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Is my child normal?

Milestones and red flags for referral

Background

Developmental problems in young children are common and have lifelong implications for health and wellbeing. Early detection of developmental problems provides an opportunity for early intervention to shift a child's developmental trajectory and optimise their potential.

Objective

This article describes and recommends a broader concept of developmental surveillance that should replace the reliance on traditional methods of early detection such as milestone checklists, parent recall, developmental screening tests and clinical judgment.

Discussion

General practitioners and other professionals in regular contact with children and their families are ideally placed to monitor a child's development, detect problems early and to intervene to optimise the child's development and thus promote long term health and wellbeing. Developmental surveillance involves eliciting parental concerns, performing skilled observations of the child, and providing guidance on health and development issues that are relevant to the child's age and the parents' needs. Standardised tools are available to assist GPs to elicit parental concerns and guide clinical decision making.

Keywords: child development; general practice; child health services; developmental disabilities/screening



Developmental problems in young children are more common than generally realised. Surveys suggest that up to 15% of children under the age of 5 years may have difficulties in one or more areas of development, including speech and language, motor, social-emotional and cognitive.¹ At the more severe end of the spectrum, developmental delay and disability will usually be detected at a relatively early stage, either because the child has a significant delay that is detected by parents and/or a health professional, or because they are high risk (eg. prematurity) and are monitored in a follow up neonatal intensive care unit program.

However, many children with mild to moderate problems are not detected until they are enrolled in structured educational settings such as kindergarten or school. In 2009, data collected nationwide on the developmental status of children entering their first year of school using the Australian Early Development Index (AEDI) indicate that up to 24% of children have developmental vulnerabilities in one or more areas.² Parents are often the first to suspect a delay in development and will seek reassurance from a general practitioner or other health professional.

In order to address this often challenging clinical scenario, GPs need to have an understanding of normal development, a strategy to detect the likelihood of problems, and a network of professionals to whom children can be referred when necessary and appropriate.

Normal development

Development in children progresses along pathways that are predictable, with specific observable developmental milestones achieved at certain ages (*Table 1*).³ However, there is considerable individual variability, so that a delay in achieving a particular milestone is not necessarily significant. However, the level of concern rises if the child is late in achieving several milestones.

Risk factors to normal development

Biological and environmental factors impact on the child's development. Biological factors include prematurity and low birth weight, birth injury, vision and hearing impairment or chronic illness. Environmental risk factors can be in the immediate family

**Table 1. Childhood milestones 0–5 years**

Communication and language milestones	Average age
Social smile	6 weeks
Cooing	3 months
Turns to voice	4 months
Babbles	6–9 months
'Mamma'/'Dadda' (no meaning)	8–9 months
'Mamma'/'Dadda' (with meaning)	10–18 months
Understands several words	1 year
Speaks single words	12–15 months
Points to body parts	14–22 months
Able to name one body part	18 months
Combines two words	14–24 months
Speaks six or more words	12–20 months
Able to name five body parts	2 years
Has 50 word vocabulary	2 years
Uses pronouns (me, you, I)	2 years
Developmental milestones (tasks)	Average age
Follows eyes past the midline	6 weeks
Smiles	6 weeks
Bears weight on legs with support	3–7 months
Sits with support	4–6 months
Sits without support	5–8 months
Crawls	6–9 months
Puts everything into mouth	4–8 months
Pulls to standing position	6–10 months
First tooth	6–9 months
Walks holding on	7–13 months
Drinks from cup	10–15 months
Waves goodbye	8–12 months
Climb stairs	14–20 months
Turns pages	2 years
Scribbles	1–2 years
Uses a spoon	14–24 months
Puts on clothing	21–26 months
Buttons up	30–42 months
Jumps on spot	20–30 months
Rides a tricycle	21–36 months
Bowel control	18 months – 4 years
Bladder control (day)	8 months – 4 years
Clear hand preference	2–5 years

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(low parental education, parental mental illness, social isolation, poverty and its consequences), and/or in the community (poor housing, poor quality services, lack of access to services). Often risk factors cluster together, for example, poverty and its frequent associations with family and environmental risk factors (which represents the highest identifiable association with mild to moderate developmental delay).

Methods of early detection

There are a number of approaches to the early detection of developmental problems; these are not necessarily mutually exclusive, and most practitioners will often use a combination of methods.

Parental concern

Because parents spend the most time with their children and see them under different circumstances, they can be expected to be the most reliable observers of their children's skills. Indeed, there is considerable evidence that where parents have concerns about the child's development, there is a reasonably high likelihood that the child will be identified as having problems following assessment.⁴ It follows that health professionals should never ignore parental concerns. On the other hand, lack of parental concern about a child's development may not mean that the child's development is normal.

Parents' recall of developmental milestones is often inaccurate and biased toward the normal.⁵ They tend to be more accurate when there is significant developmental delay present.

Milestone checklists

Many professionals use milestone checklists as an *aide memoire*. Parents especially are reassured when their child's development corresponds with developmental checklists (*Table 1*), which can be found in many parenting books. Although development is generally predictable, it is sometimes uneven, so a child developing normally may nevertheless be delayed in one or more milestones at a particular point in time but will subsequently catch up. It is likely that a reliance on developmental checklists alone will lead to the overidentification of children with delay. Checklists are best utilised as an adjunct to early detection.

Clinical judgment

All health professionals rely to a large extent on their clinical judgment; informed by their training and clinical experience. It might be reasonably assumed that the more experience practitioners have, the more reliable their clinical judgment. While this may hold true for organic conditions, it has not been shown to be the case in the detection of developmental problems. A seminal study undertaken many decades ago showed that paediatricians failed to identify almost 50% of children with mental retardation if they relied solely on clinical judgment.⁶ Surprisingly, there was little correlation between the accuracy of detection and years of experience. While



clinical judgment is an important component of the detection of developmental problems, we should not rely solely on it.

Developmental screening tests

Developmental screening tests are standardised tools used to ascertain developmental risk or identify problems in children considered to have difficulties. The Denver Developmental Screening Test (DDST) was taught to several generations of medical students worldwide and thus became the most commonly used developmental screening test. The DDST has now largely been replaced by more recent screening tests, which have significantly improved psychometric properties (Table 2).^{7,8}

However, all of these instruments have relatively low sensitivity, ie. they will miss significant numbers of children who are likely to have problems, and low specificity, ie. they will incorrectly identify children whose development is normal. It should be remembered that a screening test is not diagnostic – rather it is designed to identify those children who probably have developmental delay from those who probably do not.

Development is a dynamic, complex process characterised by spurts, plateaus and regression. It follows that a snapshot of development at a single point in time, obtained by a developmental screening test, is unlikely to provide reliable information about a child's developmental trajectory.

Developmental surveillance

This is a much broader concept than developmental screening. It is a longitudinal process that relies on repeated purposeful review of the child and family. Developmental surveillance aims to not only detect delays early, but also identify and intervene into risk factors for child development.⁹ It involves eliciting any parental concerns, performing skilled observations of children, and offering parents information and guidance on health and developmental issues relevant to the child's age and parents' needs.¹⁰ The administration of a formal developmental screening test can be part of surveillance, but the results are interpreted in the context of all the activities described above. Every encounter that the GP has with the child is an opportunity to consider their developmental progress; the monitoring of health and development is integral to primary care clinical practice.

Involvement of parents – parent questionnaires

The active participation of parents has been shown to improve the accuracy of clinical estimates of child development behaviour. Parental concerns, when carefully elicited, have been shown to fairly accurately identify developmental, language and behavioural problems.⁴

The Parents' Evaluation of Developmental Status (PEDS)¹¹ is a 10-item questionnaire suitable for use between birth and 8 years

Table 2. Commonly used developmental screening tools

Tool	Description	Age range (months/years)	Time to administer (minutes)	Availability
Ages and Stages Questionnaire (ASQ)	Parent completed age specific questionnaire; screening communication, gross motor, fine motor, problem solving and personal adaptive skills; results in pass/fail score for each domain	4–60 months	10–15	Footprint Books Pty Ltd www.footprint.com.au Telephone 02 9997 3973 Fax 02 999 3185 Email info@footprint.com.au
Brigance Screens	Directly administered tool comprising nine forms; screening articulation, expressive and receptive language, gross motor, fine motor, general knowledge and personal social skills (where applicable) For 0–23 months use parent report	0–90 months	10–15	Hawker Brownlow Education www.hbe.com.au Telephone 1800 334 603 Fax 03 8558 2444
Parents Evaluation of Developmental Status (PEDS)	Parent interview form; designed to screen for developmental and behavioral problems needing further evaluation; single response form used for all ages; may be useful as a surveillance tool	0–8 years	2–10	Centre for Community Child Health Royal Children's Hospital Melbourne Telephone 03 9345 6150 Fax 03 9345 5900 Email enquiries.ccch@rch.org.au Tools for developmental behavioral screening and surveillance www.pedstest.com



of age (Figure 1). Parental responses to the questions are scored using an accompanying scoresheet and categorised into a number of action pathways (Figure 2). PEDS is particularly attractive to busy GPs as a way of identifying children who might need further assessment or whose parents might benefit from information and guidance. It needs no particular equipment, can be completed before or during a consultation, and takes only a few minutes to complete and score. (See *Resources* for more information, including details on purchasing an Australian authorised version of the PEDS.)

Assessment

Children suspected of having developmental delay need to be referred for a formal developmental assessment, which is often multidisciplinary. Most commonly, a paediatrician undertakes the initial assessment: reviews the history, undertakes a physical and neurological examination, looking for clues as to aetiology, and may then arrange for investigations – chromosomal, chemical, metabolic and neurological – depending on clinical findings and index of suspicion. Psychologists administer standardised tests of cognitive functioning, both to ascertain level of functioning and set a baseline to document future developmental progress. Other disciplines may be involved as appropriate, including neurology, speech pathology, occupational therapy, physiotherapy, ophthalmology, social work and genetics.

The goal of the assessment is to formulate an accurate developmental profile of the child's current strength and weaknesses and ascertain any continuing risk factors. Following assessment, a detailed and individualised intervention plan can then be developed according to the needs of the child and their family.

Red flags – when to refer

In some cases the child should be referred directly for formal assessment. These include:

- developmental regression: where a child is going backward in one or more aspects of their development
- prematurity: this is especially pertinent for children born at less than 28 weeks gestation or with a birth weight of less than 1500 g. Most of these children will already be enrolled in a follow up program, but if not, the GP should consider early referral to a paediatrician or hospital clinic

- conditions associated with high risk of developmental delay: these include chromosomal abnormalities, significant hearing and/or vision problems, dysmorphism, and where there is a clearly abnormal neurological examination
- high index of suspicion on the basis of observations, failed screening tests, or major psychosocial/family risk factors
- major and persistent parental concerns, even in the face of normal observation
- suspicion of autism.

Most GPs will already have their networks of specialists and consultants whom they use. Relationships with these specialists – consultant paediatrician or hospital clinic, speech pathologists, psychologists, occupational therapists – facilitates early assessment.

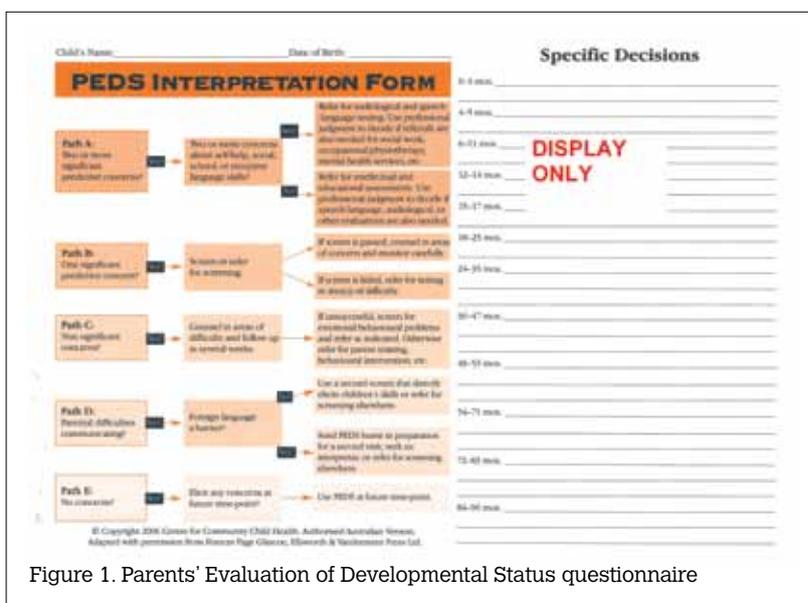


Figure 1. Parents' Evaluation of Developmental Status questionnaire

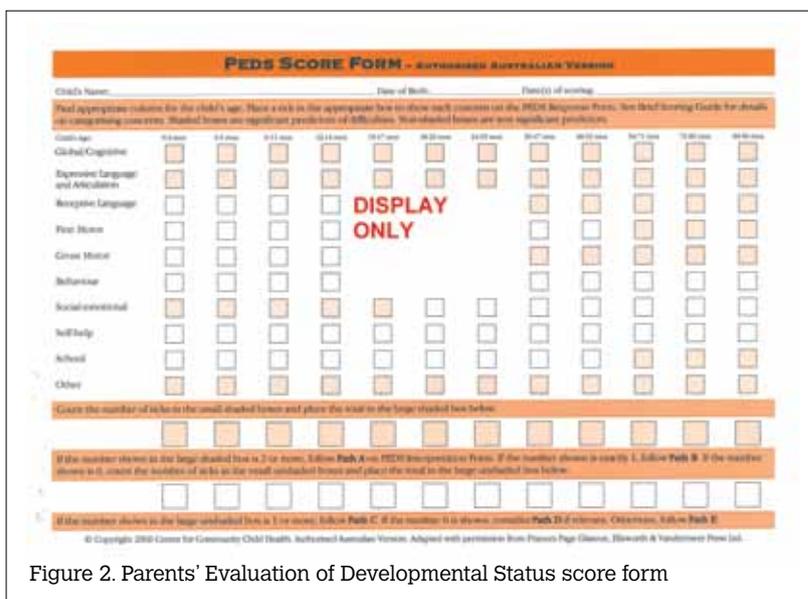


Figure 2. Parents' Evaluation of Developmental Status score form



Early detection of abnormal development

A suggested strategy for GPs¹²⁻¹⁴

- Take a developmental history. Check with parents whether the child's development is proceeding normally, and check against a list of developmental milestones. Have a range of toys in the office – blocks, drawing materials, jigsaw puzzles and books, and observe how the child interacts with these materials. Where there are major risk factors – regression, extreme prematurity, neurological abnormalities, vision or hearing abnormalities – consider early referral for assessment
- Physical examination (including neurological examination). In particular, assessment of vision and hearing
- Elicit any parental concerns about development. This can be done informally, as part of a consultation, or more formally using PEDS. Review the responses, and check against the PEDS algorithm to consider next steps
- If possible seek additional information from other professionals who have regular contact with the child, including maternal child health nurses, early childhood educators and teachers
- Consider administration of a formal developmental screening test
- Provide information and guidance to parents regarding ways of promoting health and development (see *Resources*)
- Arrange a review appointment as appropriate and necessary. Sometimes bringing the child back at a later date clarifies their developmental status. For example, if a child is unwell, hungry or tired, then this may affect the child's behaviour in the GP's office. Similarly, relatively minor concerns or borderline responses on a screening test may declare one way or the other at a subsequent visit
- Refer early for formal developmental assessment if developmental problems are identified or the risk for developmental problems is considered to be high.

Conclusion

Early detection and intervention for developmental delay in children is important because a child's development has lifelong implications for health, learning and wellbeing. Every encounter with a child is an opportunity to consider that child's developmental progress. General practitioners are in the ideal position to detect problems at an early stage and promote optimal child development because of their ongoing relationship and frequent contact with the child and their family.

Summary of important points

- The healthy development of a child yields lifelong benefits for overall health and wellbeing.
- Developmental delay is common.
- Early detection and early referral for assessment and management is important.
- Developmental surveillance represents an effective and practical

approach for GP's involved in the care of young families, to promote and support healthy development of children.

Resources

- PEDS Australia ordering information: www.rch.org.au/ccch/resources.cfm?doc_id=10963
- Raising Children Network, an Australian parenting website: www.raisingchildren.net.au.

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