



### Comparing Blood Bank Testing Methods



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## **New York** Blood Center Enterprises

EXPANDING OUR ORGANIZATION TO MEET CLINICAL, CELLULAR AND TRANSFUSION PRODUCT AND SERVICE NEEDS FOR PATIENTS. NOW PROVIDING ALMOST ONE MILLION BLOOD PRODUCTS, OVER 450,000 LABORATORY AND MULTI-ASSAY INFECTIOUS DISEASE TESTS AND OVER 12,500 SPECIALTY CLINICAL PROCEDURES ANNUALLY TO HOSPITALS NATIONWIDE.



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## Objectives

- Review the indirect antiglobulin test methodology of tube testing
- Discuss gel column agglutination, and how it is used in blood bank testing
- Discuss the solid phase red cell adherence assay (SPRCA), and how it is used in blood bank testing.



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### Tube testing:

- Direct agglutination:
  - Cold reacting antibodies
  - IgM
    - Immediate spin phase
    - Room temperature phase
    - 37C phase

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### Tube Testing:

- Indirect Antiglobulin Test (IAT)
  - Detects IgG antibodies
  - Antibodies and cells incubated at 37C
  - Unbound antibodies washed away
  - Anti-human IgG reagent added
  - Visible agglutination of antibody coated cells

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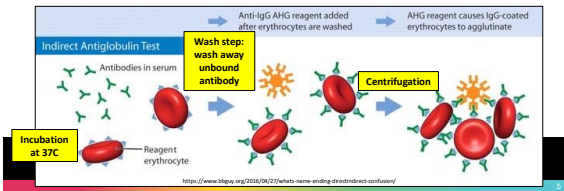
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### Tube testing video

Web Object

Address:  
<https://www.youtube.com/embed/-XUzXyMFpyQ>

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## Tube testing: things to consider

- Sample volume required
  - 2 drops of plasma per test (100ul)
- Supplies (tubes/pipets) economical
  - Reagents VERY expensive
- Competence/skill of technologists
  - Subjective grading
- Can infer IgM (immediate spin) and IgG (IAT) reactivity
- Gold Standard

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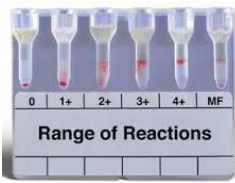
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## Gel testing



[https://labs-inc.org/pdf/358\\_1.pdf](https://labs-inc.org/pdf/358_1.pdf)



<http://www.medwom.com/med/blood-centrifuge/orthodigital-diagnostics/id-mts/58910.model-spec>

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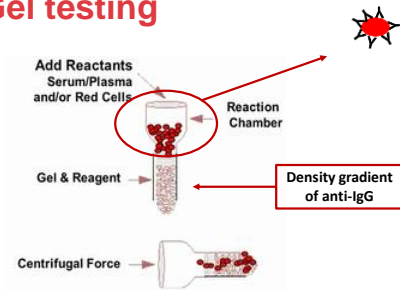
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## Gel testing



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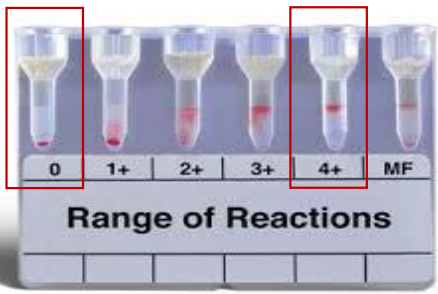
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## Grading gel reactions



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## Gel testing: things to consider

- Sample volume small: 25ul of plasma per test
- Use of 0.8% cells suspension
- Very sensitive testing
- Easy set-up, less subjective reading
- Can be automated
- No wash step



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## Gel testing: video




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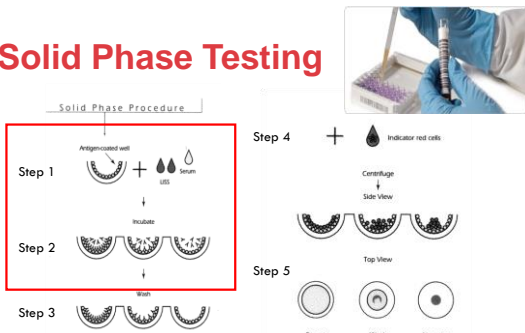
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## Solid Phase Testing




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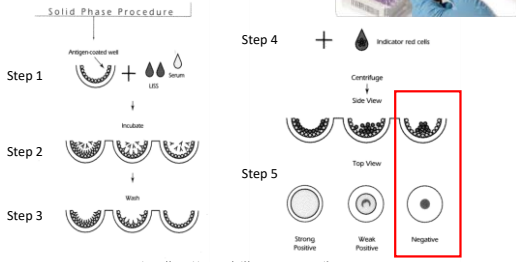
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## Solid Phase Testing



[https://www.bbguy.org/pdf/0212\\_PT\\_Testing.pdf](https://www.bbguy.org/pdf/0212_PT_Testing.pdf)



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## Solid Phase Reaction Grading

- Total effacement of well = 4+
- Centrifuged pellet of cells at the center of the well = 0

(Interestingly, this is opposite of tube testing grading)



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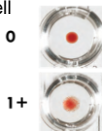
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## Solid Phase: things to consider

- Sample volume required: 1 drop (50ul)
- Must coat wells with cells prior to testing (or buy commercially prepared wells)
- Sensitive
  - Detects warm autoantibodies particularly well
- Subjective grading
- Can be automated



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## Solid Phase testing video




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## So... which is better?

- IRL uses tube testing primarily
- Many hospitals prefer automated platforms (gel or solid phase)
- **How to decide on one primary method:**
  - Consider tech time and competency
  - Sample volume requirements
  - Cost
  - Automation possibility




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Comparison of 3 Methods Handout

### Tube Testing, SPRCA, and Gel: A Comparison

Use this chart to compare & contrast the three blood banking methodologies.

Methodology	What does a positive reaction look like?	What does a negative reaction look like?	Tests for IgG, IgM, or IgA (includes inhibition at 37C/ gamma)?	Includes centrifugation (gamma)?	Advantages of this methodology	Disadvantages of this methodology
Tube	Antibody coated red cells visibly agglutinate after adding anti-IGG reagent					
Gel	Antibody coated cells get stuck in gel matrix following centrifugation					




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