# [PR2-124] Quantifying Opioid Sparing Effects to Objectively Assess Success of Regional Anesthesia in Children

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Introduction:
What establishes whether regional anesthesia is worth the time and risk? (1) What is the endpoint? In adults, success in regional occurs when surgery can be performed without general anesthesia. In pediatrics, this rarely happens, as the norm is to perform blocks with children asleep.
So, how do we establish the worth of regional anesthesia for pediatric patients? Outcomes such as length of stay, cost, patient satisfaction or opioid sparing can be surrogates for block success.(2) By analyzing opioid sparing, we might establish criteria to decide if a block is successful and if yes, how successful. The aim of this study is to analyze opioid sparing effects of regional analgesia in children.

Method:
Data was mined from the electronic medical records (EMR) of 81 consecutive pain service patients of a single pain physician (DM) to avoid confounding by multiple providers. We recorded the amount of perioperative opioids and converted this to a Morphine Equivalency Rate (MER) using an established opioid conversion table. Rates are additive between different opioids. Conversion to morphine was based on conversion factor of Fentanyl 50 micrograms to 1 milligram (mg) of Morphine, and Dilaudid 0.2mg to 1mg Morphine. Remifentanil and volatile anesthetics were not factored into MER, although known to affect MER. For these reasons, MER POD#1 was used to establish block success.

Results:
First, we compared Epidural analgesia versus the Non-Regional, patient controlled analgesia (PCA) cases on POD1 for their MER. There was a statistically significant (p-value <0.0001) opioid sparing effect (>80%) due to epidural analgesia, with a mean MER POD#1 of 3.85 mcg/kg/h for Epidural analgesia versus 22.08 mcg/kg/h for PCA cases. We then analyzed all catheter based regional analgesia (e.g. TAP catheters), and there was still a statistically significant opioid-sparing effect (37.6%, p-value=0.037) between the regional (13.76 mcg/kg/h) and PCA (22.08 mcg/kg/h) groups.

Summary:
Compared to PCA, epidural analgesia had >80% opioid sparing effect and catheter based regional analgesia had about 37% opioid sparing effect. This is a first step in data mining of EMR for better understanding of how we take care of pain following surgery. By looking at MER, we can objectively quantify what is obvious, that regional anesthesia minimizes opioid use and minimizes the risks of opioids. Since our group has increased use of regional anesthesia, respiratory depression requiring naloxone has dropped substantially.
Changing opioid usage to a common rate allows us to look at other reasons for differing opioid needs, such as type of case, use of non-narcotic analgesics, antispasmodics, anxiety issues, developmental delays and cultural reasons.

References:
1. Weber T, et al. The Journal of thoracic and cardiovascular surgery. 2007;134(4):865-70.
2. Gasior AC, et al. The Journal of surgical research. 2013;185(1):12-4.