Determining when intravenous iron treatment is appropriate in hospitalized patients
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Background
Iron deficiency anemia is the most common form of anemia and affects millions of Americans every year. Iron deficiency is a common comorbidity in pregnancy, chronic kidney disease (CKD), heart failure and many other conditions. Iron deficiency can be diagnosed if ferritin < 30ng/mL, ferritin < 100ng/mL and CKD, or ferritin 100 – 300ng/mL and transferrin saturation < 20%. Oral iron products are used to restore iron levels in patients treated with at least 1 dose of intravenous iron. The specific criteria required to switch from oral to intravenous iron varies.

Objective
This study aims to determine what factors play into the decision-making process of healthcare professionals when starting a patient on intravenous iron products.

Methods
Study design: Single-center retrospective chart review
IRB approval: Springfield Committee for Research Involving Human Subjects Institutional Review Board
Inclusion criteria: Patients treated with at least 1 dose of intravenous iron sucrose
Age 18-89 years old and hospitalized for at least 24 hours between May 2018 to May 2022
Exclusion criteria: Patients who received blood transfusion before iron panel results, diagnosed with end stage renal disease and on dialysis, active cancer being treated with chemotherapy
Data analysis: Data on these patients’ treatments, iron panels, and provider notes will be analyzed and compared.

Results

<table>
<thead>
<tr>
<th>Additional Treatments Given</th>
<th>Reasons for IV Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Iron Product</td>
<td>Patient was unable to take oral medication</td>
</tr>
<tr>
<td>Intravenous Iron</td>
<td>Patient had blood loss</td>
</tr>
<tr>
<td>Transfusion</td>
<td>Scheduled IV iron occurred during hospitalization</td>
</tr>
<tr>
<td>Erythropoietin Stimulating Agent</td>
<td>Patient had low hemoglobin levels</td>
</tr>
<tr>
<td>Other</td>
<td>Patient had anemia or IDA diagnosis</td>
</tr>
</tbody>
</table>

Table 1: No reason given

<table>
<thead>
<tr>
<th>Ferritin (ng/mL) Range</th>
<th>Patient was unable to take oral medication</th>
<th>Patient had blood loss</th>
<th>Scheduled IV iron occurred during hospitalization</th>
<th>Patient had low hemoglobin levels</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;200</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>11-200</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>16-30</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>&lt;15</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure #1

Figure #2

Figure #3

Iron Deficiency Anemia Diagnosis Compared to Reasons for IV Iron

No reason given
Patient was unable to take oral medication
Inadequate response to oral iron treatment
Patient had blood loss
Scheduled IV iron occurred during hospitalization
Ferritin < 30ng/mL
Ferritin 100-300ng/mL + Transferrin Saturation < 20% + CKD
Other
Not IDA

Figure #4

Number of Patients Per Ferritin (ng/mL) Range

>200 11-200 16-30 <15

Figure #5

Number of Patients Per Transferrin Saturation (%)

>20% 10-20% <10%

Limitations
Small sample size, single institution, retrospective design
Subjective interpretation required of some progress notes to organize reasons in Figure #2

Conclusion
Complete documentation should be encouraged across hospital staff to ensure patient safety
Ensuring patients receive necessary diagnostic test to determine guideline driven care should be encouraged.