



Blood Transfusion in Critical Care
Is your practice safe ?



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Outline

- What is most likely reason patients in die as a result of blood product therapy ?
- Review the mechanisms of complications and death from the top three causes of transfusion related mortality ?
- Which products pose the greatest risk to the critically ill patient ?
- How can we reduce the risk of preventable transfusion related adverse events ?
- What 's new in blood product therapy ?

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A preventable death- transfusion related acute hemolysis

- 1: 100 000 transfusions in Canada
- Compared with 1: 4.5 million transfusions risk of dying from transfusion acquired HIV/AIDS
- Cause of preventable acute hemolytic transfusion reactions- Wrong blood in specimen tube

“W.B.I.T” at the time of draw for the ABO/Rh group and crossmatch

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AHTR- due to ABO incompatible red cells

- Most likely cause of death by acute hemolysis
- ABO incompatible transfused red cells are destroyed by the ABO antibodies in the patient 's plasma
- Hemolysis (debris and intravascular hemolysis) in the plasma damages kidneys and other organs
- Hypoxemia, hyperimmune response: shock
- Coagulopathy due to depleted clotting factors
- Pre-existing morbidity can contribute to catastrophic pathology
- If not fatal can leave patient with severe organ damage e.g. permanent hemodialysis

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Error Prevention- myths

- I know my patient therefore this will never happen
- Blood Bank will always catch this error before patient is harmed i.e. by crossmatch blood in the bag and the patient's specimen
- I will always check the patient's armband before I draw blood samples so this will never happen
- Unfortunately death or severe morbidity can occur even if the above occur

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The only way to ensure fatal preventable AHTR is prevented

- Perform positive patient identification
- Perform checks that are unequivocal
- Includes labels and the patient
- Is always done at the bedside in the presence of the patient
- Starts with crosscheck of each label against the armband
- End with tube labelling at the bedside before leaving the patient and only after a second crosscheck

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How to contribute to a preventable death.

- Remove specimen tubes from the patient's bedside unlabelled
- Checking only the armband and not the labels against the armband
- Not checking each label against the armband
- Not crosschecking the minimum of two unique identifiers e.g. name and hospital record number
- Presuming familiarity with the patient's clinical status will "protect" him/her from such errors
- Ignoring early signs of hemolysis – fever, chills, back pain, changes in vital signs, changes in urinary status e.g. decreased output, red wine coloured urine

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Transfusion Related Acute lung Injury

- Early detection and immediate reporting are critical
- In ICU: risk is under reporting or misdiagnosing
- Any sudden onset of hypoxia, fever, in most cases, hypotension during or within six hours of completion of a transfusion must be treated quickly and reported immediately to an MD and the Blood Bank
- Trigger: white cell antibodies in donor plasma damage causing leakage of fluid (non cardiogenic pulmonary edema)
- No way to screen for TRALI pre transfusion *
- Never presume another cause particularly in the patient with complex health care problem
- Only treatment: supportive – respiratory and hemodynamic pm

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Why does the Blood Bank need to be notified

- Mandatory reporting to PHAC (Health Canada)
- *Tracking of donors, exclusion of donors (plasma) to reduce incidence risk
- Additional investigation of patient and donor (Additional patient bloodwork must go to CBS Winnipeg)

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BACON

- Bacterial contamination
- Greatest risk: components especially platelets
- Start transfusing as soon as product arrives
- Delays of greater than 30 minutes from time product leaves Blood Bank increases risk of bacterial growth
- NEVER transfuse/infuse each bag or bottle longer than 4 hours after the time it was released by Blood Bank
- Use of coolers-precautions- never share or keep for longer than 4 hours

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Bacterial Growth in Platelets



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Be vigilant

- Follow hospital policies for positive patient identification, patient assessment, adverse reaction management and appropriate use of blood product therapy
- Federal blood safety standards- new normal nurses are accountable from vein to vein
- Utilize and support transfusion safety officers
- Nursing Leaders- do not dismiss errors and practice gaps - liaise with Transfusion Medicine- identify error trends and safe practice and environmental gaps

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..and finally , what's new in blood product therapy these days

- Early 2008: Buffy coat production method of red cells, plasma and platelets
- Platelet pools are now 4 versus 5 donors
Bags have changed slightly
Platelets are now cultured by CBS not Blood Banks
- New products –new IVIG' s
 - New products to treat bleeding: plasma complex concentrates (PCC's) eg Octaplex

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