## Part 3: Supplementary tables

**Supplementary table 1. ICCAMS Expert Panel.**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Name | Role | | | |  | Specialty | Country |
| Chair | Moderator | Consensus meeting panelist | Manuscript reviewer | Conduct literature search and review results |
| Aryeh Shander, MD | X |  | X | X |  | Anesthesiology | USA |
| Jens Meier, MD | X |  | X | X |  | Anesthesiology | Austria |
| Howard L. Corwin, MD |  |  | X | X |  | Critical Care Medicine | USA |
| Jean-François Hardy, MD |  |  | X | X |  | Anesthesiology | Canada |
| Donat R. Spahn, MD |  |  | X | X |  | Anesthesiology | Switzerland |
| David Faraoni, MD |  |  | X | X |  | Anesthesiology | USA |
| Tiffany Hall, RN |  |  | X | X |  | Nursing | USA |
| Manuel Muñoz, MD |  |  | X | X |  | Medical Research | Spain |
| Axel Hofmann, ME |  |  | X | X |  | Health Economics | Austria |
| Matthew A. Warner, MD |  |  | X | X |  | Anesthesiology | USA |
| Michael Auerbach, MD |  |  | X | X |  | Internal Medicine | USA |
| Jameela Sathar, MD |  |  | X | X |  | Hematology | Malaysia |
| Cheuk-Kwong Lee, MD |  |  | X | X |  | Hematology | Hong Kong |
| Jeanna Blitz, MD |  |  | X | X |  | Anesthesiology | USA |
| Sherri Ozawa, RN |  | X |  | X |  | Nursing | USA |
| Shannon Farmer, DHSc |  |  |  | X |  | Medical Research | Australia |
| Steven M. Frank, MD |  |  |  | X |  | Anesthesiology | USA |
| Jochen Erhard, MD |  |  |  | X |  | Surgery | Germany |
| Elvira Bisbe, MD |  |  |  | X |  | Anesthesiology | Spain |
| Rosalio Torres, MD |  |  |  | X |  | Hematology | Philippines |
| Tsin Wah Leung, MD |  |  |  | X |  | Obstetrics / gynecology | Hong Kong |
| Domenico Girelli, MD |  |  |  | X |  | Internal Medicine | Italy |
| Meridian HealthComms |  |  |  |  | X | Healthcare Communications | UK |

**Supplementary table 2. Recommendations on the use of iron therapy and erythropoiesis-stimulating agents (ESAs) for treatment of preoperative anemia from selected guidelines retrieved by our literature search.**

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| **Citation** | **Organization / group** | **Objective / scope of guidelines** | **Recommendations for treating preoperative anemia with iron therapy and/or ESAs** |
| Cinnella, G., Pavesi, M., De Gasperi, A., *et al.* (2019) | Italian Society of Anesthesia, Analgesia, Resuscitation and Intensive Care (SIAARTI) | PBM in the context of perioperative hemostasis and coagulation management | Oral iron supplementation is indicated if surgery is planned after more than 6 weeks from the diagnosis of iron deficiency. IV iron supplementation is indicated in patients affected by functional or absolute iron deficiency, and those who do not tolerate or do not respond to oral administration. Additionally, iron supplementation is indicated in non-anemic patients with reduced iron stores scheduled for surgery with predicted Hb loss >3 g/dL. ESAs are indicated for treatment of anemia related to chronic renal failure. ESAs may also be given with IV iron supplementation to patients with anemia related to inflammatory diseases. |
| Kaufner, L., von Heymann, C. (2018) | German Society for Anaesthesiology and Intensive Care Medicine in cooperation with the Working Group of Scientific Medical Societies (AWMF) | Diagnosis and treatment of preoperative anemia | Treatment should be timely and tailored according to the results of diagnostic tests. If iron deficiency is proven, therapy should be started primarily with iron. For anemia of chronic disease or renal anemia, treatment may comprise erythropoietin alone or, if there is additional iron deficiency, erythropoietin plus iron. |
| Muñoz, M., Acheson, A. G., Auerbach, M., *et al.* (2017) | N/A (internati-onal consensus group) | Provide guidance and a clinical pathway for the diagnosis and management of anemia and iron deficiency in surgical patients | Treatment of preoperative IDA should be implemented as early as possible before the scheduled surgical procedure. Oral iron replacement should be targeted to patients with iron deficiency with or without anemia whose surgery is scheduled 6–8 weeks after diagnosis. Daily (40–60 mg) or alternate-day (80–100 mg) treatment with oral iron and nutritional advice should be initiated immediately in patients with iron deficiency and no contra-indications. Sufficient data exist to support IV iron as efficacious and safe. IV iron should be used as front-line therapy in patients who do not respond to oral iron or are not able to tolerate it, or if surgery is planned for < 6 weeks after the diagnosis of iron deficiency. |
| National Clinical Guideline, Centre (2015) | National Institute for Health and Care Excellence (NICE) | General principles of blood transfusion | Offer oral iron before and after surgery to patients with IDA. Consider IV iron before or after surgery for patients who have IDA and cannot tolerate or absorb oral iron, or are unable to adhere to oral iron treatment, for individuals diagnosed with functional iron deficiency, and for patients with IDA in whom the interval between the diagnosis of anemia and surgery is predicted to be too short for oral iron to be effective. Do not offer erythropoietin to reduce the need for blood transfusion in patients having surgery, unless the patient has anemia and meets the criteria for blood transfusion, but declines it because of religious beliefs or other reasons, or the appropriate blood type is not available because of the patient’s red cell antibodies. |
| National Blood Authority (NBA; 2012) | National Blood Authority (a department of the Australian Government) | General guide to appropriate practice to support the introduction of PBM practices in the perioperative setting | In surgical patients with, or at risk of, IDA, preoperative oral iron therapy is recommended (Grade B). In patients with preoperative anemia, where an ESA is indicated, it must be combined with iron therapy (Grade A). |
| Warner, M. A., Shore-Lesserson, L., Shander, A., Patel, S. Y., Perelman, S. I. and Guinn, N. R. (2020) | N/A | Practical information on the implementation of perioperative anemia management strategies in surgical patients | RBC mass (i.e., Hb) should be optimized preoperatively. Effective treatment of anemia before surgery is often a race against time as presurgical evaluation may occur only 1–2 weeks before the planned surgical procedure. However, hematinic and erythropoietic therapies require time to augment Hb levels and RBC mass, thus making 3–4 weeks before elective surgery a more appropriate time interval. If anemia is diagnosed, and the therapeutic window is short, it may be necessary or prudent to postpone high blood loss elective surgery to provide anemia treatment. Iron supplementation is the treatment of choice for IDA. IV iron is preferred to oral iron for patients who are intolerant or unresponsive to oral therapy, have severe anemia (Hb <10 g/dL), or whose planned surgery is within 6 weeks. For preoperative patients with anemia of inflammation, we recommend that epoetin alfa be administered at a dose of 600 U/kg subcutaneous weekly at least 3 weeks before surgery. This should always occur after iron repletion. |

ESA, erythropoiesis-stimulating agent; Hb, hemoglobin; IDA, iron-deficiency anemia; N/A, not applicable; PBM, patient blood management; RBC, red blood cell**.**

**Supplementary table 3. Recommendations on perioperative transfusion of red blood cells (RBCs) from selected guidelines retrieved by our literature search.**

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| **Citation** | **Organization / group** | **Objective / scope of guidelines** | **Recommendations for perioperative transfusion of RBCs** |
| Carson, J. L., Guyatt, G., Heddle, N. M., *et al.* (2016) | American Association of Blood Banks (AABB) | Specify target Hb levels for RBC transfusion among hospitalized adult patients who are hemodynamically stable | A restrictive RBC transfusion threshold of 8 g/dL is recommended for patients undergoing orthopedic surgery, cardiac surgery, and those with pre-existing cardiovascular disease (strong recommendation, moderate quality evidence). The restrictive transfusion threshold of 7 g/dL is likely comparable with 8 g/dL, but RCT evidence is not available for all patient categories. |
| National Clinical Guideline Centre (2015) | National Institute for Health and Care Excellence (NICE) | General principles of blood transfusion | Use restrictive RBC transfusion thresholds for patients who need RBC and who do not have major hemorrhage or acute coronary syndrome or a need for regular blood transfusions for chronic anemia. When using a restrictive threshold, consider a threshold of 7 g/dL and a Hb concentration target of 7–9 g/dL after transfusion. Consider a RBC transfusion threshold of 8 g/dL and a Hb concentration target of 8–10 g/dL after transfusion for patients with acute coronary syndrome. Consider single-unit RBC transfusions for adults (or equivalent volumes calculated based on body weight for children or adults with low body weight) who do not have active bleeding. After each transfusion, clinically reassess and check Hb levels, and give further transfusions if needed. |
| National Blood Authority (NBA; 2012) | National Blood Authority (a department of the Australian Government) | General guide to support introduction of PBM practices in the perioperative setting | [Patient Blood Management Guidelines: Module 2 Perioperative]  RBC transfusion should not be dictated by a Hb ‘trigger’ alone, but should be based on assessment of the patient’s clinical status. In the absence of acute myocardial or cerebrovascular ischemia, postoperative transfusion may be inappropriate for patients with a Hb level of >80 g/L. Patients should not receive a transfusion when the Hb level is ≥100 g/L.  [Patient Blood Management Guidelines: Module 4 Critical Care]  RBC transfusion is likely to be appropriate for patients with Hb concentration <7 g/dL; however, transfusion may not be required in well-compensated patients or where other specific therapy is available. |

Hb, hemoglobin; PBM, patient blood management; RBC, red blood cell; RCT, randomized controlled trial.