MINISTRY OF HEALTH
SINGAPORE

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All Registered Medical Practitioners

GUIDANCE ON CHILDHOOD DEVELOPMENTAL SCREENING

Early childhood programmes are important to ensure that children receive the best possible start and to facilitate early detection and timely intervention.

2. Childhood Developmental Screening (CDS) aims to identify concerns or delays in development for children during the early years, and entails monitoring of development at specific age milestones as part of routine child health surveillance and preventive care. CDS is often conducted opportunistically with recommended childhood vaccinations, and allows clinicians to screen for developmental delays in children to ensure timely referrals for further evaluation and any necessary early intervention.

3. To improve the affordability and accessibility of child health services in the community, **subsidies for CDS as well as nationally recommended vaccinations under the National Childhood Immunisation Schedule (NCIS)**, which are currently available only at polyclinics, will be **extended to all CHAS GP clinics with effect from 1 November 2020**. This extension is in line with the HealthySG Taskforce's recommendation to improve and promote health, and the Government's plans to provide more support in marriage and parenthood.

4. To better support the primary care sector in the provisioning of child preventive health services, an MOH Childhood Developmental Screening Workgroup was convened in 2019 to review existing local practices on CDS for children aged 0-6 years and develop guidelines and processes to streamline CDS and NCIS vaccination visits. Recommendations of the workgroup were incorporated into a set of CDS clinical guidance, appended in Annex A. Please also refer to MOH Circular 180/2020 on "Changes to the National Childhood Immunisation Schedule (NCIS)" for revisions to the NCIS, effective 1 November 2020.

5. The CDS clinical guidance includes the recommended schedule for CDS, and provides practical guidance to practitioners on monitoring and referral for developmental delays. There are seven recommended touchpoints for CDS which should be conducted within the corresponding age ranges, and clinicians should use

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the developmental checklists in the Child Health Booklet to determine if there are any areas of concern which warrant further review or referral to specialists for detailed assessment and management.

6. Growth monitoring (i.e. weight, height and occipito-frontal circumference measurements) is an important part of child health surveillance, and should be done for all CDS touchpoints and recorded in the Child Health Booklet under the growth charts for all CDS and vaccination visits.

7. As parents play an important role in monitoring the development of their child, clinicians should educate and encourage parents to complete the appropriate developmental checklists and child safety checklists in the Child Health Booklet prior to each CDS visit.

8. Clinicians may take reference from the CDS clinical guidance with immediate effect, while subsidies related to CDS and nationally recommended vaccinations will be effective from 1 November 2020. Please refer to MOH FCM No. 41/2020 ("Extension of Subsidies for Nationally Recommended Vaccinations and Childhood Developmental Screening (CDS) at All Community Health Assist Scheme (CHAS) GP Clinics") for more information.

9. Thank you for your continual support and partnership in meeting the preventive health needs of the community. Should you require further clarifications, please email MOH_INFO@moh.gov.sg.

A/PROF KENNETH MAK
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Annex A

GUIDANCE ON CHILDHOOD DEVELOPMENTAL SCREENING (2020)

A) Introduction

1. Childhood developmental screening (CDS) aims to identify concerns or delays in development during the early years, and is typically conducted as part of preventive care for all children. While the sequence of development follows the developmental milestones, children develop at different rates and the age of attainment for each milestone can vary widely. To ensure that a child is monitored for risk of developmental concerns or delays, CDS should be conducted regularly, based on the recommended frequency for developmental screenings.

2. Clinicians should use the developmental checklists in the Child Health Booklet[1], which are based on the Denver Developmental Screening Test, the only tool standardised for the local Singapore population, to determine if there are any areas of concern which warrant further review or referral to specialists for detailed assessment and management.

B) Recommended Schedule for CDS

3. There are seven recommended touchpoints at which CDS should be done (see Table 1 below). To align CDS with National Childhood Immunisation Schedule (NCIS) vaccination visits, the recommended visit schedule is typically at 4 weeks, 3, 6, 12, 18, 30, 48 months of age for children on the 5-in-1 vaccine schedule. For children on the 6-in-1 vaccine schedule, the second visit will be at 4 months instead of 3 months. However, a child could be brought in at any time within the specific age ranges below. The appropriate CDS physical examination checklist in the Child Health Booklet should be used depending on the age range at which the clinician screens the child. Nationally recommended childhood vaccinations in the NCIS for 2020 can be found in Annex B.

Table 1: Recommended touchpoints for CDS

	Recommended touchpoints for CDS	**(Age Range)**
[1]	4 weeks	4 – 8 weeks
[2]	3 months or 4 months[2]	3 – 5 months

[1] The page numbers referenced in this guidance refer to the current version of the Health Promotion Board's Child Health Booklet (2014), appended in Annex D. Please note that there may be updates to the page numbers in the next version of the Child Health Booklet.

[2] The recommended touchpoint is 3 months for children on the 5-in-1 vaccine schedule and 4 months for children on the 6-in-1 vaccine schedule.

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[3]	6 months (physical examination if deemed necessary)[3]	6 – 12 months
[4]	12 months	
[5]	18 months	15 – 22 months
[6]	30 months	24 – 36 months
[7]	48 months	48 – 60 months

4. Growth monitoring (i.e. weight, height and occipito-frontal circumference measurements) must be done for all CDS touchpoints and should be recorded in the Child Health Booklet under the growth charts for all CDS and vaccination visits.

5. Prior to each CDS visit, parents/primary caregivers should be advised to complete (a) the age appropriate developmental checklists on pages 7-24 in the Child Health Booklet which contains milestones for the four different domains, i.e. language, fine motor, gross motor, and personal-social; and (b) the child safety checklist on pages 52-54, which educates parents on the safety measures required for their child at the different ages. At each visit, clinicians should check that the child safety checklist is completed and address any questions or concerns from the parents. The red flags listed as "parental concerns" in the coloured boxes at each of these ages also need to be reviewed by the caregivers. If any issues are noted, the clinician should be alerted.

C) Broad Principles

6. As part of the CDS, a physical examination of the child is required at the all recommended touchpoints except the third one at 6 months to identify potential delays in development and check for other medical issues. For guidance, clinicians should refer to the relevant physical examination section that accompanies the developmental checklist for each touchpoint in the Child Health Booklet.

7. In particular, at the physical examination for first CDS touchpoint (recommended at 4 weeks), it is recommended that clinicians focus on identifying these possible issues:

(i) Congenital cataract
(ii) Cardiac murmurs
(iii) Prolonged jaundice
(iv) Hip dysplasia
(v) Abnormal growth monitoring (i.e. height, weight, occipito-frontal circumference)
(vi) Feeding issues (e.g. parent reported difficulties with breast or bottle feeding, vomiting/reflux)

8. CDS between 6 and 12 months: If any milestone is not met at 6 months, in particular for hearing, clinicians should educate parents to monitor the milestones on pages 12-13 of the current Health Booklet, and self-initiate a review visit immediately

[3] Examples include (i) abnormality picked up during screening questionnaires, (ii) missed previous CDS visit, (iii) physical complaints, and (iv) parental concerns.

if any milestone is not met by 9 months. This should be reviewed by the clinician at the 12-month visit.

9. CDS after 18 months: As there is a relatively large interval between the CDS at 18 months and 30 months (compared to the intervals between earlier CDS visits), clinicians should advise parents on the importance of adhering to the recommended CDS schedule and encourage parents to return for the 30-month CDS visit.

D) Monitoring of and Referral for Developmental Delays

10. If a developmental delay is suspected or detected, monitoring and referral for investigations should be performed at the discretion of the clinician. The following guidance provides the broad principles for which referral should be considered.

(I) Single isolated domain delay

(i) Refer to a private paediatricians or public sector General Paediatric clinic for:
   a) any regression of motor milestones (even if still within normal range of development for age); or
   b) gross motor delay associated with significant hypertonia or hypotonia[4].

(ii) Refer to a private developmental specialist or to the Child Developmental Programme (CDP)[5] for any of the following:
   a) language regression;
   b) language delay with hearing concerns;
   c) autism red flags; or
   d) other developmental concerns.

(iii) If there are concerns about language delay, it is important to get a hearing screen done even if the initial Universal Newborn Hearing Screening (UNHS) screen was normal.

(iv) If the above concerns are not present and there is no prior history of developmental delay in any domain, the clinician may schedule a review within the age range shown in Table 1 for isolated delays, and subsequently refer to the appropriate specialist department if the milestone is not met. At the review, referrals should be made even if the child appears to have progressed in the specified developmental domain, but still has not met the age-appropriate milestone, as the progress could be due to increasing age.

[4] Hypertonia is a red flag for possible cerebral palsy while hypotonia is a red flag for conditions such as lower motor neuron diseases.

[5] This includes the Department of Child Development (DCD) at KK Women's & Children's Hospital and the Department of Developmental-Behavioural Paediatrics [former Child Development Unit (CDU)] at National University Hospital.

(v) If the above concerns are not present, but there is prior history of delayed milestone attainment in any developmental domain, refer to a private developmental specialist or to the CDP.

(II) Delays in Multiple Domains

(i) Refer to a private paediatrician or public sector General Paediatric clinic if there is regression of milestones.

(ii) Refer to a private developmental specialists or to the CDP if there is a delay in multiple domains, regardless of whether there was a prior history of developmental delay.

(III) Others

(i) Children with isolated abnormal occipital-frontal circumference (e.g. ≤*3rd centile or* ≥*97th centile)* especially when it appears disproportionate to the weight or height, should be referred to a private paediatrician or public sector General Paediatric clinic).

(ii) Children with abnormal growth (e.g. height or weight at ≤3rd centile or ≥97th centile) should be referred to a private paediatrician or public sector General Paediatric Department if there are clinical concerns of a medical, genetic or syndromic condition. In all other cases, the clinician should review and advise on appropriate nutrition and physical activity, and monitor for progress for at least six months before making a referral.

11. Clinicians should take note of parental concerns about developmental delays or age-appropriate red flags, e.g. on autism (listed under "Parental concerns" in coloured boxes at the top of each of developmental checklist section in the Child Health Booklet).

12. In addition, refer appropriately for the following concerns at any age:

(i) Lack of response to sound or visual stimuli - to the Ear, Nose and Throat (ENT) or eye specialist respectively;
(ii) Differences between right and left side of body in strength, movement, tone or function – to a private paediatrician or public sector General Paediatric clinic.

13. For cases requiring a referral, primary care clinicians should ensure a timely referral for paediatric review, but continue to conduct the CDS at the appropriate touchpoints (refer to Table 1) unless it is very clear that this will be done by the specialist to whom the referral has been made.

E) Prematurity

14. The following guidelines apply to children born prematurely:

(i) For pre-term infants born before 35 weeks, it is recommended that hospital specialists or private paediatricians follow them up for growth monitoring and developmental screenings for the first 2 years of life, instead of at primary care. Clinicians should use the corrected age (i.e. chronological age minus the number of weeks the child was born early, taking 40 weeks as full term), for their growth monitoring and developmental screenings for the first 24 months.

(ii) For infants born between 35 and 37 weeks, growth monitoring should also be conducted using corrected age till 24 months. However developmental screening for infants born at or after 35 weeks should be based on chronological age.

15. Vaccinations, except for Hepatitis B, should still be given based on the chronological age regardless of whether the infant is pre-term or not. For Hepatitis B vaccination, please refer to the vaccination guidelines with detailed recommendations for pre-term and low birthweight infants.

Table 2: Recommended ages for CDS, growth monitoring and vaccination based on gestational period

Gestation period	**CDS**	**Growth monitoring**	**Vaccination**
Born before 35 weeks	Corrected age till 24 months old	Corrected age till 24 months old	Chronological age
Born between 35 and 37 weeks	Chronological age	Corrected age till 24 months old	Chronological age
Born after 37 weeks	Chronological age	Chronological age	Chronological age

E.g. A pre-term infant born at 32 weeks is 8 weeks premature (40 minus 32 weeks). So the corrected age at 12 weeks of life will be 4 weeks (12 minus 8 weeks) and hence the child should be assessed based on the developmental milestones at 4 weeks of age.

F) Other Points to Note

(I) Hearing Screening

16. At all first visits, clinicians should verify that a newborn hearing test had been done after delivery. Universal Newborn Hearing Screening is implemented in all Singapore hospitals with obstetric services, hence most infants born locally should have been screened unless the infant was very unwell or very premature, or if their parents declined the hearing screening. If there is no documentation in the Child Health Booklet (Page 4) that it has been done, or if the result documented does not show normal hearing (i.e. the child did not pass the screening), the clinician should

make the necessary referral to the child's birth hospital or a public hospital ENT[6] department for the test to be performed/repeated.

17. However, the newborn hearing screening only detects congenital deafness. Clinicians should continue to look out for hearing loss at each CDS visit, using simple tools, e.g. rattler. The clinician should also emphasise to parents the need for them to continue monitoring the hearing of their growing child, taking guidance from the hearing related question in the appropriate pages of the Health Booklet[7], especially if they had declined the newborn hearing screening test.

(II) Parental Education

18. The following table shows the possible topics parents may seek the doctor's advice on at the CDS visits. Clinicians are advised to refer parents to available online resources such as the Health Promotion Board (HPB) HealthHub website, HealthHub app, and the Ministry of Social and Family Development (MSF)'s Baby Bonus Parent Portal for more information.

Table 3: Topics for discussion with parents

Age range	**Possible topics**
4 - 8 weeks	• Family adjustment to the baby • Concerns/difficulties that mum is facing, e.g. feeding/ infant nutrition, breastfeeding, post-natal depression, colic, reflux • Early brain development • Safety issues (e.g. related to sleeping), car seats • Screen time
3 - 5 months	• Family functioning • Child Care arrangement, issues of caregivers, role of siblings in the family • Early brain development through environmental stimulation and interaction with others • Child safety issues • Screen time
6 - 12 months	• Weaning diet and continuation of breastfeeding • Sleep • Early brain development through environmental stimulation including reading and play • Home safety issues • Screen Time

[6] Clinician may wish to contact the respective hospitals' UNHS Programme to make an appointment if the child has not had a hearing test done at birth or if a repeat test has not yet been scheduled (KKH: 63941893; SGH: 63214540; NUH: 97248736).

[7] Hearing related questions are under the language domain of the developmental checklist for 4-8 weeks, 3 – 5 months and 6-12 months, and the hearing screening question on pages 15 (for 15-22 months), 18 (for 24-36 months) and 22 (for 48-60 months).

Age range	Possible topics
15 - 22 months	• Behaviour – temper tantrums • Dental hygiene (teeth-brushing) • Sleep • Early brain development through environmental stimulation including reading, and physical activity • Screen time • Child safety issues
24 – 36 months	• Importance of play and physical activity • Discipline and behaviour including temper tantrums • Screen time • Dental hygiene (teeth-brushing) • Child safety issues
48 - 60 months	• School readiness (learning, social interaction, emotional regulation and behaviour, attention, curiosity, appreciation of the world, literacy and numeracy) • Activities for daily living (feeding, brushing teeth, dressing, toilet training etc.) • Child safety issues, including body parts and child sexual abuse protection education • Screen time • Sleep • Child care/preschool arrangements • Discipline • Play and physical activity

(III) Screen Time guidelines

19. Clinicians may provide the following advice to parents with respect to screen time for their child:

In general

- Screen time should not displace sleep, exercise, play, reading aloud, and social interactions.
- Parents should avoid using media as the only way to calm the child (apart from specific situations, e.g. during medical procedures or airplane flights)
- Parents should designate media-free times together such as during dinner or driving, as well as media-free locations at home, such as bedrooms.

Age-specific guidelines

- **<18 months:** Avoid use of screen media other than for video-chatting.
- **18-24 months:** Parents who want to introduce digital media should choose high-quality programmes, and watch it with their children to help them understand what they're seeing.
- **2-5 years:** Limit screen use to one hour per day of high-quality programs. Parents should co-view media with children to help them understand what they are seeing and apply it to the world around them.

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- National University Hospital
- National University Polyclinics
- Northeast Medical Group
- Singapore General Hospital
- SingHealth Polyclinics

Annex B

National Childhood Immunisation Schedule (NCIS)

(from birth to age 17 years, effective from 1 November 2020)

Vaccine	Birth	2 months	4 Months	6 months	12 months	15 months	18 months	2-4 years	5-9 years	10-11 years	12-13 years	13-14 years	15-17 years
Bacillus Calmette-Guérin (BCG)	D1												
Hepatitis B (HepB)	D1	D2		D3									
Diphtheria, tetanus and acellular pertussis (paediatric) (DTaP)		D1	D2	D3			B1						
Tetanus, reduced diphtheria and acellular pertussis (Tdap)										B2			
Inactivated poliovirus (IPV)		D1	D2	D3			B1			B2			
***Haemophilus influenzae* type b (Hib)**		D1	D2	D3			B1						
Pneumococcal conjugate (PCV10 or PCV13)			D1	D2	B1								
Pneumococcal polysaccharide (PPSV23)								One or two doses for children and adolescents age **2-17 years with specific medical condition or indication**.					
Measles, mumps and rubella (MMR)					D1	D2							
Varicella (VAR)					D1	D2							
Human papillomavirus (HPV2 or HPV4)											D1 **(Females)**	D2 **(Females)**	
Influenza (INF)				Annual vaccination or per season for <u>all children</u> age **6 months to <5 years (6-59 months)**.					Annual vaccination or per season for children and adolescents age **5-17 years with specific medical condition or indication**.				

Recommended ages and doses for all children

Recommended for persons with specific medical condition or indication

FOOTNOTES:

- **D1, D2, D3:** Dose 1, dose 2, dose 3
- **B1, B2:** Booster 1, booster 2
- **10-11, 12-13, 13-14 years:** Primary 5, Secondary 1, Secondary 2 (Tdap, IPV, HPV (for females) and MMR (as catch-up) vaccines are provided as part of Health Promotion Board's school-based vaccination programme)
- **Hep B**: Doses 2 and 3 are recommended to be given as part of the 6-in-1 vaccine at 2 and 6 months, respectively
- **MMR**: Only dose 2 is recommended to be given as part of the MMRV vaccine

ANNEX C

Table 4: Recommended touchpoints for CDS and NCIS vaccinations

Age	NCIS Vaccination	Recommended CDS touchpoints	Age range for CDS touchpoint
At Birth*	BCG (D1) Hep B (D1)	-	-
4 weeks	-	4 weeks	[1] 4 – 8 weeks
2 months	6-in-1 (D1) †	-	
3 months	-	3 months or 4 months**	[2] 3 – 5 months
4 months	5-in-1 (D2) PCV (D1)		
5 months	-	-	
6 months	6-in-1 (D3) PCV (D2)	6 months	[3 & 4] 6 – 12 months
12 months	MMR (D1) Varicella (D1) PCV (B1)	12 months	
15 months	MMRV (D2)	-	[5] 15 – 22 months
18 months	5-in-1 (B1)	18 months	
30 months	-	30 months	[6] 24 – 36 months
48 months	-	48 months	[7] 48 – 60 months

* Vaccinations typically administered in hospitals

** Clinicians may wish to conduct the CDS together with vaccinations at 3 months old for children starting on 5-in-1 (DTaP/IPV/Hib) schedule, and at 4 months for children starting on the 6-in-1 schedule. The 5-in-1 vaccine includes DTaP/IPV/Hib. The 6-in-1 vaccine comprises DTaP/IPV/Hib and Hep B.

† For infants born to **HbsAG +ve** mothers, they will receive their second dose of monovalent Hep B vaccine at 1 month, followed by the 5-in-1 vaccine at 3 months of age.

ANNEX D

Item	Attachment
Child Health Booklet (2014) **Please note that revisions are planned to the Health Promotion Board's Child Health Booklet to incorporate adjustments made to the Childhood Developmental Screening touchpoints mentioned in this guidance.*	 health-booklet-2014.pdf