Opioids easily cause adverse drug events (ADEs) or therapeutic failure in case of prescribing errors, resulting in increased costs for the hospital, patient and healthcare system. The clinical pharmacist can detect and resolve these errors by performing prescription order validation (POV). Little data is available on the economic impact of this service.

**OBJECTIVE**: To evaluate the cost-outcome of pharmacist-initiated interventions on opioid prescriptions during POV, in terms of cost savings and cost avoidance for the hospital.

** METHODS**

- Setting: retrospective study in UZ Brussel, a tertiary university hospital of 721 beds in Belgium.
- Electronic opioid prescriptions (fentanyl, methadone, morphine, oxycodone, piritramide) reviewed and validated by clinical pharmacist during centralized pharmacy-based POV (Period: 1/2/2017 – 31/1/2018) – exclusion of palliative patients.
- Cost analysis using methodology by Nesbit et al.; per patient, the following evaluation was made:

1. **DRUG COST (OR SAVING)**
   - Drug cost of initial therapy (without intervention)
   - Drug cost of recommended treatment (with intervention)

2. **ADE COST AVOIDANCE**
   - Probability of ADE occurrence ∗ average hospital cost of opioid related ADE per patient

3. **POV COST**
   - Personnel expenses of clinical pharmacist and software engineer

** RESULTS AND DISCUSSION**

3040 validated opioid prescriptions; 137 pharmacist interventions (4.5%) – 94 implemented interventions (acceptance rate 68.8%) for 86 patients

**Table 1: Type of drug related problem (DRP)**

<table>
<thead>
<tr>
<th>Type of DRP</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration mode</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>Contraindication</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Dose too high</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>Duplication</td>
<td>13 (14%)</td>
</tr>
<tr>
<td>Interaction</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>No indication</td>
<td>13 (14%)</td>
</tr>
<tr>
<td>Time or frequency of administration</td>
<td>55 (59%)</td>
</tr>
<tr>
<td>Undesirable effect</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>

32% 14% 5% 19% 30%

**Figure 1: PE of ADE occurrence per patient**

- First Belgian study to estimate the cost-benefit of POV from a hospital’s perspective.
- POV is essential for patient safety. Unfortunately clinical pharmacists can not (yet) validate all prescriptions: supplementary electronic systems are needed to achieve a 100% coverage. Standardized clinical decision rules, preferably electronically integrated, can limit a potential inter-pharmacist variability by alerting high-risk prescriptions to the pharmacist.

**Limitations** (small expert panel, pragmatic cost calculation method, main focus on opioids): further research remains necessary.

**Conclusion**

Investments in clinical pharmacy services like POV of opioids are valuable, not only to improve the patient's clinical outcome, but also to reduce the hospital's costs.

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