment by/at 12 months of age; (3) report of a later presence of ADHD symptoms. The limited number of reports included suggests an association between mild early neurological markers and later developmental coordination disorder and motor overflow movements. Unfortunately, due to their small sample sizes and focus on group reports rather than individuals, they have limited power to find strong associations.

Early motor indicators of ADHD, if present, appear to be non-specific, and therefore not yet useful in clinical screening. Spontaneous motility seems to be a promising measure for early ADHD detection, although further studies with large cohorts are recommended to determine its clinical role in children at risk for ADHD.

READING 9 – AUSTRALIAN EXPERIENCE AFTER A DECADE – 6 IN 1 COMBINATION VACCINATION (DTPa-HBV-IPV/HIB VACCINE) IS A CORNERSTONE IN MAINTAINING INFANT HEALTH

Bayliss J(1), Nissen M(2), Prakash D(1), Richmond P(3), Oh KB(4), Nolan T(5). Control of vaccine preventable diseases in Australian infants: reviewing a decade of experience with DTPa-HBV-IPV/Hib vaccine. Hum Vaccin Immunother. 2020 Jun 23;1-15. PMID: 32573398

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ABSTRACT

The combined vaccine against diphtheria, tetanus, pertussis, hepatitis B, poliomyelitis, and Haemophilus influenzae b (DTPa-HBV-IPV/Hib, Infanrix Hexa, GSK) has been used for childhood immunisation in Australia according to a two-, four-, six-month schedule since 2009.

We reviewed data available in the Australian National Notifiable Diseases Surveillance System, annual vaccination coverage reports, the Database of Adverse Event Notifications, and peer-reviewed literature to assess vaccine coverage rates, incidence of all six vaccine preventable diseases, and the safety profile of DTPa-HBV-IPV/Hib vaccine in Australian infants over a period of ten years of exclusive use.

Between 2009 and 2018 vaccine coverage for infants aged 12 months increased from 91.7 percent to 94.0 percent and from 84.9 percent to 92.6 percent for all and for Indigenous infants, respectively. Over the same time period, there were no reports of poliomyelitis, diphtheria or tetanus in infants <12 months of age. The incidence of hepatitis B among Australian infants <12 months of age remains 10 to 20-fold lower than the national average. Control of *Haemophilus influenzae* b (Hib) and pertussis disease has continued to be challenging. Timely administration of the primary series, as well as increasing coverage rates, particularly among Indigenous children, has contributed to improvements in Hib and pertussis disease control. The incorporation of additional strategies such as adjustment of the first vaccination encounter to six weeks of age, parental cocooning, and most recently maternal vaccination has further reduced the burden of pertussis, particularly during the first six months of life.

The frequency of the ten most common adverse events related to the DTPa-HBV-IPV/Hib vaccine demonstrates an acceptable safety profile. Data collected over ten years of consistent, exclusive use of the DTPa-HBV-IPV/Hib vaccine in Australia highlights combination vaccination as a cornerstone in maintaining infant health.

READING 10 – TARGETED INTERVENTIONS TO IMPROVE TIMELINESS OF CHILDHOOD VACCINATION IN SINGAPORE IS NEEDED

Loy SL(1)(2), Cheung YB(3)(4), Chan JKY(1)(2), Soh SE(5)(6), Godfrey KM(7)(8), Tan KH(2)(9), Shek LP(5)(6)(10), Chong YS(5)(11), Lek N(2)(12), Yap F(2)(12)(13), Teoh OH(12), Yung CF(12), Thoon KC(14)(15). Timeliness of Childhood Vaccination Coverage: the Growing Up in Singapore Towards Healthy Outcomes Study. *Prev Sci.* 2020 Apr;21(3):283-292. PMID: 31960261

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ABSTRACT

Studies investigating timeliness for childhood vaccination are limited especially in Asia. We examined the timeliness of vaccine administration and associated factors among infant and young children in Singapore. A total of 782 children born between November 2009 and July 2011 from a prospective cohort in Singapore were studied.

Vaccination records from birth to 24 months of age were obtained from the National Immunisation Registry of Singapore. Multivariable logistic regression models were performed.

By two years of age, 92.8 percent of children in our cohort experienced a delay in receiving one or more vaccine doses according to the recommended national immunisation schedule.

When vaccinations were reviewed by series for each vaccine, 15.6 percent received all vaccine series outside the recommended age ranges. Factors associated with receiving vaccination series outside the recommended ages included maternal aged ≤ 35 years (OR 2.00; 95% CI 1.09, 3.66), Malay (1.71; 1.01, 2.89) or Indian ethnicity (2.06; 1.19, 3.59), low monthly household income (1.91; 1.14, 3.18), having at least four children (3.46; 1.62, 7.38) and private (3.42; 1.80, 6.48) and multiple vaccination providers (3.91; 1.23, 12.48).

These findings show an unacceptably high proportion of children experienced a delay in the receipt of their vaccinations. The identification of several demographic, socioeconomic, health-seeking behavioural and vaccine provider factors provides opportunities for targeted interventions to enhance the timeliness of childhood vaccination in Singapore.