

# BLOODLESS CARDIAC SURGERY

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# BLOOD TRANSFUSION IN CARDIAC SURGERY

Cardiac surgery is the largest consumer of blood products in medicine



15% -20% of all hospital transfusions in any one country are for cardiac surgery. This is a significant number when you consider that heart surgery represents only about 2% of all surgeries that are carried out in any one country.



Cardiac surgery is associated with a high rate of blood transfusion, varying from 40% to 90% in most reports



# BLOOD TRANSFUSIONS ARE OVERUSED

There is no doubt that physician practices influence bleeding and blood transfusion. Surgical practices differ widely and can dramatically influence perioperative bleeding and transfusion.

## Transfusion Practice: 'Evidence Based' or 'Behavior Based'?

- **Influence of knowledge and attitudes on the quality of physicians' transfusion practice.**  
Salem-Schatz SR, Avorn J, Soumerai SB. *Med Care*. 1993 Oct;31(10):868-878
- **The variability of transfusion practice in coronary artery bypass surgery.**  
Goodnough LT, Johnston MF, Toy PT. *JAMA*. 1991;265:86-90
- **Variability in transfusion practice for coronary artery bypass surgery persists despite national consensus guidelines: a 24-institution study. Institutions of the Multicenter Study of Perioperative Ischemia Research Group.**  
Stover EP, Siegel LC, Parks R, Levin J, Body SC, Maddi R, D'Ambra MN, Mangano DT, Spiess BD. *Anesthesiology* 1998 Feb;88(2):327-333
- **Institutional Variability in Transfusion Practice for Liver Transplantation.**  
Ozier Y, Pessione F, Samain E, Courtois F. *Anesth Analg* 2003;97:671-679

***Blood transfusions are still being overused during common heart surgery even though there is compelling evidence demonstrating the dangers of unnecessary blood transfusions.***

# BLOODLESS CARDIAC SURGERY. WHY ? ...

The phrase is somewhat confusing. The expression does not mean surgery that makes no use of blood. Rather, it refers to surgery performed without transfusion of allogeneic blood.

The last twenty years have witnessed a surge of interest in bloodless surgery, for a variety of reasons. Jehovah's Witnesses reject blood transfusions on religious beliefs; others may be concerned about bloodborne diseases, such as hepatitis and AIDS.

It is interesting to note that more and more patients are becoming interested in bloodless heart surgery, regardless of their religious beliefs.

It turns out that avoiding the transfusion of blood products has significant clinical benefits related to:

- Fewer complications related to transfusions
- Faster recovery time
- Shorter hospital stay
- Less chance of infection
- Better postoperative longevity

# BLOODLESS CARDIAC SURGERY: A professional journey toward better surgical care.

Over the years we have developed very effective surgical strategies and routines that have made bloodless cardiac surgery a reality for most of our patients.

I currently see a growing number of patients from out state who specifically travel to my center to undergo bloodless cardiac surgery procedures that were not otherwise available in their own town or state.

The complexities of performing bloodless cardiac surgery require the talents of a very experienced multispecialty team. Specialists in the bloodless cardiac surgery program team are renowned experts in their respective fields and include:



- \* Cardiac surgeons
- \* Anesthesiologists
- \* Postoperative Care Intensivists.
- \* Hematologists
- \* Cardiologists
- \* Perfusionists
- \* Scrub nurses team
  
- \* **Bloodless cardiac surgery advanced program.**

# BLOODLESS CARDIAC SURGERY PROGRAM IN QUIRÓN-TEKNON MEDICAL CENTER

Quirón-Teknon Cardiac Surgery Team people have mastered the exact level of skill and precision necessary to perform bloodless procedures. They have successfully performed the most complex and intricate surgeries using bloodless strategies.

Every team member involved in patient care follows meticulous blood conservation protocols throughout a patient's stay and works to create a sensitive and supportive environment

- FIRST STEP:            PREPARATION BEFORE SURGERY
- WE DISCUSS WHICH BLOOD FRACTIONS ARE  
ACCEPTABLE OR NOT TO THE INDIVIDUAL PATIENTS
- SECOND STEP:        SURGICAL STRATEGY  
ANESTHESIA TECHNIQUES  
SMART CARDIAC SURGERY PROGRAM
- THIRD STEP:         POSTOPERATIVE CARE PROTOCOLS

# PREPARATION BEFORE SURGERY

- We investigate any evidence of spontaneous bleeding or anemia. Complete blood test
- Adding iron , Folic Acid and nutrients to the daily diet from iron-rich food sources to boost oxygen levels to the red blood cells. Increasing vitamin C in the diet to absorb iron more effectively ( orange juice)
- Desmopressin to increase certain blood clotting factors . Erythropoietin to stimulate the bone marrow to produce more red blood cells, such as Procrit, Epoetin, Alfa, Epogen or Aranesp
- Stopping all alcohol use at least seven to 10 days before bloodless surgery
- Stopping over-the-counter, herbal or prescribed medications (with a physician's approval) prior to bloodless surgery that hinder or inhibit blood clotting such as aspirin, ibuprofen and nonsteroidal anti-inflammatory drugs, anti-coagulants such as Coumadin, vitamin E, ginkgo bilboba, garlic and other natural supplements
- Scheduling elective or non-emergency surgery when hemoglobin levels have reached an optimal range
- **INDIVIDUAL SURGICAL STRATEGY IS PLANNED...**

# SURGICAL STRATEGY (1)

## ANESTHESIA / PERFUSION TECHNIQUES:

- Administering volume expanders or intravenous fluids properly.
- Decrease hemodilution in CPB circuit (optimal priming).
- Using acute normovolemic hemodilution . These techniques involve collecting diluting and re-infusing a patient's own blood during a surgical procedure( intact coagulation properties).
- Pro-coagulation intraoperative medications: Desmopressin to increase certain blood clotting factors. Aminocaproic acid . Cuagulation factors. Novoseven.
- Implementing controled intraoperative hypotensive anesthesia to lowering blood pressure during surgery to reduce blood loss
- Inducing hypothermia to lower a patient's body temperature to decrease metabolic activity, heart rate and oxygen consumption.
- Continuos monitoring for Hb levels, ACT and platelet function.

# SURGICAL STRATEGY (2)

- INDIVIDUAL SURGICAL STRATEGY
- A CAREFUL AND METICULOUS TECHNIQUE DURING SURGERY
- MINIMALLY INVASIVE-SMART Bloodless cardiac surgery Program.
- BLOOD SALVAGE : Applying cell saver or intraoperative blood salvage techniques that use devices and methods to collect blood from an active bleeding site and re-infusing that blood into the same patient for the maintenance of blood volume
- CAREFUL RECYCLING AND RINSING of any blood absorbed in surgical pads and gauze during surgery with cell-saver machine.
- USE OF SYNTHETIC ( not derived from blood products) TOPICAL HEMOSTATIC AGENTS
- Intra-operative electrocautery for blood vessels coagulation
- Check drainages volume before transfer to ICU.

# ICU POSTOPERATIVE CARE

- CAREFUL MULTISYSTEM BODY MONITORING
- Drainages bleeding watchful attitude. BLEEDING REVISION IF NEEDED As Soon As Possible.
- PEDIATRIC TEST TUBES are used to sample ( smaller volume of blood)
- ONLY ABSOLUTELY NECESSARY TEST
- PRO-COAGULANT MEDICATIONS
- SELF-TRANSFUSING DRAINAGE SYSTEMS in first hours ( NO in Jehova's witnesses)
- INDUCED HYPOTHERMIA
- ARTERIAL PRESSURE CONTROL
- HYPERBARIC OXYGEN THERAPY : increase oxygen content in profound anemia.

# QUIRÓN-TEKNON BLOODLESS CARDIAC SURGERY PROGRAM RESULTS: the Quirón Teknon Difference...

- The Program for Bloodless Medicine and Surgery at Quirón-Teknon Medical Center is internationally recognized as a leader in the field and ranks among the best in the nation.
- Cardiac Surgery team professionals are board certified and fellowship trained in cardiovascular surgery and bloodless medicine.
- They lecture around the world on blood conservation and cardiac surgery, and host national and international visitors interested in learning about blood management techniques.

LAST 1.000 cardiac surgery patients :

	Mortality Risk (Euroscore log 1)	Mortality	Transfusion
ALL PATIENTS N: 925	10.4 %	1.8 %	18,5 %
JEHOVAH'S WITNESSES N: 75	11.3 %	1.3 %	0 %