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| **2EE — Blood transfusion** |
| **Summary of Intervention** |
| A blood transfusion may be indicated if a patient has a shortage of red blood cells (RBC) causing haemodynamic instability or impeding oxygen delivery to tissues and organs. This can be for a variety of reasons including severe bleeding, cancer or a blood disorder. However, blood transfusion carries risks and only the minimum number of units should be transfused to avoid harm.  It is recommended to use restrictive thresholds for transfusion, and to give only a single unit at a time, except where the patient has active bleeding.  **This guidance applies to adults (or equivalent based on body weight for children or adults with low body weight) only.** |
| **Number of interventions in 18/19** |
| Data are not currently available |
| **Proposal** |
| This guidance focuses on RBC transfusions for adults (or equivalent based on body weight for children or adults with low body weight) only. Do not give RBC transfusions to patients with B12, folate or iron deficiency anaemia unless there is haemodynamic instability. If haemodynamic instability is present, treat this with transfusion of appropriate blood components (do not delay emergency transfusions).  Where, however, severe acute anaemia (Hb <70g/litre) exists that is symptomatic and prevents rehabilitation or mobilisation, those patients may benefit from a single unit of blood.  For adult patients (or equivalent based on body weight for children or adults with low body weight) needing RBC transfusion, suggest restrictive thresholds and giving a single unit at a time except in case of exceptions below.  Restrictive RBC transfusion thresholds are for patients who need RBC transfusions and who do not:  — Have major haemorrhage or  — Have acute coronary syndrome or  — Need regular blood transfusions for chronic anaemia.  While transfusions are given to replace deficient red blood cells, they will not correct the underlying cause of the anaemia. RBC transfusions will only provide temporary improvement. It is important to investigate why patients are anaemic and treat the cause as well as the symptoms.  Note: Consider whether a dramatic fall in haemoglobin could be due to a severe haemolytic episode and not associated with any of the 3 exceptions.  This would also be a possible indication to transfuse more than one unit at a time.  When using a restrictive RBC transfusion threshold, consider a threshold of 70 g/litre and a haemoglobin concentration target of 70–90 g/litre after transfusion.  For patients with acute coronary syndrome, a RBC transfusion threshold of  80 g/litre should be considered and a haemoglobin concentration target of 80–100 g/litre after transfusion.  For patients requiring regular transfusion for chronic anaemia, NICE advise defining thresholds and haemoglobin concentration targets for each individual. |
| **Rationale for Recommendation** |
| NICE guidelines recommend single-unit RBC transfusion for adults (or equivalent based on body weight for children or adults with low body weight) who are not actively bleeding, do not have acute coronary syndrome or need regular blood transfusions for chronic anaemia. This decision should be based on a clinical assessment of each individual patient including their underlying cause of anaemia. They also recommend that after each single‑unit RBC transfusion the patient should be reassessed clinically, and have their haemoglobin levels checked and be given further transfusions if required.  Several randomised control trials (RCTs) have proven that it is safe to give single-unit RBC transfusions with a restrictive transfusion trigger (pretransfusion haemoglobin level or symptoms of anaemia). After receiving a single-unit RBC transfusion, symptoms may be alleviated enough to make it possible to give alternative anaemia treatment and postpone the need for further blood transfusions.  There is high quality evidence that demonstrates a lack of benefit and, in some cases, harm to patients transfused to achieve an arbitrary transfusion level. If necessary, transfuse only the minimum number of units  required instead of a liberal transfusion strategy. Potential risks and harms associated with RBC transfusions include:  — Pulmonary complications: transfusion of two or more RBC units in succession is associated with an increase in pulmonary oedema or transfusion-associated circulatory overload  — Volume overload  — Haemolysis, in particular for those with sickle cell disease  — Acute transfusion reaction due to allergy  — Transmission of infection  To monitor for transfusion reactions, observe and monitor the patient's condition and vital signs before, during and after blood transfusions.  This guidance is in line with the work of the Serious Hazards of Transfusion organisation |
| **References** |
| 1. NICE guidance: Blood transfusion (NG24): https://www.nice.org.uk/guidance/ng24.  2. NICE 2016 Blood transfusion Quality Standard (QS138.)  3. Cochrane Review: Transfusion thresholds and other strategies for guiding allogenic red blood cell transfusion.  4. NHS Advice: https://www.nhs.uk/conditions/blood-transfusion/.  5. Choosing Wisely UK – Recommendations for blood transfusion: <https://www.choosingwisely.co.uk/i-am-a-clinician/> recommendations/#1528715344800-ce240876-45ec.  6. British blood Transfusion Society: https://www.bbts.org.uk/blog/choosingwisely\_time\_to\_act\_/.  7. Choosing Wisely Canada: https://choosingwiselycanada.org/transfusionmedicine/.  8. Choosing Wisely Canada Toolkit: Why give two when one will do: https://choosingwiselycanada.org/perspective/transfusion-toolkit/.  9. JPAC Transfusion in surgery: https://www.transfusionguidelines.org/ transfusion-handbook/7-effectivetransfusion-in-surgery-and-criticalcare/7-1-transfusion-in-surgery.  10. International Society of Blood Transfusion: Single unit transfusion: https://www.isbtweb.org/working-parties/clinical-transfusion/6-single-unittransfusion/  11. NHS Blood and Transplant – Single unit blood transfusions (pilot study King’s College hospital): https://hospital.blood.co.uk/patient-services/patient-blood-management/single-unit-blood-transfusions/.  12. Markus M Mueller, MS; Hans Van Remoortel, PhD; Patrick Meybhn, MS, PhD; et al. Recommendations from the 2018 Frankfurt Consensus Conference. https://jamanetwork.com/journals/jama/article-abstract/2727453.  13. Jeffrey L Carson; Simon J Stanworth; John H Alexander; Nareg Roubinian; Dean A Fergusson; Darrell J Triulzi; Shaun G Goodman; Sunil V. Rao; Carolyn Doree; Paul C Hebert. Clinical trials evaluating red blood cell transfusion  thresholds: An updated systematic review and with additional focus on patients with cardiovascular disease: https://www.sciencedirect.com/science/article/abs/pii/S0002870318301169?via%3Dihub.  14. https://www.shotuk.org/. |