

Developmental Screening at 4-6 months

Developmental Screening at 4-6 Months: Red flags, snags and more

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Developmental Screening at 4-6 Months

- ▶ Thank you:
 - ▶ Acknowledge Biripi elders, past, present and future
 - ▶ Ministry of Children & Family Development
 - ▶ The families and colleagues who agreed to share their stories
- ▶ Context:
 - ▶ As a young therapist...

Developmental Screening at 4-6 Months

- ▶ Introduction: Key points to consider/ further learning
 - ▶ Have your goal in sight
 - ▶ What do you wish to achieve?
 - ▶ What is and isn't SCREENING
 - ▶ Keep supports top of your list
 - ▶ What are parent's thinking?
 - ▶ Answer just the question asked
 - ▶ Get it right: the challenge of sensitivity and specificity
 - ▶ Now choose your test
 - ▶ Red flags, Snags and more....
- ▶ 'The universe is full of magical things patiently waiting for our wits to grow sharper' *Eden Philpotts*

Developmental Screening at 4-6 months

Have your goal in sight

- ▶ WHAT IS Your Goal?
 - ▶ Community support of typical development?
 - ▶ Identifying Infants at Risk?
 - ▶ Monitoring infants who have had a difficult start?

What do you wish to achieve?

- ▶ Change the child?
 - ▶ Although 'plasticity' now accepted (Fox, 2015)
 - ▶ Cannot cure Developmental Disability
- ▶ Change their environment? (Morgan et al. 2013)
 - ▶ Support families
 - ▶ Understand their child
 - ▶ Understand what difference might mean
 - ▶ Create empathy:
 - ▶ The child's point of view



Screening IS:

- ▶ "a flexible, continuous process in which knowledgeable professionals perform skilled observations of children during child health care" (Dworkin, 2004)
- ▶ A first look at a 'normal' population (Meisels, Provence 1996)

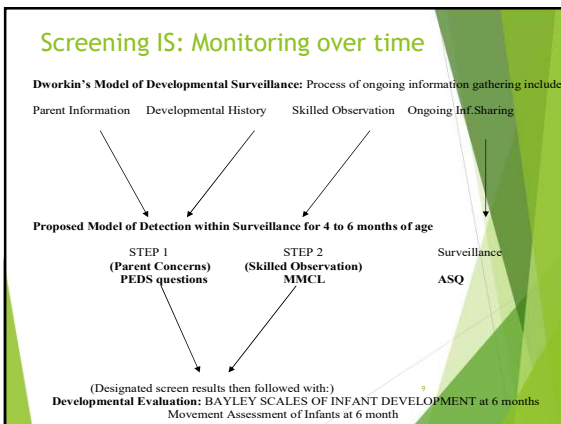
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Screening IS

- ▶ Principles (Meisels, Provence 1996)
 - ▶ Select Condition during asymptomatic stage to change outcomes
 - ▶ Quick and Easy
 - ▶ Acceptable
 - ▶ Objectively Scored
 - ▶ Broad Developmental Focus
 - ▶ Efficient Test:
 - ▶ Reliable and Valid
 - ▶ Sensitive and Specific

Screening IS:

- ▶ Surveillance versus detection (Dworkin, 2004)
 - ▶ Monitoring over time versus one 'test'
- ▶ Four Components of Surveillance (Dworkin, 1993)
 - ▶ Parent Information
 - ▶ Developmental History
 - ▶ 'Skilled Observation'
 - ▶ Ongoing information sharing



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Policy Recommendations

- ▶ US: IDEA 1997 Part C mandate
 - ▶ Public Law 99-457
 - ▶ 303.165 Comprehensive ChildFind: Procedures.. That all infants who are eligible for services are *identified...that effective methods for making referral from primary referral sources*
 - ▶ Should identify 1% of all children
 - ▶ US Preventative Care taskforce recommends 9 Months
- ▶ CANADA: Mandate for well child visits (Williams, 2016)
 - ▶ All visits: screen if parent concerns
 - ▶ Recommends universal starts at 18 month visit
 - ▶ Plea to start earlier (Harris, 2016)

Developmental Screening is NOT:

- ▶ Evaluation: detailed, comprehensive, expensive, only if indicated
- ▶ Assessment: summary, based on evidence, filtered through clinical judgment and experience
- ▶ Both require years of skilled training
 - ▶ A valued role for therapists

Keep 'supports' top of the list

- ▶ **Early Intervention disrupts the disablement process** (Pelletier 2002)
 - ▶ Based WHO model of impairments, disability, handicaps
- ▶ Review: recognizes enough evidence for positives of screening (Noritz et al 2013)
- ▶ Improves family functioning (Olds et al 1997)
 - ▶ Improves adaptive behaviors (Reynolds et al 2001)

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Keep 'supports' top of the list

- ▶ Estimate 15-18% of children could benefit from early intervention (Boyle, 2011)
- ▶ Only 1-6% of children identified in routine developmental surveillance (Lindstrom, 1997)
- ▶ 30%-50% of children reach kindergarten without identification (Glascoe, 2003)
- ▶ As many as 60% with Autism not identified before school age (Filipek et al. 2000)

Keep 'supports' top of the list

Children who have received early intervention:

- ▶ Improved school matriculation rates (Reynolds et al., 2001)
- ▶ Increased age to childbearing (Olds et al., 1997)
- ▶ Decreases criminal behavior (Reynolds et al., 2001)

What are Parents thinking?

- ▶ Parent Information (Glascoe, 2001)
- ▶ Parent Appraisals:
 - ▶ Estimations: 'How child compares to others of same age': Valid
 - ▶ Predictions: Future performance: Not valid
 - ▶ Concerns: Specific worded questions: Valid
- ▶ Parent Descriptions:
 - ▶ Recall: Past events: Not valid
 - ▶ Descriptions Current skills: Valid if specific wording

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What are Parents thinking?

- ▶ Parent Concerns:
 - ▶ Accurate if doing well 90-95% specific (Harris, 1994)
 - ▶ Over refers 300%
 - ▶ Concern of parents as PRESSCREEN
 - ▶ 10 questions PEDS (Glascoe, 2003)
 - ▶ Ages 0-8
 - ▶ Increases sensitivity of step two (Meisels, 1989)
 - ▶ High Risk:
 - ▶ Not sensitive developmental 'problem' (Rogers, 1992)

Answer just the question asked

- ▶ Understanding the Infant's efforts: The newborn period
 - ▶ Parents and 'the fussy baby'
 - ▶ Normal crying curve peaks 6 weeks (Barr, 1998)
 - ▶ Traditional cultures swaddle; no peak crying

Supporting Development

- ▶ Understanding the Infant's efforts: The newborn period
 - ▶ Questions to ask:
 - ▶ Is crying specific time of day?
 - ▶ Can I live with it? Can my family?
 - ▶ How do I feel about 'carrying' (Barr, 1998)



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Supporting Parents

- ▶ IDEAS for calming
 - ▶ Know your infants signals
 - ▶ Squiggling, frowning, knit eyebrows, hiccups
 - ▶ Reduce Stimulation
 - ▶ Rest time, routines
 - ▶ Meade, 2014



Supporting Parents

- ▶ IDEAS for calming
 - ▶ Start early rather than later
 - ▶ Look for early changes in signals
 - ▶ Support relaxation of the body
 - ▶ Sucking, 'curled in', swaddling, relaxation bath
 - ▶ Dolby et al 2014



Supporting Development

- ▶ Awareness of Development 4-6 months
 - ▶ Tasks of the infant
 - ▶ Information with the eyes, hands, sounds
 - ▶ Tasks for the parents
 - ▶ Allow the infant to take 'risks'
 - ▶ May loose it with overstimulation
 - ▶ Education: Anticipatory Guidance



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A story: Supporting Development

- ▶ Awareness of Development 4-6 months
 - ▶ Education with the screening process
 - ▶ Video training (MMCL parent film)
 - ▶ Most common questions: Book
 - ▶ "Helping Babies Help Themselves"
 - ▶ Using the book to assist parents

Get it Right: The Challenge

- ▶ Different examiners get the same results:
 - ▶ 'A test cannot be valid if it is NOT reliable'
- ▶ Reliable tests
 - ▶ Need to provide training protocols
 - ▶ Items clear, concise, user friendly
 - ▶ Directions should be clear and concise
 - ▶ Need to establish minimum levels
 - ▶ Talk in the same language for parents
 - ▶ Education is the 'key'

Get it Right: The Challenge

- ▶ Validity: The test measures what you want it to measure
 - ▶ A test can only be valid if RELIABLE!
- ▶ Sensitivity
 - ▶ Ability of the test to correctly identify children needing further evaluation
- ▶ Specificity
 - ▶ Ability of the test to exclude children who are normal
- ▶ Relationship: INVERSE
 - ▶ Example: Denver II (Glascoe 1992)
 - ▶ Abnormal: Sensitivity 83%/ Specificity 43%
 - ▶ Questionable: Sensitivity 56%/Specificity 80%

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Get it Right: The Challenge

True Positive	a	b	False Positive
<i>Positive Predictive Value</i> $a / a+b$			
False Negative	c	d	True Negative
<i>Sensitivity</i> $a/a+c$		<i>Specificity</i> $d/b+d$	

Now choose your test...

- ▶ 1. Tests which elicit behaviors
 - ▶ Denver Developmental Screening Test
- ▶ 2. Tests which elicit parent information
 - ▶ Parent Evaluation of Development (PEDS)
 - ▶ Ages and Stages Parent Questionnaires
- ▶ 3. Tests which Use skilled observation
 - ▶ Two structured tests
 - ▶ General Movements (GM's)
 - ▶ Meade Movement Checklist (MMCL)
- ▶ 4. Tests specific for Autism
 - ▶ CHAT and M-CHAT

Now choose your test

Test	Type of Test	Level Of Screen	Age	Sensitivity/Specificity
1. Denver II	Elicited Behaviors	Primary (for all)	9 to 8 years	56-83%/ 43-80%
2. Battelle	Elicited Behaviors	"	0-90 months	70% to 80%
3. BINSS	Elicited Behaviors	"	3-24 months	75% to 86% across ages
4. Brigance	Elicited Behaviors	"	0-8 years	70% to 82% across ages
5. FineStep	Elicited Behaviors	Secondary	2yrs 9mo to 6 yrs 2 mo	Correlation Wechsler .82
6. PEDS	Parent Concerns	Primary	0-8yrs	74-79%/ 70-80%
7. Ages & Stages	Parent Description	"	4,6,8,10,12,14,16,18,20,22, 24,30,33,36,42,48,54, 60	70-80%/76-91%
8. MCHAT	Parent Desc	Primary		
9. Meade MMCL	Observation Mvt	Primary	10 weeks to 24 weeks	88-89%/ 94-97%
10. AIMS	Observation Mvt	Secondary (for High Risk)	0-18 months	8mo 77.8% 8mo: 86-93%
11. MAI	Observation Elicited Mvt	"	4,8 months	67% sensitive 93% specific
12. General Movements GMs	Observation of Movement	Tertiary (skilled evaluation)	0 to 20 weeks	84.5% 82-100 (3mo) increased by age

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Now choose your test

- ▶ 1. Elicited Behaviors
 - ▶ Traditional- tummy, sit, crawl, walk
 - ▶ Study 1992 evaluated Denver 3-72mo. (Glascoe, 1994)
 - ▶ Selected only 10 of 18 known disabilities
 - ▶ Positive Predictive value 43%
 - ▶ 'Anything other than' DDST recommended (AAP guidelines 2001)
 - ▶ Good general screens: Battelle, BINNS, Brigance

Now choose your test

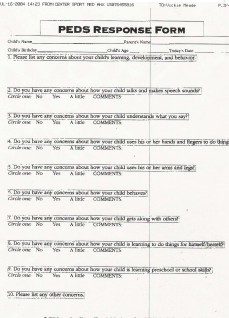
2. Parent Information

Parent Evaluation of Development Valid and Reliable (Glascoe, 2003)

Used alone

Over refers by 300% (Glascoe, 2001)

Increases sensitivity of step two (Meisels, 1989)



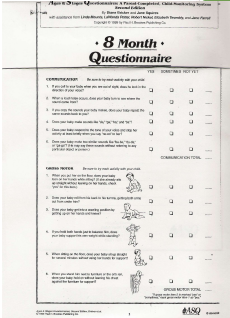
The image shows a 'PEDS RESPONSE FORM' with several numbered questions about a child's development, such as 'Does your child babble?', 'Does your child play with blocks?', etc. Each question has 'Yes' and 'No' checkboxes.

Now choose your test

2. Parent Information

Parent Descriptions accurate

Parents are good observers and reporters; they just might not know what it means



The image shows an '8 Month Questionnaire' with a table of questions and checkboxes. Questions include 'Does your child babble?', 'Does your child play with blocks?', etc.


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Now Choose your test:

- ▶ 3. Skilled Observation:
 - ▶ Clinical judgment without structure is not effective (Glascoe 1993)
 - ▶ Reliability is the challenge!
 - ▶ Structure with training can be effective
 - ▶ General Movements High Skill: 5 days
 - ▶ **MMCL: Self training video tests; 45 minutes**

Now choose your test:

- ▶ 3. Screen Using Skilled Observation
- ▶ Newborn:
 - ▶ Curled posture
 - ▶ Asymmetrical/ turned head
 - ▶ Neck extensors work to lift the head
- ▶ One Month:
 - ▶ Gravity starts to straighten flexors



Screen Using Skilled Observation

- ▶ Two Months:
 - ▶ Flexor muscles of neck
TUCK CHIN
 - ▶ Straighter body
- ▶ Three Months:
 - ▶ Flexor muscles of head: Midline
 - ▶ Hands to body
 - ▶ Eyes begin to work together
 - ▶ (Meade, 2008)



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Screen Using Skilled Observation

- ▶ Observation:
 - ▶ Four Months: Balance Flexors to Extensors
 - ▶ Flexor muscles of neck
 - ▶ chin to chest, midline
 - ▶ Hands to midline
 - ▶ Tummy muscles hold pelvic position



▶ (Meade, 2008)

Screen Using Skilled Observation

- ▶ Four Months: Balance Flexors to Extensors
 - ▶ Prone starts: stay 'short' periods
 - ▶ (SIDS guidelines have changed this)
 - ▶ Holds head as moved
 - ▶ Takes weight on legs in standing

▶ (Meade, 2008)

Screen Using Skilled Observation

- ▶ SIX months: complete balance
 - ▶ Reaches out
 - ▶ Tummy works to hold pelvis: Legs in air
 - ▶ May stay on tummy to play
 - ▶ May prefer sitting, little balance yet
 - ▶ Stronger in standing
 - ▶ Will start to roll



▶ (Meade, 2008)

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Screen Using Skilled Observation

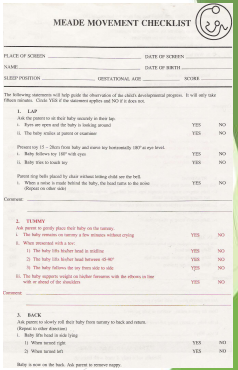
- ▶ Seven to Nine Months
 - ▶ The experimenter
 - ▶ Very unstable time to examine
 - ▶ Huge variability
 - ▶ depending on infant
- ▶ Nine to 12 Months
 - ▶ The mover
 - ▶ Once on their feet; more stable time again
 - ▶ (Meade, 2008)



Now choose your test:

Screen using Skilled Observation: MMCL

- ▶ ICC .82 (Boltjes, 2000)
- ▶ 90% agreement with standardized training
- ▶ Concurrent validity to MAI $r = .75$ $p = .0001$
- ▶ Predictive validity BSID II $r = .62$ $p = .0001$ (Meade, 1987)
- ▶ Sensitivity: 77.7% (2009)
- ▶ Specificity: 88.2% (2009)
- ▶ Standardized 447 Australian infants
- ▶ Normalization: 998 Australian infants
- ▶ VIDEO



Now Choose your test:

- ▶ Infant Evaluations
 - ▶ Require more training and skill
 - ▶ General Movements (Prechtel, 2004)
 - ▶ Available from 0-20 weeks
 - ▶ Sensitivity/Specificity to Cerebral Palsy
 - ▶ at 3 months 94.5% and 82-100%
 - ▶ Movement Assessment of Infants (Chandler et al 1980)
 - ▶ Best predictor of Cerebral Palsy
 - ▶ > 9 risk; 94% specific (Swanson et al 1992)
 - ▶ MAC to 24 months (Chandler et al 2017)
 - ▶ Alberta Infant Motor Scales
 - ▶ Sensitivity/Specificity 4 mo: 77/82
 - ▶ Sensitivity/Specificity 8 mo: 86/93 with second time period (Piper, Darrah 1994)

Developmental Screening at 4-6 months

Meade Movement Checklist (Meade et al 2009)

- ▶ Targeting a group of infants whose parents had concerns
 - ▶ Choice to attend clinics
 - ▶ 'Ruled out' normal children
- ▶ Combining two tests
 - ▶ Measuring parent concerns (Modified Peds-6 questions)
 - ▶ Skilled observation with parents (MMCL)
- ▶ Increased specificity, positive predictive value
- ▶ Predicted by research gurus
 - ▶ Portney and Watkins (2000)

MMCL (Meade et al 2009)

- ▶ 213 eligible infants invited
 - ▶ 7.04% of the total population invited (213).
 - ▶ 25.8% (n=55) infants attended one of the clinics
- ▶ 78.2% (n=43) evaluations completed by the PI
 - ▶ 34.8% (n=15) met criteria for referral for evaluation
 - ▶ 8 met criteria for ECSE,
 - ▶ 4 for specialty medical services
 - ▶ 3 for monitor
 - ▶ (rechecked at regular intervals until age 3)

MMCL (Meade et al 2009)

- ▶ 25.8% of invited parents attended one of 5 clinics for 4-6 Month old infants
 - ▶ 27% of those screened were referred (n=15 infants)
 - ▶ 60% had concerns on modified PEDS (6 questions)
 - ▶ 33 of 55 listed one or more concerns on modified PEDS
 - ▶ 61% were FEEDING CONCERNS
 - ▶ Demographic 'risk positive' status (P=.002)
- ▶ MMCL sensitivity 77.7 %; specificity 88.2%
 - ▶ Above the acceptable range of 70-80
 - ▶ Positive Predictive Value (PPV) 70%
- ▶ 7% of the population of infants invited were referred
 - ▶ 7X the Federal mandate of 1% of infants

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MMCL Research: Parent concerns

- ▶ Parents attended Clinics to get questions answered
- ▶ Ruled out 75% of normal infants
 - ▶ Concerns were accurate: (Meade, 2012)
 - ▶ Only 1 of 40% without concerns referred based on Bayley II scores
 - ▶ 75% of those eligible for services had 3 concerns
- ▶ Not concerned about future development
 - ▶ Supported by Bailey (2004): average age concern 7mo.
 - ▶ Of those with concerns, 61 % about feeding
- ▶ Target parents with concerns
 - ▶ Allow time addressing concerns
 - ▶ More time for anticipatory guidance

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MMCL Research: Take home points

- ▶ Screening 25.8% of a birth cohort in Two steps
 - ▶ ONE: Parent concerns targeted which infants needed screen
 - ▶ Parent Choice to attend Clinics
 - ▶ Modified PEDS (PCS) of 6 questions
 - ▶ TWO: Using movement structured observation
 - ▶ Supported active parent participation
 - ▶ Supported earlier access to early intervention services
 - ▶ 27% of clinic attendees went on to service
 - ▶ Increased efficacy and use of limited resources and professional time
 - ▶ Increased PPV to 70%
- ▶ Created a model for active involvement of physical and occupational therapists

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A Story: Listen to Parents and Support the Journey

- ▶ Mitch and the changing DX
- ▶ Screened at Well baby check at 5 months
- ▶ Physio: MAI 23 pts.
- ▶ Challenges in all areas
- ▶ DX age 13 Asperger
 - ▶ Picture at Age 21
- ▶ Completed University
- ▶ Working as an engineer



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Developmental Screening at 4-6 months

Red Flags:

- ▶ To Six months: (Meade, 2018)
 - ▶ Feeding Concerns
 - ▶ No big smile
 - ▶ No Movement transitions:
 - ▶ Rolling
- ▶ www.firstsign.org
 - ▶ Pointing
 - ▶ Turning to Name
 - ▶ Looking to where adults points
- ▶ Movement challenges
 - ▶ Moving into and out of sitting

Red Flags: www.firstsign.org

Social/Communication Red Flags:
If your baby shows any of these signs, please ask your pediatrician or family practitioner for an immediate evaluation:

- No big smiles or other warm, joyful expressions by six months or thereafter
- No back-and-forth sharing of sounds, smiles, or other facial expressions by nine months or thereafter
- No babbling by 12 months
- No back-and-forth gestures, such as pointing, showing, reaching, or waving by 12 months
- No words by 16 months
- No two-word meaningful phrases (without imitating or repeating) by 24 months
- Any loss of speech or babbling or social skills at any age

"Most mothers and daddies tell me "I thought there was a problem at 14 or 15 months...and they told me let's wait and see because sometimes some kids grow out of it." Well, that's not a good answer. We've got to make the distinction between less important problems, where we can wait and see from core problems, which involve a lack of reciprocity and a lack of getting to know your world. For these core problems, we have to act on it yesterday. We can't wait nine months, we can't wait two months." (Stanley I. Greenspan, M.D., Child Psychiatrist)

SNAGS

- ▶ Universal Screening
 - ▶ Time- BIG numbers
 - ▶ Personnel
 - ▶ Community Goals are Critical
- ▶ Recommendations
 - ▶ All well child visits if parents concerned
 - ▶ Use multiple methods to gather information
 - ▶ NOT looking for problems
- ▶ The Future?
 - ▶ Universal quality child care (Urkin, 2017)

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SNAGS and more...

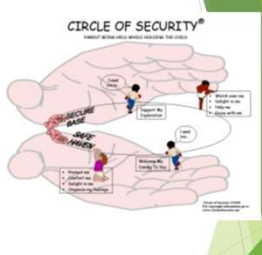
- ▶ The 'failure' dilemma
 - ▶ Can't fail a 'screening test'
- ▶ Recommendations
 - ▶ Should be a process of 'anticipatory guidance'
 - ▶ Assessment as Intervention
 - ▶ Understanding 'Well baby's' needs
 - ▶ Understanding 'Well baby' parent needs

SNAGS and More....

- ▶ Impact on the parent-infant dyad
 - ▶ Possibility of disrupting the attachment relationship
- ▶ Recommendations:
 - ▶ Power of first conversations (Marvin, 1997)
 - ▶ Parents provide a relational & regulatory base from which the infant learns
 - ▶ Focus on facilitating secure attachment and supporting the family on the journey with curiosity and surprise (model delight)

SNAGS and More....

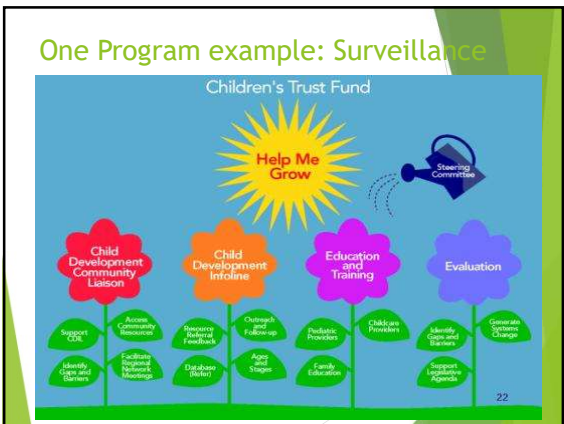
- ▶ Partner with Parents
- ▶ Within & Across disciplines:
 - ▶ Strength based
 - ▶ Provide "hands on the circle" support for families and for team members or organizations
 - ▶ Training for professional to become skilled in creating a "holding environment" for building family capacity
- ▶ www.circleofsecurityinternational.org



Developmental Screening at 4-6 months

SNAGS and More....

- ▶ Referral, followup and The 'scare' factor
 - ▶ How do you present 'the next step'?
 - ▶ 17% followup of referrals (Schoeman, 2017)
 - ▶ Need to be able to partner with families!! (Roche,2005)
- ▶ Who do you refer to? (Earls, 2015)
 - ▶ Education and information is 'empowerment'
 - ▶ Support for the 'cranky' infant
 - ▶ Support for the 'cranky' parent
 - ▶ Information for optimal development (Rahi, 2004; Johnson 2001)
 - ▶ Any 'suspect' child!
 - ▶ Partner with all intervention services



Conclusions

- ▶ Developmental Screening at 4-6 months of age
 - ▶ Consistent with policy to screen if Parent Concerns
 - ▶ Use 'skilled observation' for those infants whose parents have concerns
- ▶ Training should CERTIFY screeners at all levels
 - ▶ To ensure reliability, validity, efficiency and acceptability for medical providers and families
- ▶ Be mindful of SNAGs
 - ▶ Parents want information and partnerships

Developmental Screening at 4-6 months

Thank You!

- ▶ Get involved and help parents enjoy their journey from the very first look