

**THERE ARE NO NORMAL VALUES IN MICROBIOLOGY!
AN IMPROPERLY COLLECTED SPECIMEN MEANS UNINTERPRETABLE RESULTS!**

Community-Acquired Methicillin-Resistant *Staphylococcus aureus*

Learning points

- Strains of *S. aureus* causing abscesses and severe cellulitis tend to produce a specific toxin referred to as Panton-Valentine Leukocidin. (PVL)
- A strain of methicillin-resistant *S. aureus* producing PVL, identical to one causing outbreaks in the United States, is being recovered with increasing frequency from outpatients in the Calgary Health Region.
- Wound cultures on patient with abscesses and furuncles will detect patients with resistant strains and provide susceptibility testing to determine oral treatment options for clinicians.

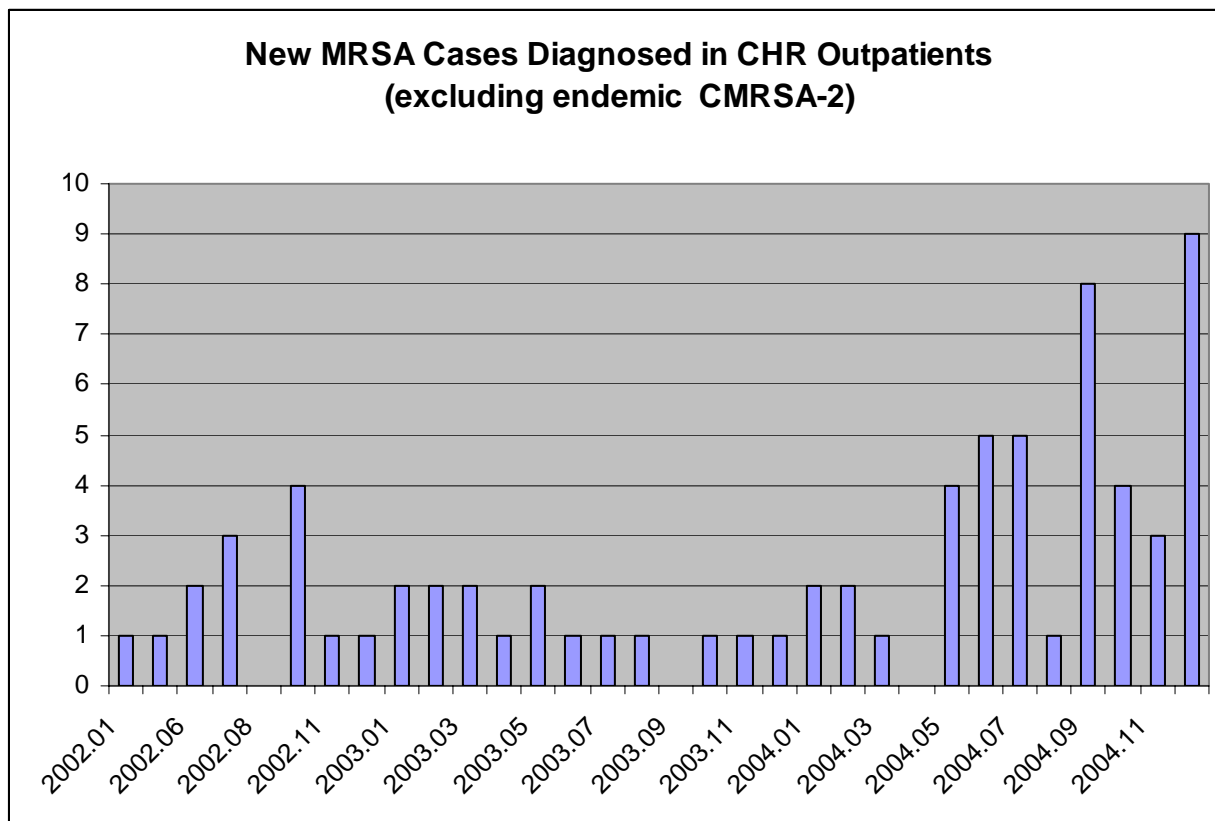
In 1932, Panton and Valentine in London, England identified a soluble factor release by some strains of *S. aureus* that causes death of polymorphonuclear leukocytes. This toxin is now referred to as Panton-Valentine leukocidin or PVL for short. Investigators found this toxin to be present in only ~ 3 – 5% of clinical isolates of *S. aureus*, and as such little investigation into this virulence factor was conducted in the 50 years after it was initially discovered.

More recently, PVL has been found to be a major factor in strains recovered from patients with severe *S. aureus* skin infections. Several investigators have identified that up to 50% of strains with *S. aureus* causing severe cellulitis, deep abscesses, and furuncles produce PVL. In addition, 85% of patients with community acquired *S. aureus* pneumonia also produce PVL (*S. aureus* causes only ~ 2% of CAP cases), and such cases are usually fatal. Interestingly, PVL positive strains of *S. aureus* rarely cause endocarditis, osteomyelitis, or urinary tract infections. Treatment of soft tissue infections in patients with PVL strains and non-PVL consists of appropriate drainage and antibiotics active against the infecting strain.

Hospital-acquired methicillin-resistant *S. aureus* (MRSA) infections have been a problem in Canada for the last 10 years. In Calgary, the vast majority of hospital acquired MRSA isolates belong to a clone called CMRSA-2.

An important recent development in MRSA infections has been the spread of new clones of MRSA outside of the health care setting. Community acquired MRSA infections have been seen worldwide, and all contain PVL. These strains are generally susceptible to non-beta-lactam antibiotics such as clindamycin, cotrimoxazole, and tetracyclines. Outbreaks have been seen in drug using populations, correctional facilities, homeless persons, and recently sports teams. In the United States, a single clone (USA 300 also known as CMRSA-10) has accounted for the majority of these outbreaks.

Unfortunately, this clone of *S. aureus* has been identified in the Calgary Health Region in similar populations described in the US, with an increasing frequency over the last year. As a consequence, physicians treating patients from the above patient groups with soft tissue infections, should consider the possibility of MRSA and obtain a culture if possible.



Suggested Reading

1. Vandenesch F et al. Community-Acquired Methicillin-Resistant *Staphylococcus aureus* Carrying Panton-Valentine Leukocidin Genes: Worldwide Emergence. *Emerg Infect Dis.* 2003 Aug;9(8):978-84. (<http://www.cdc.gov/ncidod/EID/vol9no8/pdfs/03-0089.pdf>)
2. Kazakova S et al. A Clone of Methicillin-Resistant *Staphylococcus aureus* among Professional Football Players. *N Engl J Med* 2005 352: 468-475

**IF YOU HAVE ANY QUESTIONS OR COMMENTS ABOUT HOW THE LABORATORY WORKS,
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770-3281 (Dr. Church, Division Head, Microbiology)**