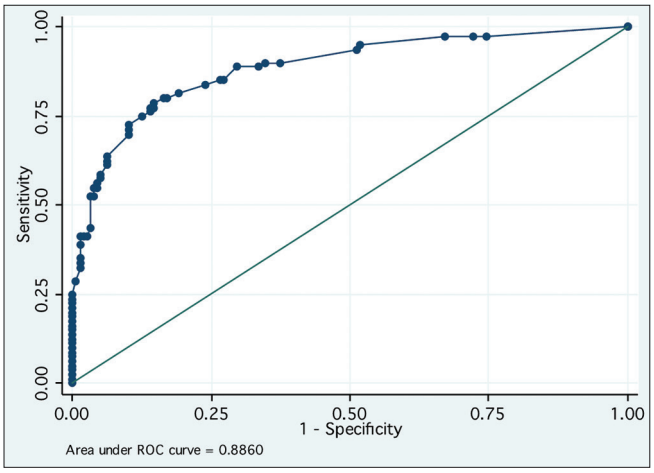
Additional File

Incidence of Re-exploration due to Bleeding for Each Year (2008–2015)

Incidence of re-exploration due to bleeding for each year (2008-2015)			
Year	**Number of patients**	**Number of events**	**Percentage**
2008	649	34	5.2
2009	678	28	4.1
2010	668	28	4.2
2011	645	32	5.0
2012	609	36	5.9
2013	582	15	2.6
2014	547	11	2.0
2015	543	31	5.7
Total	4921	215	4.4

Hosmer–Lemeshow Receiver Operating Characteristic Curve



Postoperative Drainage Threshold for Re-exploration

- >300 mL/h after minimal bleeding
- >400 mL/h in the first hour
- >300 mL/h in 2 to 3 h
- >200 mL/h in 4 h
- Active bleeding >100 cc/h in the first 6 h
- Active bleeding and hemodynamic instability
- Bleeding >1500 cc in 24 h
- Suspected or diagnosed cardiac tamponade.

Trigger for Red Cell Transfusion

Intraoperative period

The intraoperative criteria for transfusion applied by our Cardiovascular Anesthesia Department are those defined in the 2007[1] transfusion and Blood Conservation in Cardiac Surgery guidelines, updated in 2011.[2]

Transfusion is unlikely to improve oxygen transport when the hemoglobin concentration is greater than 10 g/dL and is not recommended (Level of evidence C) III.

With hemoglobin levels below 6 g/dL, red blood cell transfusion is reasonable since this can be lifesaving. Transfusion is reasonable in most postoperative patients whose hemoglobin is less than 7 g/dL but no high-level evidence supports this recommendation (Level of evidence C) IIa.

It is reasonable to transfuse nonred cell hemostatic blood products based on clinical evidence of bleeding and preferably guided by point-of-care tests that assess hemostatic function in a timely and accurate manner (Level of evidence C) IIa.

During cardiopulmonary bypass (CPB) with moderate hypothermia, transfusion of red cells for hemoglobin ≤6 g/dL is reasonable except in patients at risk for decreased cerebral oxygen delivery (i.e., history of cerebrovascular attack, diabetes, cerebrovascular disease, carotid stenosis) where higher hemoglobin levels may be justified (Level of evidence C) IIa.

In the setting of hemoglobin values exceeding 6 g/dL while on CPB, it is reasonable to transfuse red cells based on the patient's clinical situation, and this should be considered as the most important component of the decision-making process. Indications for transfusion of red blood cells in this setting are multifactorial and should be guided by patient-related factors (i.e. age, severity of illness, cardiac function, or risk for critical end-organ ischemia), the clinical setting (massive or active blood loss), and laboratory or clinical parameters (e.g., hematocrit, SVO2, electrocardiogram, or echocardiographic evidence of myocardial ischemia etc.) (Level of evidence C) IIa.

It is reasonable to transfuse nonred cell hemostatic blood products based on clinical evidence of bleeding and preferably guided by specific point-of-care tests that assess hemostatic function in a timely and accurate manner (Level of evidence C) IIa.

It may be reasonable to transfuse red cells in certain patients with critical noncardiac end-organ ischemia (e.g., central nervous system and gut) whose hemoglobin levels are as high as 10 g/dL but more evidence to support this recommendation is required (Level of evidence C) IIb.

In patients on CPB at risk for critical end-organ ischemia/injury, transfusion to keep the hemoglobin ≥7 g/dL may be considered (Level of evidence C).

Postoperative period[3]

Any patient with hemoglobin levels ≤8 g/dL in the first 48 h postoperatively (In very low-risk patients, for example, atrial septal defect closure in young patients, transfusion is recommended only if the hemoglobin is <7 g/dL).

Patients with hemoglobin >8 and <10 g/dL shall be transfused only if they fulfill any of the following criteria (at least one of the three):

- Hemodynamic instability (cardiogenic shock, use of IABP, more than one inotrope/vasopressor) I
- Evidence of tissue hypoperfusion defined as: SAT VO2 <65% and arterial lactate >3 mmol/L + diuresis <0.5 ml/kg/hour in the last three hours (all three criteria are required)
- Excessive bleeding (more than 500 cc since the time the sample was taken for Hgb).

Note: Patients with excessive bleeding immediately postoperative s hould be transfused, replacing blood loss 1:1, regardless of the hemoglobin levels (these are not useful in severe, active bleeding).

References

1. Society of Thoracic Surgeons Blood Conservation Guideline Task Force, Ferraris VA, Ferraris SP, Saha SP, Hessel EA 2nd, Haan CK, *et al.* Perioperative blood transfusion and blood conservation in cardiac surgery: The society of thoracic surgeons and the society of cardiovascular anesthesiologists clinical practice guideline. Ann Thorac Surg 2007;83:S27-86.
2. Society of Thoracic Surgeons Blood Conservation Guideline Task Force, Ferraris VA, Brown JR, Despotis GJ, Hammon JW, Reece TB, *et al.* 2011 update to the society of thoracic surgeons and the society of cardiovascular anesthesiologists blood conservation clinical practice guidelines. Ann Thorac Surg 2011;91:944-82.
3. Guidelines for Postoperative Management of Cardiac Surgery and Manual of Cardiovascular Surgery. Available in Isolucion. Bogotá DC, Colombia: Instituto de Cardiologia – Fundacion Cardioinfantil; 2016.

List of procedures termed "others "

Surgical procedures	No.
Atrial septal defect closure	4
Atrial septal defect closure + tricuspid plasty	3
Atrial septal defect closure + maze procedure	2
Pulmonary thromboendarterectomy	1
Tricuspid plasty + patent foramen ovale closure + removal of pacemaker electrode	1
Coronary button reimplantation (Bentall's late postoperative)	1
Atrial myxoma resection	1
Partial anomalous venous return correction + tricuspid plasty	1