Research questions for the update of the PBM Guidelines (Modules 2-6)

| Theme # | Theme | Active question | Population*Subgroups* | Intervention(s) | Critical outcome(s) |
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| **1** | **Effect of a PBM program** | **U1-GQ01** | All patients * *Perioperative*
* *Medical*
* *Critical care*
* *Obstetrics and maternity*
* *Neonatal and paediatrics*
 | PBM program | * Mortality
* Transfusion
 |
| **2** | **Effect of RBC transfusion** | **U1-GQ02** | All adult patients* *Perioperative*
* *Medical*
* *Critical care*
 | RBC transfusion | * Mortality
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|  |  | **U1-Q25** | Neonatal and paediatric patients | RBC (allogeneic) transfusion | * Mortality
* Composite of mortality and severe morbidity
* Neurodevelopmental disability
* Necrotising enterocolitis
 |
| **3** | **Restrictive vs. liberal transfusion strategies** | **U1-GQ03** | All patients* *Perioperative*
* *Medical*
* *Critical care*
* *Obstetrics and maternity*
* *Neonatal and paediatrics*
 | Restrictive vs. liberal RBC transfusion | * Mortality
* Transfusion
* Neurodevelopmental disability *(neonatal only)*
* Necrotising enterocolitis *(neonatal only)*
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| **4** | **Optimal Hb threshold for transfusion** | **U1-Q20** | Chronically transfused patients* *Paediatrics*
* *Myelodysplasia*
 | RBC transfusion (at different Hb thresholds) | * Mortality/survival
* Functional/performance status
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| **5** | **Effect of blood component therapy** | **U1-GQ06** | Patients receiving anti-platelet medication* *Perioperative*
* *Medical*
* *Critical care*
 | Platelet transfusion | * Mortality
* Blood component utilisation
* Bleeding into critical sites/organs
* Major bleeding
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|  |  | **U1-Q22** | Patients with critical bleeding* *Perioperative*
* *Obstetrics*
* *Paediatric patients*
 | Cryoprecipitatevs. Fibrinogen concentrate | * Mortality
* Blood component utilisation
 |
|  |  | **U1-Q26** | Neonatal and paediatric patients* *Surgical*
* *Trauma*
* *Critical illness*
 | 1. Platelet transfusion *(preterms and newborns)*2. Fibrinogen concentrate *(paediatric surgical and trauma patients)* | * Mortality
* Major bleeding
* Intraventricular haemorrhage *(neonatal only)*
* Blood component utilisation
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| **6** | **Trigger for blood component therapy** | **U1-GQ04** | All patients* *Perioperative*
* *Medical*
* *Critical care*
* *Obstetrics and maternity*
* *Neonatal and paediatrics*
 | Platelet transfusion | * Mortality
* Bleeding in previously non-bleeding patients (including intracranial haemorrhage for neonates)
* Bleeding into critical sites/organs
* ischaemic/thromboembolic events
* Blood component utilisation
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|  |  | **U1-GQ05** | Patients with acquired abnormalities of haemostasis* *Perioperative*
* *Medical*
* *Critical care*
* *Obstetrics and maternity*
* *Neonatal and paediatrics*
 | 1. Plasma transfusion or prothrombinex (at an INR threshold)2. Cryoprecipitate or fibrinogen concentrate (at a specific fibrinogen level)3. Platelet transfusion (at a specific platelet count) (included in GQ04)94. Blood component therapy based on viscoelastic testing | * Mortality
* Major bleeding
* Intracranial haemorrhage *(neonatal only)*
* Ischaemic or thromboembolic events
* Blood component utilisation
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| **7** | **Effect of cessation of medications that affect haemostasis** | **U1-Q17** | 1. Surgical patients2. Patients undergoing invasive procedures | Anti-coagulants and anti-platelet therapy, including aspirin, clopidogrel, direct-acting anti-coagulants, warfarin | * Mortality
* Transfusion
* Procedure-related bleeding
* Reoperation for bleeding
* Ischaemic or thromboembolic events
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| **8** | **Effect of non-transfusion interventions** | **U1-Q16** | Surgical patients* *Preoperative*
* *Intraoperative*
* *Postoperative*
 | 1. Iron therapy (oral and/or parenteral) | * Mortality
* RBC transfusion
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|  |  | **U1-Q19** | Medical patients* *Haematology oncology*
* *Renal*
* *Congestive heart failure*
 | 1. ESAs2. Iron therapy (oral or parenteral IV or IM)3. Combination of these | * Mortality
* RBC transfusion
* Ischaemic or thromboembolic events
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|  |  | **U1-Q21** | Critically ill patients | 1. Iron therapy (parenteral IV)2. ESAs3. Combination of these | * Mortality
* RBC transfusion
* Ischaemic or thromboembolic events
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|  |  | **U1-Q23** | Obstetrics and maternity patients | 1. Iron therapy (oral and/or parenteral IV) | * Mortality (maternal)
* Transfusion
* Measures of fetal outcome
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| **9** | **Effect of blood conservation strategies** | **U1-Q18** | Surgical patientsPatients undergoing invasive procedures (TXA only)* *Obstetrics*
 | 1. Cell salvage (perioperative)2. Deliberate induced hypotension3. POC testing for coagulation status and Hb4. Restrictive sampling 5. Administration of antifibrinolytics (TXA, aprotinin) and DDAVP | * Mortality
* Transfusion
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|  |  | **U1-Q24** | Obstetrics and maternity patients* *Bleeding patients (postpartum/antepartum haemorrhage, placenta problems, ectopic pregnancy, miscarriage)*
 | 1. Viscoelastic testing2. Administration of antifibrinolytics (TXA only)3. Cell salvage (intraoperative)4. Interventional radiology (iliac balloon catheters or embolisation only) | * Mortality (maternal)
* Transfusion
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|  |  | **U1-Q27** | Neonatal patientsPaediatric patients* *Surgical (cardiac, burns, transplantation, orthopaedic)*
* *Critical illness (ECMO/ECLS, trauma)*
 | Preterm and newborn1. Placental transfusionInfant/child/adolescent – surgical1. Deliberate controlled/induced hypotension2. Cell salvage (intraoperative)3. Viscoelastic testing4. Administration of antifibrinolytics (TXA, aprotinin)Infant/child/adolescent – critical illness1. Viscoelastic testing | Preterm and newborn* Composite death and/or major morbidity
* Transfusion
* Mortality
* Neurodevelopmental outcomes

Infant/child/adolescent – surgical/critical illness* Mortality
* Transfusion
* Neurodevelopmental outcomes
* Major bleeding
* Intraventricular haemorrhage (neonatal only)
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Abbreviations: DDAVP, desmopressin; ECLS, extracorporeal life support; ECMO, extracorporeal membrane oxygenation; ESA, erythrocyte-stimulating agents; Hb, haemoglobin; IM, intramuscular; IV, intravenous; IVIg, intravenous immunoglobulin; LBW, low birth weight; NSAID, non-steroidal anti-coagulant; POC, point-of-care; RBC, red blood cell; TXA, tranexamic acid.