<table>
<thead>
<tr>
<th>Topic: CP104 Transfusion Medicine College</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making a living in Transfusion Medicine in a community hospital</td>
<td>1:30-2:00 p.m.</td>
</tr>
<tr>
<td>When blood is not available!</td>
<td>2:00-2:30 p.m.</td>
</tr>
<tr>
<td>My patient refuses blood!</td>
<td>2:30-3:00 p.m.</td>
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<tr>
<td>Break</td>
<td>3:00-3:30 p.m.</td>
</tr>
<tr>
<td>So now you tell me! Managing recalls and market withdrawals</td>
<td>3:30-4:00 p.m.</td>
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<tr>
<td>T&amp;S and the Three Day Rule-Does it make sense in today’s market?</td>
<td>4:00-4:30 p.m.</td>
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<tr>
<td>JUST DO IT!: Manage &amp; Dx ATRs</td>
<td>4:30-5:00 p.m.</td>
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<tr>
<td>Commencement</td>
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</table>
My Patient Refuses Blood!

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Session Learning Goals

• Develop a structured approach to counsel and manage adult patients who refuse transfusion

• Provide information regarding alternatives to conventional transfusion

• Serve as effective consultant to clinicians regarding the management of adult patients who refuse transfusion
Case Study: Part 1

It’s Friday afternoon before a holiday weekend and a surgeon calls you with the following question:

“ I have a 70 year old female who is scheduled for surgery and is refusing blood transfusion. What should I do?”
Structured Approach to Adult Patients Refusing Transfusion

• Why is the patient refusing transfusion?

• What are the options to consider and/or to present to the patient?

• What are the requirements for pathologists regarding patient consent for transfusion?
Structured Approach to Adult Patients Refusing Transfusion

Why is the patient refusing transfusion?

- What are the options to consider and/or to present to the patient?

- What are the requirements for pathologists regarding patient consent for transfusion?
Reasons for Refusing Transfusion

- Risk
  - Infectious
  - Noninfectious
- Lack of patient understanding of benefits
- Religious reasons
Addressing Transfusion Risk Concerns

- Transfusion has never been safer than it is today!

- Non-infectious risks described in handout

<table>
<thead>
<tr>
<th>Infectious agent</th>
<th>Estimated USA frequency (per unit transfused)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV-1</td>
<td>&lt; 1: 2,135,000</td>
</tr>
<tr>
<td>HIV-2</td>
<td>Extremely rare</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>1: 205,000</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>1: 1,935,000</td>
</tr>
<tr>
<td>HTLV-I/II</td>
<td>&lt; 1: 2,993,000</td>
</tr>
<tr>
<td>Bacteria</td>
<td>1: 2000 (in plts)</td>
</tr>
<tr>
<td>Syphilis</td>
<td>Rare</td>
</tr>
</tbody>
</table>

*Modified from Yomtovian RA, Downes KA, Shulman IA *Transfusion Therapy: Balancing the Risks and Benefits*
Reasons for Refusing Transfusion

• Risk
  – Infectious
  – Noninfectious
  ➢ Lack of patient understanding of benefits

• Religious reasons
Addressing Lack of Patient Understanding of the Benefits of Transfusion

- *The Circular of Information for the Use of Human Blood and Blood Components* – succinct reference for medical personnel
  - composition of blood components
  - benefits, indications, and adverse effects of transfusion.
- CFR Title 21 requires the *Circular* be available to medical personnel involved in transfusion processes
- Available online at http://www.aabb.org/All_About_Blood/COI/aabb_coi.htm (last accessed July 1, 2004)
Reasons for Refusing Transfusion

- Risk
  - Infectious
  - Noninfectious
- Lack of patient understanding of benefits
  - Religious reasons
Understanding Religious Concerns

Jehovah's Witnesses view blood as sacred life force and believe that blood transfusion is forbidden by the Bible

- **Prohibited**: whole blood, RBCs, Platelets, WBC, plasma

- **Not absolutely prohibited**: albumin, RhIg, EPO, immune globulins, and hemophiliac preparations

- **Individual decision**: Intra-operative blood salvage techniques, heart-lung equipment (non-blood-prime), organ/tissue transplantation

http://www.watchtower.org/library/hb/index.htm
If the patient refuses transfusion, what alternatives/substitutes (if any) are available?

Risks versus benefits

Informed consent

Accept txn

Reject txn

*Image A from: http://www.nature.com/nsu/030602/030602-7.htm
*Image B from: www.noblood.org
Structured Approach to Adult Patients Refusing Transfusion

- Why is the patient refusing transfusion?

- What are the options to consider and/or to present to the patient?

- What are the requirements for pathologists regarding patient consent for transfusion?
Alternatives/options for Patients Refusing Transfusion

- Transfusion-based alternatives
  - Autologous donation
  - Designated/Directed donation

- Blood recovery/salvage techniques
  - Acute normovolemic hemodilution (ANH)
  - Intra-operative blood salvage
  - Post-operative blood recovery

- Pharmacological interventions
  - Recombinant Factor VIIa
  - Erythropoietin (EPO)
  - Erythrocyte stimulating factor

- Blood substitutes

- Management of Jehovah’s Witnesses
Case Study: Part 2

• The patient was scheduled for a left hip replacement in 7 days and was concerned about transfusion associated risks.

• The pathologist reviewed the current transfusion associated risks with the surgeon who then shared them with the patient.

• The surgeon again called the pathologist asking, “The patient wants either to donate her own blood for her surgery or have her son donate blood specifically for her--is that okay?”
Requirements for autologous donation

- Order to collect blood from patient-donor’s physician
- Medical criteria for autologous donor
  - Hemoglobin $\geq 11 \text{ g/dL}$
  - Hematocrit $\geq 33\%$
  - No clinical condition for which there is bacteremia risk
- Time frame for donation
  - Blood collections shall be completed $> 72$ hours before time of anticipated surgery or transfusion
Designated/Directed Donation

• Prospective donor known to patient
• Presumption that “known” allogeneic donor has lower infectious risk than anonymous allogeneic donor
• No evidence that directed donations are safer than anonymous allogeneic blood
• Must be ABO-compatible
• Time for collection and processing
Case Study: Part 3

- The patient was medically ineligible for autologous donation.
- She and her son were ABO-incompatible and thus were ineligible for directed donation.
- On learning the current infectious risks from transfusion, the patient consented to allogeneic transfusion and received 2 allogeneic RBC units.
Alternatives/options for Patients Refusing Transfusion

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Acute Normovolemic Hemodilution

Collection of whole blood in OR
Under anesthesia

Loss of blood at lower HCT

Transfusion of unit after acute blood loss

Figure A see http://www.lhsc.on.ca/lab/bldbank/bloodye.htm
Acute Normovolemic Hemodilution

- Collection of blood from patient after anesthesia induction but before surgery with replacement volume with colloid/crystalloid
  - Blood stored in OR for up to 8 hours and re-infused into the patient after major blood loss has stopped.
  - Volume removed depends upon predicted blood loss and patient’s tolerance of anemia

- Ineligible patients:
  - Similar to autologous donation but no age restrictions
  - Risk of bacteremia
  - Significant cardiac abnormalities
  - Renal failure candidates - excess fluid
Intra-operative Blood Salvage

- Collection and re-infusion of blood from a patient during surgery
- Associated adverse events
  - Air embolism
  - Hemolysis of recovered RBCS, inadequate washing
  - Dilutional coagulopathy
Post-operative Autologous Blood Recovery

- Recovery and re-infusion of washed and unwashed wound drainage from patients after orthopedic procedures
- Adverse effects associated with potential re-infusion of
  - Fibrin degradation products, activated coagulation factors, complement
  - Free hemoglobin, red cell stroma
  - Marrow fat, tissue debris
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Recombinant Factor VIIa (rFVIIa)

- A hemostatic agent that complexes *in vivo* with tissue factor to activate Factor X thereby initiating the clotting cascade by bypassing requirements for Factors VIII and IX.

- Discussed in another session of Transfusion Medicine College course
Erythropoietin (EPO)

- EPO regulates RBC production
  - increases erythrocyte survival
  - causes erythroid progenitor cell maturation/proliferation
- EPOGEN® (rHuEPO; Epoetin alfa)
  - recombinant EPO that stimulates RBC production.
- EPO initially used to treat anemia associated with chronic renal failure but use has expanded to treat
  - Anemia due to other causes
  - Peri-operative surgical patients
  - Autologous blood donors
- Some Jehovah’s Witness patients may refuse EPO because it contains albumin
Erythropoiesis Stimulating Factor

- A novel synthetic erythropoiesis-stimulating factor (NESP, darbepoetin alfa (Aranesp) Amgen Inc, Thousand Oak, CA)
- Compared with rHuEPO, NESP has
  - higher carbohydrate content
  - longer plasma half-life
- Reported to maintain Hgb as effectively in patients with chronic renal failure as rHuEPO but with less frequent dosing
Alternatives/options for Patients Refusing Transfusion

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Hemoglobin Substitutes

- Hgb substitute would be invaluable for patients requiring emergent transfusion or unwilling to receive transfusions.
- Two classes of Hgb substitutes
  - Hgb-containing fluids
  - Perfluoro compound emulsions.
- Inherent difficulties with hgb-based products include high oxygen affinity, a short plasma half-life and auto-oxidation.
- More studies are needed to determine the efficacy and side-effect profile of these compounds.
Alternatives/options for Patients Refusing Transfusion

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Management of Jehovah’s Witnesses

• Jehovah's Witnesses may refuse transfusions, even when the transfusion is life saving for them.
• Intra-operative blood salvage with cell savers and auto-transfusion may be used in some patients.
• Collection devices can be modified to ensure a continuous closed connection with the patient’s own circulation.
• Jehovah’s Witnesses may accept synthetic blood substitutes but refuse Hgb-based substitutes composed of human protein.
• For anemic patients EPO may be an option to increase hemoglobin values prior to surgery or delivery in the pregnant patient.
• In trauma/massive hemorrhage may use rFVII.
Structured Approach to Adult Patients Refusing Transfusion

- Why is the patient refusing transfusion?
- What are the options to consider and/or to present to the patient?
- What are the requirements for pathologists regarding patient consent for transfusion?
Role of Pathologist
Transfusion Consent

Standard 5.19.1 Recipient Consent
The blood bank or transfusion service medical director shall participate in the development of policies, processes, and procedures regarding recipient consent for transfusion.

Informed Consent for Transfusion

Standard **5.19.1.1**

At a minimum elements of consent include:

1). A description of the risks, benefits, and treatment alternatives
2). The opportunity to ask questions
3). The right to accept or refuse transfusion

*AABB Standards for Blood Banks and Transfusion Services 22nd Edition*  
AABB, 2003, p.54-55.
Summary

• A structured approach for understanding why a patient is refusing transfusion and knowing the risk, benefits and alternatives of transfusion allow a pathologist to serve as an effective consultant to clinicians wondering how to manage adult patients who refuse transfusion.

• The decision to accept or reject a transfusion is made by an individual, is a process and must include the minimum elements of informed consent.
The blood bank or transfusion service medical director shall participate in the development of policies, processes, and procedures regarding recipient consent for transfusion.
The *Circular of Information* contains information about the composition, benefits, indications, and adverse effects of blood and is available online at http://www.aabb.org/All_About_Blood/COI/aabb_coi.htm
(last accessed July 1, 2004)
The blood supply is safer today than it ever has been in history with the approximate infectious risk per unit transfused for HIV-1 about 1 in 2.1 million, for HBV approximately 1 in 205,000, and for HCV about 1 in 1.9 million.