Intravenous Iron is effective in reducing the need for blood transfusion in Acute Medical Settings
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INTRODUCTION
Blood transfusions are necessary for patients with significant symptomatic anaemia in acute medical settings. NHS England issues approximately 1.5 million units of packed red cells per year accounting for a need of 31 units per thousand population (1). However given the attendant risks of blood transfusions, coupled with supply shortages we aimed to evaluate whether the increasing use and availability of intravenous (IV) iron in these patients may reduce the need and frequency for blood transfusions.

METHODS
The following IT systems were interrogated: Electronic Patient Record, Integrated Clinical Environment (requests and results) and E-Prescribing and Medicines Administration.

A list of inpatient episodes was generated for the years 2014 - 2016 whose discharge summaries included one of the following coded diagnoses: anaemia, menorrhagia or gastrointestinal bleeding (using respective anatomical terms). These records were then reviewed to identify those who received packed red cell (PRC) transfusions. Those who did not receive PRC transfusions or were transfused as outpatients or a semi-elective day case setting were excluded. Pharmacy supply and distribution records for IV iron (Cosmofer or Ferinject) were obtained and were then cross-compared with those receiving PRC transfusions.

GraphPad Prism was used to generate graphs and statistical analysis (unpaired t-test).

RESULTS
321 of 770 episodes received PRC transfusion. The overall units transfused were: 468 in 2014, 334 in 2015 and 309 in 2016; equating to an equivalent of 93,600mg, 66,800mg and 61,800mg of elemental iron (200mg/unit). For those coded with anaemia (n=137), there was a significant reduction in the mean PRCs transfused in 2016 compared to 2014 (Graph 1).

With regards to IV iron preparations the following table displays the raw data for all patients from 2014 - 2016:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Elemental Iron (mg)</th>
<th>Mean Dose / Administration (mg)</th>
<th>Ferinject 500mg Doses</th>
<th>Ferinject 1000mg Doses</th>
<th>Cosmofer 100 - 1600mg (Variable Doses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>168,490</td>
<td>923</td>
<td>10</td>
<td>87</td>
<td>86</td>
</tr>
<tr>
<td>2015</td>
<td>229,000</td>
<td>970</td>
<td>14</td>
<td>222</td>
<td>0</td>
</tr>
<tr>
<td>2016</td>
<td>387,500</td>
<td>969</td>
<td>25</td>
<td>375</td>
<td>0</td>
</tr>
</tbody>
</table>

Using the same sample population as Graph 1 (those coded with anaemia), we note a significant increase in the mean amount of IV iron administered in 2016 compared to 2014 (Graph 2).

CONCLUSIONS
Over three consecutive years, this retrospective study demonstrates an overall reduction in the number of PRC transfusions given to inpatients with anaemia, GIIB, or menorrhagia, and an increase in IV iron (mg) administered. Furthermore, for patients coded with anaemia in 2014 and 2016, the data indicates a significant change in administration of both PRCs and IV iron.

This correlative data is suggestive that the increased utilisation of IV iron contributes to a reduction in PRC transfusions. This is particularly evident in those patients with anaemia as opposed to overt bleeding.

The primary reasons for our findings include: the increased availability of parenteral iron, promulgation of a lower haemoglobin level at which to transfuse and the increased availability of elective day-case management of patients requiring transfusion.

This growing change in practice to use IV iron instead of PRC transfusions in anaemic patients in acute medical settings is likely to result in safer patient care and help alleviate the ever growing demand for both blood products and their respective donors within the UK.

REFERENCES

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