**Supplemental Table 1: Practice Guidelines Evaluated and Summarized with Level of Evidence.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Guideline**  **Intervention** | **2011 ACCF/AHA Guideline for Coronary Artery Bypass Graft Surgery45** | **STS/SCA Blood Conservation Clinical Practice Guidelines19,26** | **ASA Practice Guideline for Perioperative Blood Management22** | **ESA Management of Severe Perioperative Bleeding Guidelines20,21** | **AABB Clinical Practice Guidelines for RBC transfusion24** | **AABB Clinical Practice Guideline for Platelets transfusion23** | **EACTS/EACTA Guidelines on Patient Blood Management for Adult Cardiac Surgery25** |
|  | **PREOPERATIVE** | | | | | |  |
| **Preoperative hemoglobin optimization** |  | Erythropoietin and iron in preoperative anemia or those who refuse transfusion  (Class IIa, LOE:B)  Preoperative erythropoietin after autologous donation  (Class IIb, LOE:A) | Supplementation of iron for iron deficiency anemia  Erythropoietin with or without iron in non iron deficiency anemia or those who refuse transfusion | Evaluation for anemia several weeks prior to elective surgery  (Class I, LOE:C)  Iron supplementation in iron deficiency anemia  (Class I, LOE:B)  Erythropoiesis stimulating agents (with or without iron) for non iron deficiency anemia  (Class II, LOE:B)  Iron and/or erythropoiesis stimulating agent after preoperative autologous donation  (Class II, LOE:C) |  |  | Iron supplementation in anemia prior to cardiac surgery  (Class IIb, LOE:C)  Erythropoietin with iron in non iron deficiency anemia  (Class IIa, LOE:B)  RBC transfusion to correct preoperative  anemia is not recommended  (Class III, LOE:C) |
| **Transfusion algorithms / protocols** | A multimodal approach with transfusion algorithms, and a focused blood conservation strategy  (Class I, LOE:A) | A multimodality approach involving multiple stakeholders, institutional support and enforceable transfusion algorithms (Class I, LOE:A) | Multimodal protocols including transfusion algorithms and POC testing | Algorithms with pre-defined transfusion triggers based on viscoelastic assays  (Class I, LOE:C) |  |  | Transfusion protocols for bleeding patients  (Class I, LOE:C) |
| **Platelet assessment** |  | Preoperative platelet count  (Class I, LOE:A)  Platelet function tests with preoperative anti-platelet medications  (Class IIb, LOE:C) | Platelet function tests with preoperative anti-platelet medications | Platelet function tests with preoperative anti-platelet medications (Class II, LOE:B) |  |  | Platelet function tests with preoperative anti-platelet medications  (Class IIb, LOE:B)  Routine platelet function testing is not recommended in the absence of preoperative  anti-platelet therapy (Class III, LOE:C) |
|  | **INTRAOPERATIVE/POSTOPERATIVE** | | | | | |  |
| **Antifibrinolytics** | Lysine analogues (Class I, LOE: A) | Lysine analogues (Class I, LOE:A)  Use of aprotinin is not recommended  (Class III, LOA:A) | Antifibrinolytics for CPB | Prophylactic administration of tranexamic acid for CPB  (Class I, LOE:A) |  |  | Antifibrinolytic therapy  (Class I, LOE:A) |
| **Heparin resistance and antithrombin\* administration**  \*Antithrombin administration for heparin resistance may be considered off-label in some countries. |  | Antithrombin for Antithrombin-mediated heparin resistance prior to CPB  (Class I, LOE:A) |  |  |  |  | Antithrombin to improve heparin sensitivity  (Class I, LOE:B)  Antithrombin to reduce post-CPB bleeding is not recommended  (Class III, LOE:C) |
| **Minimizing hemodilution** | Aggressive attempts to limit hemodilution  (Class I, LOE:B) | Minicircuits to reduce hemodilution  (Class I, LOE:A)  Modified ultrafiltration (Class I, LOE:A)  Retrograde autologous priming  (Class IIb, LOE:B)  Acute normovolemic hemodilution  (Class IIb, LOE:B) | Acute normovolemic hemodilution may be considered | Acute normovolemic hemodilution  (Class II, LOE:C) |  |  | Limitation of  hemodilution  (Class I, LOE:B)  Minimized CPB circuits  (Class IIa, LOE:B)  Retrograde autologous  priming  (Class IIa, LOE A)  Modified ultrafiltration  (Class IIb, LOE: B)  Acute normovolemic hemodilution  (Class IIb, LOE:B) |
| **Coagulation and platelet monitoring** | Point of care testing (Class I, LOE:A) | Point-of-care testing (Class I, LOE:A) | Viscoelastic-guided algorithms and a platelet count  OR  Conventional assays–guided algorithms | Viscoelastic-guided algorithms  (Class I, LOE:B)  OR  Conventional assays –guided algorithms  (Class I, LOE:C) |  |  | Viscoelastic-guided algorithms  (Class IIa, LOE:B) |
| **RBC transfusion triggers** |  | Hb < 7g/dl  (Class IIa, LOE:C)  Hb ≤ 6 g/dl on CPB with moderate hypothermia.  (Class IIa, LOE:C)  Hb ≤ 7 g/dl on CPB if risk for critical end-organ ischemia.  (Class IIb, LOE:C)  Transfusion is not recommended for Hb ≥ 10 g/dl.  (Class III, LOE:C). | Restrictive transfusion strategy | Restrictive transfusion strategy  (Class I, LOE:A)  Target Hb of 7-9 g/dl in bleeding patients  (Class I, LOE:C) | Restrictive transfusion strategy with  Hb ≤ 8 g/dL if clinically stable |  | Based on clinical  condition rather than a  pre-defined Hb level  (Class I, LOE:B)  Target HCT of 21-24% when oxygen delivery is adequate  (Class IIb, LOE:B) |
| **Cell salvage** |  | Routine use  (Class I, LOE:A) | Cell-salvage as a blood-sparing intervention | Routine use  (Class I, LOE:B) |  |  | Routine use  (Class IIa, LOE: B) |
| **Platelets (PLT) transfusion triggers** |  | Bleeding with supporting POC tests (Class IIa, LOE:C) | Bleeding with lower than 50,000/μl or with PLT dysfunction | Bleeding with lower than 50,000/μl, with PLT dysfunction or with preoperative anti-platelet therapy  (Class II, LOE:C) |  | Prophylaxis before major surgery when lower than  50,000/μl  with lower than 50,000/μl, and/or PLT dysfunction. | Bleeding with lower than 50,000/μl, with PLT dysfunction or with preoperative anti-platelet therapy  (Class IIa, LOE:C) |
| **Fibrinogen supplementation (cryoprecipitate/ fibrinogen concentrate\*)**  \*Administration of fibrinogen concentrate for acquired hypo-fibrinogenemia may be considered off-label in some countries**.** |  | Bleeding with supporting POC tests  (Class IIa, LOE:C) | Bleeding with fibrinogen level below 100 mg/dl  Rarely indicated if fibrinogen greater than 150 mg/dl. | Bleeding with fibrinogen level below 150-200 mg/dl  (Class I, LOE:C) |  |  | Bleeding with fibrinogen level below 1.5 g/l  (Class IIb, LOE:B)  Prophylactic fibrinogen  supplementation not recommended  (Class III, LOE:B) |
| **Coagulation factors supplementation (Plasma/PCC\*)**  **\***PCC in bleeding patients with coagulation factor deficiency that is not warfarin-related may be considered off- label in some countries. |  | Part of massive transfusion algorithm  (Class IIb, LOE:B)  Bleeding with coagulation factor/s deficiency  (Class IIa, LOE:B)  For urgent warfarin reversal PCC\* is preferred, but plasma is reasonable when PCC\* does not contain factor VII  (Class IIa, LOE:B)  Prophylactic use in the absence of bleeding is not recommended  (Class III, LOE:A) | Bleeding with increased INR.  Obtain coagulation tests before transfusion  PCC\* or plasma (and vitamin K) for warfarin reversal | Bleeding with coagulation factor/s deficiency  (Class I, LOE:B)  PCC\* and vitamin K for warfarin reversal  (Class I, LOE:B).  PCC\* may be preferred over plasma for better risk profile  (Class II, LOE:C) |  |  | Bleeding with coagulation factor/s deficiency  (Class IIa, LOE:B)  PCC\* or plasma for warfarin reversal  (Class IIb, LOE:B)  PCC\* may be preferred over plasma for better risk profile  Prophylactic use in the absence of bleeding is not recommended  (Class III, LOE:B) |
| **Recombinant factor VIIa\* (rFVIIa)**  \*Recombinant factor VIIa for severe refractory bleeding after CPB may be considered off-label in some countries. |  | Excessive non-surgical bleeding refractory to routine therapies  (Class IIb, LOE:B) | Excessive non-surgical bleeding refractory to routine therapies | Excessive non-surgical bleeding refractory to routine therapies (Class II, LOE:C)  Prophylactic use is not recommended. |  |  | Excessive non-surgical bleeding refractory to routine therapies  (Class IIb, LOE:B)  Prophylactic use is not recommended  (Class III, LOE:B) |
| **Use of Desmopressin (DDAVP)** |  | Bleeding with PLT dysfunction known to respond to this agent (uremia, CPB-induced, type I von Willebrand’s disease)  (Class II, LOE:B) | Bleeding with PLT dysfunction | In acquired von-Willebrand factor deficiency  (Class II, LOE: C) |  |  | Bleeding with PLT dysfunction  (Class IIa, LOE:C) |

Table 1: Summary of recommendations for common daily practices of blood management and conservation in cardiac surgical patients from currently published guidelines.

AABB = American Association of Blood Banks, ACCF = American College of Cardiology Foundation, AHA = American Heart Association, ASA – American Society of Anesthesiologists, CPB = Cardiopulmonary Bypass, DDAVP = Desmopressin, EACTA = European Association of Cardiothoracic Anesthesiology, EACTS = European Association of Cardio-Thoracic Surgery, ESA = European Society of Aneasthesiology, HCT = Hematocrit, INR = International Normalized Ratio, PCC = Prothrombin Complex Concentrate, POC = Point Of Care, PLT = Platelets, RBC = Red Blood Cells, rFVIIa = Recombinant Activated Factor VII, ROTEM = Rotational Thromboelastometry, SCA = Society of Cardiovascular Anesthesiologists, STS = Society of Thoracic Surgeons, TEG = Thromboelastography.