In adult surgical patients, does administration of routine IV Tylenol, in conjunction with opioids for pain management, decrease the use of opioids during the ICU postoperative period?

### Background
- Pain is the most common complaint of patients undergoing moderate to complex surgical procedures and is one of the biggest hurdles for healthcare providers in the intensive care setting.
- Parenteral administration of opioids are the mainstay treatment for severe pain following various types of surgical procedures.
- Opioid-based analgesia has side effects such as nausea, vomiting, respiratory depression, excessive sedation, urinary retention, depression of gastric motility and confusion.
- These side effects can be frustrating and can adversely affect post-operative mobility and recovery.
- Joint Commission on Accreditation of Healthcare Organizations has also suggested excessive opioid-based analgesia leads to decreased patient satisfaction.

### Methods
- **Searches:**
  - ClinicalTrials.gov
  - Embase
  - MEDLINE
  - PubMed
  - Cochrane
  - CINAHL
- **Search terms:** "IV paracetamol" or "IV Tylenol" AND "prescription" and "postoperative pain" NOT "spinal analgesia"
- **Inclusion criteria:** adults age 18-80, year 2004 or newer, journals, full text, English language
- **Exclusion criteria:**
  - Not relevant to the study
  - Lack of randomized controlled trial
  - Only letters without data
  - Not enough data to assess

### Summary of Literature

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<th>Study</th>
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<td>Galvão et al., 2016</td>
<td>118 patients</td>
<td>IV paracetamol</td>
<td>Opioids</td>
<td>Postoperative pain</td>
<td>Significant reduction in postoperative pain compared to opioids (P&lt;0.001)</td>
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<tr>
<td>Rønnegard et al., 2013</td>
<td>1,000 patients</td>
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<td>Skov et al., 2014</td>
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<td>Significantly lower pain scores at 60 minutes postoperatively (P&lt;0.001)</td>
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<td>Fink et al., 2014</td>
<td>200 patients</td>
<td>IV paracetamol</td>
<td>Opioids</td>
<td>Postoperative pain</td>
<td>Significant reduction in postoperative pain compared to opioids (P&lt;0.001)</td>
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### Summary of Findings
- Reviewed literature included various types of surgical procedures.
- In the majority of reviewed studies, opioid consumption was less in the paracetamol groups but not consistently statistically significant.
- In studies that also measured patient satisfaction, satisfaction with analgesia was notably higher in the paracetamol groups than opioids based analgesia alone.
- Paracetamol administration was superior in pain relief to opioids during activities such as deep breaths and mobilization.
- When examined as an outcome variable, administration of paracetamol did not have an impact on hepatic function or vital signs.
- Parallel findings found a decrease in post-operative nausea/vomiting and decrease in time to extubation with paracetamol.
- IV paracetamol is a useful component of multimodal analgesia after major surgery in adults and can increase patient satisfaction with pain control.

### Limitations
- IV Tylenol preparations were not FDA approved in the United States until 2010.
- Small RCT sample sizes in many of the studies.
- Research covers a large variety of different surgical procedures.
- Lack of a large amount of research on specific procedures establishes generalizability but makes application to a specific procedure difficult.

### Moving Forward
- Paracetamol can decrease the use of opiates as primary pain control in the immediate postoperative period.
- Policy implementation for routine use of paracetamol can be beneficial to both patients and healthcare providers in the realm of acute pain control.
- Dissemination of education regarding low incidence of paracetamol related side effects can increase adherence and compliance.
- Policy implementation with predetermined pain control order set for moderate/major surgical procedures would also increase
- Paracetamol should not be used in hepatic impairment or paracetamol allergies.