Pediatric Palliative Care

Use of Opioids for the Management of Pain

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Supplementary Material

This supplementary material contains the tables referred to in the full version of this article, which can be found at http://pediatricdrugs.adisonline.com.

<table>
<thead>
<tr>
<th>Commonly used rotation protocols from other opioids to methadone/levomethadone</th>
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<tr>
<td>There are two common adult protocols that have been adapted for children. These protocols are commonly used despite a lack of clinical trials to support them. This figure shows regimens commonly used in Germany.</td>
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<td><strong>Modified German protocol according to Nauck et al.</strong> [172]</td>
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<td>Stop current opioid therapy. On day 1, administer 0.1 mg/kg (maximal 5 mg) of oral levomethadone (alternatively 0.05 mg/kg [maximal 2.5 mg] intravenously) every 4 hours, and additionally every hour if needed. On days 2 and 3, titrate the dose to effect by increasing each dose by up to 30% if needed. Keep the dose administration interval constant. Restrict the breakthrough dose to 1 hourly. On day 4, the effective single dose is given every 8 hours and if needed additionally every 3 hours. The following days are used to fine tune the single dose to effect while keeping the dose administration interval constant.</td>
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<td><strong>Ripamonti protocol for methadone switch</strong> [173]</td>
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<td>The opioid switch will take at least 3 days with daily reduction of the established opioid and concomitant administration of oral methadone every 8 hours. On days 1–3, the primary opioid is reduced by 30% and augmented by an amount of methadone calculated as follows.</td>
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<tr>
<td>- Previous oral morphine equivalence dose (OMED) 30–90 mg/day then conversion factor 4:1 (morphine:methadone)</td>
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<td>- OMED 90–300 mg/day then conversion factor 6:1</td>
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<tr>
<td>- OMED &gt;300 mg/day then conversion factor 8:1</td>
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<td>After 3 or more days, the child should be exclusively receiving methadone every 8–12 hours. One-tenth of the daily methadone dose should be prescribed as an additional ‘on demand’ bolus dose against breakthrough pain.</td>
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Rotation to fentanyl transdermal therapeutic system (TTS)\textsuperscript{[19]}

Until such time as data for children contradicts the adult approach, a 12-hour overlap of previous opioid and application of fentanyl patch seems reasonable. However, given individual variance, careful monitoring is required and rescue medication is to be continued.

Patient on continuous intravenous/subcutaneous infusion of morphine or hydromorphone:
- Apply fentanyl TTS; continue with morphine/hydromorphone infusion for 12 hours, then stop the infusion. For the next 24 hours use intravenous/subcutaneous morphine/hydromorphone exclusively in case of breakthrough pain, thereafter switch to oral breakthrough pain control.

Patient exclusively on unretarded morphine/hydromorphone every 4 hours:
- Apply fentanyl TTS, continue to give oral immediate release morphine/hydromorphone by the clock for the next 12 hours, then change to as needed.

Patient on 12-hour-retarded morphine/hydromorphone:
- Apply fentanyl TTS together with the last dose of retarded morphine/hydromorphone. Order immediate-release oral opioid for breakthrough pain.

Patient on 24-hour-retarded morphine/hydromorphone:
- Apply fentanyl TTS 12 hours past the last dose of 24-hour-retarded morphine/hydromorphone. Order immediate-release oral opioid for breakthrough pain.
References


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