Targeting Parents with Concerns Increases Efficacy of Developmental Screening for 4 Month Old Infants

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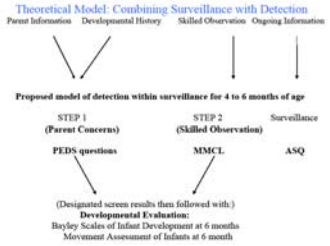
Problem: Few infants receive services

- Individuals with Disabilities Education Improvement Act (IDEA) 1997, 2004 Part C; must find eligible children
  - Only 1.8% through age 2 years receive Part C Early Intervention services (Bailey et. al. 2004)
  - 12.8% documented health care need (birth through age 17) (van Dyck et. al. 2004)
  - 30%-50% reach kindergarten without identification (Glascoe, 2003)
  - 83% physicians cite time as primary barrier to screening; 49% cite reimbursement for time (Sand et. al. 2005)
- Ages and Stages Questionnaires (ASQ) used with parents in MD offices not effective: did not meet standards of 70-80% sensitivity/specificity (Hix-Small et. al. 2007)

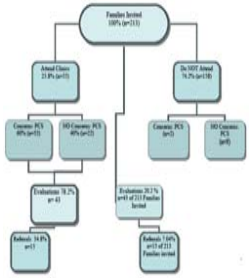
Solution: Alternative model using non-physician professionals



Purpose: Create an efficient child-find protocol to screen fewer infants and refer more for evaluation

Method:

Subjects: 213 families invited



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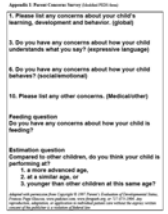
Method: Invite & survey parents (step 1); screen infants (step 2)

Step One: Parent Concerns Survey (PCS) (Glascoe ,1997, 2002)



Step Two: Meade Movement Checklist (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)
- Standardized: 447 Australian infants
- Normalization: 998 Australian infants

Data Analysis: MMCL scores compared Bayley Scales of Infant Development II (BSIDII) and Movement Assessment of Infants (MAI)I at age 6 months; ASQ at age 8 months.

Determine efficacy;

Positive predictive value (PPV) as best measure

Results:

1. Parents who chose to attend had significantly more concerns as measured on PCS. (X2=6.43, p=.011)

Sensitivity[a], specificity[b] as measured by parent concerns and parent choice to attend clinics (Group 1 and Group 2)

	# of Parents Attending Clinic	# of Parents not Attending Clinic	Total
# Parents concerned	33	2	35
# Parents not concerned	22	9	31
Total	55	11	66

[a]Sensitivity: 33/55= 60.0%
[b]Specificity 9/11= 81.8%
[c]Positive Predictive Value 33/35= 94.2%
[d]Negative Predictive Value 9/31= 27.2%

2. Targeting infants increased PPV from 32% to optimal 70%

Sensitivity[a], specificity[b] of MMCL and BSID PDI

MMCL	PDI of BSID > 1.0 SD below mean	PDI of BSID within 1SD of mean	Total
MMCL > 6 risk points	7	3	10
MMCL 6 or less risk points	1	32	33
Total	8	35	43

[a]Sensitivity = 7/8 = 87.5 %
[b]Specificity = 32/35= 91.4 %
[c]Positive Predictive Value 7/10 = 70.0 %
[d]Negative Predictive Value 32/33= 96.9%

3. Significant correlations with MMCL support its use in screening in step two: MMCL to MAI (r=.58; p=.01); to BSID II (r=.-48; p=.01).

4. 27.7% (n=15) infants referred for evaluation : 34 were 'risk positive' but 19 risk positive scored as NORMAL.

Conclusions:

- Target screening for infants whose parents have developmental concerns
- Combine two tests for an efficient model (PPV 70%)
- Exclude almost 75% of the well baby population from screening
- Save physicians' valuable time for those needing further evaluation
- Answer parent questions when problem small: 61% were feeding
- Meade Movement Checklist is a sensitive (87.5 %), specific (91.4%) screening tool for 4 to 6 month old infants
- Two step screening by non-physician health professionals can revolutionize the structure of community-based infant screening protocols

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