Resource

Perioperative Blood Management Program

- Phone: 902-473-3117 or 902-473-8776
- www.cdha.nshealth.ca/perioperative-blood-management

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https://library.nshealth.ca/Patients-Guides

Connect with a registered nurse in Nova Scotia any time:
Call 811 or visit: https://811.novascotia.ca

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Patient & Family Guide

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Perioperative Blood Management (PBM) Program

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www.nshealth.ca

- **Volume expanders**: These are non-blood fluids given by I.V. to raise your amount of blood (like Voluven®).

These options may be available to you, but not all options are right for everyone.

Is there artificial blood?

- Yes. There are products called blood substitutes. These products do not contain any blood, but still carry oxygen through the body.
- These products are **NOT** licensed for clinical use (to be given to patients) in Canada.

Can I refuse a blood transfusion?

- If you are capable of making decisions about your own health, you have the right to refuse or stop any treatment.
- **If you do not want a blood transfusion for any reason, including religious beliefs, tell your health care provider**.
- There are risks associated with refusing a blood transfusion. Please ask your health care provider for more information.

- **Cell saver (blood salvage)**: Depending on your condition, blood lost during surgery can be recycled and returned to you. The removed blood is kept in the O.R. with you. This must be arranged by your doctor before your planned surgery.
- **Electrosurgical and ultrasonic harmonic scalpel coagulators**: These are used to coagulate (clot) your blood during surgery to lower blood loss.
- **Endoscopic and laparoscopic surgery**: Your surgery is done through a surgical tube so there is a smaller incision (cut).
- **Laser surgical techniques**: A laser light is used to remove diseased tissue or treat bleeding blood vessels.
- **Hypotensive anesthesia**: Medication is used to lower your blood pressure so blood is less likely to leak.
- **Hypothermia**: Your body temperature is lowered to lower the amount of oxygen used.
- **Pediatric sampling**: You will have a smaller than usual amount of blood taken for lab testing.
- **Pulse oximetry**: This is a device that tracks your oxygen levels during surgery.

Perioperative Blood Management (PBM) Program

What is blood made of?

- Blood has:
  - White blood cells that fight infection
  - Red blood cells that contain a protein called hemoglobin. Hemoglobin carries oxygen and releases it in your organs and tissues.
  - Platelets that help with clotting to stop bleeding
- These cells and platelets float in a liquid called plasma. Plasma has many parts or factors, including those needed for clotting.
- Blood is made up of:
  - Water: 50%
  - Red blood cells: 43%
  - Plasma: 5%
  - White blood cells and platelets: 1%

What is anemia?

- Anemia is a low level of red blood cells, hemoglobin, or blood.
- Normal hemoglobin levels are:
  - Women: 120 g/l (grams per litre) or higher
  - Men: 130 g/l or higher

If you have anemia:

- Talk with your health care provider. They may want to:
  - Test to find the type and cause of your anemia
  - Check the iron levels in your blood
  - Check your vitamin levels
  - Check if your medications might raise your chance of bleeding or of needing a blood transfusion (see page 3)
- Depending on the type of anemia you have, your hemoglobin levels can be raised with:
  - Iron
  - Vitamin B12
  - Folic acid
  - Vitamin C
  - Minerals needed to make red blood cells
  - Erythropoietin (Eprex®): A hormone that helps your body make more red blood cells
- Your health care provider will help you make a treatment plan to raise your hemoglobin levels.

During surgery

- You may need medications or blood products to help your blood clot during surgery. These may include:
  - **Antifibrinolytic medications**: Medications that help blood to clot
  - **Fibrin sealant**: A combination of human proteins used during surgery to control bleeding when standard surgical techniques are not effective or practical
  - **Plasma-derived clotting factors or proteins**: Blood products made from human plasma that are used to replace a clotting factor in your blood or reverse the effects of a medication

The following procedures may be done during your surgery:

- **Acute Normovolemic Hemodilution (ANH)**: Some of your blood is removed at the beginning of your surgery and replaced with a salt or starch solution. The removed blood is kept in the operating room (O.R.) with you. If you need blood during surgery, the doctors can give you your own blood.

- If there is enough time before your surgery, you may be able to take medication to help with certain types of anemia.

Autologous donation (donating your own blood)

- If your surgery is planned and it is not urgent, you may be able to donate your own blood at Canadian Blood Services. This will depend on your condition.
- This must be arranged by your primary health care provider and your surgeon well before your surgery.
- Autologous donation before surgery is becoming less common. This is because of more waste, anemia, the risk of needing a blood transfusion (donated blood from someone else), and inconvenience for the patient.

What are the benefits of PBM?

- When PBM is used to lower or prevent the need for a blood transfusion, patients have:
  - Fewer complications
  - Faster recoveries
  - Shorter stays in the hospital
  - Less risk of infections
- PBM also helps save donated blood for people who really need it.

What is a blood transfusion?

- A blood transfusion is when you receive a blood component or product through an intravenous (I.V.) tube inserted into a vein in your arm using a needle.
- A blood component or product is made when donated blood is separated into different parts. When you receive a blood component or product, you are receiving only what you need.
- Blood components include:
  - Red blood cells
  - Platelets
  - Plasma
  - Cryoprecipitate

- Blood products include:
  - Albumin
  - Clotting factors
- You may need a blood transfusion if you lose a lot of blood (like during surgery).

Where does the blood for a transfusion come from?

- Blood is collected from healthy volunteer donors by Canadian Blood Services. Blood donors must answer questions about their health. Only people without health concerns can donate.
- All donated blood is tested for:
  - Syphilis
  - Hepatitis B (liver infection)
  - Hepatitis C (liver infection)
  - HIV (the virus that causes AIDS)
  - Other viruses
- Blood is **NOT** used for a transfusion if there is any concern that it could pass on a virus or a disease.
- In an emergency, your doctor will decide whether to transfuse blood and what component or product to use.

- When getting ready for surgery, the need for a blood transfusion can be lowered or prevented through careful planning. Your surgeon, the PBM Program, and your primary health care provider (family doctor or nurse practitioner) will work together to make sure you are as healthy as possible.

Important: Even when PBM strategies are used, you may still need a blood transfusion. The healthier you are before your surgery, the less likely it is that you will need a blood transfusion.

Before your surgery

- Talk with your health care provider **at least** 2 to 4 weeks before your surgery about any medications you are taking like:
  - Over-the-counter medications
  - Herbal preparations
  - Vitamin E
  - Non-steroidal anti-inflammatory drugs (like ibuprofen, naproxen)
  - Medications that affect blood clotting (like warfarin, dabigatran, Aspirin®, clopidogrel). These may raise your risk of bleeding during surgery.

The health risks of not having a blood transfusion when you need it are much higher than the risks of having a transfusion.

What is PBM?

- Perioperative blood management (PBM) helps a patient before, during, and after a planned surgery to:
  - Manage anemia
  - Lower blood loss
  - Lower or prevent the need for a blood transfusion
  - Improve your health after surgery

How does the PBM Program work?

- If you are having a planned surgery, you will have a complete blood count (CBC) taken before your surgery date (at least 4 weeks is recommended).

Why might I need a blood transfusion?

- You may need a blood transfusion to:
  - Increase your red blood cells, which will increase the oxygen in your blood
  - Replace clotting factor or platelets in your blood, to help stop bleeding
  - Replace blood lost from a trauma or injury, or a treatment or procedure that caused your blood cells to be lower for a time

Informed consent

- If your doctor prescribes a blood transfusion for you, they will explain:
  - What the blood component or product is
  - The benefits and risks of the transfusion. This will depend on what blood component or product you receive and on your illness or condition.
  - Any other options available
- They will give you the chance to ask questions. Then they will ask you to sign a consent form for the transfusion. This discussion will be documented in your chart.

What are the risks of a blood transfusion?

- For each blood component or product received, the risk of some viral (caused by a virus) infections is estimated to be:
  - 1 in 2 million for hepatitis B
  - 1 in 12,900,000 for HIV
  - 1 in 27,100,000 for hepatitis C
  - Less than 1 in 1 million for West Nile virus
- The risk of some non-viral infections is estimated to be:
  - 1 in 100 for minor allergic reactions
  - 1 in 300 for febrile (having a higher temperature) reactions
  - 1 in 2,500 for delayed hemolysis (red blood cells are destroyed)
  - 1 in 500,000 for bacteria getting into the red blood cells

Source: *Bloody Easy 5.1: Blood Transfusions, Blood Alternatives and Transfusion Reactions. A Guide to Transfusion Medicine*, fifth Edition Handbook July, 2023.

- **Receiving blood components or products in Canada is very safe**. Serious complications are rare, but may be life-threatening. Reactions may be mild or severe and could come from:
  - Allergies
  - Human error
  - Transfusion-related lung injury (immune reaction affecting the lungs)
  - Being less able to fight infections for a time
  - Fluid overload
- A blood transfusion is never risk-free. But the risk of getting sick from a transfusion is very small. Please talk with your doctor about whether having a blood transfusion is right for you.

What if I choose not to have a blood transfusion?

- There are several options to lower or prevent the need for a blood transfusion, but not all options are right for everyone. Many types of surgery and treatments are possible without a blood transfusion.