

# 4. IRON THERAPY

Iron can be given in oral or intravenous forms for patients with iron deficiency.

## Key messages

- Iron therapy is an important tool for optimising red blood cell mass (PBM Pillar 1).
- Iron therapy may be used as a primary treatment for anaemic or non-anaemic iron deficiency (including sub-optimal iron stores prior to surgery), or to augment the response to ESAs.<sup>1,2</sup>
- The underlying cause of the iron deficiency should be identified and managed.

## Clinical implications

- In medical patients with iron deficiency anaemia, iron therapy is required to replenish iron stores regardless of whether a transfusion is indicated.<sup>2</sup>
- Iron therapy is recommended for patients with or at risk of iron deficiency and for those with suboptimal iron stores.<sup>1,2</sup>
- Oral iron therapy is suitable and effective in most patients.<sup>3</sup>
- Intravenous iron should be considered for patients whose surgery cannot be delayed, or if oral iron is contraindicated or not tolerated.<sup>1,3</sup>
- Newer preparations of intravenous iron are safe, easy to administer and well tolerated.<sup>3,4</sup>
- Patients should be provided with information brochures about oral or intravenous iron therapy.
- Oral iron therapy is not recommended in the early postoperative period as it is not clinically effective.<sup>1</sup>

## Background

Iron therapy may be used as a primary treatment for anaemic or non-anaemic iron deficiency, or to augment the response to ESAs. When administered with ESAs, iron therapy prevents both absolute and functional iron deficiency and minimises the dose of ESA needed to achieve target Hb concentrations.<sup>1,2</sup> In Australia, ESAs are only indicated for the "treatment of anaemia requiring transfusion, defined as a haemoglobin level of less than 100 g/L, where intrinsic renal disease, as assessed by a nephrologist, is the primary cause of the anaemia".<sup>5</sup> (See ESA companion)

In medical patients with iron deficiency anaemia, iron therapy is required to replenish iron stores regardless of whether a transfusion is indicated (MED-PP4).<sup>2</sup> In patients with chronic heart failure (CHF), identification and treatment of iron deficiency (functional and absolute) has been shown to reduce symptoms and improve submaximal exercise tolerance and quality of life (MED-R3).<sup>2,6</sup> In patients with cancer, the aetiology of anaemia is often multifactorial; and where appropriate, reversible causes should be identified and treated (MED-PP8).<sup>2</sup>

The WA Health PBM Program has developed a [list of surgical patients who will benefit from preoperative iron/RBC assessment](#).

In surgical patients, iron therapy is recommended for patients with or at risk of iron deficiency (PO-R4,PP7); and for those with suboptimal iron stores (PO-PP6).<sup>2</sup> Most studies report that preoperative oral iron supplementation is effective in raising haemoglobin concentration, and decreases perioperative transfusion by 50–82%.<sup>4</sup> Oral iron is not recommended in the early postoperative period as it is not clinically effective due to reduced absorption associated with the acute inflammatory response post-surgery (PO-R6).<sup>2</sup>

Although oral iron supplementation may be suitable for a high proportion of patients, there are some in whom intravenous iron should be considered, e.g. for patients whose surgery cannot be delayed, or if oral iron is contraindicated or not tolerated, usually due to gastrointestinal side effects.<sup>3,4</sup>

Two studies of intravenous iron sucrose, administered preoperatively to patients scheduled for major surgery, have shown a significant increase in haemoglobin concentration, resolving anaemia in up to 58% of patients in one study.<sup>4</sup> Preoperative intravenous iron can reduce transfusion among patients undergoing surgery for trochanteric hip fracture by 33%.<sup>4</sup>

However, in contrast to these results, a randomised controlled trial performed in 60 patients undergoing colorectal cancer resection reported that intravenous iron administered 14 days before surgery had no impact on haemoglobin concentration in comparison with placebo, and no impact on transfusion rates.<sup>4</sup>

Intravenous iron may provide a greater increase in haemoglobin concentration than oral iron. In a randomised, prospective study, women with anaemia caused by menorrhagia were treated with intravenous iron sucrose or oral iron protein succinylate daily.<sup>4</sup> Treatment was administered during the 3 weeks before elective surgery, and a significantly greater increase in haemoglobin concentration was observed in the intravenous group (3.0 vs. 0.8 g/dL). One study in gynaecological cancer showed a 64% reduction in RBC transfusion in patients treated with IV iron compared to those who received oral iron.<sup>2,4</sup>

Intravenous iron is well tolerated. Older preparations of iron for intravenous administration (e.g. iron dextran) were associated with a risk of anaphylactic reactions.<sup>4</sup> However, a number of studies performed in recent years have reported favourable tolerability. Currently available intravenous iron preparations are much safer than previous preparations, although the possibility of adverse events such as hypotension, arthralgia, abdominal discomfort and back pain remains. There is no prospective data to confirm association with bacteraemia and intravenous iron.<sup>4</sup>

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## References

1. National Blood Authority. [Patient Blood Management Guidelines: Module 2 – Perioperative](#). Australia, 2012.
2. National Blood Authority. [Patient Blood Management Guidelines: Module 3 – Medical](#). Australia, 2012.
3. Pasricha SR, Flecknoe-Brown SC, Allen KJ, Gibson PR, McMahon LP, Olynyk JK, et al. [Diagnosis and management of iron deficiency anaemia: a clinical update](#). MJA 2010;193:525–532.
4. Kozek-Langenecker SA, Afshari A, Albaladejo P, Santullano CA, De Robertis E, et al. [Management of severe perioperative bleeding: guidelines from the European Society of Anaesthesiology](#). Eur J Anaesthesiol. 2013;30:270–382.
5. The Schedule of Pharmaceutical Benefits. Accessed 10 September 2013. Available at: <http://www.pbs.gov.au/pbs/home>
6. National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand (Chronic Heart Failure Guidelines Expert Writing Panel). [Guidelines for the prevention, detection and management of chronic heart failure in Australia](#). Updated July 2011.