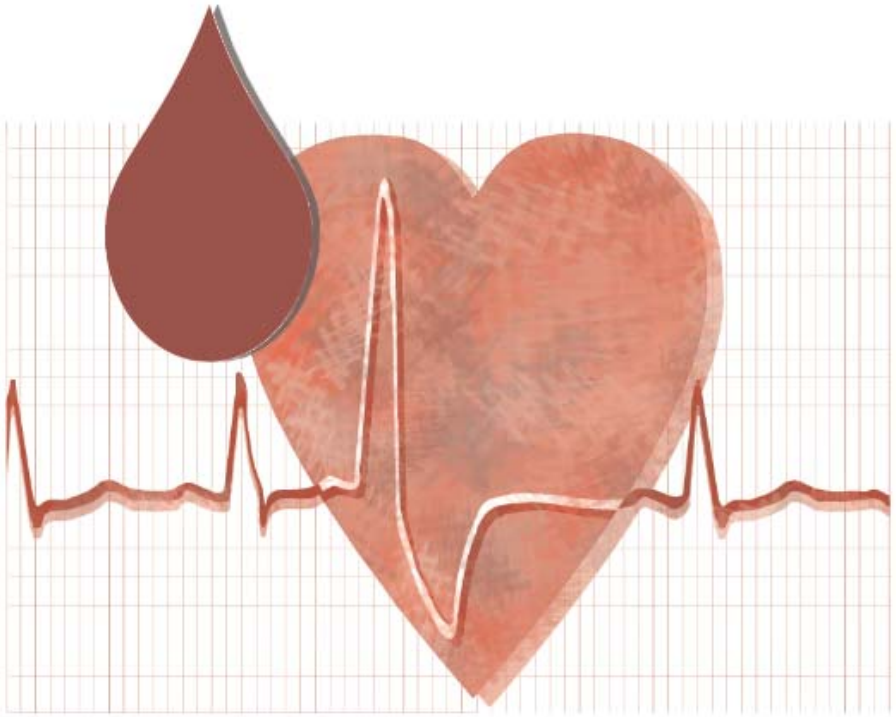
Making Choices: Blood Transfusion in Heart Surgery



A Decision Aid for Patients

Welcome !

This workbook and cassette tape prepare you for a discussion with your doctor about the advantages and disadvantages of two alternatives for blood transfusion at the time of your surgery: donated blood from volunteers and self-donated blood (autologous).

Instructions:

1. Set aside 30 minutes.
2. Have a pencil ready to use.
3. Place the cassette in a tape recorder.
4. Press the play button.
5. Stay on the page until you are asked to turn to the next page.

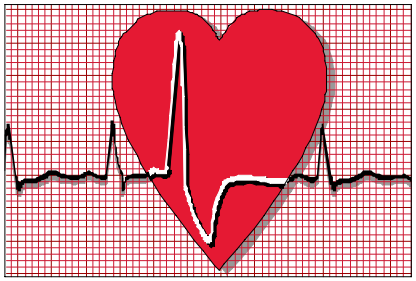
Please Note:

Research studies that support statements are referenced by numbers such as [1] . The complete list of references is at the back of this workbook.

Table of Contents

This workbook is for you if you are :

- having heart surgery (bypass or valve surgery);
- wondering about the approaches to blood transfusion;
- wondering which of the approaches is best for you.



You will learn about:

- blood transfusion in surgery;
- the advantages and disadvantages of two approaches to replacing blood loss:

  #1) donated blood from volunteers
  #2) self-donated blood (autologous)

- steps to decide which approach is best for you.

What does blood do ?

- essential for health;
- carries oxygen to the body;
- oxygen carried by hemoglobin in red blood cells;
- adults have about 5 litres (or nine pints) of blood.

What happens if I lose blood and it isn't replaced ?

If you lose a little blood…
- you may have no reaction

If you lose a little more blood…
- weak and tired

If you lose a moderate amount of blood...
- chest pain
- shortness of breath

If you lose a lot of blood...
- risk of heart attack and death is increased

What is a blood transfusion ?

- transfusions replace blood lost during surgery;
- given through a needle into a vein in your arm (intravenously);
- measured in units;
- one unit of blood is 300 ml (10 fluid ounces);
- each unit is given in a separate bag and comes from a separate donor.

How does a blood transfusion help ?

- useful for people who lose a lot of blood;
- reduce your chance of problems from too much blood loss;
- people who lose a small amount of blood don’t need a blood transfusion.

Will I need a blood transfusion ?

Depends on:

- your health;
- the difficulty of the surgery;
- how much blood you lose; and
- practices in your hospital.

About 35 of every 100 patients having heart surgery need at least one transfusion.

65 out of 100 will not need a transfusion

35 out of 100 will need a transfusion

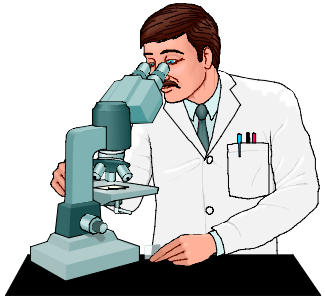
- those needing transfusion usually get an average of 2 units of blood

- no way of knowing before surgery whether **you** will need a blood transfusion

#1: Donated Blood From Volunteers

How is the blood collected and tested ?

- anonymous, unpaid, volunteer donors;
- all potential blood donors have to answer a screening questionnaire to make sure they are healthy; and
- all donated blood is tested in a laboratory to detect known infectious diseases (such as hepatitis and HIV).



What are the advantages of blood donation from volunteers ?

- widely available and convenient;
- free of charge;
- can be given quickly if you need blood.

What are the disadvantages of donated blood from volunteers ?

- minor side effects such as fever and chills [1,10,12] (1 in 100 transfusions)

Immediate Reactions

	Chance out of 1 Million Patients	
	Patients Experiencing Complication	Patients Not Experiencing Complication
● wrong blood reaction[13]	37	
● allergy to blood[8, 12]	5	
● storage infection[7, 12, 15]	1	
Immediate reactions	43 (total)	999,957
Deaths from immediate reactions	2	999,998

Delayed Infections

	Chance out of 1 Million Patients	
	Patients Experiencing Complication	Patients Not Experiencing Complication
● hepatits; liver disease[5]	18	
● HIV-AIDS[6, 12]	1	
● HTLV-leukemia, nerve destruction[5]	1	
Delayed Infections	20 (total)	999,980
Deaths from delayed infections	3	999,997

- infections not yet discovered

Summary of risks for donated blood from volunteers

Adding all the known risks together, the chance of getting ill after being transfused with blood from volunteers is **63** per million patients having surgery.

The chance of dying immediately from a transfusion with blood from volunteers is **2** per million and the additional chance of dying from a blood transfusion in the next 10 years is **3** per million.[5-15]

#2: Self-Donated Blood (autologous)

What is it?

- donate your own blood 2 to 3 times in the weeks before your surgery;
- get your own blood back first;
- blood that is not used for you would be discarded.

How do I donate my blood before surgery?

- discuss with your surgeon and let his or her office know;
- meet with blood specialist;
- have blood count taken;
- donate one unit each week, 2 or 3 times before surgery;
- blood stored for up to 35 days.

What are the advantages of self-donated blood?

- free of charge;
- reduces your chances of getting blood from anonymous volunteers from 35% to 8% in the average hospital.

Will I only get my own blood if I need a transfusion ?

- every effort will be made to use **only** your blood;
- donated blood from volunteers may **also** have to be used;

65 out of 100 will not need a transfusion

35 out of 100 will receive donated blood from volunteers

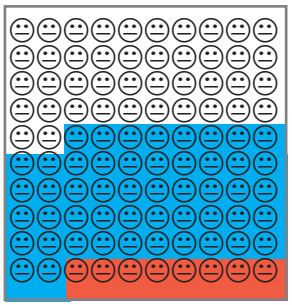
Volunteer Donated Blood

42 out of 100 will not need a transfusion

50 out of 100 receive self-donated blood

8 out of 100 will receive donated blood from volunteers

Self Donated Blood



- your chance of getting any transfusion will increase from 35% to 58%

Why do patients who self-donate blood receive more transfusions ?

- patients may have lower blood counts before surgery;
- surgeons may transfuse self-donated blood more often.

What are the disadvantages of self-donated blood ?

- inconvenient;
- may need to be hospitalized for fainting or chest pain when donating the blood (40 per million donations)[9]
- complications described below:

Immediate Reactions

	Chance out of 1 Million Patients	
	Number getting the complication	Number not getting the complications
• wrong blood reaction [13] • allergy to blood [8,12] • storage infection [7,12,15] **Immediate reactions**	69 1 1 **71 (total)**	 **999,929**
Deaths from immediate reactions	**2**	**999,998**

Delayed Infections

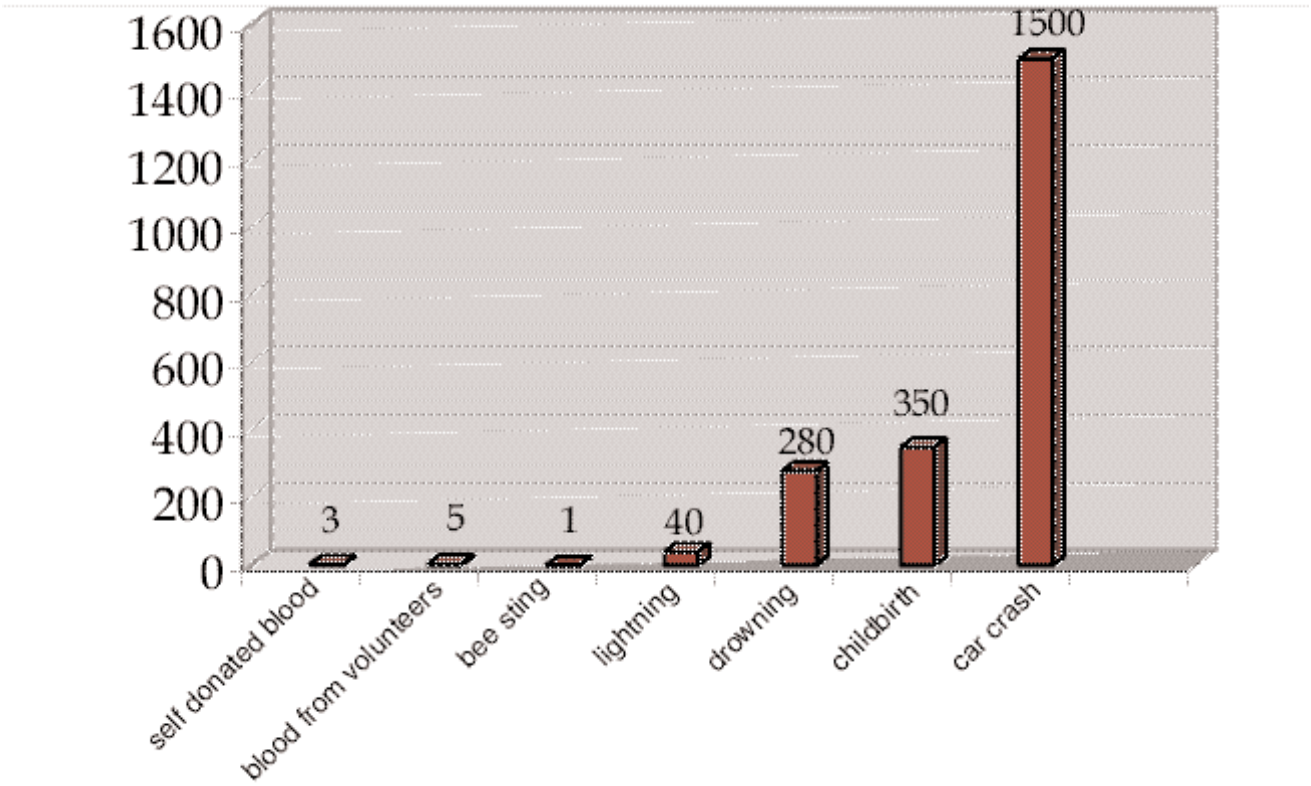
	Chance out of 1 Million Patients	
	Number getting the complication	Number not getting the complications
• hepatitis- liver disease [5] • HIV-AIDS [6,12] • HTLV- leukemia, nerve destruction [5] **Delayed infections**	5 nearly 0 nearly 0 **5 (total)**	 **999,995**
Deaths from delayed infections	**1**	**999,999**

Summary of risks for self-donated blood

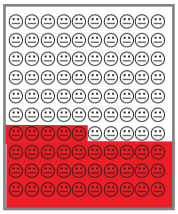
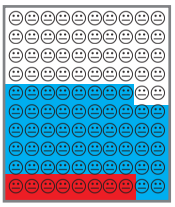
Adding all the known risks together, the chance of getting ill after being transfused with self-donated blood is **76** per million patients having surgery.

The chance of dying immediately from a transfusion of self-donated blood is **2** per million and the additional chance of dying from a blood transfusion in the next 10 years is about **1** in a million.

Risk of Dying From Blood Transfusion Approaches Compared to Other Causes (per million)



Summary of Advantages and Disadvantages

Options	Chance of having a transfusion ● volunteers ● self-donated ● no transfusion	Chance of complication per million patients Immediate Reaction	 Delayed Infection	Chance of death per million patients Immediate	 Delayed	Convenience	Cost	Other
Donated blood from volunteers		43	20	2	3	No extra preparation	Free	Possible undiscovered infections
Self-donated blood (autologous)		71	5	2	1	Trips to centre Blood tests	Free	Possible fainting or chest pain

Steps in Decision Making

Step 1: **Learn as much as you can about the procedures.**

(call your surgeon, blood specialist, or autologous program office at 798-5555 ext. 7483 if you have any questions)

Step 2: **List the things that are important to you in the decision.**

_____

_____

_____

_____

Step 3: **Discuss the decision with your physician and others whose opinion you value.**

Step 4: **Notify your surgeon about your decision as soon as possible.**

Scientific References

Guidelines for Blood Transfusion:

1. Crosby E, Ferguson D, Hume HA, Kronick JB, Larke B, LeBlond P and colleagues. *Guidelines for red blood cell and plasma transfusion in adults and children. The expert working group*. **Can Med. Assoc**. J. 1997; 156(11): S1-S12 (Includes Patients' Guide)

2. Stehling LC, Doherty DC, Faust RJ, Greenburg AG, Harrison CR, Landers DF and colleagues. *Practice guidelines for blood component therapy: A report by the American society of Anesthesiologists Task Force on Blood Component Therapy.* **Anesthesiology.** 1996; 84: 732-47

3. Audet AM, Goodnough LT. *Practice strategies for elective red blood cell transfusion.* **Annals Intern Med**. 1992;116(5):403-6

4. Welch HG, Meehan KR, Goodnough LT. *Prudent strategies for elective red blood cell transfusion*. **Annals Int Med**. 1992; 116(5): 393-402

Assessment of the Risks of Transfusion:

5. Schreiber GB, Busch MP, Kleinman SH, Korelitz JJ for the *Retrovirus Epidemiology Donor Study. The risk of transfusion-transmitted viral infections* **N Engl J Med** 1996; 334:1685-90

6. Remis RS, Delage G, Palmer RHW. *Risk of HIV infection from blood transfusion in Montreal*. **Can Med Assoc J**. 1997;157:375-82

7. Kishnan L, Brecher ME. *Transfusion-transmitted bacterial infection*. **Hematol Oncol Clinics North Am** 1995;9:167-85

8. Sloop GD, Friedberg RC. *Complications of blood transfusion*. **Postgrad Med.** 1995;98(1);159-72

9. Popovsky MA, Whitaker B, Arnold NL. *Severe outcomes of allogeneic and autologous blood donation: frequency and characterization*. **Transfusion** 1995:35:734-37

10. Walker R *Special report: transfusion risks*. **Am J Clin Pathol.** 1987;88:374- 8

11. Iwarson S, Norkrans G, Wejstal R. *Hepatitis C: natural history of a unique infection*. **Clin Inf Dis.** 1995;20:1361-70

Scientific References

12.United States General Accounting Office. Report of the Ranking Minority Member, Committee on Commerce, House of Representatives. *Blood Supply: Transfusion-Associated Risks.* Feb. 1997 Document No. GAO/PEMD-97-2

13.Linden JV,Paul B, Dressler KP. Report of 104 transfusion errors in New York State. **Transfusion** 1992: 32:601-6

14.McMahon BJ, Alberts SR, Wainwright RB et al. *Hepatitis B-related sequellae. Prospective study of 1400 hepatitis B surface antigen-positive Alaska native carriers.* **Arch Intern Med** 1990;150:1051-54

15. Halpin EJ, Moore W, Waterman SH et al. *Red blood cell transfusions contaminated with Yersinia enterocolitica. United States,1991-1996 and initiation of a national study to detect bacteria-associated transfusion reactions*. **JAMA** 1997;278:196-7

Appendix: Calculation of Risks of Transfusion

The authors have based their estimates of risk on studies in the medical literature (reference 5-15). The estimates are approximate, and serve as a guide to making decisions.

Assumptions:
35% of those who do not pre-donate blood will receive 2 units of blood.
50% of those who pre-donate blood will receive 2 units of their own blood.
8% of those who pre-donate blood will receive 2 units of their own blood and also 2 units of volunteer-donated blood.

Complications:
wrong blood reaction (risk 1/19,000 fatal 1/800 000) (ref. 13)
severe allergic reaction (risk 1/150 000 20%fatal) (ref. 8,12)
hepatitis B (1/63 000) hepatitis C (1/103 000) (ref. 5)
HIV (1/913 000) (ref. 6)
bacterial infection (1/1 000 000) (ref. 7, 12, 15)
donation risk for self-donation (1/16 783), risks include fainting and chest pain. (ref. 9)

The general form of the risk calculation is:

Number of patients out of a million affected=
(number of units transfused) (risk per unit) (%transfused/100)
(1 000 000)

Example:
number of patients contracting hepatitis B out of a million receiving volunteer-donated blood=
(2) (1/63 000) (.35) (1 000 000) = 11