Dell Children’s Medical Center Pediatric Guideline

Title: Pediatric Opioid, Benzodiazepine, and Alpha Agonist Weaning Guideline

Purpose
To outline the recommended dosing conversion from opioid, benzodiazepine, and alpha-agonist continuous infusions to methadone, lorazepam, and clonidine and recommended weaning plan.

Personnel Affected
Authorized Prescribing Practitioners, Pharmacists, and Registered Nurses

Guidelines

OPIOIDS AND BENZODIAZEPINES

Duration of Methadone and Lorazepam Wean Based on Duration of Infusion

≤ 3 days: No taper necessary
4 days: Discontinue infusion without a wean or wean infusion over 24-36 hours. Monitor for symptoms of withdrawal. If symptoms occur, begin “short course” weaning plan.
5-13 days: Start a “short course” methadone/oralazepam wean. Start methadone and lorazepam 1-2 days prior to discontinuing infusions. Decrease opioid and benzodiazepine infusions by 25% with the 2nd dose of methadone and lorazepam, respectively. Continue to decrease infusions by 25% (of starting rate) every 6 hours. Alternate timing of methadone and lorazepam doses. Wean methadone and lorazepam daily until off. See below.
≥ 14 days: Start a “long course” methadone/oralazepam wean. Follow same protocol as for the “short course” wean; however wean doses every other day until off. Alternate methadone and lorazepam weaning steps daily. See Below.

Conversion from Infusions to Methadone and Lorazepam

*May begin as IV doses if NPO, however enteral administration is preferred

*PO designates enteral route, NG/NJ are acceptable

Opioid conversion plan:
Calculate starting methadone dose:

Fentanyl: Multiply current fentanyl drip rate (mcg/kg/h) X 0.05 = _____ mg/kg/dose methadone q6h (max initial dose 0.2 mg/kg/dose q6h AND max 10 mg q6h)

Morphine: Current morphine drip rate (mg/kg/h) = _____ mg/kg/dose methadone q6h (max initial dose 0.2 mg/kg/dose q6h AND max 10 mg q6h)

Benzodiazepine conversion plan:
Calculate starting lorazepam dose:

Midazolam: Multiply current midazolam drip rate (mg/kg/h) X 0.5 = _____ mg/kg lorazepam q6h (max initial dose 0.2 mg/kg/dose q6h AND max 4 mg q6h)

Weaning Methadone and Lorazepam

Once stable on methadone and/or lorazepam for 24 h with no withdrawal symptoms, wean methadone and lorazepam as follows.

Methadone

Short Course Methadone Wean (wean every day)

Step 1- Starting dose of methadone PO q6h x4 doses (see above calculation)
Step 2- W to 80% of starting dose PO q6h x4 doses
Step 3- W to 80% of starting dose PO q8h x3 doses
Step 4- W to 80% of starting dose PO q12h x2 doses
Step 5- W to 80% of starting dose PO q24h x1 dose
Step 6- If each dose is ≤0.1 mg/kg, discontinue methadone. If not, wean methadone dose by ≤20% (of starting dose) each day until ≤0.1 mg/kg/dose Q24h x1 dose (last step may be an ~10% wean). Then discontinue methadone.

Long Course Methadone Wean (wean every other day)

Step 1- Starting dose of methadone PO q6h x8 doses (see above calculation)
Step 2- W to 80% of starting dose PO q6h x8 doses
Step 3- W to 80% of starting dose PO q8h x6 doses
Step 4- W to 80% of starting dose PO q12h x4 doses
Step 5- W to 80% of starting dose PO q24h x2 doses
Step 6- If each dose is ≤0.1 mg/kg, discontinue methadone. If not, wean methadone dose by ≤20% (of starting dose) each other day until ≤0.1 mg/kg/dose Q24h x2 doses (last step may be an ~10% wean). Then discontinue methadone.

Lorazepam

Short Course Lorazepam Wean (wean every day)

Step 1- Starting dose of lorazepam PO q6h x4 doses (see above calculation)
Step 2- W to 80% of starting dose PO q6h x4 doses
Step 3- W to 80% of starting dose PO q8h x3 doses
Step 4- W to 80% of starting dose PO q12h x2 doses
Step 5- If each dose is ≤0.05 mg/kg, discontinue lorazepam. If not, wean lorazepam dose by ≤20% (of starting dose) each day until ≤0.05 mg/kg/dose Q12h x2 doses (last step may be an ~10% wean). Then discontinue lorazepam.

Long Course Lorazepam Wean (wean every other day)

Step 1- Starting dose of lorazepam PO q6h x8 doses (see above calculation)
Step 2- W to 80% of starting dose PO q6h x8 doses
Step 3- W to 80% of starting dose PO q8h x6 doses
Step 4- W to 80% of starting dose PO q12h x4 doses
Step 5- If each dose is ≤0.05 mg/kg, discontinue lorazepam. If not, wean lorazepam dose by ≤20% (of starting dose) each other day until ≤0.05 mg/kg/dose Q12h x4 doses (last step may be an ~10% wean). Then discontinue lorazepam.
Clonidine Management Based on Duration of Dexmedetomidine Infusion

- **≤ 3 days**: No clonidine or dexmedetomidine taper necessary
  - Monitor for symptoms of withdrawal. If symptoms occur, begin clonidine patch, may rescue with clonidine enterally as needed.

- **4 days**:
  - Discontinue dexmedetomidine infusion without a wean or wean infusion by 25% of original dose every 6 hours

- **≥ 5 days**:
  - Start clonidine patch (best to initiate 24-48 hours prior to planned discontinuation of dexmedetomidine infusion)
  - Dexmedetomidine infusion rate of ≤ 1 mcg/kg/hr: Clonidine target dose of 5 mcg/kg/day x 7 days
  - Dexmedetomidine infusion rate of > 1 mcg/kg/hr: Clonidine target dose of 10 mcg/kg/day x 7 days
  - Target dose should be calculated, then rounded down to the nearest ¼, ½, ¾, or whole patch. Patches available as 0.1 mg/24h, 0.2 mg/24h, 0.3 mg/24h. (0.1mg = 100 mcg). DO NOT CUT PATCH (cover excess with adhesive bandage).

  - Dexmedetomidine should be discontinued without weaning after: (whichever is first)
    1. 24 hours of clonidine patch
    2. Extubation and discontinuation of noninvasive ventilation

*Clonidine patch may take 2-3 days to reach steady state concentrations

If patch must be removed or falls off at any point, request a replacement patch from pharmacy to complete duration of therapy.

MANAGEMENT OF EXCESSIVE SEDATION AND WITHDRAWAL BASED ON PHARMACEUTICAL CLASS

Methadone and/or Lorazepam ONLY

**Excessive Sedation**
- If excessive sedation is apparent on clinical assessment after beginning methadone and/or lorazepam, hold the next dose x1, then proceed to the next step on the weaning plan.

**Withdrawal Symptoms**
- Opioid withdrawal symptoms include: Gastrointestinal (diarrhea, vomiting, feeding intolerance), central nervous system (tremors, seizures, agitation, insomnia, yawning, sneezing), and sympathetic hyperactivity / autonomic dysfunction (tachycardia, diaphoresis, hypertension, tachypnea, nasal stuffiness, hyperpyrexia)
- Benzodiazepine withdrawal symptoms include: Central nervous system (agitation, restlessness, irritability, delirium, hallucinations, seizures) and sympathetic hyperactivity (tachycardia, hypertension, tachypnea, hyperpyrexia)
- Management:
  1. If WAT-1 score ≥3* and assessment consistent with withdrawal, give morphine 0.05-0.1 mg/kg (max 5 mg) IV x1. Reassess WAT-1 score in 1 hour.
  2. If WAT-1 score still ≥3* and assessment consistent with withdrawal, give lorazepam 0.05-0.1 mg/kg (max 4 mg) IV x1. Reassess WAT-1 score in 1 hour.
  3. If WAT-1 score still ≥3* and assessment consistent with withdrawal, give morphine 0.05-0.1 mg/kg (max 5 mg) IV x1. Reassess WAT-1 score in 1 hour.
  4. If patient requiring greater than 3 rescue doses of morphine and/or lorazepam in a 12 hour period, resume previous dosage on the weaning plan (or increasing dose 20% if on Step 1). Resume wean when WAT-1 score <3 OR withdrawal symptoms have been resolved x24 hours.

  *Physician may choose higher WAT-1 score if patient has preexisting condition such as baseline hypertonia. See “DCMC WAT-1 Guidelines”.

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**Clonidine ONLY**

**Excessive Sedation**

- If excessive sedation due to dexmedetomidine or clonidine is apparent on clinical assessment after beginning clonidine, perform the following in a stepwise manner:
  1. Discontinue dexmedetomidine infusion, if still infusing
  2. Remove clonidine patch (Note: it may take time for concentrations to decline)
  3. Reduce the dosing of or discontinue concomitant sedation

**Withdrawal Symptoms**

- Alpha-agonist withdrawal symptoms include: rebound hypertension, tachycardia, agitation, insomnia

- If withdrawal due to dexmedetomidine or clonidine is apparent on clinical assessment, perform the following in a stepwise manner:
  1. Give clonidine enterally 2 mcg/kg x1 (up to Q6h PRN) [If clonidine is being used frequently, wean clonidine by 25% of dosing daily until off.]
  2. Start clonidine doses as recommended above based on dexmedetomidine infusion rate, if not on clonidine
  3. If already on clonidine and greater than 2 rescue doses needed in a 12 hour period, increase clonidine patch dose by 25%
  4. If withdrawal symptoms not controlled, restart dexmedetomidine infusion

**Methadone, Lorazepam, and Clonidine**

**Excessive Sedation**

- If excessive sedation is apparent on clinical assessment after beginning methadone, lorazepam, and/or clonidine, hold the next dose of methadone and/or lorazepam x1, then proceed to the next step on the weaning plan. If excessive sedation continues, refer to the stepwise “Clonidine ONLY Excessive Sedation” management above.

**Withdrawal Symptoms**

- There is considerable overlap in the withdrawal symptoms of opioids, benzodiazepines, and alpha agonists (see the symptoms associated with each above).

- Management:
  1. If symptoms isolated to rebound hypertension and tachycardia, refer to the “Clonidine ONLY Withdrawal Symptoms” management above.
  2. For other symptoms of withdrawal, refer to the “Methadone and/or Lorazepam ONLY Withdrawal Symptoms” management above.

**References**


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