Outcome measures in acute pain clinical trials in neonatal & infant populations

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Content

- Some considerations
- Available scales
- Validation
- What is needed for analgesic trials

Some considerations

- Acute pain -> postoperative pain included
- 0-to-2-years of age-> cognitive and emotional development
- No gold standard for pain

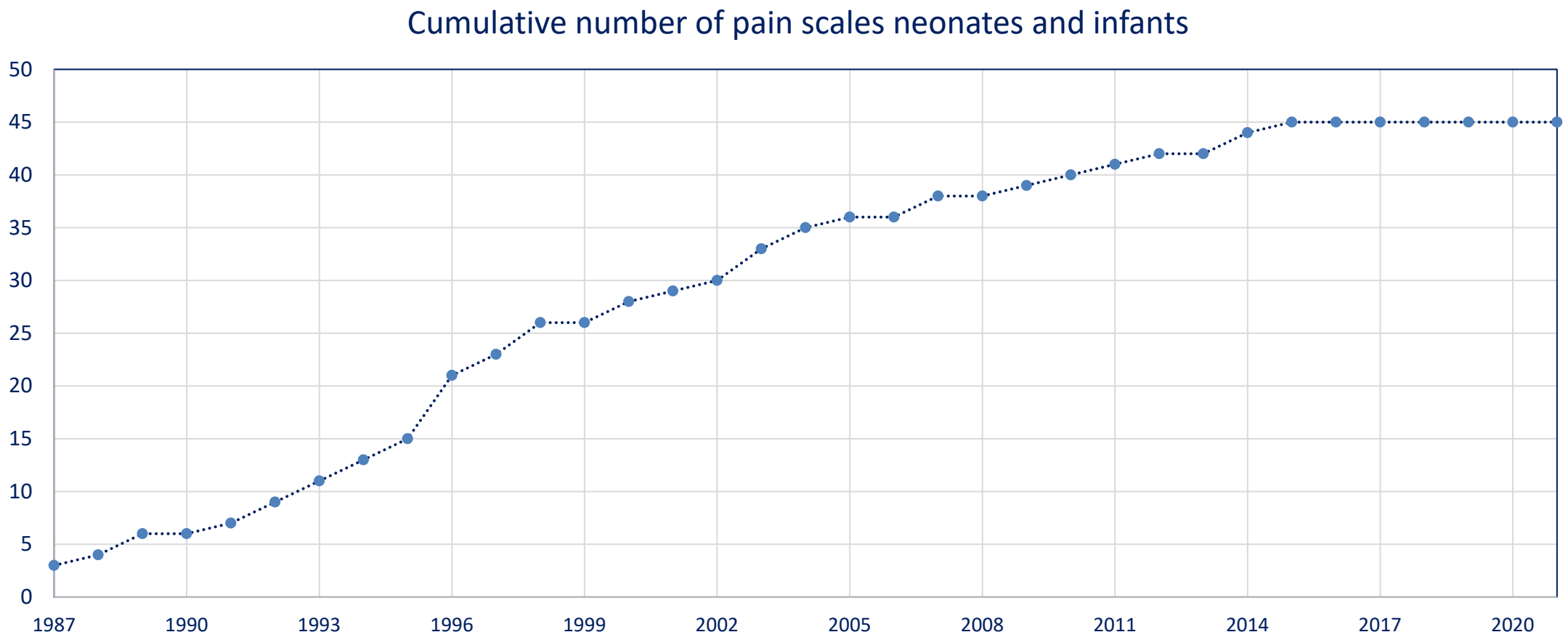
Patient characteristics and circumstances

- Hunger
- Thirst
- Temperament
- Neurological irritability
- Age-related separation anxiety
- Fear for strangers
- Extended hospital stay
- Noise
- Light
- Parents not present

Treatment or illness-related symptoms

- Type of respiratory support
- Analgesics/sedatives
- Catheters and lines
- Neuromuscular blocking agents
- Sepsis/fever
- Reflux

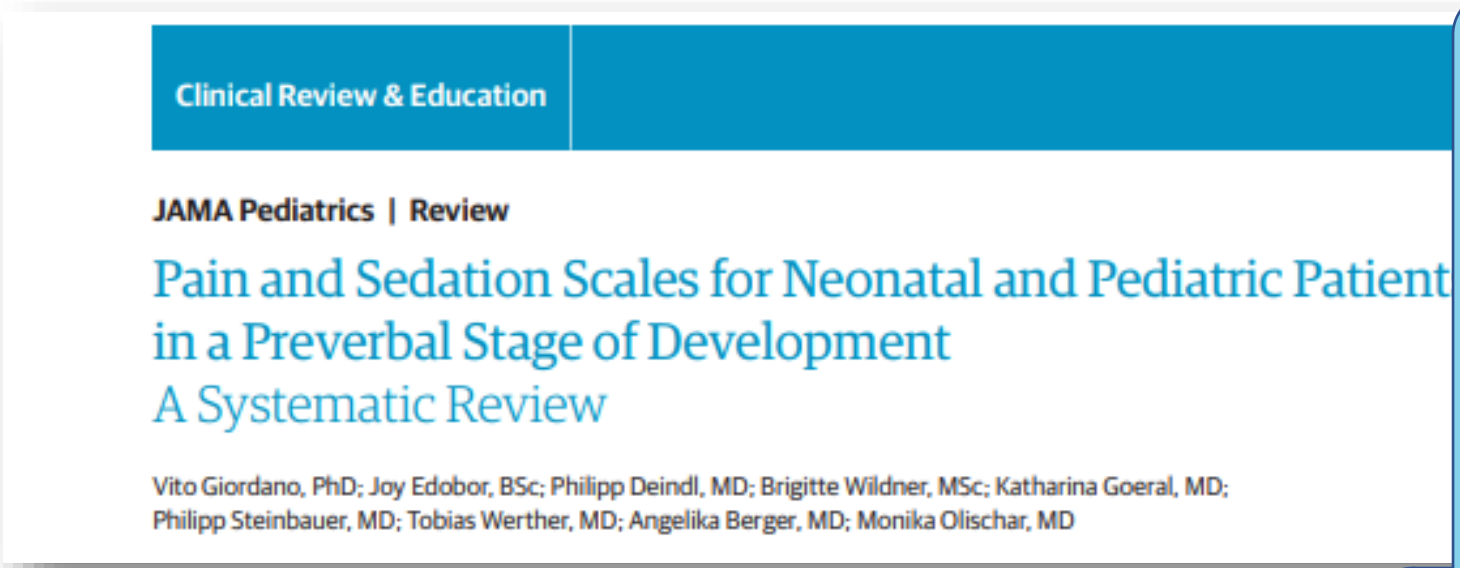
Many pain scales available



	instruments	year	Facial Expression	Body movement	Behavioral state	Cry/ vocal	Vital signs	Posture/ Muscle tone
1	CHEOPS	1985	√	√		√√		√
2	NFCS	1990	√√√√√√					
3	NIPS	1993	√	√√	√	√	√	
4	BPS	1995	√	√				√
5	CRIES	1995	√		√	√	√√	
6	PIPP	1996	√√√		√		√√	
7	FLACC	1997	√	√√		√		
8	DAN	1997	√	√		√		
9	COMFORT-B	2000	√	√	√	√		√
10	CHIPPS	2000	√	√√		√		√
11	EDIN	2001	√	√	√			
12	BPNS	2004	√		√	√	√√	√
13	MAPS	2007	√	√	√		√	
14	BIIP	2007	√√√√	√√	√			
15	N-PASS	2008	√		√	√	√√√√	√
16	COMFORTneo	2009	√	√	√	√		√
17	FANS	2010		√		√	√√	
18	PASPI	2012	√	√	√		√√	
19	ALPSneo	2014	√	√	√		√	√
20	NIAPAS	2014	√		√	√	√√	√
% of scales that include item			95%	70%	65%	60%	50%	45%

Pink=neonates only

Recent review


Clinical Review & Education

JAMA Pediatrics | Review

Pain and Sedation Scales for Neonatal and Pediatric Patient in a Preverbal Stage of Development
A Systematic Review

Vito Giordano, PhD; Joy Edobor, BSc; Philipp Deindl, MD; Brigitte Wildner, MSc; Katharina Goeral, MD; Philipp Steinbauer, MD; Tobias Werther, MD; Angelika Berger, MD; Monika Olischar, MD

- Most relevant scales with cutoffs
- Most relevant scales by clinical applicability
- Process behind scale selection

2019, 173 (12) 1186-1197

Differences between scales

- Validated for different age groups
- Validated for acute, postoperative or prolonged pain
- Level of validation varies

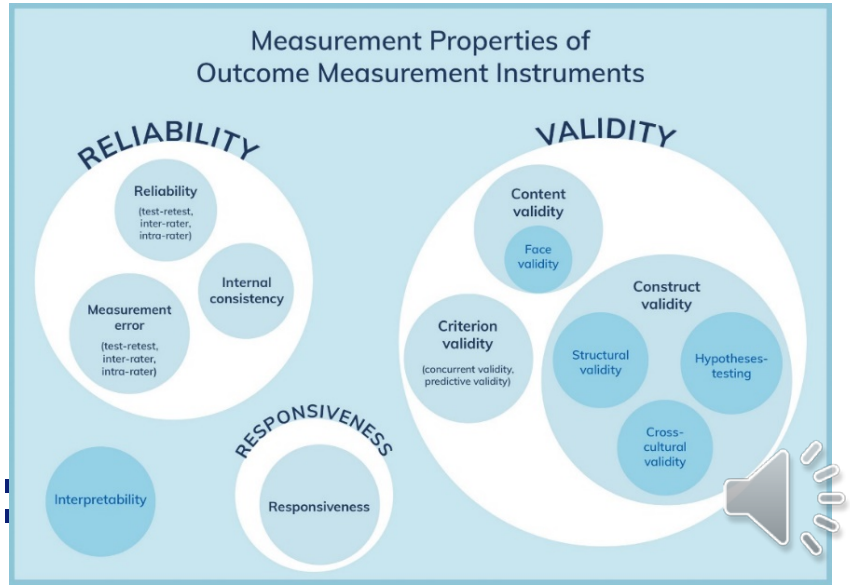
Outcome measures and validation

Current standards of the

COSMIN COnsensus-based Standards for the selection of health Measurement Instruments founded in 2005

Comparable to the CONSORT guidelines for RCTs

Website: www.cosmin.nl



Other outcome parameters assessing stress levels

Skin conductance

- The measurement of skin conductance (SC) is based on the sympathetic nervous system's response to stress
- *Hu, J. et al, scoping review. Clin J Pain, 2019*
- Conclusion: the inconsistent findings in the studies suggest that further research is needed before it could be applied to the clinical settings.

ANI or NIPE based on heart rate variability

- NIPE heart rate variability-based technology for assessing pain and comfort in neonates and infants under 2-years-old
- *Recher, M., et al. A literature review. J Clin Monit Comput, 2021.*
- Conclusion: more studies are required to confirm the NIPE usefulness in the different clinical settings.

- ANI=analgesia-nociception index, NIPE=Newborn Infant Parasympathetic Evaluation

Important for analgesic trials: assessment

- Responsiveness
- Tested cutoff values
- Establish interrater reliability among observers

Important for analgesic trials: general

- If caregiving nurses perform the assessments they should be involved during the preparation of the trial
- Informed consent procedure requires attention
- Involve clinicians from the workplace in preparation and executing the study
- RCT results should be preferably tested in real life -> implemention research
- Acute pain-> postoperative pain -> prolonged pain