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A practical guide on how to use the Neonatal Pain, Agitation and Sedation Score (N-PASS)

For participants in DEXTA

DEXTA

NHS
University Hospitals of Derby and Burton
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NOTTINGHAM CLINICAL TRIALS UNIT
at the University of Nottingham

Purpose

This guidance is to support the use of NPASS babies taking part in DEXTA (IRAS ID:1012134), during the 120-hours infusion of morphine and the IMP.

It is intended to be used in conjunction with the DEXTA protocol (see here), which remains the definitive source of study instructions.

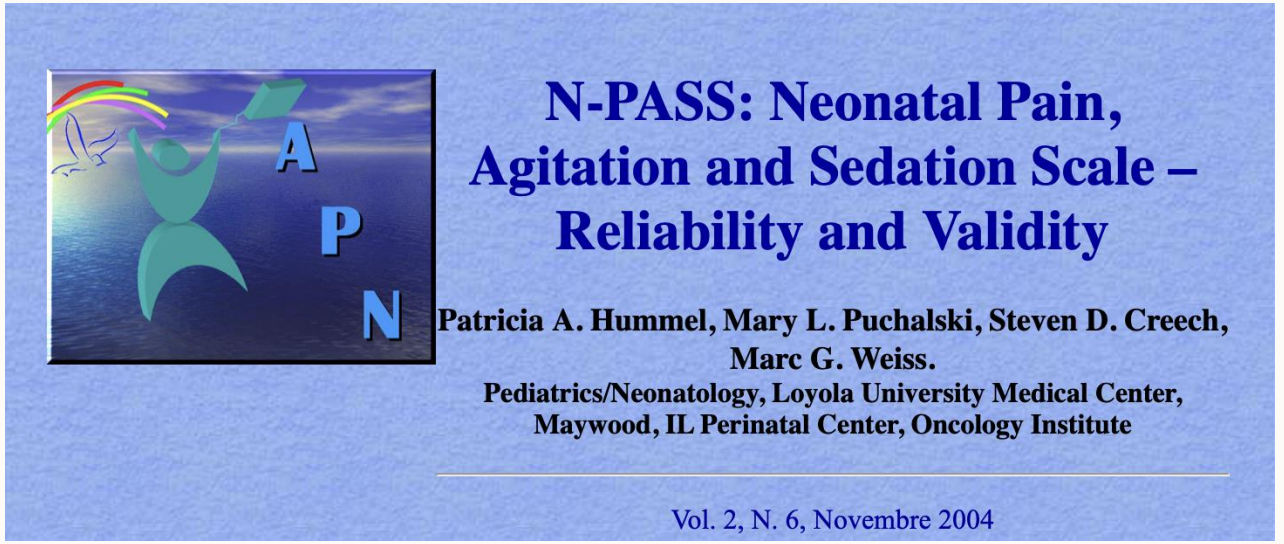
N-PASS: Neonatal Pain, Agitation and Sedation Score

- Measures pain, agitation and sedation levels
- Can be used for pain assessment in mechanically ventilated preterm infants
- Shows good validity and reliability for pain assessment in acute and chronic pain
- Validation studies included 23 to 40 weeks' gestation infants
- Includes multidimentional indicators of pain (5 criteria) – each graded from -2 to 2 and a total score obtained by adding the scores for each criteria

Ref: Morgan et al., 2020; https://doi.org/10.1038/s41372-020-00840-7
Giordano et al., 2019; https://doi.org/10.1001/jamapediatrics.2019.3351

N-PASS: Neonatal Pain, Agitation and Sedation Score

- To access the full N-PASS tool, as developed initially, click here.



- At the bottom of the web page, click on the link to download the Microsoft word version of the tool.

N-PASS: Neonatal Pain, Agitation and Sedation Score

Assessment	Sedation		Normal	Pain / Agitation	
Criteria	**-2**	**-1**	**0**	**1**	**2**
Crying **Irritability**	No cry with painful stimuli	Moans or cries minimally with painful stimuli	Appropriate crying Not irritable	Irritable or crying at intervals Consolable	High-pitched or silent-continuous cry Inconsolable
Behaviour State	No arousal to any stimuli No spontaneous movement	Arouses minimally to stimuli Little spontaneous movement	Appropriate for gestational age	Restless, squirming Awakens frequently	Arching, kicking Constantly awake or Arouses minimally / no movement (not sedated)
Facial Expression	Mouth is lax No expression	Minimal expression with stimuli	Relaxed Appropriate	Any pain expression intermittent	Any pain expression continual
Extremities Tone	No grasp reflex Flaccid tone	Weak grasp reflex ↓ muscle tone	Relaxed hands and feet Normal tone	Intermittent clenched toes, fists or finger splay Body is not tense	Continual clenched toes, fists, or finger splay Body is tense
Vital Signs: **HR, RR, BP, SaO_2**	No variability with stimuli Hypoventilation or apnea	< 10% variability from baseline with stimuli	Within baseline or normal for gestational age	↑ 10-20% from baseline SaO_2 76-85% with stimulation – quick recovery	> 20% from baseline SaO_2 ≤75% with stimulation – slow Out of sync with vent

N-PASS: Neonatal Pain, Agitation and Sedation Score

- Accounts for pain AND sedation status
- Five categories of assessment
- Each category has a possible score or -2 to 2
- Total score of -10 to 10
- Parents should be actively encouraged to participate in the pain assessment and management

N-PASS: Neonatal Pain, Agitation and Sedation Score

Pain or agitation assessment

Assessment	Sedation		Normal	Pain / Agitation	
Criteria	-2	-1	0	1	2
Crying **Irritability**	No cry with painful stimuli	Moans or cries minimally with painful stimuli	Appropriate crying Not irritable	Irritable or crying at intervals Consolable	High-pitched or silent-continuous cry Inconsolable
Behaviour State	No arousal to any stimuli No spontaneous movement	Arouses minimally to stimuli Little spontaneous movement	Appropriate for gestational age	Restless, squirming Awakens frequently	Arching, kicking Constantly awake or Arouses minimally / no movement (not sedated)
Facial Expression	Mouth is lax No expression	Minimal expression with stimuli	Relaxed Appropriate	Any pain expression intermittent	Any pain expression continual
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N-PASS: Neonatal Pain, Agitation and Sedation Score

Pain or agitation assessment

- Assess each of the 5 categories
- Score each category as 0, 1 or 2
- Add to obtain the total score (can be from 0 to 10)
- If infants is
    - <28 weeks corrected age: add 3 to the total score
    - 28 to 31 weeks corrected age: add 2 to the total score
    - 32 to 35 weeks corrected age: add 1 to the total score

N-PASS: Neonatal Pain, Agitation and Sedation Score

Pain or agitation assessment: interpretation

Total score	Interpretation	Suggested actions
0 to 3	“normal”	Comfort measures should be in place as routine e.g., optimal positioning and environment.
3 to 5	Some pain and discomfort	Optimise comfort measures and non-pharmacological pain management e.g., swaddling, skin-to-skin care. Involve parents in pain management where possible.
> 5	Significant pain	Increase pharmacological management: increase morphine infusion rate, consider bolos of morphine

N-PASS: Neonatal Pain, Agitation and Sedation Score

Sedation assessment

Assessment	Sedation		Normal	Pain / Agitation	
Criteria	-2	-1	0	1	2
Crying Irritability	No cry with painful stimuli	Moans or cries minimally with painful stimuli	Appropriate crying Not irritable	Irritable or crying at intervals Consolable	High-pitched or silent-continuous cry Inconsolable
Behaviour State	No arousal to any stimuli No spontaneous movement	Arouses minimally to stimuli Little spontaneous movement	Appropriate for gestational age	Restless, squirming Awakens frequently	Arching, kicking Constantly awake or Arouses minimally / no movement (not sedated)
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N-PASS: Neonatal Pain, Agitation and Sedation Score

Sedation assessment

- Assess each of the 5 categories
- Score each category as 0, -1 or -2
- Add to obtain the total score (can be from 0 to -10)
- Response to stimuli should be assessed when stimulus is given for care – infant should not be stimulated just for assessing response

N-PASS: Neonatal Pain, Agitation and Sedation Score

Sedation assessment: interpretation

Total score	Interpretation	Suggested actions
0 to -1	“normal”	Comfort measures should be in place as routine e.g., optimal positioning and environment.
-2 to -5	light sedation	may be suitable for an infant on mechanical ventilation
-6 to -10	deep sedation	Reduce pharmacological management: decrease morphine infusion rate

N-PASS: Neonatal Pain, Agitation and Sedation Score

Paralysis or muscle relaxation

- It is not possible to behaviourally evaluate pain in a paralysed infant
- Increase in heart rate and blood pressure may be the only indicator of a need for more analgesia

N-PASS: Neonatal Pain, Agitation and Sedation Score

Scoring criteria: crying / irritability

Score	Criteria
-2	No response to painful stimuli e.g., • No cry with needle sticks • No reaction to ETT or nares suctioning • No response to care giving
-1	Moans, sighs, or cries audible or silent) minimally to painful stimuli e.g., needle sticks, ETT or nares suctioning, care giving
0	Not irritable- appropriate crying • Cries briefly with normal stimuli • Easily consoled • Normal for gestational age
1	Infant is irritable/crying at intervals – but can be consoled. • If intubated – intermittent silent cry
2	Any of the following: • Cry is high pitched • Infant cries inconsolably • If intubated – silent continuous cry

N-PASS: Neonatal Pain, Agitation and Sedation Score

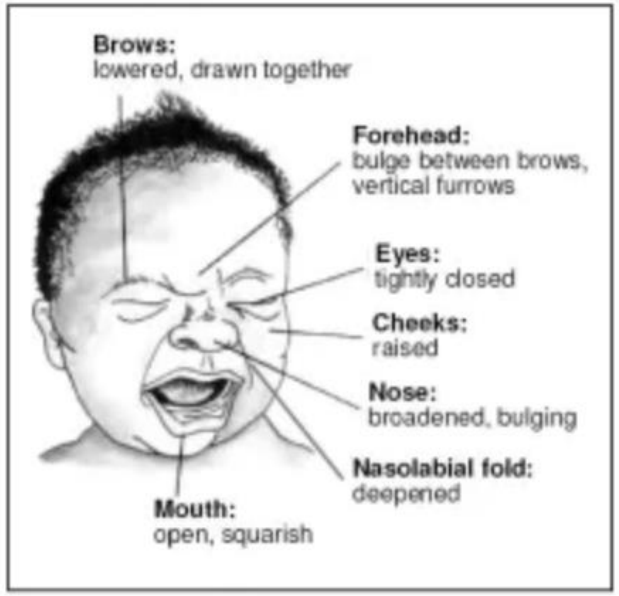
Scoring criteria: behaviour state

Score	Criteria
-2	Does not arouse or react to stimuli • Eyes continually shut or open • No spontaneous movement
-1	Little spontaneous movement, arouses briefly and/or minimally to any stimuli • Opens eyes briefly • Reacts to suctioning • Withdraws to pain
0	Behaviour and state ae gestational age appropriate
1	Any of the following: • Restless, squirming • Awakens frequently/easily with minimal or no stimuli
2	Any of the following: • Kicking • Arching • Constantly awake • No movement or minimal arousal with stimulation (in appropriate for gestational age or clinical situation, i.e., post-operative)

N-PASS: Neonatal Pain, Agitation and Sedation Score

Scoring criteria: facial expression

Score	Criteria
-2	Any of the following: • Mouth is lax • Drooling • No facial expression at rest or with stimuli
-1	Minimal facial expression with stimuli
0	Face is relaxed at rest but not lax – normal expression with stimuli
1	Any pain face expression observed intermittently
2	Any pain face expression is continual



Facial expression of physical distress and pain in the infant.

Reproduced with permission from Wong DL, Hess CS: Wong and Whaley's Clinical Manual of Pediatric Nursing, Ed. 5, 2000, Mosby, St. Louis

N-PASS: Neonatal Pain, Agitation and Sedation Score

Scoring criteria: extremities / tone

Score	Criteria
-2	Any of the following: • No palmar or plantar grasp can be elicited • Flaccid tone
-1	Any of the following: • Weak palmar or plantar grasp can be elicited • Decreased tone
0	Relaxed hands and feet – normal palmar or sole grasp elicited – appropriate tone for gestational age
1	Intermittent (<30 seconds duration) observation of toes and/or hands as clenched, or fingers splayed. • Body is *not* tensed.
2	Any of the following: • Frequent (≥30 seconds duration) observation of toes and/or hands as clenched, or fingers splayed. • Body is tense/stiff

N-PASS: Neonatal Pain, Agitation and Sedation Score

Scoring criteria: vital signs: HR, BP, RR, & O2 saturations

Score	Criteria
-2	Any of the following: • No variability in vital signs with stimuli • Hypoventilation • Apnea • Ventilated infant: no spontaneous respiratory effort
-1	Vital signs show little variability with stimuli – less than 10% from the baseline
0	Vital signs and/or oxygen saturations are within normal limits with normal variability – or normal for gestational age
1	Any of the following: • HR, BP, and/or RR are 10-20% above baseline • With care/stimuli infant desaturates minimally to moderately (SaO_2 76-85%) and recovers quickly (within 2 min)
2	Any of the following: • HR, BP, and/or RR are >20% above baseline • With care/stimuli infant desaturates severely (SaO_2 <75%) and recovers slowly (>2 min) • Infant is out of synchrony with the ventilator – fighting the ventilator

N-PASS: Neonatal Pain, Agitation and Sedation Score

- N-PASS should be used to score and document pain levels in babies who are in DEXTA while they are receiving the investigational medicinal product (IMP)
- During the 120-hour IMP infusion period, infants should have N-PASS score measured **at least every 2 to 4 hour** and recorded
- N-PASS scores of -5 to 3 signify that the baby is comfortable
- N-PASS score should be interpreted in view of the baby's clinical condition and other observations that may suggest pain or sedation

N-PASS: Neonatal Pain, Agitation and Sedation Score

In the first 24 hours of the IMP infusion,
If N-PASS score is -5 to 3 (comfortable) or <-5 (sedated)

- Reduce morphine infusion rate (follow DEXTA 'Guidance on Morphine Dose Reduction' training aid)
- **Stop morphine**, if appropriate

If N-PASS score is >3 or other clinical assessments suggest pain,

- Consider giving a bolus dose of morphine
- Increase morphine infusion rate

Continue IMP, at half rate. DO NOT reduce or stop IMP unless concerns about haemodynamic instability *(see flow chart here).*

N-PASS: Neonatal Pain, Agitation and Sedation Score

During 25 to 120 hours (days 2 to 5) of the IMP infusion,

If N-PASS score is >3 or other clinical assessments suggest pain,

- Increase **IMP infusion to full rate**
- If N-PASS still >3 or other clinical assessments suggest pain,
  - Increase morphine infusion rate, Consider giving morphine bolus

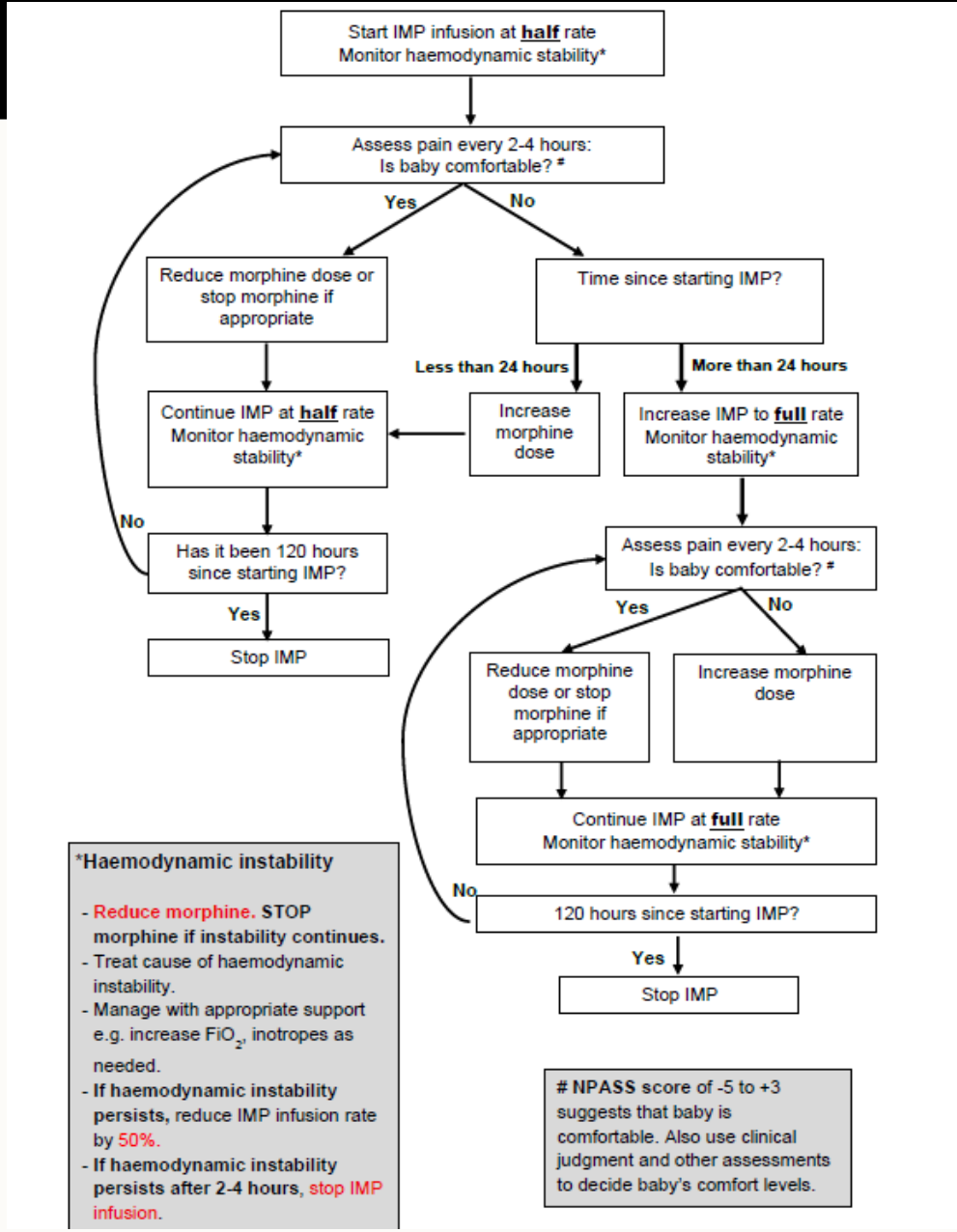
If N-PASS score is -5 to 3 (comfortable) or <-5 (sedated)

- Reduce morphine infusion rate
- Stop morphine, if appropriate

Continue IMP, at full rate. DO NOT reduce or stop IMP unless concerns about haemodynamic instability *(see flow chart here).*

Using N-PASS in DEXTA

- Measure and record N-PASS score every 2-4 hours
- Ensure N-PASS is measured within 2 hours of making any change in morphine or IMP infusion



Summary

- N-PASS is a routinely used pain score, validated for use in ventilated preterm infants
- It uses 5 criterial to score pain and sedation
- N-PASS should be scored and recorded every 2-4 hours while the baby is on the IMP in DEXTA
- Morphine should be reduced and stopped if the baby remains comfortable
- IMP should be continued for 120 hours unless clinical concerns about hemodynamic instability

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Feel free to email us: dexta@nottingham.ac.uk

Or visit the website = www.dexta.ac.uk

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