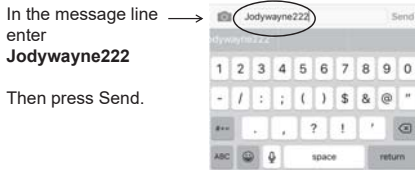


**Expanding your Educator's Toolbox:**  
Critical Thinking Tools for Teaching Immunohematology

Before we start please join our interactive session if you are able to text



**Expanding your Educator's Toolbox:**  
Critical Thinking Tools for Teaching Immunohematology

Jody Wayne, MS, MT(ASCP)SBB<sup>CM</sup>  
Jennifer Talmo, MT(ASCP)

Mayo Clinic, Rochester, MN

Clinical Laboratory Educators' Conference  
February 24, 2017

**Objectives**

- Recognize the role critical thinking exercises have in the learning experience
- Review critical thinking exercises used by the Transfusion Medicine Education Resource Team
- Select critical thinking exercises that will work for your learners and formulate their use in your teaching sessions

medical laboratory science classes do you teach?

- Blood Bank
- Microbiology
- Hematology
- Chemistry
- Other

**Start the presentation to activate live content**  
If you see this message in presentation mode, install the add-in or get help at PollEv.com/app

What is the average class size you teach?

**Start the presentation to activate live content**  
If you see this message in presentation mode, install the add-in or get help at PollEv.com/app

format do you utilize to deliver your learning content?

- Face-to-Face
- Lecture
- Online
- Blended
- Other

**Start the presentation to activate live content**  
If you see this message in presentation mode, install the add-in or get help at PollEv.com/app

Mayo Clinic Rochester  
Department of Laboratory Medicine and Pathology

- > 80 testing labs
- ~ 3000 employees
- > 20 million tests performed annually



Mayo MLS Program

- 10.5 months
- 43 semester credits
- 24 students admitted
- Class of 2017 is 9<sup>th</sup> graduating class
- Blended Curriculum
  - Traditional – Online –Blackboard Platform
- Hospital Based (via NCCLS accreditation)



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Immunohematology Course

- 6 week rotation
- 3 sessions of 8 students each
- Clinical Experience includes:
  - Donor Services
  - Blood Component Lab
  - Transfusion Lab
  - Tissue Typing Lab
  - Human Cellular Therapy Lab
  - Advanced level exercises



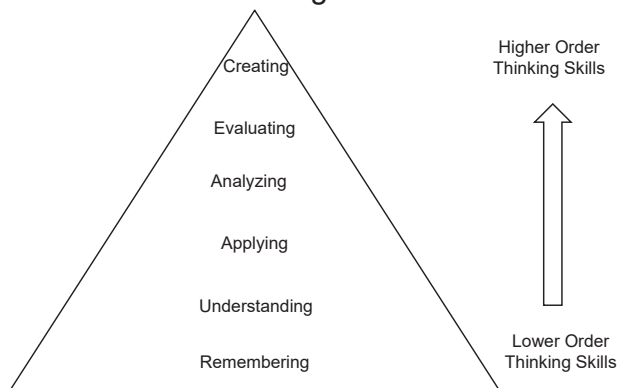
Principles of Adult Learning

Blooms Taxonomy of Learning Domains
Cognitive (knowledge)
Affective (attitude)
Psychomotor (skills)

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Levels of the Cognitive Domain



Level	Objective Verbs
Creating	designing, constructing, planning, producing, inventing, devising, making
Evaluating	checking, hypothesizing, critiquing, experimenting, judging, testing, detecting, monitoring
Analyzing	comparing, organizing, deconstructing, attributing, outlining, finding, structuring, integrating
Applying	implementing, carrying out, using, executing
Understanding	interpreting, summarizing, inferring, paraphrasing, classifying, comparing, explaining, exemplifying
Remembering	recognizing, listing, describing, identifying, retrieving, naming, locating, finding

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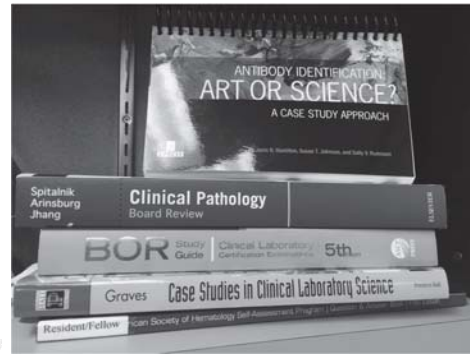
## Start at the Remembering Level

- “Flip” the learning process when possible
  - Engage the learner
  - Keep the students accountable
  - Self-assessment
- Give the students plenty of resources
  - Textbook
  - SOPs
  - Standards
  - Technical manual



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## Use what's already out there!



Use audience response systems to help keep the students engaged!

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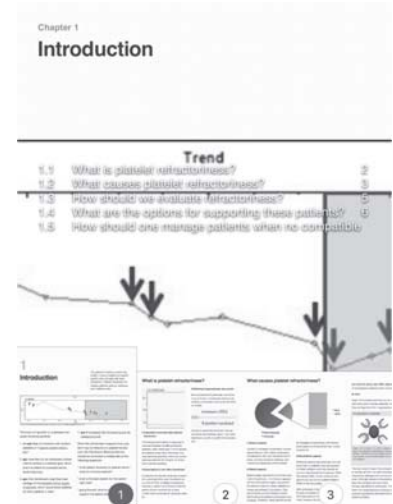
iBook



iTunesU

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## iBook



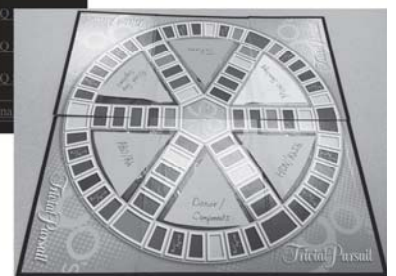
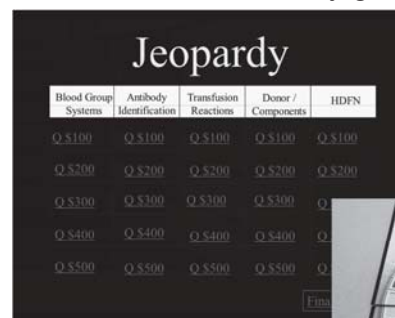
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## Websites

- Manufacturers
- Regulatory & Accreditation: FDA & CAP, AABB, NAACLS
- Professional Organizations: ASCLS, ASCP
- Misc: [Blood Bank Guy](#), [Creepy Dreadful Wonderful Parasites](#), [Transfusion News Question of the Day](#)

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## Play games



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## Use Questions to Provoke Critical Thinking

- Ask open-ended questions appropriate to the student's experience and objective level

### • Hints:

- Ask clear questions
- Give the student time to answer
- Create a safe learning environment – let the students know it's ok if they don't know the answer



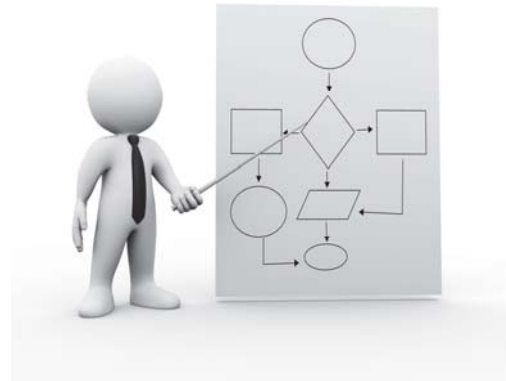
## ? SOP "What-if" Discussion ?

- After the student is comfortable with the routine steps of the SOP ask problem solving questions:
  - What if you only added 1 drop of plasma instead of 2?
  - If a tech forgot to add a reagent what might happen?
  - How may your test result be different if you performed step 2 before step 1?

## Dry Cases Basic – Antibody Identification



## Dry Case Example – Working Backwards



## Mock Morning Conference



## Positive Crossmatch with a Negative Antibody Screen - Discussion Board...or Not

The screenshot shows a discussion board titled "Discussion Board" with a sidebar menu containing items like "Getting Started", "Welcome", "Meet the Faculty", "Schedule", "Session 1", "Lesson Plans (LP)", "Seroology", "Hemolytic Disease of the Fetus and Newborn", "Transfusion Reactions", "Donor", "Blood Components", "Administration", "Human Cellular Therapy", "Human Leukocyte Antigen", "Genetics", "Regulatory/Accreditation", and "Assignments".

The main content area shows a forum post with the following text:

**Positive Serology, Crossmatch with a Negative Antibody Screen**

The cases below will review some possibilities to consider when the antibody screen is negative, but the crossmatch is positive.

Students will be broken down into 4 groups & each group will be given a different case to work on. All four cases have the same patient introduction & pretransfusion testing results as described below. The cases will vary in the additional antibody identification work performed. Each group will work together & post answers in the discussion board.

**Patient Case Study:**

Two units of red cells have been ordered for a patient with a 5.2g hemoglobin. The patient has AML, and was previously transfused 2 units of A pos red cells and 3 units of O pos plasma two weeks ago at an outside institution.

# Event Reports & Audits...

# Role Play Anyone?

**TRANSFUSION MEDICINE EVENT REPORT**

**CONFIDENTIAL** Event #: E-0003

Date of Report: 5/13/08 Date/Time event discovered: 5/13/08 Reported by: S. Smith  
 Date/Time event occurred: 5/13/08 Unit No: N/A  
 Patient Donor Name: Shanda Lear Clinic #: 7-787-412  
 Work areas/Personnel involved: Blood Bank / Donor 1, Donor  
 Product type, if appropriate: N/A

**Description, investigation, and potential cause (if known):**  
 On 05/13/08 when performing type and screen in part of a transfusion order, a sample drawn on 05/12/08 at 0655 from Mr. Bore typed as B Pos. The computer displayed a conflict with a historical typing of O Pos. The patient had been typed on 5 previous occasions and all were typed as O Pos. The sample was sent to the Reference Lab for investigation.

**Immediate action taken:**  
 The typing on the current sample was repeated and found again to be B Pos. A second sample was ordered to help resolve the conflict. This second sample was drawn at 0659 on 05/13/08. The second sample typed as O Pos. The Venopuncture supervisor was notified of the incorrect draw at 0655. No additional labs were drawn on the same accession number and therefore no clinical notification was done. Antibody screen testing was repeated using the correct sample and O Pos blood was released for transfusion.

**Probability of Recurrence**  
 Extremely High  Very High  High  Medium  Low  Very Low

**Severity of Patient Donor Harm and/or Financial/Regulatory Risk**  
 Extremely High  Very High  High  Medium  Low  Very Low

**Additional Action**  
 No additional action at this time  
 Send to Event Management Team  Perform Root Cause Analysis  
 Corrective Action/Preventive Action (CAPA) Item

Reviewed: QA \_\_\_\_\_ Date(s) \_\_\_\_\_  
 Supervisor(s) \_\_\_\_\_ Date(s) \_\_\_\_\_  
 Staff Physician(s) \_\_\_\_\_ Date(s) \_\_\_\_\_  
 Division Chief \_\_\_\_\_ Date \_\_\_\_\_  
 Patient Event Reportable  RMT Reportable  ITA Reportable   
 Data Reported \_\_\_\_\_ Date Reported \_\_\_\_\_

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# Mass Casualty Exercise



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# Transfusion Reaction Interpretation and Hemovigilance Sign-out

Does the patient's wristband or other form of identification match intended recipient label on blood product?  
 Yes  No

Product Given: RBCs Amount Given: 200 mL Product ABO/Rh: O neg  
(From Current Product Label) (From Current Product Label) (From Current Product Label)

Unit Number: W8675309 Patient ABO/Rh: O neg  
(From Current Product Label) (From Current Product Label)

Patient Diagnosis: MDS Indication for current Transfusion: low hgb 6.8  
(If not enable, send "N/A")

Transfusion reaction signs: 1/13 time: 15:45  
(Type for most recently related blood product)

Pre-Transfusion BP: 80 / 59 / 14 T: 37.1 X/Dial  Rectal  Axillary  Tympanic  Bladder  Core  
(Type for most recently related blood product)

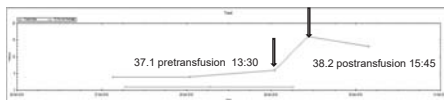
Current BP: 76 / 85 / 12 T: 38.2 X/Dial  Rectal  Axillary  Tympanic  Bladder  Core  
(Type signs later at time of reaction)

Excluding this reaction, has the patient had a temp of 38°C or higher in the last 24 hours?  Yes  No

**CHECK ALL THAT ARE APPLICABLE:**  
 Rigors/Shaking chills  Pulmonary Rales   
 Wheezing, facial edema  Red or dark urine   
 Shortness of breath/Dyspnea  Hives   
 Pain (Arm, Chest, or Back)  Rash/itching   
 Other (Explain in comments section below): Temp increase > 1°

**Additional comments:** (Describe signs and symptoms checked if appropriate. Add other pertinent observations not included in listed signs and symptoms above. DO NOT remove what is already clearly documented. Also include any relevant comments from the patient care provider within patient and family.)

Initial Workup
Clerical Check = Okay
Hemolysis = negative
DAT = Negative
ABO/Rh = O pos



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# Blood Donor Eligibility Role Play



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# Summary

- Adults have three different learning domains:
  - Cognitive (knowledge)
  - Affective (attitude)
  - Psychomotor (skills)
- The goal for your learner is to get to a higher order of thinking.
- There are many easy & inexpensive ways to help your learner not only remember the basics, but also achieve a higher level of thinking.

# Questions & Discussion



\*Text LEAVE to exit out of Poll Everywhere

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