Preliminary Validation of a Parent-Child Relational Framework for Teaching Developmental Assessment to Pediatric Residents

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ABSTRACT

OBJECTIVE: A parent–child relational framework was used as a method to train pediatric residents in basic knowledge and observation skills for the assessment of child development. Components of the training framework and its preliminary validation as an alternative to milestone-based approaches are described.

METHODS: Pediatric residents were trained during a 4-week clinical rotation to use a semistructured interview and observe parent–child behavior during health visits using clinical criteria for historical information and observed behavior that reflect developmental change in the parent–child relationship. Clinical impressions of concern versus no concern for developmental delay were derived from parent–child relational criteria and the physical examination. A chart review yielded 330 preterm infants evaluated using this methodology at 4 and 15 months corrected age who also had standardized developmental testing at 6 and 18 months corrected age. Sensitivities and specificities were computed to examine the validity of the clinical assessment compared with standardized testing. A subset of residents who completed 50 or more assessments during the rotation was timed at the end of 4 weeks.

RESULTS: Parent–child behavioral markers elicited from the history and/or observed during the health visit correlated highly with standardized developmental assessment. Sensitivities and specificities were 0.72/0.98 and 0.87/0.96 at 4 to 6 and 15 to 18 months, respectively. Residents completed their assessments <1 minute on average if they had completed at least 50 supervised assessments.

CONCLUSIONS: A parent–child relational framework is a potentially efficient and effective approach to training residents in the clinical knowledge and skills of child development assessment.

KEYWORDS: developmental assessment; developmental surveillance; medical education; parent–child relationship

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WHAT'S NEW

Markers of developmental change of the parent–child relationship reflect commensurate change in a child's development. The result is an alternative approach to training pediatricians in the assessment of child development at health visits offering potential advantages of efficiency and accuracy.

CLINICAL KNOWLEDGE AND skills of child development are considered essential to health supervision activities.[1] This assumption, however, stands in the face of well documented discontent with current pediatric training to prepare primary care practitioners to manage developmental and behavioral concerns.[2,3] This is most evident for the detection of developmental delay for which current guidelines recommend a protocol for developmental surveillance at each health visit with developmental screening at specified health visits and whenever surveillance raises a concern.[4] Developmental surveillance includes addressing parental concerns, maintaining a developmental history, making accurate and informed observations of the child, identifying risk and protective factors, and documenting the process and findings.[4] Clinical assessment of child developmental progress using history and observation is a central component of surveillance for which most clinicians ask parents about their concerns and use milestone-based checklists.[5] However, evidence suggests that clinical impression using this approach is quite inaccurate.[6–8] One approach to improving the accuracy of surveillance and screening has been to use validated tools for eliciting parental concerns, documenting developmental milestones, and examining psychosocial risk factors.[9–11]

Alternative approaches for training pediatricians to improve clinical knowledge and skills central to assessment of child development at health encounters are options to be explored. Parent–child observation is a recommended

activity for the health encounter and has been suggested as a possible approach to the developmental assessment component of surveillance despite lacking evidence, parameters, and clinical criteria to guide interpretation.[1,4] Nevertheless, there is ample rationale to explore this approach. Parent–child relational assessment has been used in early intervention and infant mental health.[12,13] From this work, stage-salient features have been elaborated for the developmental tasks of this relationship that include attachment, autonomy/self-awareness, and self-control/peer relationships (Table 1).[14] Theoretically, behavioral criteria for these developmental tasks can be defined and sampled as an alternative to milestone-based approaches. For example, infant proximity seeking at 9 to 12 months reflects a cognitive appraisal (eg, of a stranger), an emotional reaction (fear), social communication (looking for the parent's reaction), and motor activity (movement toward parent). Because a primary function of the parent–child relationship is support for competence in self-regulation, its relevance as a clinical framework extends to the promotion of optimal physical health, behavioral health, and learning.[14,15]

We describe a parent–child relational framework (PCRF) and present the results of a preliminary evaluation for training and clinical care. We hypothesize that parent–child relational behavior correlates with child maturation and propose that a PCRF provides a viable alternative for training pediatricians in basic knowledge and skill in clinical assessment of child development and behavior. To explore the validity of this approach, we examine the accuracy and speed of PCRF-based assessment of preterm infants by pediatric residents compared with developmental standardized testing.

METHODS

SAMPLE

Subjects were low birth weight preterm infants and their caregivers seen consecutively at the Los Angeles County and University of Southern California Medical Center's Premature Infant Clinic between September 1, 2009, and December 31, 2014. Infants were seen routinely by pediatric residents at 4, 9, 15, and 24 months, and they received standardized developmental testing at 6 and 18 months—all ages corrected for prematurity. A review of 456 medical records yielded a sample of 330 infants with pediatric resident assessment and standardized testing results allowing for comparisons between the 2 at 4 to 6 months and 15 to 18 months. The university institutional review board approved the study.

DEFINITIONS OF PARENT–CHILD RELATIONAL PARAMETERS

Historical and observation criteria of developmental change in the parent–child relationship were defined for each developmental task and criteria for posture control were defined for the physical examination (Table 1).[14,16] For pediatric assessments at 4 months, social turn-taking was defined as infant smiling and vocalizing in response to the mother's or the examiner's social bid to the infant. For pediatric assessments at 15 months, exploration and experimentation were defined by mobility away from, but anchored to the parent, and behavior whose intent was to discover where things are or how things work. Experimentation was also credited by observing the child's indiscriminate (trial and error) approach to placement of a shape into the puzzle board. Social referencing (ie, looking to the parent when separated), was emphasized as primary evidence for intention to communicate at 15 months.[14] Residents' training included 10 hours of lecture based on the PCRF and direct supervision of their assessments.

RESIDENT ASSESSMENT PROCEDURE

Pediatric residents used a semistructured interview organized by the recommended activities of developmental surveillance to elicit parent concerns, describe the infant's current developmental competencies, and discuss the child's psychosocial context by discussing parental adaptation and family resources. Interviews were structured using

Table 1. Developmental Tasks, Behavior, and Physical Examination Criteria

Developmental Task (Age, Months)	Relational Behavior Criteria	Physical Examination Criteria
Physiological regulation (0–3)	• Circadian patterning of sleep and wake • Predictable feeding rhythm • Crying behavior peaks then declines	• Primitive reflexes • Head control
Social reciprocity (3–6)	• Baby smiles/coos when talked to • Examiner engages infant likewise	• Increasing trunk control • Primitive reflexes decline
Initiative (6–9)	• Grasps objects, explores with senses • Parent scaffolds, elaborates experience	• Independent sitting • Protective reflexes • Radial digital grasp
Attachment (9–12)	• Seeks proximity with stress • Fear/wariness with stranger or separation • Social referencing: looks to parent when uncertain	• Mobility • Pulling to stand • Pincer grasp
Exploration and experimentation (12–18)	• Explores larger surround • Trial and error approach to problems	• Independent walking • Spoon use
Autonomy and self-awareness (18–30)	• Self-assertion: resists help; says "no," "mine" • Self-awareness: points to self and others • Shows a positive self-evaluation with praise, pouts, saddens with limit-setting • Reflects before acting (with puzzle board)	• Running, jumping