Baxter elastomeric pumps: weighing as an alternative to visual inspection

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BACKGROUND

- Elastomeric pumps are used to administer continuous 46-hour infusions of 5-fluorouracil (5FU) in ambulatory cancer patients.¹
- Standard practice involves patients visually monitoring their pumps to ensure proper infusion.² This subjective process can be confusing and lead to concerns about under- or over-dosing.
- Currently, Baxter manufactures 96% of ambulatory chemotherapy pumps, and has not acknowledged weighing pumps as a validated alternative approach to visual inspection.³,⁴

METHODS

- Prospective pre-post dual-site study including patients on a 46-hour 5FU infusion.
- Patients returned to the clinic approximately 24 hours after starting treatment and their pump was weighed on a StarFrit™ kitchen scale.
- Date, time, weight, and current chemotherapy cycle number were recorded and patients were asked if they preferred weighing or visually inspecting their pump.
- Total infusion time elapsed, change in weight, and infusion rate of pumps were calculated and compared to expected values derived from the manufacturer defined rate of 5 mL/h ± 10%.
- Primary outcomes: rate of infusion and its associated variability.
- Secondary outcome: patient preference.

PATIENT PREFERENCE RESULTS

Table 1. Patient preference for weighing or visual inspection based on chemotherapy cycle number.

<table>
<thead>
<tr>
<th>Cycle number</th>
<th>Number of patients</th>
<th>Preferred weighing</th>
<th>Preferred visual inspection</th>
<th>No preference/ not sure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;8</td>
<td>15 (39.5%)</td>
<td>4 (10.5%)</td>
<td>19 (50.0%)</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>≥8</td>
<td>13 (34.2%)</td>
<td>8 (21.1%)</td>
<td>17 (44.7%)</td>
<td>38</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

- In our population, infusions were running faster and pumps were weighing less than expected at weigh-in time points. The average flow rate over elapsed time was outside of the defined 10% variability but within the maximum variability of 40%.
- Patient variables influence flow rates, so it is imperative to educate patients about these factors and their effects in order to minimize variability.
- The flow rate calculated using linear regression over the time interval 17.25 – 27.5 hours was 8.78% slower than expected, however, according to Baxter the rates slow around this point of infusion, which is consistent with our data.
- Of the 52.7% of patients who expressed a preference regarding pump assessment method, more than twice as many preferred weighing over visual inspection.

CONCLUSIONS

- Weighing Baxter Infusors™ with a kitchen scale can be an acceptable and objective alternative to the current standard of visual inspection.
- It is important to provide education to patients, as there are many factors that can influence flow rates of their pump.
- Implementation of voluntary patient pump weight assessment would require provision of literature describing the method and safe weight ranges for pumps at various time points throughout the infusion. This could be provided in an electronic form for mobile access.

References


This study was approved by the Health Research Ethics Board of Alberta Cancer Committee.