



# Saint Luke's Regional Laboratories Clinical Laboratory Letter



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## Hand Sanitizer Alert—Read the Label!

Hand sanitizers have become widely available and are used by the general public in homes, schools, and daycare centers. They have been shown to be effective in reducing gastrointestinal illnesses in these settings. Alcohol-based sanitizers have also become the hand cleanser of choice in healthcare facilities. For effective germicidal activity, the FDA recommends an ethanol or isopropanol content of 60% to 95%.

A recently published evaluation (Reynolds, et al, EID, March 2006) of hand sanitizers showed that some antimicrobial gels marketed to the public are not effective in reducing bacterial counts on hands, despite label claims of "kills 99.9% of germs and harmful bacteria." Handwashing experiments verified that bacterial colony counts on hands washed with tap water, 40% alcohol, and hand sanitizer gel containing 40% alcohol were not reduced at all. Further experiments confirmed that an over-the-counter sanitizer gel containing 62% alcohol did effectively reduce bacterial colony counts.

Consumers should be informed to inspect the label prior to purchasing hand sanitizer gels, to make sure the product contains at least 60% ethanol (ethyl alcohol) or isopropanol (isopropyl alcohol).

## Compatibility Testing Clarified

Compatibility tests are performed in order to help prevent hemolytic transfusion reactions which may be caused by antibodies of the ABO blood group system or by antibodies to other blood group antigens. Compatibility testing includes verification of the ABO & Rh type of the donor blood and the following tests on recipient's blood:

- ABO and Rh typing
- Antibody screen for unexpected antibodies
- Crossmatch between donor red cells and recipient serum.

A sample must be obtained from the patient within 3 days of the scheduled transfusion for

compatibility testing if any of the following conditions exist:

- Patient has been transfused with a blood component containing red blood cells in the preceding 3 months
- Patient has been pregnant within the preceding 3 months
- Patient history is uncertain.

Testing of a new sample is necessary because a patient can develop a primary antibody response at any time within the first three months following immunization.

The following information must be included with a crossmatch request:

1. Component desired.
2. Number of units needed.
3. Transfusion priority: Hold, Give, Surgery.
4. Date of transfusion or surgery.

Determination of ABO blood groups is the most important pretransfusion compatibility test. ABO typing is accomplished by:

- Testing patient's red cells with anti-A and anti-B antisera (called forward typing)
- Testing patient's serum for anti-A and anti-B (called back or reverse typing).

The ABO system is unique in that a subject's plasma has naturally occurring antibodies to the ABO red cell antigens that are absent from his or her own red cells. These antibodies are the basis for ABO compatibility criteria when selecting red cells and plasma for transfusion.

Rh typing is performed so that Rh positive red blood cells will not be given to an Rh negative recipient. This prevents Rh immunization in patients without pre-existing anti-D and prevents hemolytic transfusion reactions in patients who have already developed anti-D antibodies. The presence or absence of the D antigen in the Rh blood group system defines whether a person is Rh-positive or Rh-Negative. About 85% of the US population is Rh positive and 15% is Rh negative. Rh-positive recipients can receive Rh positive or Rh negative

RBCs, but Rh-negative recipients should only receive Rh-negative blood. Rh negative patients can be given Rh positive blood in an emergent situation if they lack anti-D antibody.

The antibody screen detects alloantibodies and autoantibodies, which have specificity for red blood cells, in patient plasma. This test is performed by incubating patient plasma with two or three commercially available group O RBCs that have been extensively antigen typed under conditions that detect most clinically significant antibodies. Screening cells cannot possibly be positive for all of the 400 different RBC antigens. Therefore, it is possible to get a falsely negative antibody screen.

The last step in compatibility testing is to perform a crossmatch, which consists of testing patient serum against a sample of red cells from the actual RBC unit that has been selected for transfusion. There are two types of crossmatches; immediate spin (IS) and anti-human globulin (AHG). If the antibody screen is negative and blood bank records show no previous history of antibody, an IS crossmatch is performed. However, if the antibody screen is positive, antibody identification and selection of antigen negative units must be completed prior to performing an anti-human globulin (AHG) crossmatch. An immediate spin crossmatch takes about 5 minutes to perform, while an AHG crossmatch test requires at least 30 minutes.

Of course, the purpose of compatibility testing will be negated if safeguards are not taken to insure that the RBC unit is transfused to the correct patient. When blood arrives on the nursing unit, the patient's medical record should be checked to verify the physician's order. Then 2 nurses must confirm the identity and compatibility of the donor and recipient. Transfusion should not begin unless this identity check is accurate and complete. Discrepant information must be resolved with the Transfusion Service before starting the transfusion.

### **Community-Acquired MRSA: A Clone of a Different Color**

Community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) has emerged as a distinctly different infectious agent than MRSA that causes health-care associated infections (HA-MRSA). CA-MRSA is predominantly associated with skin and soft tissue infections in otherwise healthy children and young adults. Outbreaks have been documented among sports teams and

correctional facility inmates. Fatal pulmonary infections in children have also been reported. CA-MRSA is typically resistant only to B-lactam antibiotics and erythromycin, while HA-MRSA is usually resistant to multiple antibiotics.

The molecular characteristics of CA-MRSA have recently been published. Hundreds of CA-MRSA organisms have now been analyzed by pulsed-field gel electrophoresis (PFGE). PFGE is a strain typing method that is used to determine how closely related 2 or more bacterial isolates are to each other. This technique has revealed that most CA-MRSA strains within the U.S. belong to just two clones, designated USA 300 and USA 400. The latter is associated with severe pneumonia in children and skin infections in Native American populations. USA 300 accounts for the majority of the remaining CA-MRSA skin and soft tissue infections, and has now been identified in several outbreaks ranging geographically from Washington State to Florida.

*Staphylococcus aureus* is known to produce multiple toxins which contribute to its virulence. A toxin known as Panton-Valentine leucocidin (PVL) has been identified in the majority of CA-MRSA isolates, but not in HA-MRSA. PVL genes encode membrane toxins which target leukocytes, and are epidemiologically linked to severe skin infections and necrotizing pneumonia. Another molecular characteristic of CA-MRSA is its resistance gene, designated SCCmec type IV, that is distinct from the *mec A* resistance gene harbored by HA-MRSA.

In summary, CA-MRSA organisms are distinct clones, and not hospital-associated organisms that have moved into the general public. The prevalence of CA-MRSA is rapidly increasing. Clinicians should have a high index of suspicion for CA-MRSA, particularly when a wound resembling a "spider-bite" is present. Culture and susceptibility testing should be requested.

### **Vancomycin Range Change**

Effective April 3, the laboratory has changed the therapeutic trough level and critical value for vancomycin.

	<b>Previous</b>	<b>New</b>
Trough	5-10 ug/mL	10-20 ug/mL
Critical	>20 ug/mL	>30 ug/mL