**Diagnosis and Management of PVL-** *Staphylococcus aureus* **Infections**  
Quick Reference Guide for Primary Care(1)

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**B-**  
- Panton-Valentine Leukocidin (PVL) is a toxin produced by less than 2% of *S. aureus*, including MRSA(1,2).
- PVL-SA cause recurrent skin and soft tissue infections, but can also cause invasive infections, including necrotising haemorrhagic pneumonia in otherwise healthy young people in the community.

**B-**  
### CHARACTERISTICS OF INFECTIONS WITH PVL1,3  

<table>
<thead>
<tr>
<th>Recurrent skin infections:</th>
<th>Invasive infections:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boils (furunculosis), carbuncles, folliculitis, cellulitis</td>
<td>Necrotising pneumonia often after flu-like illness</td>
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<tr>
<td>Cutaneous lesions can be &gt;5cm</td>
<td>Necrotising fasciitis</td>
</tr>
<tr>
<td>Pain/erythema out of proportion to severity of signs</td>
<td>Osteomyelitis, septic arthritis and pyomyositis</td>
</tr>
<tr>
<td>With necrosis</td>
<td>Purpura fulminans(3)</td>
</tr>
</tbody>
</table>

**B-**  
### RISK FACTORS & GROUPS3,4  
- Risk factors: Remember the “5 Cs”;
  - Contaminated items shared – eg: towels, razors
  - Close contact
  - Crowding
  - Cleanliness: poor hygiene
  - Cuts and other compromised skin integrity
- Risk groups often young and healthy:
  - Closed communities with close contact
  - Close contact sports eg: wrestling, rugby, judo
  - Military training camps
  - Gyms
  - Prisons

**C**  
### WHEN AND HOW SHOULD I INVESTIGATE FOR PVL *S. aureus*?5  
- **When should I take a specimen?**
  - Recurrent boils/abscesses
  - Necrotising skin and soft tissue infections
  - If ≥ 1 case in a home or closed community
- **Community-acquired necrotising/haemorrhagic pneumonia:** sputum and swabs & refer immediately
- **On form state risk factors and request PVL.**
  
**C**  
### WHEN AND HOW DO I TREAT WITH ANTIBIOTICS?1,3  
- This advice is mainly based on clinical outcome in the treatment of non-PVL-MRSA.
- If immunocompromised or deteriorating clinically seek advice

<table>
<thead>
<tr>
<th>Infection</th>
<th><em>Antibiotic</em>6</th>
<th>Adult Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor furunculosis, folliculitis and small abscesses without cellulitis</td>
<td>NO antibiotics; Perform incision and drainage if necessary</td>
<td></td>
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<tr>
<td>Other non-suppurative minor skin &amp; soft tissue infections.</td>
<td>Flucloxacillin</td>
<td>Oral 500 mg qds</td>
<td>5-7 days</td>
</tr>
<tr>
<td>As resistance is increasing reserve topical antibiotics for very localised lesions. Only use mupirocin for MRSA.</td>
<td>Fusidic acid</td>
<td>Topically tds</td>
<td>5 days</td>
</tr>
<tr>
<td>Moderate SSTIs eg cellulitis or abscesses &gt;5cm with Meticillin-sensitive PVL</td>
<td>Flucloxacillin</td>
<td>500 mg qds</td>
<td>5-7 days</td>
</tr>
<tr>
<td>or Clindamycin – stop if diarrhoea develops</td>
<td>450 mg qds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If PVL is likely to be MRSA</td>
<td>Rifampicin</td>
<td>300 mg bd</td>
<td>5-7 days</td>
</tr>
<tr>
<td>Treat empirically with 2 agents and then be guided by antibiotic susceptibility results.</td>
<td>Doxycycline (not children) or Sodium fusidate</td>
<td>100 mg bd</td>
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<tr>
<td>or Trimethoprim</td>
<td>500 mg tds</td>
<td></td>
<td></td>
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<tr>
<td>OR Clindamycin alone</td>
<td>200 mg bd</td>
<td></td>
<td></td>
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<tr>
<td>On advice of microbiologist/hospital</td>
<td>Third line</td>
<td>Linezolid</td>
<td>600 mg bd</td>
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</table>

| Severe SSTIs with systemic symptoms or pneumonia. | Refer immediately |

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**Footnotes:**
1. PVL Guidance
2. No further searches were undertaken. Produced 18th May 2009
3. For review December 2010
C  WHEN SHOULD I ADVISE SUPPRESSION OF PVL IN PATIENTS AND THEIR CLOSE CONTACTS?

- When considering decolonization of patients and close contacts, discuss risk factors, risk groups, employment settings and compliance with Health Protection Unit/Microbiology.
- Offer decolonisation to all primary cases.
- Suppression of PVL is ineffective if skin lesions still leaking.
- Start suppression after primary infection resolved.

A- 5 DAY TOPICAL TREATMENT PROCEDURE FOR SUPPRESSION OF PVL-STAPHYLOCOCCUS AUREUS

Topical treatment aims to reduce colonisation and may prevent further infections and interrupt transmission.

A patient information leaflet is available at (Patient leaflet)8,9

BODY10

- Use Chlorhexidine 4% bodywash/shampoo or Triclosan 1 - 2% (Skinsan or Oilatum Plus). Use daily as liquid soap in the bath, shower or bowl for 5 days. Use as a shampoo on day 1, day 3 and day 5.
- Do NOT dilute product in water as this reduces efficacy.
- Apply product directly to wet skin as soap on a disposable cloth or on hand.
- Do NOT use other bath soap/shower gel in addition during baths/showers.
- Pay particular attention to armpits, groins, under breasts, hands and buttocks.
- It should remain in contact with the skin for about a minute.
- Rinse off before drying thoroughly, especially if skin conditions.
- Patients with skin conditions/delicate skin – Dermol should be considered.
- Dermatological opinion may be necessary in patients with skin conditions eg eczema.

A- NOSE10

- Use matchstick head-sized amount (less for small child) of Mupirocin.
- Apply 3 times day for 5 days with cotton bud to inner surface of each nostril.
- Massage gently upwards.
- If applied correctly, patient can taste Mupirocin at back of throat.

C  FOLLOW-UP

- Advise patient to return if infection persists or recurs.
- Patients with recurrent infections or persistent colonization should maintain sensible precautions to prevent transmission (as outlined above) Appendix 1.
- Only undertake repeated screening/decolonization if patient:
  - immunosuppressed
  - poses a special risk to others (e.g. healthcare worker, carer, food handler)
  - spread of infection is ongoing in close contacts. Guidance

C  WHO AND WHEN SHOULD I INFORM ABOUT A CASE OF PVL?

WHO
- The local Health Protection Unit
- Tel: ___________________________
- Inform hospital before any admissions

WHEN
- Where there has been one case of PVL-related infection in a closed community.
- Suspicion of spread of PVL-associated infection in families, nurseries, schools and sports facilities

KEY  A  B  C  D indicates grade of recommendation (A highest, C formal opinion)

References
10. Simmons AE, Philip I, McGee A et al. Randomized controlled trial of chlorhexidine gluconate for washing, intranasal mupirocin, and rifampicin and doxycycline versus no treatment for the eradication of methicillin-resistant Staphylococcus aureus colonization Clin Infect Dis 2007; 44:178-185. References 7 and 10 are for non-PVL-MRSA, but we have assumed similar outcomes.

This is a summary for primary care based on the Guidance on the diagnosis and management of PVL-associated Staphylococcus aureus infections (PVL-SA) in England produced by the Department of Health Steering Group on Healthcare-associated Infections in 2008. PVL Guidance No further searches were undertaken. Produced 18th May 2009 For review December 2010
Grading of guidance is based on the strength of the evidence and study design of the research papers referenced and those other papers referenced within the CDC and DH PVL Guidance

The strength of each recommendation is qualified by a letter in the left hand margin.

<table>
<thead>
<tr>
<th>Study design</th>
<th>Recommendation Grade</th>
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<tbody>
<tr>
<td>Good recent systematic review of studies</td>
<td>A+</td>
</tr>
<tr>
<td>One or more rigorous studies, not combined</td>
<td>A-</td>
</tr>
<tr>
<td>One or more prospective studies</td>
<td>B+</td>
</tr>
<tr>
<td>One or more retrospective studies</td>
<td>B-</td>
</tr>
<tr>
<td>Formal combination of expert opinion</td>
<td>C</td>
</tr>
<tr>
<td>Informal opinion, other information</td>
<td>D</td>
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