Infants at Risk for NAS

Modified NAS Score

Begins at 4 hours of life, 30-60 minutes after feeding, and is done every 3-4 hours. Scoring should be done with patient cares.

- **High NAS: Score of 24 Rule:**
  - 3 consecutive scores ≥ 8 or
  - 2 consecutive scores averaging ≥ 12
  - Reassess in 1 hour if score ≥ 8 per protocol

**Does not meet Score of 24 Rule**

Observation, NAS Score every 3-4 hours

Consider substance half-life

- **Short half-life**
  - Morphine
  - Oxycodone

  Observe for 72 hours.
  - NAS stable
  - Home situation stable
  - Appropriate f/u arranged

- **Long half-life**
  - Methadone
  - Buprenorphine

  Observe for 5 days.
  - Consider earlier discharge if:
    - NAS stable
    - Home situation stable
    - Appropriate f/u arranged

**Meets Score of 24 Rule**

Pharmacologic Intervention Required

- **Benzodiazepine**
- **Opioid/Unknown/Poly**

  Consider utilizing a benzodiazepine

  Morphine

  - Morphine ≥ 1 mg/kg/day required

  Weaning Pharmacological Treatment
  - Discharge when off scheduled therapy and all scores are < 8 for a minimum of 48 hours.

  - Second/Third Line Clonidine
### Pharmacologic Treatment Recommendations for NAS

#### Benzodiazepine (Isolated Exposure)

<table>
<thead>
<tr>
<th>Score</th>
<th>Initial Dose</th>
<th>Route</th>
<th>Maintenance Dosing</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenobarbital</td>
<td>20 mg/kg</td>
<td>PO</td>
<td>3 mg/kg/dose every 24 hours. Start maintenance 24 hours after loading dose.</td>
<td>Consider starting morphine if scores remain high 24 hours after observation and consult with pharmacist.</td>
</tr>
</tbody>
</table>

#### Opioid/Unknown/Poly

**Morphine**

When pharmacologic treatment begins, patient will be started on scheduled dosing, no prns will be used
- Start morphine if Score of 24 Rule is met.
- Start course based on highest score in the last 24 hours.

<table>
<thead>
<tr>
<th>Score</th>
<th>Initial Dose</th>
<th>Frequency/Route: Ordered every 3 hours* PO**</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-10</td>
<td>0.05 mg/kg/dose ORALLY = 0.025 mg/kg IV</td>
<td></td>
</tr>
<tr>
<td>11-13</td>
<td>0.08 mg/kg/dose ORALLY = 0.04 mg/kg IV</td>
<td></td>
</tr>
<tr>
<td>14-16</td>
<td>0.11 mg/kg/dose ORALLY = 0.055 mg/kg IV</td>
<td></td>
</tr>
<tr>
<td>&gt;16</td>
<td>0.17 mg/kg/dose ORALLY = 0.085 mg/kg IV</td>
<td></td>
</tr>
</tbody>
</table>

**Morphine Dose Escalation**

If Score of 24 Rule is met after initiation, increase dose by 20%. Dose may continue to be increased by 20% every 12 hours (3-4 doses) if Score of 24 Rule is met.

* Nurse may give dose every 3-4 hours based on feeding schedule
** IV morphine dose is ½ the oral morphine dose

- Allow infant to stabilize 24 hours on a dose that controls symptoms prior to initiation of weaning.
- If symptoms are not controlled on a total daily dose > 1 mg/kg/day, consider adding a second line medication (clonidine).

#### Second Line Medication

- If patient requires more than 1 mg/kg/day of morphine, add second line medication
- May also be started when tapering if conditions under “Weaning Pharmacologic Treatment” are met
- After starting second line medication, allow infant to stabilize for 24 hours. If Score of 24 Rule is met, continue to gradually increase morphine dose as outlined in titration schedule.

<table>
<thead>
<tr>
<th>Initial Dose</th>
<th>Route</th>
<th>Maintenance Dosing</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clonidine</td>
<td>1 mcg/kg/dose every 6 hours</td>
<td>PO</td>
<td>Max dose 1 mcg/kg/dose every 3 hours</td>
</tr>
</tbody>
</table>
**Weaning Pharmacologic Treatment**

- “Stable NAS score” is defined as all NAS scores < 8 in the preceding 24 hours
- Allow 24 hours between medication weans to assess tolerance.
- Do not change morphine interval during wean (maintain every 3 hour interval)
- After discontinuing morphine, continue to perform NAS scoring every 3-4 hours with feeds. If Score of 24 Rule is met, resume scheduled morphine at the most recently discontinued dose.
- Patient may be discharged when scheduled therapy is discontinued and all NAS scores are < 8 for at least 48 hours.

| Morphine Only | When NAS scores are stable, IF doses are:
| < 0.1 mg/kg/dose then wean dose by 20%**
| ≥ 0.1 mg/kg/dose then wean dose by 10%**

- Allow 24 hours between morphine weans; Consult pharmacist after 2 dose changes

  When morphine dose reaches 0.02 mg/kg/dose every 3 hours, change frequency to every 6 hours

  Discontinue morphine when infant has tolerated a dose of 0.02 mg/kg/dose every 6 hours for 24-48 hours.

Consider addition of clonidine if:
- Morphine dose has not been weaned for 2-3 days due to NAS scores
- Infant has failed discontinuation of morphine therapy
  - Restart morphine at 0.02 mg/kg/dose PO every 3 hours with clonidine

| Morphine and Clonidine | When NAS scores are stable, IF doses are:
| < 0.1 mg/kg/dose then wean dose by 20%
| ≥ 0.1 mg/kg/dose then wean dose by 10%

- Allow 24-48 hours between morphine weans; Consult pharmacist after 2 dose changes

  Discontinue morphine when infant has tolerated a dose of 0.02 mg/kg/dose every 3 hours for 24-48 hours.

  After morphine is discontinued, start decreasing clonidine by 25% when all NAS scores are < 8 for at least 24 hours. Discontinue clonidine at a dose of 0.25 mcg/kg/dose

** Percent is calculated from the original morphine dose at the start of weaning

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**References:**
