Blackpool Teaching Hospitals NHS
NHS Foundation Trust

Document Type: **PROCEDURE**		**Unique Identifier:** CORP/PROC/612
Title: **Management of Panton-Valentine Leukocidin (PVL) producing *Staphylococcus aureus* (Meticillin Susceptible *Staphylococcus aureus* (MSSA) and Methicillin Resistant *Staphylococcus aureus* (MRSA))**		**Version Number:** 2 **Status:** Ratified
Target Audience: Trust wide		**Divisional and Department:** Infection Prevention
Author / Originator and Job Title: Dr Ruth Palmer – Consultant microbiologist/Infection Prevention Doctor Acknowledgement to previous author		**Risk Assessment:** Not Applicable
Replaces: CORP/PROC/612 Version 1, Management of PVL producing MSSA & MRSA	**Description of amendments:** Amendment to title and throughout document	
Validated (Technical Approval) by: Whole Health Infection Prevention Committee (WHIPC)	**Validation Date:** 10/03/2017	**Which Principles of the NHS Constitution Apply?** 1 - 4
Ratified (Management Approval) by: Medicine Management and Safety Review Committee	**Ratified Date:** 20/04/2017	**Issue Date:** 20/04/2017
Review dates and version numbers may alter if any significant changes are made		**Review Date:** 01/03/2020

Blackpool Teaching Hospitals NHS Foundation Trust aims to design and implement services, policies and measures that meet the diverse needs of our service, population and workforce, ensuring that they are not placed at a disadvantage over others. The Equality Impact Assessment Tool is designed to help you consider the needs and assess the impact of your policy in the final Appendix.

CONTENTS

1 PURPOSE

The purpose of this policy is to ensure that patients with PVL producing MRSA and MSSA are identified and managed appropriately.

2 TARGET AUDIENCE

This document applies to all healthcare personnel working within the Blackpool Teaching Hospitals NHS Foundation Trust.

3 PROCEDURE

3.1 Introduction

3.1.1 What is PVL producing Staphylococcus aureus?

Panton-Valentine Leukocidin (PVL) is a toxin that destroys white blood cells and is a virulence factor in some strains of Staphylococcus aureus (SA). These strains of PVL-SA producing a new pattern of disease have emerged in the UK and worldwide. In the UK the genes encoding for PVL are carried by < 2% of clinical isolates of S. aureus.

3.1.2 What are the risk factors for acquisition of PVL-SA?

- **C**ontaminated items
- **C**lose contact i.e. households, close contact sports e.g. wrestling, rugby military training camps, gyms etc.
- **C**rowding
- **C**leanliness
- **C**uts and other compromised skin integrity

3.1.3 What is the clinical significance of PVL-SA and when would you suspect it?

Following skin lesions such as recurrent boils and abscesses in:

i. Previously healthy individuals in the community

ii. Clustering of skin and soft tissue infections (SSTI) within a household or social group

Invasive infections in immunocompetent individuals such as:

i. Necrotising fasciitis

ii. Osteomyelitis, septic arthritis and pyomyositis

iii. Purpura fulminans

iv. Necrotising haemorrhagic pneumonia (haemoptysis)

One of the most serious presentations is a necrotising haemorrhagic pneumonia which is associated with a high mortality. This often follows a “flu-like” illness. A co-infection with respiratory viruses, including influenza, should be investigated.

All patients fitting the PVL epidemiological profile should be flagged to the duty Consultant / on-call microbiologist so that treatment can be optimised. The infection prevention team should be contacted for appropriate infection prevention advice.

3.2 Samples for microbiology investigations:

- Blood culture, pus from exudates, aspirates from sterile sites (synovial fluid etc.), sputum or bronchial washings (BW) and any other relevant sample.
- Sputum or bronchial washing samples for viral culture and Polymerase Chain Reaction (PCR) should be sent if co-infection with a respiratory virus is under consideration.
- Carrier site swabs (Nose/throat/perineum) for PVL MRSA / MSSA

It is essential to delineate the diagnosis and/or suspicion that PVL MRSA / MSSA infection on request cards. This ensures that the laboratory is aware of the potential diagnosis and will ensure that the PVL *Staphylococcus aureus* protocol is implemented and any S aureus isolated is drawn to the attention of Consultant Microbiologist at the earliest opportunity.

3.3 Management of skin and soft tissue infections (SSTI):

Minor SSTI (furunculosis, folliculitis, small abscesses / boils without cellulitis) do not need systemic antibiotic treatment unless the patient is immunocompromised, an infant or deteriorating clinically. Incision and drainage is the optimal management for abscesses.

Moderate SSTI including cellulitis and larger abscesses (especially those > 5cm) should be treated with oral anti-staphylococcal antibiotics in addition to drainage.

If there is systemic involvement suggestive of toxic shock or pyomyositis (hypotension, tachycardia, diarrhoea, vomiting, and high creatinine kinase) use empirical parenteral antibiotics effective against MRSA until Sensitivity tests and MRSA / MSSA identity established. Severely ill patients in Intensive Care Unit (ICU) setting may require Intravenous (IV) immunoglobulin (IVIG).

3.4 General care

Lesions should be covered, personal hygiene emphasised (avoid sharing towels, bath water etc.) and patients advised to return if the lesions do not resolve or there is clinical deterioration.

3.5 Antibiotic Treatment

Most PVL-MSSA strains in the UK are susceptible to flucloxacillin, erythromycin and clindamycin, although tests need to be performed for dissociated resistance to clindamycin in erythromycin-resistant strains. Adult doses are given below. (For paediatric doses see BNF-C.)

For moderate SSTI with MSSA use either:

- Flucloxacillin 1g qds or clindamycin 600 mg qds

When PVL-MRSA is suspected and hospital admission is not warranted empirical treatment with:

- Clindamycin 600mg QDS is advised for 5-7 days. If clindamycin is contraindicated or isolate is resistant contact consultant microbiologist for further advice on antibiotics.

For all severe infections where PVL-SA (MSSA or MRSA) is suspected:

- Parenteral antibiotics such as glycopeptides PLUS 2 other agents are should be used in severe infections with features of toxic shock, necrotising fasciitis, or purpura fulminans. Please discuss antibiotic treatment for severe infections with consultant microbiologist.
- It is very important to undertake early surgical debridement.
- Treatment should be continued for minimum 10-14 days many infections will need 4 weeks of treatment or longer.

Adjunctive therapy with Intravenous Immunoglobulin (IVIG) in necrotising pneumonia should be considered.

Since PVL-SA infections are not common as yet, all cases (severe infections including osteomyelitis and other deep seated infections) need to be discussed with the consultant microbiologist regarding appropriate investigations and management.

3.6 Decolonisation of infected adults

Topical decolonisation as per Management of Staphylococcus aureus policy should be offered (http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-PROC-408.docx) without prior screening in primary cases.

3.7 Decolonisation of neonates

Decolonisation of neonates, especially premature neonates, is difficult and not standardised. Where decolonisation is required, **nasal Mupirocin** may be used. Antiseptic solutions, such as Chlorhexidine, may damage the fragile skin of premature neonates. In these circumstances, wash with plain water, even just "topping and tailing", may be helpful. When it is felt appropriate to use antiseptic, this must always be an aqueous preparation and never alcohol-based (risk of burn injuries in neonates).

Decision on decolonisation of any neonates will be based on individual risk benefit analysis performed with the consultant microbiologist. No neonate should be decolonised without prior discussion with consultant microbiologist.

3.8 Decolonisation of family contacts of a case of necrotising pneumonia

Close (e.g. partner) or household contacts of a patient diagnosed with necrotising pneumonia likely to be caused by PVL-SA may be the source of, or acquire and subsequently suffer from infections with PVL-SA. Close contacts should be offered a five-day topical decolonisation regimen starting immediately (including chlorhexidine gargle if feasible).

Consideration should be given to using oseltamivir prophylaxis if the index case is found to have had influenza and advice obtained from a Consultant Respiratory Physician / Consultant microbiologist.

For further advice on decolonisation in the community/healthcare setting please contact consultant microbiologist.

3.9 Infection prevention and control for hospitalised patients:

Follow the 'Management of Staphylococcus aureus policy' (http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-PROC-408.docx)

In addition, for patients with necrotising pneumonia-

Transmission of PVL-SA to staff has occurred following contact with respiratory secretions during intubation of a case of necrotising pneumonia where protective (PPE) was not worn. Healthcare workers (HCWs) should wear PPE, including face and eye protection (e.g. surgical mask with integral eye protection), during intubation and respiratory care of a patient with possible necrotising pneumonia. Health Care Workers in direct contact with respiratory secretions (particularly during intubation or mouth to-mouth resuscitation from a PVL-positive patient) and who were not protected by appropriate PPE should be screened three to seven days after the exposure and advised to report to a physician should symptoms of infection present subsequently. Screening should be arranged through occupational health.

In an event of increased transmission or outbreak, screening of HCWs will be on further instructions of Infection Prevention Team. Care is needed to distinguish between transient

carriage (i.e. nasal carriage which is lost within a day or so of removal from contact with PVL-positive patients and carries little risk of onward transmission) and prolonged carriage (especially associated with skin lesions and throat colonisation). This distinction is usually best achieved by screening staff as they come on duty at the beginning of their shift and not as they leave at the end of their shift.

3.10 Management of HCW who are confirmed PVL positive either from screening or clinical samples

HCW with PVL colonisation (i.e. asymptomatic), who are asked not to attend work will be considered medically suspended. The days off work will not contribute to their sick leave or annual leave calculations.

If a staff member develops an infection (i.e. is symptomatic), an incident form should be completed and sent to risk management. The incident should then be assessed and if thought to be healthcare acquired, it may possibly be reported under Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013) (RIDDOR) to the Health and Safety Executive. Diagnosing clinician will be required to partake in the Serious Untoward Incident (SUI) form. Care and treatment of the HCW is under the responsibility of Occupational Health Department (OHD), with advice and support from IPT +/- local PHE.

HCWs should not work with infected skin or purulent eye lesion. All cuts and grazes should be reported to OHD and affected areas should be covered. A HCW with proven PVL infection should not work until acute infection has resolved and 48 hours of a 5 day decolonisation regimen has been completed.

OHD should enquire re PVL related disease in close contact of HCW, so that contacts can be decolonised / treated simultaneously, if required. Follow-up screening following topical decolonisation should be done (three screens, one week apart). Re-colonisation can happen even after 3 negative screen due to the nature of transmission of PVL (more likely from the community, unlike hospital acquired MRSA), so HCW should understand the need to stop working and reporting to OHD if further skin lesions develop.

If despite two courses of decolonisation regime, a HCW remains a carrier, he/she can be allowed to continue work provided that:

a) HCW was not implicated in any hospital transmission of PVL-SA infection

b) HCW cease to work as soon as a possibly infected skin lesion develops. In this instance, HCW is advised to report to OHD.

3.11 Infection prevention and control for affected people in the community

The key principles of preventing and controlling the spread of infection in the Community setting centre on:

- Early suspicion of infection, with rapid diagnosis and appropriate treatment

- Ensuring lesions are covered with clean, dry dressings, which are changed as soon as discharge seeps to the surface
- Personal hygiene and good skin care (particularly those with eczema)
- Using separate towels and not sharing personal items such as razors, toothbrushes, face cloths etc.
- Ensuring laundry of towels, bed linen, clothing etc. using a hot wash (60 degrees C), (where possible)
- Regular household cleaning
- Avoiding communal and recreational settings until lesions are healed if they cannot be adequately contained by a dressing; certain facilities such as gyms, saunas, swimming pools, those offering massage etc. should be avoided until the lesions have healed.
- Those who work in occupations where they might pose a risk of infection to others, such as healthcare workers; carers in nurseries, residential or care homes or similar; or food handlers, should be excluded from work until the lesions have healed.

For further information please click on the following link which will take you to the current guidance from the HPA: -
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/322857/Guidance_on_the_diagnosis_and_management_of_PVL_associated_SA_infections_in_England_2_Ed.pdf

4 ATTACHMENTS	
Appendix Number	**Title**
1	Equality Impact Assessment Form

5 PROCEDURAL DOCUMENT STORAGE (HARD AND ELECTRONIC COPIES)
Electronic Database for Procedural Documents
Held by Procedural Document and Leaflet Coordinator

6 LOCATIONS THIS DOCUMENT ISSUED TO		
Copy No	**Location**	**Date Issued**
1	Intranet	20/04/2017
2	Wards, Departments and Service	20/04/2017

7 OTHER RELEVANT / ASSOCIATED DOCUMENTS	
Unique Identifier	**Title and web links from the document library**
CHS/POL/001	Infection Prevention in the Community Setting http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CHS-POL-001.docx

7 OTHER RELEVANT / ASSOCIATED DOCUMENTS	
Unique Identifier	**Title and web links from the document library**
CORP/GUID/309	Antimicrobial Formulary – For the Management of Common Infections in Adults within General Medicine and Surgery http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-GUID-309.docx
CORP/POL/116	Infection Prevention in the Acute Setting http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-POL-116.docx
CORP/PROC/101	Untoward Incident and Serious Incident Reporting http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-PROC-101.docx
CORP/PROC/408	Management Of Staphylococcus Aureus (SA) - Meticillin-Resistant (MRSA) And Meticillin-Sensitive (MSSA) http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-PROC-408.docx
CORP/PROC/418	Hand Hygiene Procedure http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-PROC-418.docx
CORP/PROC/465	Safe Disposal Of Clinical Waste And Other Hazardous Wastes http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-PROC-465.doc

8 SUPPORTING REFERENCES / EVIDENCE BASED DOCUMENTS
References In Full
Crown. (2013). The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013. Available: http://www.legislation.gov.uk/UKSI/2013/1471/contents/made . Last accessed 26/04/2017.
Guidelines for the control and prevention of methicillin-resistant *S. aureus* (MRSA) in healthcare facilities. E. Coia, G.J. Duckworth, D.I. Edwards, et al. J Hosp Infect 2006; 66 (S1):1-44
Health Protection Agency. (2008). Guidance on the diagnosis and management of PVL-associated *Staphylococcus aureus* infections (PVL-SA) in England. Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/322857/Guidance_on_the_diagnosis_and_management_of_PVL_associated_SA_infections_in_England_2_Ed.pdf . Last accessed 26/04/2017.

9 CONSULTATION / ACKNOWLEDGEMENTS WITH STAFF, PEERS, PATIENTS AND THE PUBLIC		
Name	**Designation**	**Date Response Received**
Michelle Wong	Antimicrobial Lead Pharmacist	
Members of the WHIPC committee (whole health infection prevention control committee) on	Dr ODonnell – Medical Director/Director of Infection Prevention Mawdsley Sharon – Consultant Infection Prevention Nurse Cross Patricia (BFWH) – Lead Nurse	

9 CONSULTATION / ACKNOWLEDGEMENTS WITH STAFF, PEERS, PATIENTS AND THE PUBLIC		
Name	**Designation**	**Date Response Received**
10th March 2017 via email	Infection Prevention 'mark.mcgivern@phe.gov.uk – Public Health England Shelagh Snape – Lead Health Protection Practitioner, PHE Dr Guleri , Dr R Sharma – consultant microbiologists Susan Houldsworth (BFWH);Occupational health nurse lead Chesters Kerrie (BFWH) Dr Saunders (BFWH) – Consultant Anaethetist Dr Goode (BFWH); Consultant cardiologist John Sweeney (BFWH); - consultant sexual health Dorothy Wardrope (BFWH); - CSDD manager Anita Watson – Lead infection prevention nurse - LCC Lesley Anderson-Hadley (Blackpool CCG); Deputy Chief Nurse/ Head of Quality and Safety Maria Cann (MLCSU) CSU - Performance & Quality Dr Curtis (BFWH) – consultant paediatrician Nicola Parry (BFWH);- Associate director of nursing/head of midwifery David Kay (BFWH) - Head of Service Clifton Hospital	

10 DEFINITIONS / GLOSSARY OF TERMS	
BW	bronchial washings
HCWs	Healthcare workers
ICU	Intensive Care Unit
IV	Intravenous
IVIG	Intravenous immunoglobulin
MRSA	Methicillin Resistant *Staphylococcus aureus*
MSSA	Meticillin Susceptible *Staphylococcus aureus*
OHD	Occupational Health Department
PCR	Polymerase Chain Reaction
PPE	Person Protective Equipment
PVL	Panton-Valentine Leukocidin
SA	Staphylococcus aureus

10 DEFINITIONS / GLOSSARY OF TERMS	
SSTI	skin and soft tissue infections
SUI	Serious Untoward Incident

11 AUTHOR / DIVISIONAL / DIRECTORATE MANAGER APPROVAL			
Issued By	Dr Ruth Palmer	**Checked By**	Alastair Gibson
Job Title	Consultant Microbiologist	**Job Title**	Director of Pharmacy
Date	10th March 2017	**Date**	April 2017

APPENDIX 1: EQUALITY IMPACT ASSESSMENT FORM

Department	Organisation Wide	**Service or Policy**	Procedure	**Date Completed:**	February 2013

GROUPS TO BE CONSIDERED

Deprived communities, homeless, substance misusers, people who have a disability, learning disability, older people, children and families, young people, Lesbian Gay Bi-sexual or Transgender, minority ethnic communities, Gypsy/Roma/Travellers, women/men, parents, carers, staff, wider community, offenders.

EQUALITY PROTECTED CHARACTERISTICS TO BE CONSIDERED

Age, gender, disability, race, sexual orientation, gender identity (or reassignment), religion and belief, carers, Human Rights and social economic / deprivation.

QUESTION	**RESPONSE**		**IMPACT**	
	Issue	Action	Positive	Negative
What is the service, leaflet or policy development? What are its aims, who are the target audience?	The Procedural Document is to ensure that all members of staff have clear guidance on processes to be followed. The target audience is all staff across the Organisation who undertakes this process.	Raise awareness of the Organisations format and processes involved in relation to the procedural document.	Yes – Clear processes identified	
Does the service, leaflet or policy/ development impact on community safety • Crime • Community cohesion	Not applicable to community safety or crime	N/A	N/A	
Is there any evidence that groups who should benefit do not? i.e. equal opportunity monitoring of service users and/or staff. If none/insufficient local or national data available consider what information you need.	No	N/A	N/A	
Does the service, leaflet or development/ policy have a negative impact on any geographical or sub group of the population?	No	N/A	N/A	
How does the service, leaflet or policy/ development promote equality and diversity?	Ensures a cohesive approach across the Organisation in relation to the procedural document.	All policies and procedural documents include an EA to identify any positive or negative impacts.		
Does the service, leaflet or policy/ development explicitly include a commitment to equality and diversity and meeting needs? How does it demonstrate its impact?	The Procedure includes a completed EA which provides the opportunity to highlight any potential for a negative / adverse impact.			
Does the Organisation or service workforce reflect the local population? Do we employ people from disadvantaged groups	Our workforce is reflective of the local population.			
Will the service, leaflet or policy/ development i. Improve economic social conditions in deprived areas ii. Use brown field sites iii. Improve public spaces including creation of green spaces?	N/A			
Does the service, leaflet or policy/ development promote equity of lifelong learning?	N/A			
Does the service, leaflet or policy/ development encourage healthy lifestyles and reduce risks to health?	N/A			
Does the service, leaflet or policy/ development impact on transport? What are the implications of this?	N/A			
Does the service, leaflet or policy/development impact on housing, housing needs, homelessness, or a person's ability to remain at home?	N/A			

APPENDIX 1: EQUALITY IMPACT ASSESSMENT FORM

Are there any groups for whom this policy/ service/leaflet would have an impact? Is it an adverse/negative impact? Does it or could it (or is the perception that it could exclude disadvantaged or marginalised groups?	None identified			
Does the policy/development promote access to services and facilities for any group in particular?	No			
Does the service, leaflet or policy/development impact on the environment • During development • At implementation?	No			

ACTION:			
Please identify if you are now required to carry out a Full Equality Analysis	**~~Yes~~**	**No**	**(Please delete as appropriate)**

Name of Author: **Signature of Author:**		**Date Signed:**	**February 2013**
Name of Lead Person: **Signature of Lead Person:**		**Date Signed:**	
Name of Manager: **Signature of Manager**		**Date Signed:**	February 2013