Summary of the **key points, best practices, and evidence-based recommendations** from the National Association of Neonatal Nurses (NANN) *Newborn Pain Assessment and Management*, Guideline for Practice, 2012

SOOTHE Noxious Stimuli Workgroup

Purpose

- To provide a standardized, evidence-based approach for assessing and managing pain in neonates to reduce short- and long-term complications.

Use Validated Pain Assessment Tools

- Select **developmentally appropriate, validated tools** for assessing pain in neonates
- Common tools include:
  - **NIPS** (Neonatal Infant Pain Scale)
  - **PIPP-R** (Premature Infant Pain Profile–Revised)
  - **NFCS** (Neonatal Facial Coding System)
- Tools should account for gestational age, behavioral state, and type of pain (acute, procedural, postoperative, chronic)

Table 1. Most Commonly Used Pain Measures for Neonates[a]

Pain Instrument	Population	Indicators	Validity	Reliability
Premature Infant Pain Profile (PIPP)[97,98]	Four data sets (n = 27, 39, 48, and 124) of infants 28–40 weeks' gestation	Gestational age Behavioral state Heart rate Oxygen saturation Brow bulge Eye squeeze Nasolabial furrow	• Content validity (experts and literature) • Construct validity (scores between no pain and pain situations, paired t test = 12.24, two-tailed [$p < .0001$])	• Internal consistency (correlation coefficients for individual items 0.59–0.76; the standardized item alpha for six of the items was 0.71)
CRIES Neonatal Postoperative Pain Assessment Score[99]	24 infants 32–60 weeks' gestation	Crying Requires oxygen to maintain saturation at 95% Increased blood pressure and heart rate Expression Sleep state	• Concurrent validity (Spearman's rank-order correlation between the Objective Pain Scale and CRIES was 0.73 ($p < 0.0001$) • Discriminant validity (lower pain scores after analgesics; $p < .0001$)	Interrater reliability r = 0.72 ($p < .0001$)
Neonatal Infant Pain Scale (NIPS)[100]	38 preterm and full-term infants; 90 procedures observed	Facial expression Cry Breathing patterns Arm movement Leg movement State of arousal	• Content validity (survey) • Concurrent validity (correlations 0.53–0.84 when compared with visual analog scale) • Construct validity (change in pain scores over time was seen with main effect of time being statistically significant, F ratio, 18.97 [$p < 0.001$])	• Interrater reliability (Pearson's correlation 0.92–0.97) • Internal consistency (Cronbach's alpha 0.87–0.95)
Neonatal Pain Agitation and Sedation Scale (N-PASS)[101]	59 observations collected for 42 infants ranging in gestation between 23 and 42 weeks at birth and < 30 days old at time of procedure		Construct (discriminate) validity established through Wilcoxon signed-ranks test, comparing distribution of heel stick and sham N-PASS scores. Mean pain scores were 3.93 (2.30) and 0.81 (1.21) for heel stick and sham procedures, respectively (Z score = -6.429, $p < .0001$). Convergent validity was demonstrated by correlation with PIPP scores (Spearman's rank-order correlation of 0.75 and 0.72 for raters 1 and 2, respectively).	Interrater reliability measured by intraclass coefficients (ICC); the ICC estimates (95% CI) of pain scale were 0.86 (0.78, 0.92) and 0.93 (0.88, 0.96) for a single rating and average of two independent ratings, respectively ($p < .0001$). Internal consistency, measured by Cronbach's alpha (0.84–0.89). Test–retest reliability was demonstrated by repeat scoring of videotaped heel sticks, measured by Spearman's rank-order correlation (0.874, $p <$ .0001).

[a]*Documented with published psychometric data.*

Adapted from "A Systematic Integrative Review of Infant Pain Assessment Tools," by L. Duhn & J. Medves, 2004, Advances in Neonatal Care, *4(3), 126–140.*[38]

Incorporate Both Physiologic and Behavioral Indicators

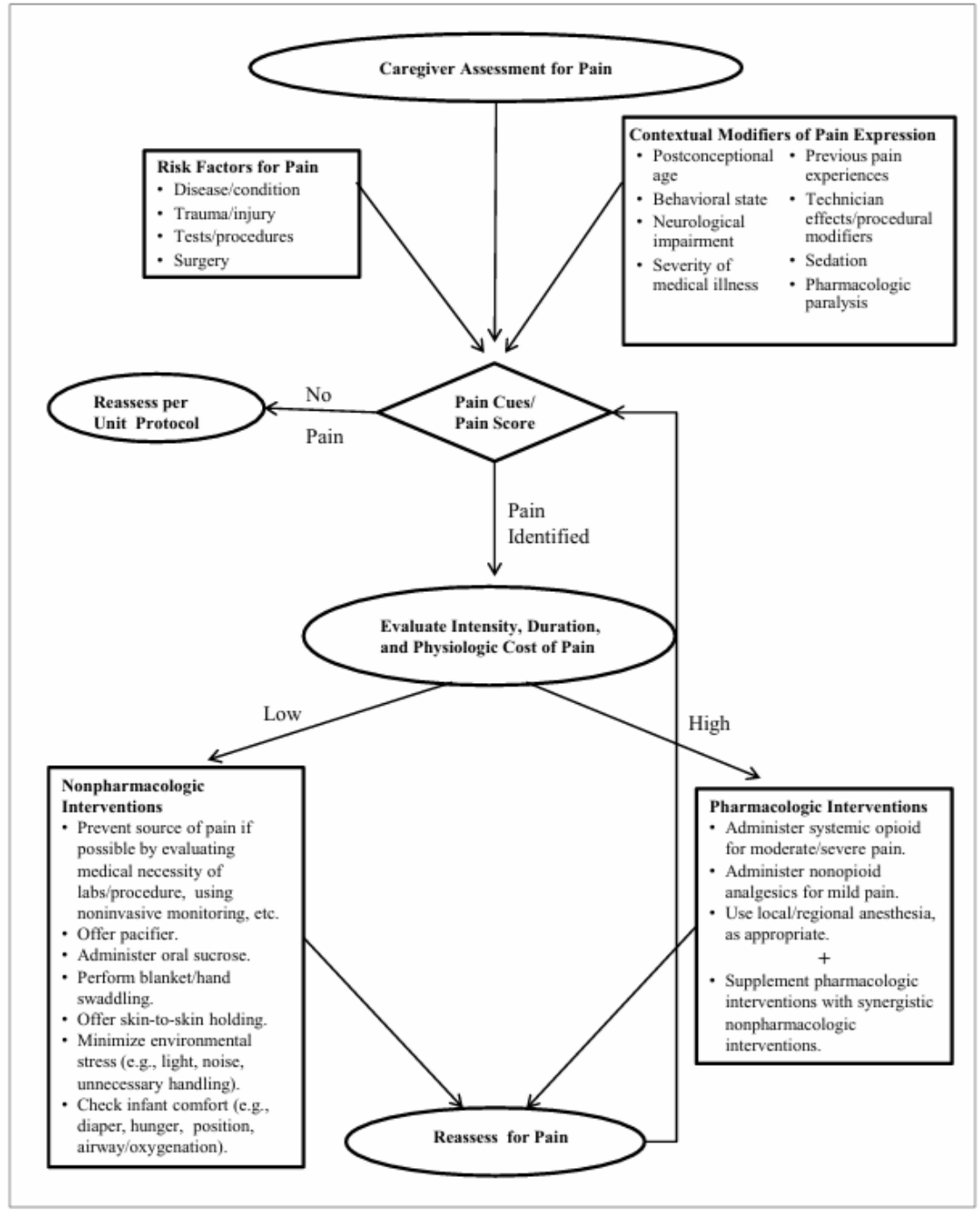
- Pain assessments should combine:
  - **Physiological indicators**: heart rate, respiratory rate, oxygen saturation.
  - **Behavioral indicators**: facial expressions, body movements, crying.

- Recognize limitations—e.g., critically ill or sedated infants may not exhibit typical pain behaviors

Assess Pain Regularly and Reassess After Interventions

- Perform pain assessments:
  - On admission
  - Before, during, and after procedures
  - At regular intervals (as defined by unit protocols)
- Document and **reassess after interventions** to evaluate effectiveness

Algorithm for Assessment and Management of Pain in Neonates



Prioritize Non-Pharmacologic Interventions First

- For mild to moderate pain or as adjuncts to pharmacologic measures:
  - Kangaroo care (skin-to-skin contact)
  - Non-nutritive sucking (pacifier)
  - Sucrose/glucose solution
  - Swaddling or facilitated tucking
  - Breastfeeding during minor procedures
- Tailor interventions to the infant's gestational age and condition

Use Pharmacologic Measures When Indicated

- Use medications for:
  - Moderate to severe pain
  - Postoperative pain
  - Ventilated neonates requiring comfort
- Examples:
  - Opioids: morphine, fentanyl
  - Acetaminophen
  - Local anesthetics for procedures
- Monitor closely for side effects and tolerance

Educate and Involve Families

- Include **parents and caregivers** in pain management plans
- Educate them on:
  - Signs of pain
  - Comfort techniques they can use
  - Rationale for medications or procedures

Standardize Protocols and Documentation

- Develop **unit-specific protocols** for:
  - Pain assessment frequency
  - Tool selection
  - Intervention thresholds
- Ensure **consistent documentation** of assessments, interventions, and responses

Support Ongoing Staff Education

- Train staff regularly on:
  - Pain physiology in neonates
  - Assessment tools
  - Intervention techniques