

Improving the odds for effective developmental surveillance

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It is now well known and documented that healthy early child development (ECD) is crucial, not only for long-term development for learning, but also for physical, emotional and mental health throughout one's lifetime (1-5). To highlight the importance of this, the Canadian Paediatric Society (CPS) recently struck a task force on ECD to provide additional resources and advocacy tools to promote and enhance the quality of ECD. Primary health care providers, such as community paediatricians, family physicians and nurse practitioners, occupy a unique and pivotal role for the early detection of developmental abnormalities and are thus positioned to provide timely interventions for improving developmental outcomes.

It is important to distinguish the concept of developmental surveillance, which is the monitoring of development over time for early identification of problems, from that of the more time-intensive practice of developmental screening, which is the application of a standardized testing instrument with published sensitivity and specificity, and targeted at specific ages. The term 'general screeners' refers to the use of validated developmental screening tests that include all developmental sectors: fine and gross motor, speech and language, cognitive and social-emotional development. Other developmental screening instruments may evaluate only one of the above sectors of development.

Developmental surveillance can ideally be provided during the regularly scheduled preventive paediatric health visits, more commonly known as well-baby or well-child visits. It should be emphasized that surveillance not only relies on monitoring developmental milestones, which should be anchored in the best available evidence, but it also needs to be grounded by a comprehensive understanding of the role of the gene-environment interaction that makes every child unique. Observing and documenting these findings at each health maintenance visit is critical to the delicate balance between continued monitoring or referral for further evaluation and diagnosis.

Developmental surveillance alone lacks the sensitivity and specificity of validated screening tools, but both methods could complement one another when there is a robust developmental surveillance in place. In this regard, the 'red flag' approach (upper limit of attainment of the specific skill) increases the quality of surveillance and could enhance its validity. However, this approach needs the support of evidence-based milestone acquisition timelines. Milestones designated for various ages in health maintenance and anticipatory guidance visits have generally been widely accepted and time honoured but have not been accompanied by levels of evidence (6-8).

Currently, recommendations vary for the use of developmental surveillance and/or developmental screening in different countries. Most European countries focus on child development surveillance and do not recommend developmental screening. Canadian guidelines have not yet been established and, to date, the CPS has not recommended an approach – but has endorsed the Rourke Baby

Record recommendations (www.rourkebabyrecord.ca). These include developmental surveillance at all well-baby or well-child visits, with further assessment of development recommended if there is either a lack of attainment of any 'red flag' milestones or parental or caregiver concern about development.

The American Academy of Pediatrics (AAP) recommends the routine use of formal developmental screening at the nine-, 18-, and 24- or 30-month well-child visits and, in addition, at all other well-child visits should concerns arise during developmental surveillance at any visit (9). The response in the United States to these AAP recommendations for routine developmental screening has been inconsistent, and physician acceptance of this early intervention process, as well as time-resource concerns, are believed to be partially responsible for this (10,11).

The article by Dosman et al (12) in the current issue of *Paediatrics and Child Health* (pages 561-568) is indeed timely because it describes the format for a valid, reliable and practical mechanism for monitoring child development. Their proposal for surveillance via age-specific milestones is based on a review of the literature and on assigning a grade to the evidence.

The Dosman article not only documents the level of evidence for developmental milestone acquisition, but it also demonstrates how this can be used in day-to-day practice. The distinction between using the 50th percentiles (typical development) and the 90th percentiles (red flags indicating atypical development) for individual milestones is an important concept for practical application. The addition of developmental trajectories to this document refines our understanding of milestone acquisition, which is essential to the efficacy of surveillance.

Tables 3 and 4 in the Dosman article are an attempt to succinctly display both the age of the attained milestone goal and the quality of evidence in the selected/chosen references. Due to their complexity, the tables may be somewhat confusing. Because their reference sources classified milestone attainment in a variety of different ways (such as 90th percentile mastery, 50th percentile mastery, or 'oldest age' of typical mastery), the authors use a series of letters (A to E) in these two tables to assign a grade to their evidence, based on the developmental sector under scrutiny: ABC = high quality, DE = low. It is important for the reader to recognize that these letters are not a standard grading system for level of evidence.

Not surprisingly, the authors found that the evidence is most robust for milestone acquisition for fine and gross motor development, less so for speech and language, and least robust for cognitive and social-emotional development. References used by the authors for grading the level of evidence of milestones were based on recommendations from selected experts in the field (physical, occupational, and speech-language therapists and psychologists). Although this approach lends itself to some bias because the search of the literature may have been limited to published data with referenced percentiles, the absence of randomized controlled trials and the reliance on standardization studies makes it difficult

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to assign a conventional interpretation of the quality and strength of the evidence.


The authors also discuss a number of possible interventions to consider when concerns arise from developmental surveillance. They then discuss the use of various resources depending on which developmental sector or sectors are affected. It is important to point out that resources vary depending on location. For children exhibiting delays in multiple developmental sectors, a multidisciplinary assessment in a tertiary level centre may be attainable in many locations, but may not be feasible in others, especially in rural and remote parts of Canada. Even in tertiary care centres, timely access to multidisciplinary assessment can be a significant problem.

Dosman et al (12) conclude that the evidence supports the use of developmental surveillance based on red flags and invite us to consider the use of developmental screeners when red flags are identified. This is consistent with the recommendations in the 2011 Rourke Baby Record. Further research is needed to delineate the outcomes of various approaches related to developmental surveillance and screening.

This is an opportune time for the CPS to further examine this issue to develop recommendations for developmental surveillance and screening and, in particular, when to apply a specific developmental screening tool to health maintenance visits where the appropriately selected developmental milestones for the age have not been achieved.

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