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Developmental and Social-Emotional Screening Instruments for Use in Pediatric Primary Care in Infants and Young Children

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Developmental and Social-Emotional Screening Instruments for Use in Pediatric Primary Care in Infants and Young Children

Purpose of this Document

The American Academy of Pediatrics (AAP) recommends the use of valid and reliable developmental surveillance and screening instruments through formal protocols for all infants and children in the primary care setting because this practice has been shown to improve accuracy and increase the likelihood that developmental delays will be identified and referrals for services made in a timely fashion (1). Needs are therefore better addressed. Nonetheless, through a study conducted by the AAP several years after they originally issued the guidelines, only 23% of pediatricians responding routinely used standardized developmental screening instruments compared to 71% who made decisions without formal screening (2). Another study of young children referred to developmental specialists by their pediatrician found a 15.5 month lag between parental concern and developmental evaluation (3).

The Early Intervention Program (EI) has provided screening, evaluation, and intervention to infants and toddlers (birth to 36 months old) with disabilities in all 50 states and the District of Columbia since 1994. While there has been growth in EI participation over the years, the most recent administrative data (2007) show that only 2.5% of age-eligible children receive EI services (4). However, it is estimated that approximately 13% of young children (9 to 24 months old) have developmental delays that would make them eligible for EI services, and that only one young child in ten with delays received necessary intervention by 24 months of age (5). When screening instruments are incorporated into routine screening protocols in pediatric practice, EI referral rates increase. In one study more than two-thirds (67.5%) of young children identified as delayed using a formal screening tool had not been identified by their pediatrician, and use of formal screening tools increased EI referral rates by more than 200% (6).

Beginning at 36 months of age, young children with developmental delays would, if eligible, receive services through preschool special education programs typically run by their local education agency. Eligibility requirements (degree of developmental delay) for preschool special education may be more restrictive than for EI. Also, EI eligibility may be established because of developmental delay whereas preschool special education requires that the child be found to have a mental, physical or emotional disability (7).

Lack of adherence to AAP guidelines is due to a number of significant barriers, including time constraints, costs, staff limitations and inadequate reimbursement (2). Another important barrier revolves around the selection process of the screening instruments themselves (8). The instruments and corresponding logic models provided here are intended to serve as a resource to pediatric primary care providers interested in integrating formal, evidence-based developmental surveillance and screening into their practice. In the tables, a brief description of the instruments is given, along with respective age range, method of administration and average time to administer, thereby facilitating the selection process. For the more time-consuming screening tools listed, for example, clinics may

find that a separate screening appointment may be needed. Information about billing codes for developmental screening from the AAP is also included as an Appendix to at least partially help address the issue of cost as a barrier through reimbursement.

Developmental Screening vs. Surveillance

It is important for pediatric primary care providers to distinguish between developmental screening and surveillance and to use a combination of both in providing care. Developmental surveillance is a continuous process, in partnership with the child's caregiver, to identify and document any developmental concerns, risk factors, or possible delays (9). Developmental surveillance includes: taking a developmental history; asking parents whether their child has met age-appropriate developmental milestones and eliciting concerns; observing the child; identifying risk factors that may affect the child and protective factors that may enhance development; and recording findings in the medical chart so they can be reviewed at subsequent health care encounters. Surveillance should be done, at minimum, at every well child visit (8). If there is concern about the child's development established through surveillance, the child should be screened using a standardized developmental screening tool. Additionally, all children should be screened for developmental delay at the 9, 18, and 24 or 30 month visit, and for autism spectrum disorders at 15 or 18 months and again at 24 months (1). For high risk populations, including children affected by biological (e.g., low birth weight) and psychosocial (e.g., foster care, homelessness) risk factors, earlier and more frequent formal developmental screening may be warranted (10).

Many of the instruments in this list may be used for developmental surveillance as well as screening. Some practices adopt a two-pronged approach to infant and early childhood screening using a parent-report tool like the PEDS or ASQ at every well visit and following up with a directly administered screening (e.g., the PEDS-DM, Battelle or Brigance Screeners) for children identified by parent report. Autism spectrum disorder screening may also be done in two stages, using a level-one screener like the M-CHAT with all children and following up if indicated with a level-two screening tool like the CARS (11). These second level screening may be done at a billable follow-up visit.

It is important to note that screening instruments do not confirm a developmental delay, establish eligibility for services through an EI or preschool special education program, and do not allow for diagnoses to be made. Rather, they indicate deviation from expected norms for age and the need for more extensive formal evaluation (12). These evaluations may be provided at no cost to parents through programs established under the federal Individuals with Disabilities Education Act (Early Intervention and preschool special education) or through developmental specialists in the health care system.

Finally, we strongly echo the AAP *Bright Futures*' recommendations that appropriate psychosocial surveillance and assessment should be done on a regular basis throughout childhood and adolescence (13). Periodic screening for maternal depression should be strongly considered as well, especially in the infant well child visits (14). This is especially relevant and important in marginalized and underserved populations, where the risk of maternal depression is higher (15).

Inclusion Criteria for Screening Tools

All of the screening instruments included in this list have documented validity – adequate or better sensitivity (avoidance of false-negatives) and specificity (avoidance of false-positives), test-retest reliability and inter-rater reliability. We focused on screening instruments that are in general use in primary pediatric care, child care, early education (including Head Start), and EI settings. We consulted multiple sources for lists of tests in use; these are listed at the end of this document. Because very- and extremely-low birthweight infants are at especially high developmental risk (16), we included several neuromotor tests that may be used for appropriate screening in primary care. We listed in a separate category screening tools that primarily target psychosocial and social-emotional development.

Because we assumed that children who screen positive in a primary care setting would be referred for evaluation, we excluded standardized assessment tools that are primarily used for evaluation following identification and referral. There is, however, overlap in use of tools for screening and evaluation especially with infants and young children, and some instruments we included may also be used as part of a multi-disciplinary evaluation (e.g., EI eligibility determination). We specifically excluded instruments that were designed for children diagnosed with specific disabilities (e.g., hearing impairment), tools for use in specialized settings such as in-patient rehabilitation centers, and instruments that require or recommend several hours of training before use. Because our focus was on screening in the pediatric primary care setting, we excluded tests that routinely require 30 minutes or longer to administer but did include some tests with variable administration time that may exceed 30 minutes.

Suggestions for Developmental Screening in Pediatric Primary Care Settings

The appropriate use of any standardized screening instrument requires skill and experience in testing as well as familiarity with the specific screening tool used. We noted in the “How Administered” column the tests with more stringent requirements for the training and experience of the professionals who would use them. All screening and assessment instruments should be administered and scored in accordance with instructions in the test manual.

The developmental screening tools in Table One, supplemented by an autism screening instrument (e.g., the M-CHAT) from Table Five will be sufficient for most pediatric settings. For high-risk populations, a social-emotional screening tool (Table Three) should also be considered. The neuromotor screening instruments (Table Two) are especially suitable for infants and young children at neurobiological risk, e.g., in a low birth weight follow-up clinic or similar setting. The speech-language screeners in Table Four are especially useful for to screen school readiness and possible special education needs. A comprehensive infant and early childhood screening program will also include formal hearing and vision screening, lead testing, and (especially for high-risk patients) screening for iron deficiency anemia

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Table 1: DEVELOPMENTAL SCREENING TOOLS FOR INFANTS, TODDLERS & YOUNG CHILDREN

Name	Use	Areas Screened	Age range	How Administered
Ages and Stages (ASQ)	A norm-referenced parent-report screening designed to identify developmental delays during the first 5 years of life. Different forms are used for different age groups. Recommended for use in pediatric primary care settings and for developmental surveillance of high risk infants and toddlers. Results may be used to differentiate children who should be referred for developmental assessment from children who should be monitored and re-screened. Available in Spanish. Time: Each form takes 10-15 minutes to complete and approximately 5 minutes to score	Communication, gross motor, fine motor, problem solving, and personal-social.	Birth - 60 months	Parent Report
Battelle Developmental Inventory Screening Test (BDIST)	This norm-referenced screening tool is comprised of 96 items drawn from the Battelle Developmental Inventory (BDI). There are two items for each developmental domain and age level (at 6 month intervals from birth-23 months and one year intervals thereafter). Items assess attention, self-help, interactions, fine and gross motor, memory, reasoning, and expressive and receptive language skills. Time: Administration time varies with child's age (20-30 minutes for 3-5 year olds, 10-15 minutes for under 3 and over 5 years olds)	Subtests may be scored for five domains: adaptive, motor, communication, cognition, and social-emotional.	12 months – 96 months	Combination: Direct With Child and Parent Interview

Bayley III Screening Test, formerly the Bayley Infant Neurodevelopment Screen (BINS)	The Bayley Scales of Infant Development (BSID) is a norm-referenced instrument which, in its various versions, is often considered the “gold standard” in infant-toddler cognitive assessment. The Bayley III Screening Test is intended to identify infants and young children at risk of developmental delay who should be evaluated further. The Bayley III screener is especially useful in monitoring the development of premature and low birth weight infants. Time: 15-25 minutes to administer depending on age of child	The Screener focuses on the cognitive, language, and motor domains. The motor subtest may be useful with premature and other high-risk infants.	1 month - 42 months	Direct With Child. Intended to be used by a qualified health, mental health or child development professional.
Birth to Three Assessment and Intervention System, Second Edition (BTAIS-2) Screening Test of Developmental Abilities	The BTAIS-2 is designed as an integrated system for screening, assessment and intervention with infants and toddlers birth to 36 months. The Screening Test of Developmental Abilities is a norm-referenced 85-item instrument which yields standardized scores that can be converted to age-equivalents indicating the child’s functional level. Children who screen positive should be referred for developmental evaluation. The BTAIS-2 evaluation component (240-item criterion-referenced Comprehensive Test of Developmental Abilities) may be used. Time: 15 minutes to complete the screening	Screens functioning for motor, expressive and receptive language, nonverbal thinking, and social/personal development.	Birth - 36 months	Direct With Child
Brigance Screens, 2 nd edition (Brigance-II): Infant & Toddler, Early Preschool; Preschool-II; K & 1 forms.	Nine different forms are available to accommodate different age groups (birth – 23 months; 24-30 months; 3 and 4 year olds; kindergarten and first graders). The re-design of the test incorporates both criterion-referenced and norm-referenced elements. The Early Preschool and Preschool Screens may be especially useful for children in Early Head Start and Head Start Programs. The Brigance-II is also intended to identify children who are gifted and talented. Available in Spanish. Time: 15-20 minutes to administer	Gross motor, fine motor, self-help, social-emotional, receptive and expressive language, visual-graphomotor, articulation & fluency, quantitative concepts, prereading skills, and ability to give personal information as appropriate for child’s age.	Birth - 90 months	Parent Report for Infant and Toddler Form; others Direct With Child

Cognitive Abilities Scale – Second Edition (CAS-2)	Norm-referenced screening tool designed for early identification of children with cognitive delays. There are two forms, Infant (79 items) and Preschool (88 items). Can be used to assess cognitive skills of non-verbal children. Results for preschoolers correlate strongly with those of language screening tools such as the TELD-3, and for two-year olds there is a strong correlation with results of the BSID-2. Time: 20-30 minutes to administer	The Infant Form is in three sections: exploration of objects, communication, initiation and imitation of activities. The Preschool Form is in five sections: oral language, reading, math, writing, and enabling behaviors.	3 months - 47 months	Direct With Child by a professional trained in test administration
Cognitive Adaptive Test and Clinical Linguistic and Auditory Milestone Scale (CAT/CLAMS) also called the Capute Scales	Designed for use by primary care pediatricians in the office setting to identify children with developmental delay or atypical development. The complete screening consists of 100 items. The language scale (CLAMS) has strong concurrent validity with the Mental Development Index of the Bayley Scales of Infant Development Version II (BSID-II), which suggests that it also identifies children who may have delayed cognitive development. Time: 15-20 minutes to administer; time varies with age of child	Consists of two tests, one for visual-motor functioning and the other for language development (expressive and receptive). This model helps distinguish children with global developmental delay from children with delays in specific area(s).	1 month - 36 months	Direct With Child and Parent Report. Was designed for use by pediatricians.

Denver Developmental Screening Test – II (Denver II)	The Denver II is frequently used by health care providers as part of EPSDT screening. It has 125 items in four categories with markings indicating the age at which 25%, 50%, 75%, and 90% of the standardization sample had met the milestone or were able to perform the skill. A subset of items is administered based on the child's age. The original Denver was criticized for low sensitivity (under-identifying children with delays); the revised version is improved relative to the original DDST. The Denver II is not designed as a test that should be scored; decisions about referral for developmental evaluation or continued monitoring require clinical judgment. Time: 10-20 minutes to administer	The Denver II items are grouped in four categories: gross motor, fine motor-adaptive, language, and social skills.	1 month - 72 months	Direct With Child and Parent Report depending on the item
Developmental Activities Screening Inventory-II (DASI-II)	Designed for early detection of developmental delay with special focus on young children with language impairment whose cognitive abilities may not be accurately screened with a tool that requires the child to follow spoken instructions. DASI-II instructions may be either verbal or visual. There are 67 items which can be administered in one or two settings. Can be used by classroom teachers. Time: 25-30 minutes to administer	Tasks are organized in 15 skill categories including sensory intactness, means-end relationships, causality, memory, and reasoning	1 month - 60 months	Direct With Child
Developmental Assessment of Young Children (DAYC)	This norm-referenced screening and assessment tool is designed to meet Individuals with Disabilities Education Act/Early Intervention Program requirements to address the five developmental domains. It focuses on developmental delays and atypical development as well as on developmental strengths. Can be used with non-English speaking families through a translator. Time: Approximately 20 minutes to administer the full screening; however, specific subtests may be used based on impressions of the child's strengths and needs	There are five subtests: Physical Development, Adaptive Behavior, Cognition, Communication, and Social-Emotional skills.	Birth - 71 months	Direct With Child and Parent Report especially if used with infants

Early Learning Accomplishment Profile (E-LAP), Learning Accomplishment Profile, Third Edition (LAP-3)	The E-LAP is a criterion-referenced screening tool for infants and toddlers. It is considered a source of information about the young child's functioning and should be used to identify young children who need a referral for a developmental assessment, e.g., through the local Early Intervention Program. The items are drawn from a wide range of standardized screening and assessment instruments. The LAP-3 is designed to screen preschool children. Screening results are linked to specific intervention activities that facilitate individualized curriculum development and special education planning if needed. There is an emphasis on providing information to be shared with parents. Available in Spanish. Time: 12-15 minutes to administer	The LAP system focuses on the five principle developmental domains: motor (gross, fine), self-help (adaptive), language (communication), cognitive, and social-emotional functioning. The LAP-3 adds pre-writing skills.	E-LAP: birth - 36 months; LAP-3: 36 - 72 months	Direct With Child
Early Screening Inventory-Revised (ESI-R)	A norm-referenced developmental screening instrument for use with preschool and young school aged children. It was originally designed for 4-6 year olds and revised to include 3 year olds. Screens for developmental delays, lags in school readiness, and possible learning problems. The normative sample included children in Head Start Programs. The screening includes a parent questionnaire for supplemental information. There are 2 versions, for preschool (ESI-P) and for kindergarten (ESI-K). Time: 15-20 minutes to administer	The screening covers developmental, sensory, and behavioral concerns in the child's visual motor/adaptive, language cognitive, and gross motor functioning.	ESI-P: 3 years - 54 months; ESI-K: 55 months - 72 months	Direct With Child and Parent Report

Early Screening Profiles (ESP)	This norm-referenced screening tool is designed to use information from multiple sources. It is comprised of 3 Profiles and 4 Surveys; the examiner chooses those that are appropriate for the individual child. Test items assess reasoning, visual organization and discrimination, receptive and expressive vocabulary, gross motor skills, tracing, and drawing shapes. Not available in Spanish. Time: The Profiles take 15-30 minutes to administer, and the surveys require an additional 15-20 minutes	The test items are in three Profiles: Cognitive/Language, Motor, and Self-Help/Social. The Articulation and Behavior (observed during testing) Surveys are filled out by the examiner, and the Home and Health History Surveys are completed by the parent.	24 months – 83 months	Direct With Child and Parent Report
Infant Development Inventory (IDI) and Child Development Review (CDR)	Parent questionnaires that use open-ended questions and a “Possible Problems” Checklist to get a description of infant (IDI) or young child (CDR) functioning and elicit parental concerns about health and development. A sample CDR question is: “What has your child been doing lately?” A sample checklist item is: “Can’t sit still; may be hyperactive.” Written at the sixth grade level. Available in Spanish. Time: 10 minutes to administer and 5 minutes to score	Social, self help, gross motor skills, fine motor skills and language.	IDI: Birth - 17 months; CRR: 18 months - 60 months	Parent Report
Infant Toddler Symptom Checklist	This 21 item norm-referenced screening tool is intended to identify infants and young children who may have or are at risk for developing sensory integration or attention deficit disorders, and those with emotional, behavioral, or learning difficulties. Time: 10-15 minutes to administer	Screens for sensory and regulatory disorders, specifically of self-regulation, self-care, communication, vision, and attachment.	7 months – 30 months	Parent Report

Parents' Evaluation of Developmental Status (PEDS)	Standardized and designed to comply with American Academy of Pediatrics policy on early developmental and behavioral screening in pediatric primary care. The PEDS is a 10 item questionnaire which elicits parent concerns based on response of "yes/no/a little." Written at fifth grade level. Available in Spanish. Time: Less than 5 minutes to administer	Cognition, expressive and receptive language, fine-motor, gross-motor, behavior, social-emotional, self-help, and school.	Birth – 96 months	Parent Report
Parents' Evaluation of Developmental Status: Developmental Milestones (PEDS:DM)	The PEDS:DM may be used as a follow-up for children identified using the PEDS or as a stand-alone screening. It was designed to facilitate early identification of developmental and behavioral problems as a validated replacement for informal developmental checklists often used in primary care. The brief screening is comprised of 6-8 items per primary care encounter; one age-appropriate item is selected for each developmental domain. This can be supplemented with additional items for an assessment-level ("level 2") screening. Normative data shared by the publishers of the Brigance Screens was used in developing the test. Time: 10-15 minutes to administer	The items cover expressive and receptive language, fine and gross motor, social-emotional, self-help (adaptive), and academic or pre-academic skills (cognitive) functioning.	Birth – 95 months	Parent Report and/or Direct With Child

Table 2: INFANT NEUROMOTOR DEVELOPMENT SCREENING TOOLS**NOTE: These instruments should be used by professionals with training and experience assessing motor development**

Name	Use	Areas Screened	Age range	How Administered
Alberta Infant Motor Scale (AIMS)	The AIMS is a norm-referenced assessment of gross motor maturation. It is performance-based and assesses qualitative aspects of movement. Only two of the 58 items require handling by the examiner. The parent should be present during the screening. The AIMS is useful in screening high-risk infants and differentiating among infants whose neuromotor development is within normal limits, suspect, and atypical. The AIMS is also useful in the identification of infants and toddlers who may have cerebral palsy. Time: 15 minutes to administer	The items are organized around four physical positions: supine, prone, sitting, and standing. Each item assesses weight-bearing, posture, and anti-gravity movements.	Birth - 18 months	Direct With Child
Harris Infant Neuromotor Test (HINT)	This norm-referenced screening tool to identify early signs of motor and cognitive delay in high-risk infants was developed in Canada and subsequently demonstrated to be valid with U.S. infants. The 21-item test focuses on movement against gravity, muscle tone, behavior and cooperation, stereotypical behaviors. Head circumference is also assessed. The test design integrates parental input. Its results correlate well with those of the ASQ. Overall examiner impression should reflect the infant's muscle tone, primitive reflexes, automatic reactions and volitional movement, all of which may help predict later diagnosis of cerebral palsy. Time: 15-30 minutes to administer and score	The items assess, by observation: behavior, cooperation, mobility, eye muscle control, positioning, locomotion and transitioning, posture. By testing: visual tracking, reflex, passive range of motion, and transitions. By parent report: background and degree of concern and specific concerns.	2.5 months – 12.5 months	Direct With Child and Parent Report

Milani-Comparetti Neuro- developmental Screening Examination	This brief neurodevelopmental screening tool is intended to be integrated into the health and developmental screening of infants and toddlers. It was developed to screen for the quality of integration of primitive reflexes and volitional movement against gravity. The screening focuses on spontaneous behavior and evoked responses. It is most useful for infants (under 13 months of age). Time: Less than 10 minutes to administer	Specific spontaneous behavior items include head and body postural control. Evoked responses items assess primitive reflexes and righting reactions including parachuting.	Birth - 24 months	Direct With Child
Toddler Infant Motor Evaluation (T.I.M.E.)	The TIME is a norm-referenced assessment-level standardized tool that combines neurological examination items with test items for quality of motor functioning. Movement sequences are elicited by parents and observed by the professional administering the test. The infant or toddler is assessed in five positions: supine, prone, sit, quadruped, and stand. The test identifies atypical transitions and movement sequences characteristic of delayed motor development. Also provides information regarding the relationship of motor function to adaptive skills. Time: 15-45 minutes to administer	There are three principle subtests: mobility, stability, and social-emotional. Optional subtests include atypical positions, quality rating, and component analysis (used if tracking functional changes over time).	4 months - 42 months	Direct With Child

Table 3: INFANT/TODDLER SOCIAL-EMOTIONAL SCREENING TOOLS

NOTE: Some instruments may be used with preschool aged children

Name	Use	Areas Screened	Age range	How Administered
Ages and Stages: Social-Emotional (ASQ:SE)	Norm-referenced 30 item screening instrument that intended to identify infants, toddlers, and preschool-age children with social-emotional deficits. Reading level is below the 6th grade. There are different forms for specific age groups (6, 12, 18, 24, 30, 36, 48, and 60 months). Available in Spanish. Time: 15-20 minutes or less to complete and under 5 minutes to score	Focuses on social-emotional domain only: self-regulation, compliance, communication, adaptive functioning, autonomy, affect, interpersonal interaction.	3 months - 66 months	Parent Report
Brief Infant Toddler Social Emotional Assessment (BITSEA)	Norm-referenced 42 item screening tool designed to identify a child's behavioral problems and competencies. Based on BITSEA results, children may be evaluated using the ITSEA, a more extensive (166 item) assessment instrument with four subscales (externalizing and internalizing behaviors, regulation, and competencies). Written at 4th to 6th grade level. Available in Spanish. Time: 10 minutes or less to complete and 5 minutes to score	Focuses on social-emotional domain only, screening for general symptoms and competencies.	12 months - 36 months	Parent Report and/or Child Care Provider Report

Carey Temperament Scales (CTS)	The CTS is comprised of five questionnaires for use with different age groups. These are: Early Infancy Temperament Questionnaire (1-4 months); Revised Early Infancy Temperament Questionnaire (4-11 months); Behavioral Style Questionnaire (12-36 months); Behavioral Style Questionnaire (3-7 years) and Middle Childhood Questionnaire (8-12 years). Its use gives information about the child's temperament and behavioral style and their impact on the parent and other caregivers. Can facilitate counseling around parenting skills and other interventions. Time: Each form takes 25-30 minutes to complete and should be subsequently scored by a professional	The CTS is based on the behavioral style categories of the New York Longitudinal Study (NYLS). These are: Activity Level, Regularity, Approach-Withdrawal, Adaptability, Intensity, Mood, Persistence, Distractibility, and Sensory Threshold.	1 month - 12 years and 11 months	Parent Report
Greenspan Social-Emotional Growth Chart	Norm-referenced 35-item questionnaire designed to identify problems in emotional functioning in infants, help establish goals for early intervention and monitor progress in early intervention programs. Uses a six stage model of functional emotional milestones. Responses are on a scale of 0 (can't tell) to 5 (all of the time). Can be used to screen for autism spectrum disorder. Time: Less than 10 minutes to complete	Focuses on six areas: self-regulation and interest in the world, relationships, communication, problem solving, and expression.	Birth - 42 months	Parent Report
Temperament and Atypical Behavior Scale (TABS), TABS Screener	The TABS Screener is one of three components of the TABS System. It is a norm-referenced 15-item screening tool intended to identify infants and young children with temperamental and self-regulatory problems that indicate risk of developmental delay. Results are presented in a way that is consistent with Early Intervention Program eligibility criteria, and it may be especially useful in establishing eligibility for services for infants and toddlers with a primary mental health diagnosis. Written at the 3rd grade reading level. Available in Spanish. Time: Approximately 5 minutes to complete. A positive screening should be followed up with assessment using the 55 item checklist-format TABS assessment tool	Provides information about temperament, attention and activity, attachment and social behavior, neurobehavioral state, sleep, play, vocal and oral behavior, sensory and motor functioning, and self-stimulatory behavior.	11 months - 71 months	Parent Report

Table 4: EARLY CHILDHOOD SPEECH-LANGUAGE SCREENING TOOLS

Name	Use	Areas Screened	Age range	How Administered
Communication and Symbolic Behavior Scales Developmental Profile (CSBS DP) Infant-Toddler Checklist	A 24-item checklist organized into seven clusters and three composites (social, speech, symbolic). Screens for pre-linguistic behaviors and skill acquisition and may identify children who should be further assessed for autism spectrum disorder. Item responses are “Not Yet/Sometimes/Often.” Intended to be filled out by parent (requires good reading skills). Scoring should be done by a health or early childhood professional who should also observe the child as an additional source of information to supplement parent report. Intended for use in developmental surveillance, with repeat screening at three-month intervals. Time: 5-10 minutes to administer	The seven clusters are: motion and eye gaze, communication, gestures, sounds, words, understanding, use of objects.	6 months-24 months	Parent Report and Observation
Early Language Milestones Scale, Revised (ELM-2)	A 43 item norm-referenced screening instrument. Responses can be recorded based on testing with child, observation of child, and/or parent report; direct testing is not feasible for some items or for infants. The scoring identifies children functioning at a level below 90% of other children their age. Not all items need to be administered, depending upon the child’s age and developmental functioning. Can be scored on a point system (recommended for identification of children at risk) or pass/fail. Suitable for population-based screening at pediatric clinics and Early Head Start Programs. Time: 10 minutes or less to administer	There are three scales: auditory expressive, auditory receptive, and visual (tracking, pointing, etc.).	Birth-36 months	Direct With Child and/or Parent Report

Fluharty Preschool Speech and Language Screening Test – Second Edition (Fluharty-2)	Norm-referenced speech and language screening test which is presented in five subtests (Articulation, Repeating Sentences, Following Directives and Answering Questions, Describing Actions, and Sequencing Events). Identifies children who should be referred for a comprehensive speech-language evaluation. Provides information about strengths and needs that could be used to design intervention strategies. Time: 10 minutes to administer	The subtests yield scores for Receptive Language, Expressive Language, and General Language. Specifically assessed are single word articulation, short-term memory, language comprehension, syntax and pragmatics.	42 months- 83 months	Direct With Child. May be supplemented with a Teacher Questionnaire
Language Development Survey (LDS)	Norm-referenced screening tool designed to identify toddlers with early signs of delayed expressive language development. Comprised of 310 words arranged organized into 14 semantic categories (e.g., food, vehicles, people). Can be filled out by parents in the waiting room of a pediatric office. Fewer than 50 vocabulary words at 24 months should trigger a referral for developmental evaluation. Results correlate well with the longer MacArthur-Bates CDI. The LDS was designed for use in settings such as pediatric offices. Time: 10 minutes to complete	Vocabulary, word combinations, length of utterance.	18 months -35 months; best if given at or close to 24 months	Parent Report
MacArthur-Bates Communicative Development Inventories (CDIs), Second Edition	Norm-referenced communication screening tool with two different forms for older and younger children: a “word and gestures” form for age 8-18 months and a “word and sentences” for 16-30 months. The current (revised) version reflects demographic changes in the U.S. population. Available in Spanish as the MacArthur-Bates Inventarios del Desarrollo de Habilidades Comunicativas (Inventarios). Time: 20-40 minutes to administer followed by 10-15 minutes to score	Early language and communication development including non-verbal communication, expressive and receptive language, vocabulary, syntax, length of utterance.	8 months -37 months	Parent Report

Peabody Picture Vocabulary Test – 4 th Edition (PPVT-4)	Updated version of the norm-referenced PPVT-3 with more colorful and culturally appropriate pictorial stimuli. There are 228 stimulus words grouped in 19 sets of 12 items organized by increasing difficulty. The person administering the test says the stimulus word and the child picks out the picture (from four illustrations) that the word most closely represents. The PPVT-4 may be used with non-speaking children including children with autism or other developmental disorders. Only item sets consistent with the child's functional level are presented. It takes about 10-15 minutes to administer five item sets and must be administered precisely as directed. The Spanish language version does not use identical stimulus words (translated) as the English version. Norms are available for Mexican and Puerto Rican Spanish speakers. Time: Approximately 10-15 minutes to administer five item sets and must be administered precisely as directed	Test of receptive vocabulary (comprehension of spoken English or Spanish). Words cover 20 content and concept areas: actions, tools, food; and parts of speech (nouns, verbs, attributes). May identify children at risk of reading and other academic problems.	30 months and older	Direct With Child. Should be administered by a professional skilled in testing.
Preschool Language Scale, Fourth Edition (PLS-4)	Norm-referenced screening test comprised of two subscales, Auditory Comprehension and Expressive Communication. It is organized in three developmental levels, infant/toddler, preschool, and young school age (5 and 6 year olds). Considered to have excellent psychometric properties in the English language version. A strength of the PLS-4 is that the Spanish language version was independently standardized; however, this version has been criticized as being idiomatically oriented towards Spanish as spoken in Mexico and potentially less suitable for other primarily Spanish speaking populations. Time: 25-30 minutes to administer	Areas screened vary with age. Infant/toddler: attention, play with objects and other pre-linguistic markers; preschool: vocabulary, concepts, and grammatical markers; young school age: preliteracy skills (phonological awareness, sequencing, word definitions). The PLS-4 is supplemented by a language sample checklist, articulation screener, and caregiver questionnaire.	Birth-83 months	Direct With Child and Parent/ Caregiver Report. Should be administered by a professional skilled in testing.

Test of Early Language Development – 3rd Edition (TELD-3)	Norm-referenced 38-item screening and assessment tool that focuses on language development. This version of the TELD uses new materials that are intended to be more appealing to younger children, although some of the vocabulary used has been criticized as not being consistently age-appropriate. Time: Approximately 15 to 40 minutes to administer depending on the child's age and developmental level	Has subtests for expressive and receptive language and identifies speech-language strengths as well as needs.	24 months -95 months	Direct With Child
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Table 5: AUTISM SPECTRUM DISORDER (ASD) SCREENING TOOLS

Name	Use	Areas Screened	Age range	How Administered
The Childhood Autism Rating Scale (CARS)	Criterion-referenced 15 item screening tool to identify children with autistic symptoms and estimate the severity of these symptoms. Intended to differentiate autism from other developmental disabilities such as mental retardation. A 4-point scale is used to rate the child's functioning. Best used as a "level two" screener for children who screened positive on the M-CHAT or similar screening tool. The rating scale lends itself to tracking symptom severity over time for children diagnosed with autism. Time: 15 minutes to complete	Items are categorized as: relating to people, imitation, emotional response, body use, object use, adaptation to change, visual response, listening response, taste-smell-touch response, level and consistency of intellectual response, and general impressions.	24 months through adulthood	Completed by professional, teacher or parent based on observation of the child.
Gilliam Autism Rating Scale, Second Edition (GARS-2)	A norm-referenced screening tool designed identify, diagnose people with symptoms consistent with autism beginning at 36 months of age. The 42 items describe symptoms consistent with the American Psychiatric Association (DSM-IV) diagnostic criteria. The screening uses a frequency-based rating scale for the symptoms to estimate severity. A structured parent interview form focusing on diagnostically-relevant information is included. Time: 5 to 10 minutes to complete the symptom profile	Stereotyped behaviors, communication, and social interaction.	36 months - 22 years	Can be used by Professional, Teacher and Parent. Includes Parent Report.

Modified Checklist for Autism in Toddlers (M-CHAT)	A 23 item screening tool with a yes/no format. Can be completed by parents or professionals by interview; direct observation of the child is not required. Items include questions like, “Does your child take an interest in other children?” and “Does your child respond to his/her name when you call?” Screening failure should trigger a comprehensive developmental evaluation and does not imply autism diagnosis. The M-CHAT is a “level one” screening tool that can be used with all children as part of developmental surveillance and screening in pediatric primary care. It is available as a free download. Time: 10 minutes to complete	Areas include pretend play, communication (proto-declarative pointing, auditory responsiveness), eye contact, responsiveness, sensory sensitivity, and self-stimulatory behavior.	16 months - 30 months. Target is 24 months	Parent Report
Pervasive Developmental Disorders Screening Test-II (PDD-ST II)	Designed to screen for autistic spectrum disorder with 23 questions divided into two age brackets (asking about signs of a possible problem first noticed when the child was 12-18 months old and those first noticed at 18-24 months). Sample questions are, “Had anyone expressed concern that your baby might have a hearing loss?” and “At times did you feel that your baby didn’t care if you were there or not?” Time: 10-15 minutes to complete and 5 minutes to score	Questions ask about the child’s awareness of and relationship to others, stereotypical and self-stimulatory behaviors, sensory responsiveness, play behavior, proto-declarative pointing, adaptation to change, communication.	12 months - 60 months	Parent Report
Social Communication Questionnaire (SCQ), formerly known as the Autism Screening Questionnaire	Screens for autism spectrum disorders by focusing on communication skills and social functioning. Consists of 40 yes/no questions and takes 10 minutes to complete. The “Lifetime” version asks about the child’s developmental history; the “Current” version focuses on behavior during the previous three months. Both are filled out at the first screening. It is useful as a first level autism spectrum disorder screening tool. Time: 5-10 minutes to complete	The screening focuses on the child’s body movements, use of language or gestures, and style of interacting.	48 months and older	Parent Report

Table 6: SCREENING TOOLS FOR PRESCHOOL AGE CHILDREN

Note: Other tools suitable for screening preschool age children can be found in Table 1

Name	Use	Areas Screened	Age range	How Administered
Developmental Indicators for the Assessment of Learning, Third Edition (DIAL-3)	The DIAL-3 is a norm-referenced developmental screening instrument intended to identify preschool and young school aged children who need of further developmental assessment. Specific test items include catching, jumping, hopping, building with blocks, cutting, copying shapes and letters; answering simple questions, naming or identifying objects and actions; and pointing to named body parts, naming or identifying colors, counting. It is recommended for use in Head Start Programs. Available in Spanish. Time: The DIAL-3 takes 20-30 minutes to administer. An abbreviated version, the Speed-DIAL, can be completed in 15-20 minutes	Screens functioning in the motor (gross and fine), language (expressive and receptive), cognitive domains with test items, and self-help (adaptive) and social development screened with a parent questionnaire.	36 months - 83 months	Direct With Child and Parent Report
FirstSTEP Screening Test for Evaluating Preschoolers	A norm-referenced screening tool designed to identify children at risk of cognitive delay who should be referred for developmental evaluation. There are 12 subtests organized in 3 domains of 4 subtests each. Not all subtest items need be presented, item selection being based on the child's age. Available in Spanish. Time: 15 minutes to administer	Subtests cover cognitive, communication, and motor domains. Also includes a social-emotional scale and adaptive behavior functioning checklist completed by report.	33 months - 74 months	Direct With Child and Parent or Teacher Report

Pediatric Symptom Checklist (PSC) and Youth Pediatric Symptom Checklist (Y-PSC) for age 11 and older.	Psychosocial screening instrument for cognitive, emotional and behavioral problems. Comprised of 35 items with different cut-off scores for preschool and school-age children. Intended to facilitate early intervention for identified problems. Part of the American Academy of Pediatrics Bright Futures best-practice protocols for use in pediatric primary care. Available in Spanish. Time: Approximately 5 minutes to administer plus 2 minutes to score	Areas screened include somatic concerns, fearfulness, mood, school problems, attention, and peer relations.	48 months - 16 years	Parent Report or Self-Report (age 11+)
Pediatric Intake Form, also called Family Psychosocial Screen	Part of the Bright Futures protocols recommended for developmental surveillance and screening by the American Academy of Pediatrics. Intended to provide the primary care provider with information about family history, current functioning, concerns. Identifies parents who need mental health referral and children at risk of developmental delay who should be further assessed. Suitable for use in low-literacy populations. Time: Approximately 15 minutes if completed independently	Parental depression, substance use, history of abuse, and current domestic violence and social supports.	For incoming pediatric patients of any age	Parent Report

Table 7: MENTAL HEALTH SCREENING TOOLS**NOTE: Some of these may be also used with older children**

Name	Use	Areas Screened	Age range	How Administered
Achenbach System of Empirically Based Assessment (ASEBA) formerly Achenbach Child Behavior Checklist (CBCL)	Norm-referenced instrument. There are sets of forms for preschool age (18 months to 5 years) and school-age children (6-18 years). There are Child Behavior Checklists (CBCL) for each age group. The preschool set includes a caregiver-teacher report form; the school-age set includes a teacher report form and a self-report form for ages 11-18. Incorporates the Language Development Survey (LDS) for ages 18-35 months. The forms are long; for example, the parent and teacher report forms for 18 months to 5 years contains 99 items. Time: 20-30 minutes to administer	ASEBA forms yield results consistent with these DSM-IV diagnoses: Affective and anxiety disorders, somatic problems, attention deficit disorder; oppositional-defiant disorder and conduct disorder.	18 months - 18 years	Parent Report, Teacher Report, and Self-Report depending on child's age
Behavioral and Emotional Screening System (BESS); Behavioral Assessment System for Children, Second Edition (BASC-2)	The BESS is a norm-referenced behavioral questionnaire comprised of items drawn from the BASC-2. It uses parent and teacher report supplemented as age and developmentally appropriate by child self-report. The BESS focuses on the child's problem behavior and strengths. The 3 forms range from 25-30 items requiring response on a 4-point Likert scale ("never-sometimes-often-almost always"). The parent and teacher forms are written at the 6th grade level and the child self-report form is at the 2nd grade level. Children who screen positive on the BESS may be further assessed using the BASC-2. The parent and student forms are available in Spanish. Time: Approximately 10 minutes to administer and subsequently must be scored by a qualified professional	Scales assess hyperactivity, aggressive behavior, anxiety, depression, communication and social skills, attention, learning.	36 months - 17 years	Parent Report, Teacher Report, and Self-Report depending on child's age

Conners Rating Scales-Revised (CRS-R)	Norm-referenced screening and assessment forms to identify symptoms of attention deficit hyperactivity disorder and other problem behavior. Written at 6th to 9th grade level depending on version. The long forms correspond to the DSM-IV diagnostic criteria for ADHD. Time: Available in long (15-20 minutes to complete) and short (5-10 minutes to complete) versions	Assessment of ADHD with subscales useful for assessment of conduct problems, cognitive problems, family problems, emotional, anger control and anxiety problems	36 months - 17 years for caregiver and teacher report, 12 years - 17 years for self-report	Parent Report, Teacher Report, Self-Report
Devereux Early Childhood Assessment (DECA)	A norm-referenced 37 item strength-based assessment of Protective Factors (27 items) and Behavioral Concerns (10 items). The Protective Factors Scale was based on a “within-child” resilience model; the Behavioral Concern Scale was derived from the Devereux Scales of Mental Disorders. The screening results are intended to be used to develop strategies at home and school to strengthen the child’s protective factors and foster optimal social-emotional development. Developed as a low-literacy tool. Time: 5-10 minutes to administer with subsequent scoring by a qualified professional	Protective Factors subscales: initiative, self-control, attachment. Behavioral Concerns subscales: attention, aggression, emotional control, withdrawal/depression.	24 months - 60 months	Parent Report and Teacher Report
Eyberg Child Behavior Inventory	Norm-referenced screener for indicators of disruptive behavior problems at home and school. It measures the frequency of specific problematic behaviors and has a scale which reflects the impact of the problem (tolerance, stress) on the parent and/or teacher. Comprised of 36 items for response on a Likert scale. The items reflect the behaviors most frequently reported as problem by parents and teachers. Written at the 6th grade level. . Available in Spanish. Time: 10 minutes to complete and score	Has two scales: Intensity (severity of disruptive behavior) and Problem (parent perception of child’s behavior) and a 3-factor structure: Inattentive, Oppositional Defiant, and Conduct Problem Behavior.	24 months - 16 years	Parent Report

Parenting Stress Index, 3 rd Edition (PSI)	A 120-item parent report test designed to screen for parent-child problems and family problems including risk of child maltreatment. The focus is on identifying family environments that are not conducive to optimal child development. Can be used with parents of children of any age, including newborns. Time: 20-30 minutes to administer	May identify children with emotional and behavioral problems, dysfunctional family characteristics, and families that need supportive intervention.	Parents of any age child	Parent Report. Should be administered by a health or mental health professional.
Spence Anxiety Scales	There are different scales of preschool (parent report, 28 items plus an open-ended question about potential traumatic events which may trigger 5 additional items). The children's scale (SCAS) is has two forms, self-report and parent- report, with 39 items. It may be used with adolescents as well. The literacy requirements are low (e.g., "I am scared of the dark" and "I worry about being away from my parents"). Responses are on a 4 point scale ("never, sometimes, often, always"). Forms may be downloaded for free. Available in Spanish. Time: Approximately 10 minutes to administer	The SCAS measures generalized anxiety, panic/agoraphobia, social phobia, separation anxiety, obsessive compulsive disorder and physical injury fears.	30 months - 15 years	Parent Report or Self-Report

Additional Sources Consulted

Multiple sources of information were used to identify screening tests for inclusion and to describe these tests. As is typical when many sources are consulted, considerable contradictory information became available. We used our best judgment in sorting this out and take responsibility for any errors that may have resulted. In addition to the sources cited below, we used online information from test publishers and distributors, test reviews in *Buros Mental Measurement Yearbooks*, and articles describing specific tests' psychometric properties published in peer reviewed journals, to the extent they were available.

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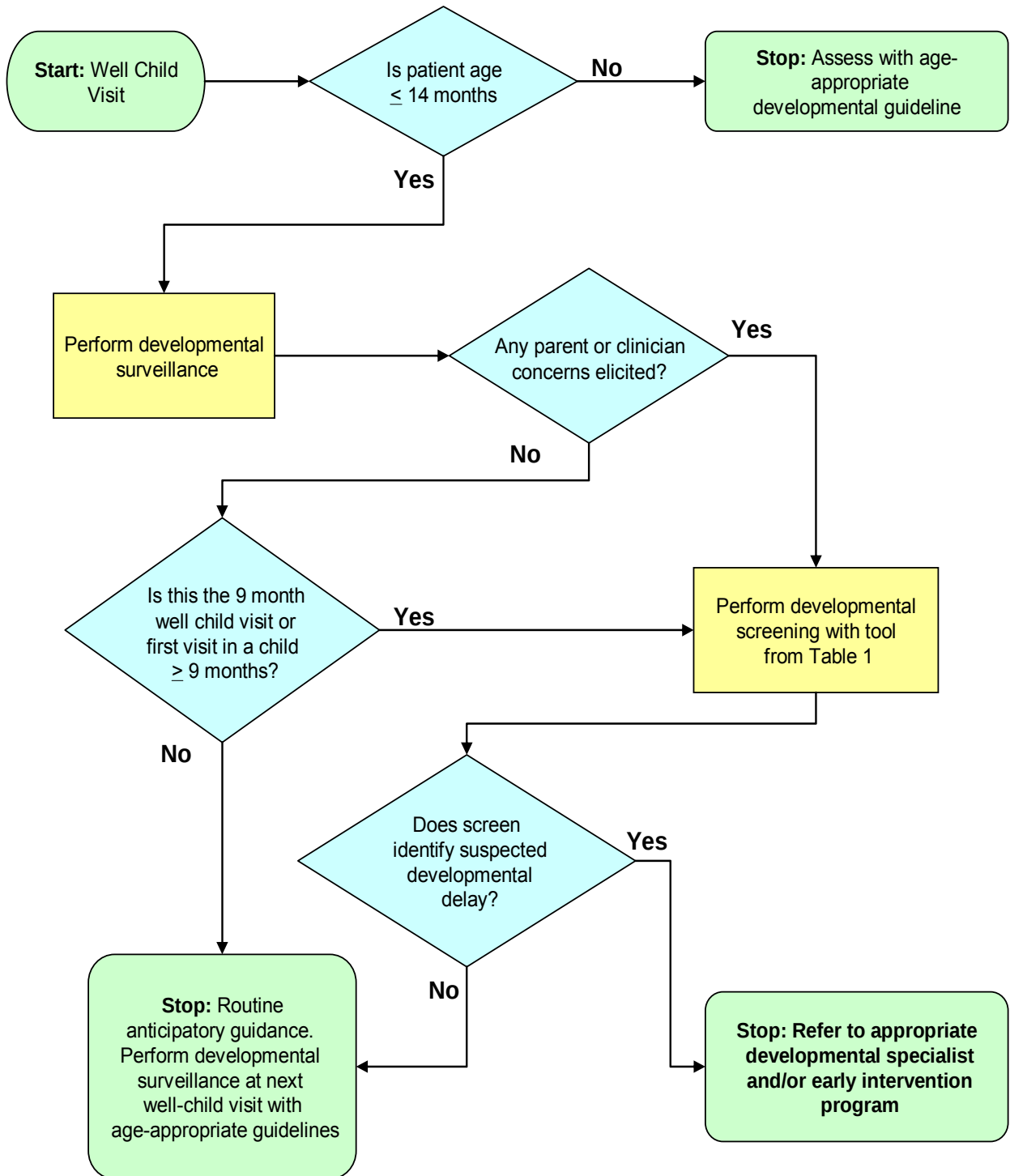
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APPENDIX 1: LOGIC MODELS

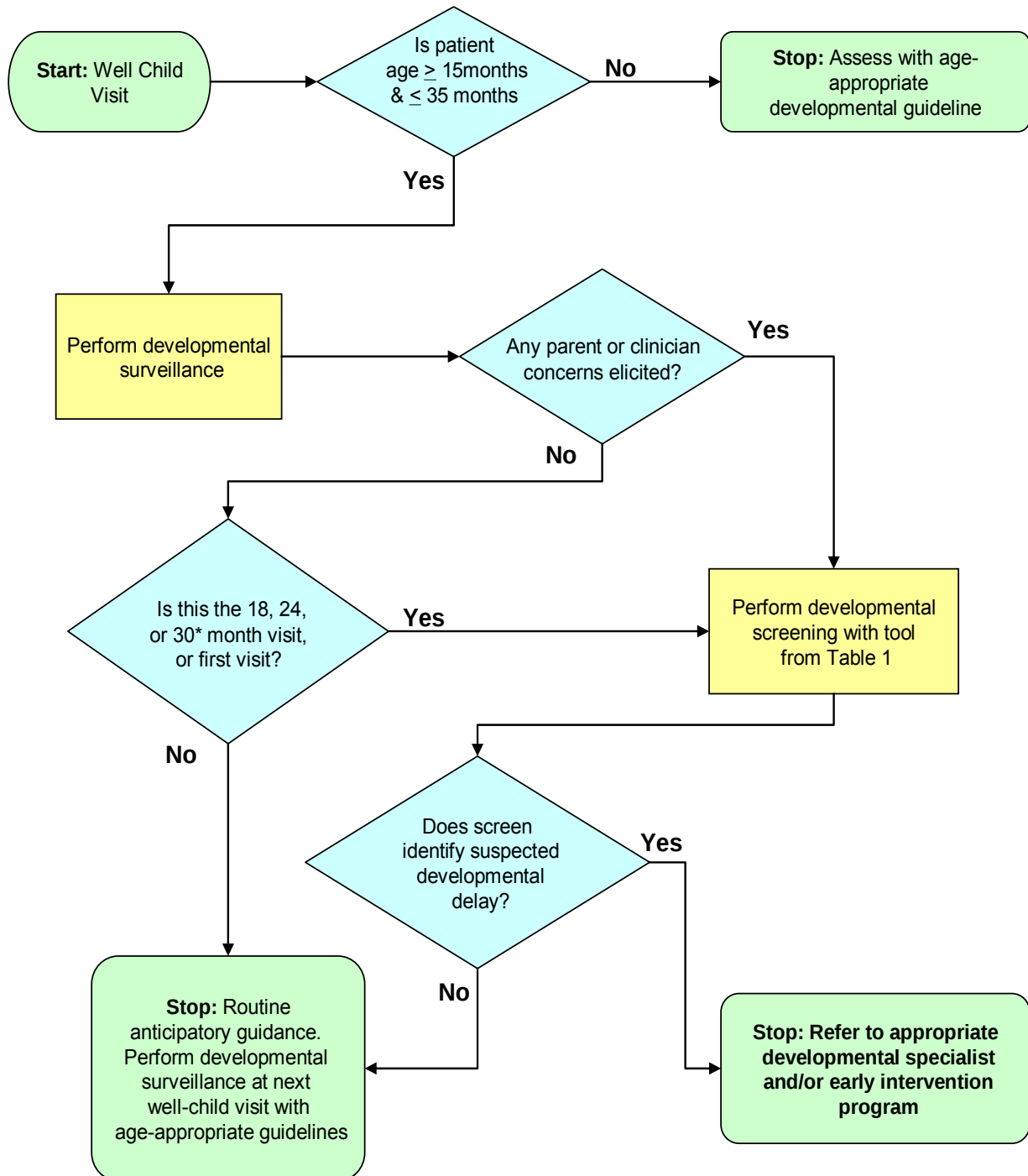
Introduction

In addition to understanding which standardized developmental screening tools are recommended for use in primary pediatric practice, it is also important to understand how the screening process, coupled with surveillance and referral, fits into the normal schedule of pediatric well child appointments. For this purpose, Children's Health Fund has adapted logic models from the AAP recommended screening protocols for pediatric populations at high social risk to reflect the surveillance and screening needs of children at increased risk of developmental delay. Because of this risk and potential for loss to follow-up, at times we may recommend earlier and more frequent formal developmental screening. Though beyond the scope of the logic models represented in this document, we encourage a comprehensive screening protocol that includes formal and aggressive perceptual screening and lead testing.

Developmental Screen: Birth to ≤ 14 Months

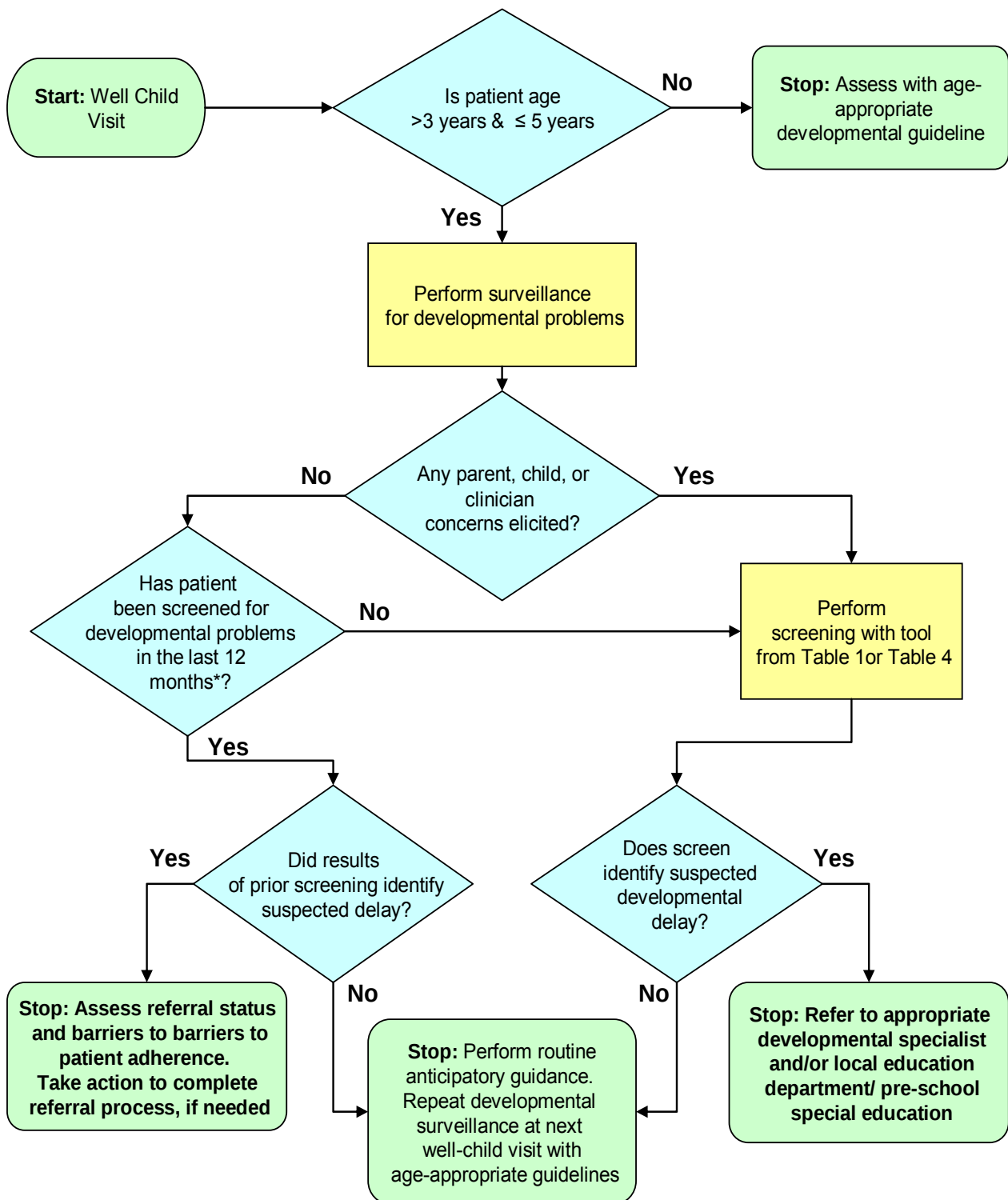


Developmental Screen: 15 to $\leq$ 35 Months



Editors: Delaney Gracy, MD, MPH, Roy Grant, MA, Arturo Brito, MD, MPH, Tanesha Lawrence, MD, Grace Matthew, LMSW
Originally prepared by Sarah Overholt, MA & Clare Stone, MPH. Revised 10/2010

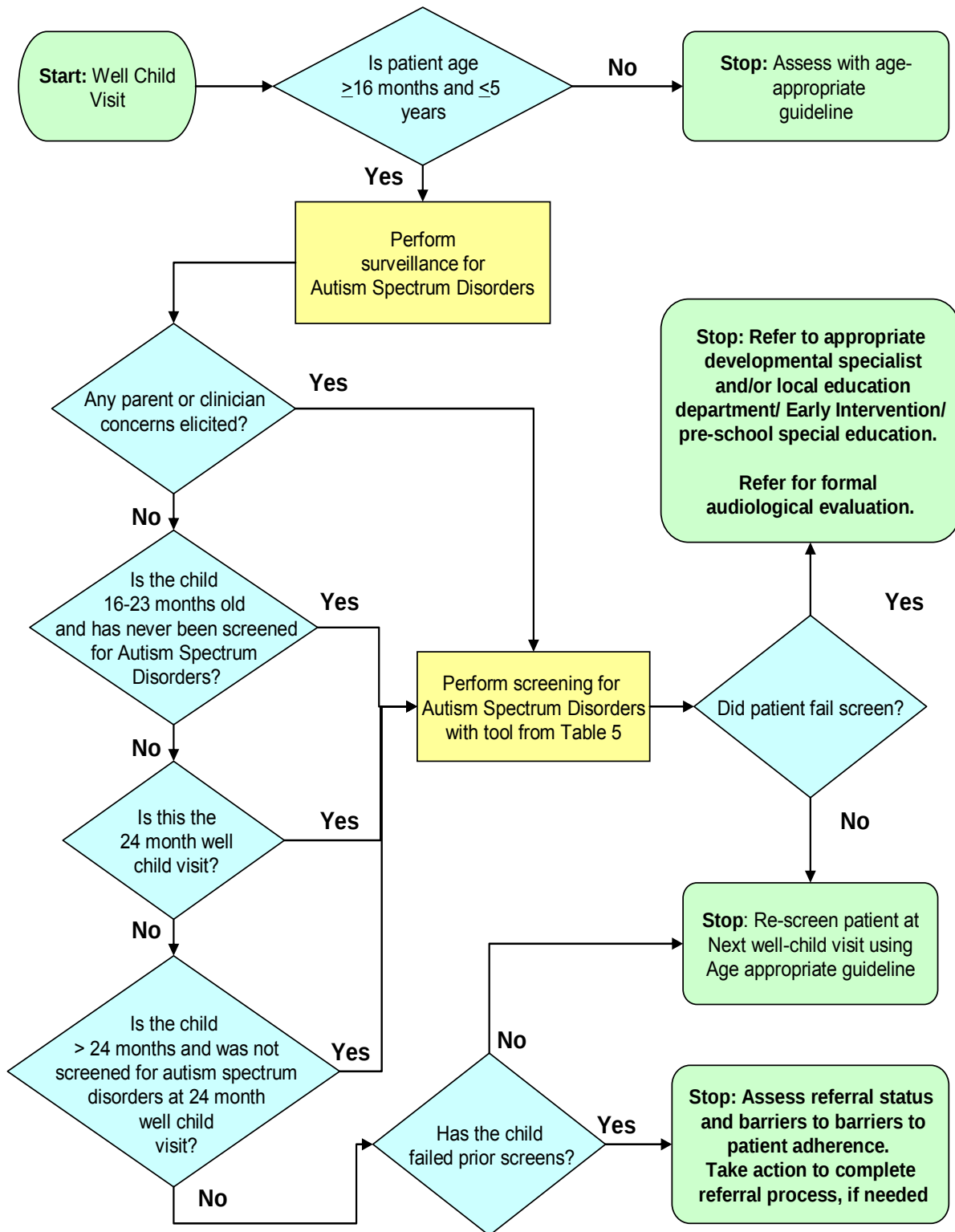
Developmental Screen: 3 to ≤5 Years



*For high risk patients, consider screening every 6 months

Editors: Delaney Gracy, MD, MPH, Tanesha Lawrence, MD, Andrea Tinio, MD, Grace Matthew, LMSW, Roy Grant, MA, Arturo Brito, MD, MPH. Originally prepared by Sarah Overholt, MA & Clare Stone, MPH. Revised 10/2010

Autism Spectrum Disorders Screen: ≥ 16 Months and ≤ 5 Years



Authors: Delaney Gracy, MD, MPH, Natalie Langston-Davis, MD, Grace Matthew, LMSW, Roy Grant, MA, & Arturo Brito, MD, MPH. Originally prepared by Sarah Overholt, MA. Revised 10/2010.

APPENDIX 2: BILLING CODES FOR DEVELOPMENTAL SCREENING AND TESTING

Adapted from: American Academy of Pediatrics. Developmental Screening/Testing Coding Fact Sheet for Primary Care Pediatricians
Online at: <http://www.cdc.gov/ncbddd/child/documents/AAP%20Coding%20Fact%20Sheet%20for%20Primary%20Care.pdf>

For developmental screening the **CPT code 96110** (Developmental testing, limited) is recommended. This code can be used for developmental screening using a standardized instrument whether parent-report (PEDS, ASQ) or directly administered (Brigance or Battelle Screens). It is not necessary that the pediatrician administer the screening. This is reflected in the low 2005 relative value unit (RVU) of 0.36. For older children, the Pediatric Symptom Checklist can be a billable screening using this CPT code.

This code is typically used when formal screening is done during a preventive (well) visit. There is no limit on how many times, or how frequently, developmental screening is done and billed. This is at the discretion of the primary care provider. The code may be combined with a V20.2 ICD-code (Routine infant or child health check) or it can be used at a follow-up visit specifically for developmental screening.

If only developmental surveillance (developmental history taking and asking questions about milestones and concern) is done, the activity is part of the well visit/anticipatory guidance and is not separately billable.

For more extensive developmental testing **CPT code 96111**: (Developmental testing, extended) is recommended. This code should be used when a more time consuming test (frequently taking an hour or longer to administer) that requires a higher level of expertise is performed. These tests may be done by the primary pediatric provider or another appropriately trained health professional, e.g., a licensed psychologist. This code is appropriate when tests like the Bayley Scales of Infant Development or the Peabody Picture Vocabulary Test (PPVT) are administered. It is not necessary that a comprehensive developmental assessment be done, only that an appropriate testing instrument be used. The 2005 RVU is 3.83.