

# AUTOTRANSFUSION

## Clinical leaflet



## Perioperative therapies reducing homologous transfusion during cardiovascular surgery: A network meta-analysis of randomized controlled trials

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### INTRODUCTION

- In order to optimize patient care in cardiac surgery, hospitals are developing Blood Management strategies to minimize blood loss, reduce the need for allogeneic blood transfusions and reduce health-care costs<sup>1</sup>.
- A network meta-analysis has been developed to **determine the most effective therapy or combination of therapies in:**
  - minimizing the exposure to homologous transfusions
  - minimizing the number of RBC units transfused
  - maximizing post-operative hemoglobin

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### METHODS

#### SEARCH METHODS

- The Australian Patient Blood Management Guidelines (PBMG) issued their recommendations basing on a thorough review of the literature published up to June 2009<sup>2</sup>.
- **Systematic literature review** of randomized controlled trials (RCTs) from 2009 to 2015 using the same search string used in the Australian Patient Blood Management guidelines and having thoracic surgery as main surgical application.
- Search on Medline and PubMed of **meta-analysis and reviews** of papers published before July 2009, but not included in Australian Guidelines. Also a non-systematic search was performed using Google Scholar.

#### OUTCOMES INVESTIGATED

- **Transfusion rate (TR):** Percentage of patients who received allogeneic blood
- **Packed red blood cells transfused (PRBCs):** Total number of transfused RBC bags
- **Post-operative Hemoglobin (PO Hb):** Level of Post-Operative Hemoglobin

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### RESULTS

#### SEARCH RESULTS

- 86 RCT selected
- 48 different therapies identified grouped into 5 broad categories of active strategies for comparison:
  1. **Autologous transfusion (AT):** including the use of **washed cell salvage (CS)**, **Ultra Filtration (UF)**, or **unwashed blood salvage (noCS)**
  2. **Administration of antifibrinolytics (AA):** for example aprotinin, tranexamic acid, aminocaproic acid or desmopressin
  3. The combined use of **autologous transfusion and antifibrinolytics (AT+AA)**
  4. **Acute normovolemic haemodilution (ANH)**
  5. Decision to take **no action to treat blood loss (NT)**

<sup>1</sup> Santos AA et al. - *Rev Bras Cir Cardiovasc.* 2014 - Oct-Dec;29(4):606-21

<sup>2</sup> Patient Blood Management Guidelines: Module 2 Perioperative. - *National Blood Management Australia 2012*

## ANALYSIS RESULTS

- The combined use of **autologous transfusion and antifibrinolytics (AT+AA)** has the **highest probability (>90%) to best active strategy** in reducing TR and PRBCs while reaching high PO Hb. The sole use of AT follows with a probability of ~40%.
- Among all the different autologous techniques to be used with antifibrinolytics, **washed cell salvage results being the most effective. In fact the combined used of washed cell salvage and antyfibrinolytics (CS+AA)** results the most effective therapy in terms of odds of TR, total PRBCs:

Transfusion rate (Odds Ratio)		
	noCS + AA	UF + AA
CS + AA	0.36	0.31
noCS + AA		0.87

CS+AA reduces odds of transfusion by 64% compared to noCS +AA and by 69% compared to UF+AA

  

PRBC Transfused (Mean Difference)		
	noCS + AA	UF + AA
CS + AA	-0.74	-0.90
noCS + AA		-0.16

CS+AA reduces the units of PRBCs by:  
~1 bag vs. noCS+AA  
~1 bag vs. UF+AA

  

PO Hb (Mean Difference)		
	noCS + AA	UF + AA
CS + AA	-0.23	-0.23
noCS + AA		-0.00

The level of PO Hb is comparable between the strategies

## CONCLUSION

- The use of **Washed Cell Salvage in combination with Antifibrinolytics is the optimum strategy** to address perioperative blood loss.
- **Replacing Cell Salvage with other autologous techniques** such as Unwashed Cell Salvage and Ultra filtration, or **abolishing the combined use of antifibrinolytics, will increase the recourse to banked blood.**

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