NICHHD National Institute of Child Health and Human Development - Neonatal Research Network

Vermont Oxford Network

Definition of NDI
Neurodevelopmental impairment

Definition of
Severe Disability

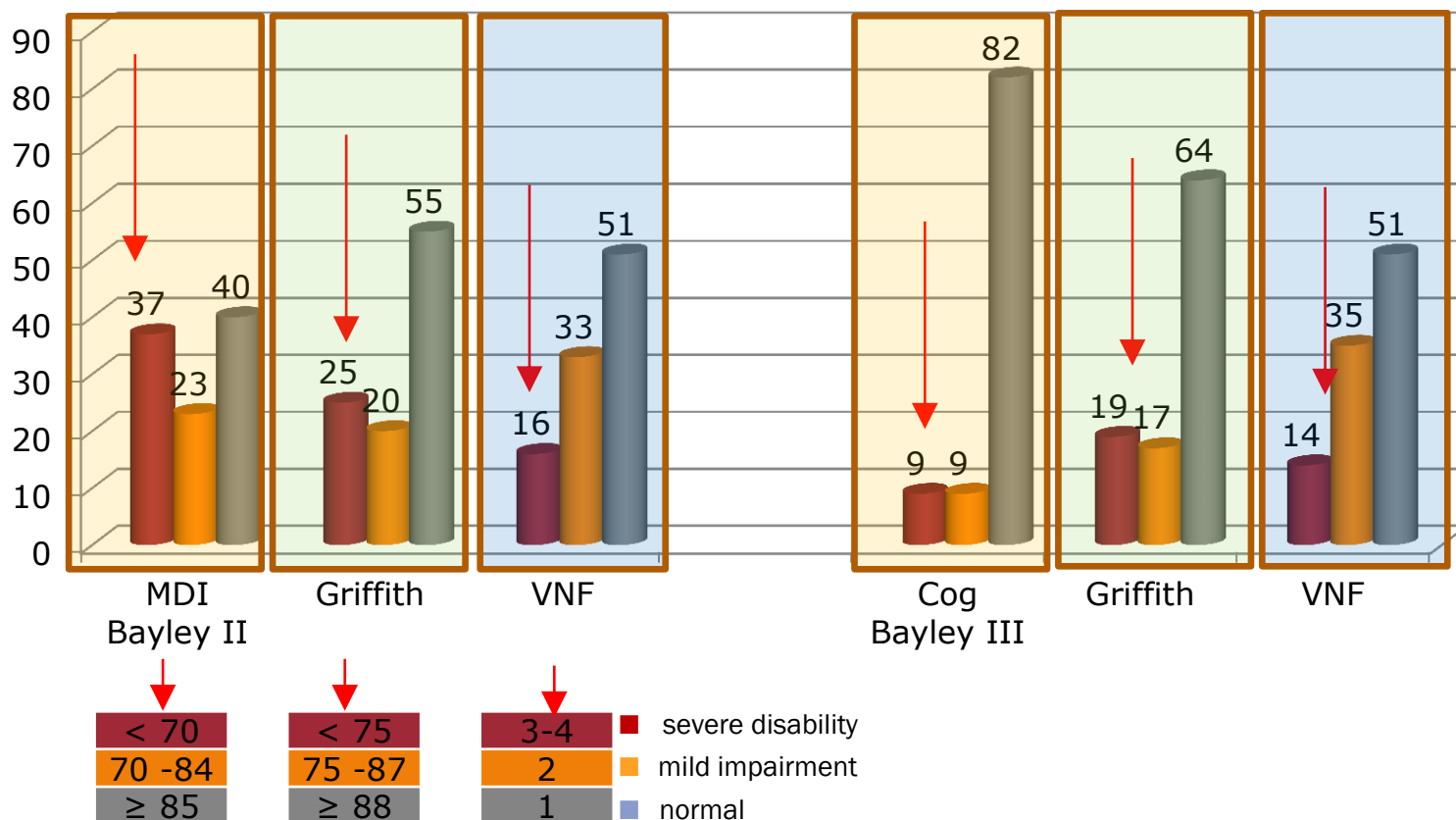| COMPONENT	Neurodevelopmental impairment (NICHHD)	Severe disability (VON)
NEUROLOGIC	Moderate to **severe CP** with GMFCS ≥2	Cerebral palsy
DEVELOPMENT	**Bayley III** cognitive score **<70**; GMFCS ≥2	**Bayley III** cognitive, language, motor **< 70**
VISION	< 1/10 bilateral	visual impairment: bilateral blindness
HEARING	The child can't understand the directions and can't communicate despite amplification with a cochlear implant or hearing aids	Hearing loss (requiring amplification)

ELBW Follow-up Mangiagalli

Confronto *a 2 anni*

1° periodo 2003-2006   vs   2° periodo 2007-2010
(98 bambini valutati con Bayley II)   (108 bambini valutati con Bayley III)

	< 70	severe disability
	70 -84	mild impairment
	≥ 85	normal

	< 75
	75 -87
	≥ 88

	3-4
	2
	1

Fondazione IRCSS Ca' Granda Ospedale Maggiore Policlinico

Are Outcomes of Extremely Preterm Infants Improving? Impact of Bayley Assessment on Outcomes

Betty R. Vohr, NICHHD (National Institute of Child Health and Human Development's Neonatal Research Network), **The Journal of Pediatrics, 2012**

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Betty R. Vohr, MD[1], Bonnie E. Stephens, MD[1], Rosemary D. Higgins, MD[2], Carla M. Bann, PhD[3], Susan R. Hintz, MD, MS Epi[4], Abhik Das, PhD[5], Jamie E. Newman, PhD, MPH[3], Myriam Peralta-Carcelen, MD, MPH[6], Kimberly Yolton, PhD[7], Anna M. Dusick, MD, FAAP[8], Patricia W. Evans, MD[9], Ricki F. Goldstein, MD[10], Richard A. Ehrenkranz, MD[11], Athina Pappas, MD[12], Ira Adams-Chapman, MD[13], Deanne E. Wilson-Costello, MD[14], Charles R. Bauer, MD[15], Anna Bodnar, MD[16], Roy J. Heyne, MD[17], Yvonne E. Vaucher, MD, MPH[18], Robert G. Dillard, MD[19], Michael J. Acarregui, MD[20], Elisabeth C. McGowan, MD[21], Gary J. Myers, MD[22], and Janell Fuller, MD[23], for the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development Neonatal Research Network*

- 2 gruppi ELBW
- *1° gruppo (n=1012)* 2006-2007 *using* Bayley II
  2° gruppo (n=1616) 2008-2010 *using* Bayley III

Table III. *Child development, motor, and neurosensory outcomes by study period*

Variable	Original samples			Matched samples		
	Period 1 (n = 1012)	Period 2 (n = 1616)	P value	Period 1 (n = 922)	Period 2 (n = 922)	P value
Development						
MDI versus Cognitive score, mean ± SD	77 ± 19	88 ± 15	**<.001**	77 ± 19	88 ± 15	<.001
MDI <70 versus Cognitive <70, n (%)	375 (37)	159 (10)	**<.001**	339 (37)	92 (10)	<.001
MDI <70 versus cognitive <75, n (%)	375 (37)	237 (15)	<.001	339 (37)	139 (15)	<.001
MDI <70 versus cognitive <80, n (%)	375 (37)	328 (20)	<.001	339 (37)	194 (21)	<.001
MDI <85 versus cognitive <85, n (%)	643 (64)	491 (30)	**<.001**	581 (63)	290 (31)	<.001
MDI <55 versus cognitive <55, n (%)	188 (19)	47 (3)	<.001	167 (18)	25 (3)	<.001
MDI <70 versus language/cognitive <70, n (%)	375 (37)	347 (21)	**<.001**	339 (37)	201 (22)	<.001
MDI <70 versus language/cognitive <80, n (%)	375 (37)	743 (46)	<.001	339 (37)	447 (49)	<.001
MDI <85 versus language/cognitive <85, n (%)	643 (64)	886 (55)	<.001	581 (63)	528 (58)	.027
Language score, mean ± SD	NA	84 ± 17	NA	N/A	83 ± 18	NA
Language score <70, n (%)	NA	312 (19)	NA	N/A	178 (20)	NA

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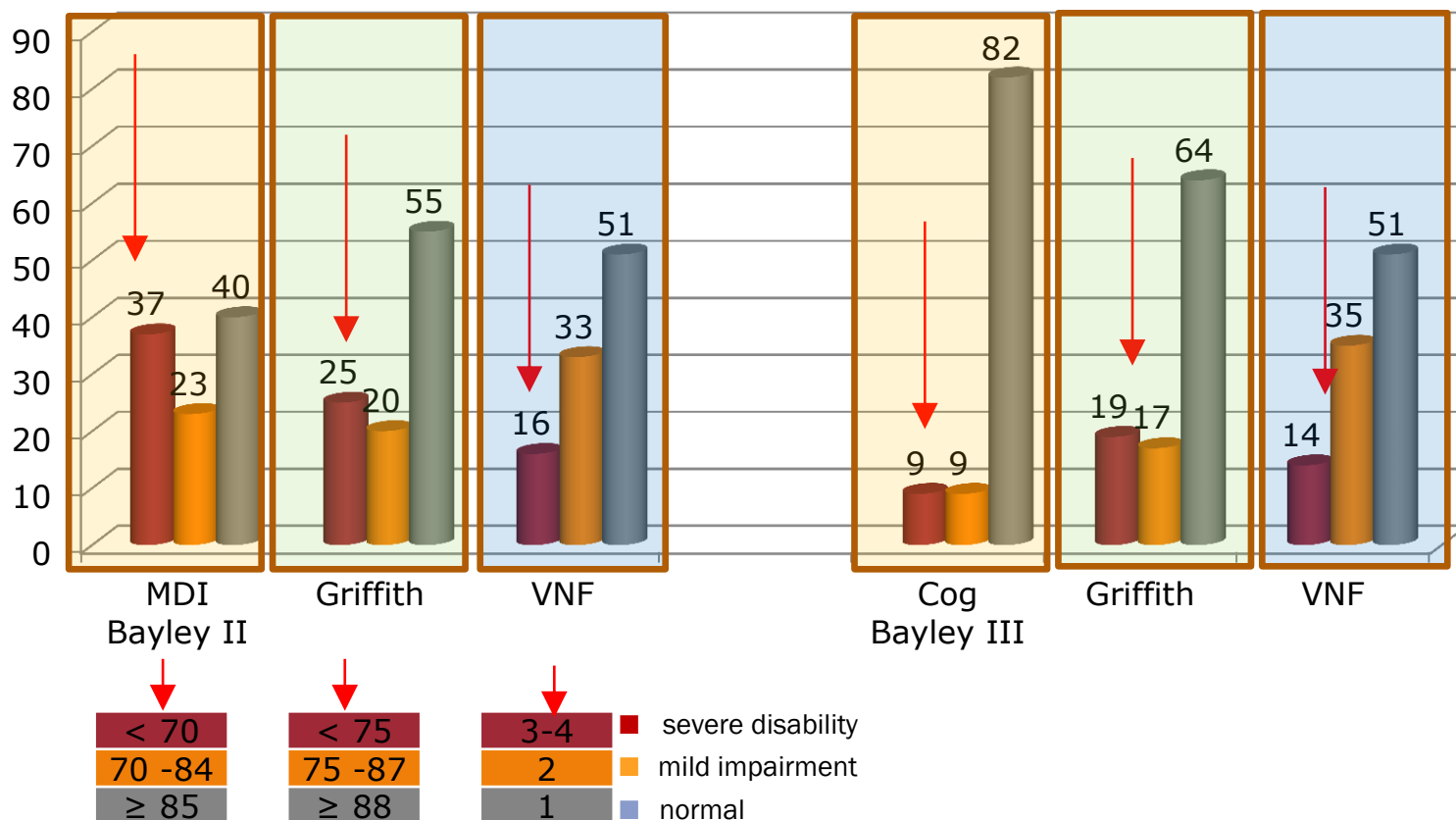| COMPONENT	Neurodevelopmental impairment (NICHHD)	Severe disability (VON)
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Betty R. Vohr, NICHHD (National Institute of Child Health and Human Development's Neonatal Research Network), **The Journal of Pediatrics, 2012**

Title: NEURODEVELOPMENTAL OUTCOME OF ELBW AT 2 YEARS: A COMPARISON BETWEEN GRIFFITHS AND BAYLEY SCALES

Odoardo Picciolini[1], Chiara Squarza[1], Camilla Fontana[1,2], Maria Lorella Gianni[2], Laura Gardon[1], Gisella Presezzi[1], Ivan Cortinovis[2], Monica Fumagalli[1,2] and Fabio Mosca[1,2]. [1]NICU, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan, Italy and [2]Department of Clinical Sciences and Community Health, Università degli Studi di Milano, Milan, Italy.

Background: Efforts have been made to find a highly accurate assessment tool for the early detection of infants at high risk for adverse neurodevelopmental outcomes. Timely confirmation of impairment is essential to guide parents and early intervention in maximizing the child's abilities and assisting the transition to school.

Objective: The aim of this study is to compare the outcomes of the Bayley Scales (B-II vs B-III edition) in a cohort of extremely preterm infants at 24 mo corrected age, in order to define which edition shows a higher

...agreement with the GMDS-R and thus can be considered a more reliable assessment procedure.

Design/Methods: All the consecutively newborns, admitted at the same Institution, 2003-2010, entered the study. Inclusion criteria were: BW 401-1000g and/or GA≤27 weeks. Exclusion criteria were the presence of neurosensory disabilities and/or genetic abnormalities. Infants underwent neurodevelopmental evaluation at 24 mo corrected age using the GMDS-R and either the B-II (birth years 2003-2006) or the B-III (2007-2010). Statistical analysis was based on weighted K of Cohen to estimate concordance between scales and on Youden's Index to combine sensitivity and specificity.

Results: 194 infants were assessed at 24 mo corrected age. Concordance was excellent between GMDS-R and B-III composite scores for both cognitive-language and motor abilities (Weighted K=0.80 and 0.81 respectively) and poorer for B-II (Weighted K=0.63 and 0.50). The Youden's Index revealed higher values for B-III than for B-II (75.9% vs 69.6%). Compared to GMDS-R, B-III showed -3% of severe impairment on cognitive-language abilities and -7.8% of mild impairment on motor skills while B-II showed, compared to the GMDS-R , higher rates of severe impaired children both for cognitive and motor abilities (+14,1% and +15,3% respectively).

Conclusions: Our study suggests that the B-III has a higher agreement with the GMDS-R compared to the B-II and increases the ability of the scale to identify both healthy and impaired children. However, the B-III tends to underestimate neurodevelopmental delay and appears poorly effective in discriminating mild and severe impairment.
We therefore recommend using multiple measures to assess neurodevelopmental outcome of ELBW children at 2 years, especially for mildly impaired children evaluated using B-III.