Promoting the use of safer injectable medicines using a novel metric
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What was done and why

• In 2002, to reduce the risk of patient harm, the National Patient Safety Agency (NPSA) in the UK recommended restricting the supply of strong potassium chloride (KCl) solutions in ampoules and maximising the supply of ready-to-administer (RTA) infusions.1
• The World Health Organisation’s High 5s project recommended standardisation of concentrated high risk injectable medicines including KCl.2
• Later guidance recommends the use of ready-to-use (RTU) or ready-to-administer (RTA) injectable products where these are available to reduce the risk of patient harm from errors in the preparation of injections and infusions on hospital wards.2
• Although organisations are asked to state that recommendations have been implemented, the extent of implementation is not measured. Compliance is therefore assumed rather than demonstrated.
• Following publication of the Carter Report3 which refers to Medication Safety as a Clinical Service providing organisational assurance and governance to ensure patients are not harmed by medicines, we developed a series of metrics to measure compliance with national guidance for the safe use of injectable medicines

How it was done

• A simple metric to compare the numbers of concentrated and RTA/RTU injectables issued to clinical areas by Pharmacy was developed (Box 1)
• The metric is expressed as a percentage (%) and informs the organisation the extent to which safer injectable medicines are used. A high % indicates good compliance.
• Pharmacy issue data for high risk injectables including intravenous potassium chloride, IV midazolam, IV magnesium, IV fentanyl were used (Box 2).
• Metrics for the two hospitals within our organisation (Site 1 and Site 2) were calculated and compared.
• Variations in practice were identified and an action plan to maximise the metrics score was put in place

What was achieved

Table 1. Monthly and baseline metrics for four high risk drugs

<table>
<thead>
<tr>
<th>High Risk Drug</th>
<th>Calculated metric % for baseline and monthly for 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2016</td>
</tr>
<tr>
<td>Potassium chloride (all clinical areas)</td>
<td>Site 1</td>
</tr>
<tr>
<td>Potassium chloride (excluding paediatrics)</td>
<td>Site 1</td>
</tr>
<tr>
<td>Midazolam 1mg/ml</td>
<td>Site 1</td>
</tr>
<tr>
<td>Midazolam 1mg/ml</td>
<td>Site 2</td>
</tr>
<tr>
<td>Magnesium sulphate 20%</td>
<td>Site 1</td>
</tr>
<tr>
<td>Magnesium sulphate 20%</td>
<td>Site 2</td>
</tr>
<tr>
<td>Fentanyl 2.5mg/50ml</td>
<td>Site 1</td>
</tr>
<tr>
<td>Fentanyl 2.5mg/50ml</td>
<td>Site 2</td>
</tr>
</tbody>
</table>

What is next

• The use of the metric has highlighted and quantified unwarranted variation in the use of safer injectable medicines across our organisation.
• Monthly monitoring with further analysis where metric results are unexpectedly low has facilitated further reductions in the use of concentrates by identifying causes, encouraging changes in prescribing practices and raising awareness of the availability of ready-to-administer formulations.
• This was especially the case for potassium chloride where there was intermittent unwarranted variation
• The metrics model is being used successfully to measure implementation of other initiatives to promote safe medicines use.
• Discussions are underway to benchmark data between organisations locally.
• Data are reported upwards within the organisation to provide assurance that risks are being actively managed.

We believe that these metrics are a measure of medication safety within organisations. Further work is needed to validate the relationship between the metrics and patient safety

References
1. Potassium solutions: risks to patients from error occurring during intravenous administration. 2002. Available at: www.nrls.npsa.nhs.uk/resources/type/alerts?entryId45=598824p=4
2. Action on Patient Safety: High 5s. Available at www.who.int/patientsafety/solutions/high5s/High5s_overview.pdf

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