



# Evaluating Panton Valentine Leukocidin testing practices, prevalence and geographical distribution in North West London.

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## Background

Panton Valentine Leukocidin (PVL) is a well recognised toxin produced by *Staphylococcal aureus*. Pathogenicity of the toxin is not certain but it is recognised as a marker of virulent *S. aureus* strains. PVL producing *S. aureus* has potentially fatal consequences and is of public health importance thus awareness and correct identification is paramount. PVL producing *S. aureus* strains have a notable geographic variation in prevalence, with an overall prevalence of <2% reported in the UK. With PVL genotypic diagnosis frequently only available at centralised reference laboratories, early suspicion, referral and diagnosis can change management and reduce incidence. We aimed to identify all samples referred for PVL testing from North West London Pathology (NWLP; a centralised laboratory serving multiple hospitals and primary care practices for over 2.5 million patients), evaluate the frequency of tests referred on clinician suspicion, and the geographical distribution of positive cases in North West London.

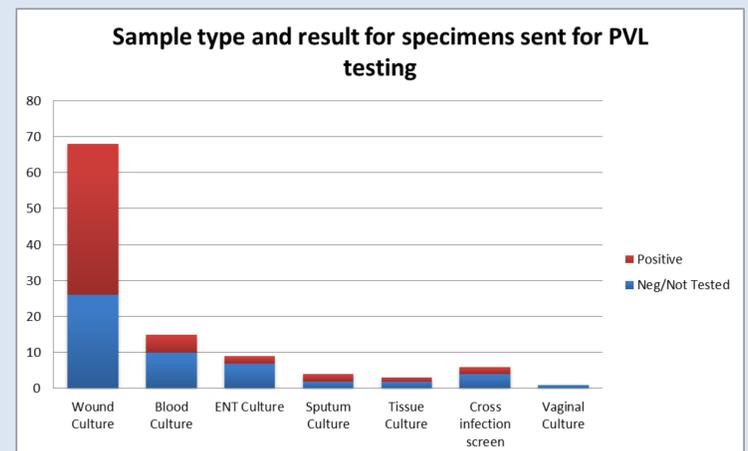
## Method

A multicentre retrospective observational study was undertaken for all NWLP region. Search terms used included 'Panton Valentine Leukocidin' and 'PVL'. Clinical and laboratory data was collected, including demographic data, sample type, parent team, evidence of active requests by community/ward clinician and outward patient postcodes, for samples referred from April 2016 to August 2017. Statistical analysis was undertaken with STAT and heat map generated with eSpatial software.

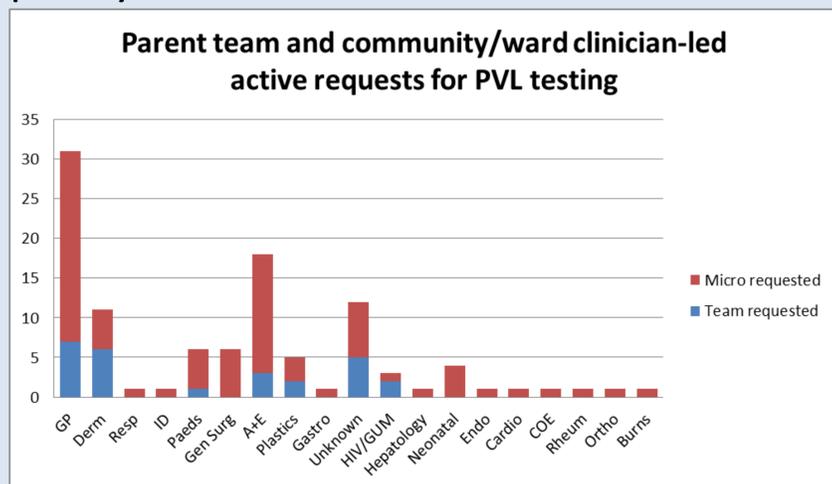
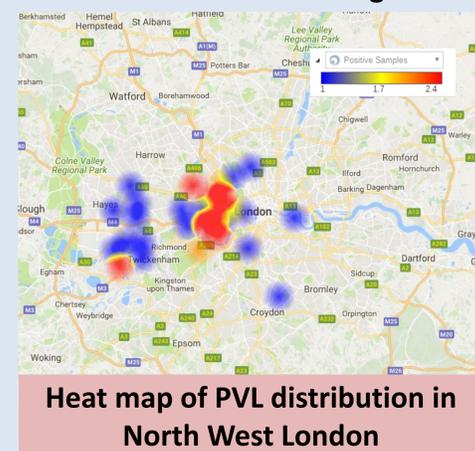
## Results

106 samples were referred for PVL testing with 48 samples sent from males and 58 from females. Mean age of patient cohort was 29 with a median of 28 (Range=89, IQR=36). 102/106 samples were tested, of which 48 were negative and 54 positive. No significant seasonal variation was observed. The highest frequency of samples referred were under community care (n=31) and Accident and Emergency (n=18). It was observed that Community/ward clinicians actively requested testing on 26/106 samples. 11/26 (42%) samples requested for testing by Community/ward clinicians were positive compared to 43/80 (53%) referred later (p=0.31). Dermatology and HIV teams most frequently actively requested sample referral, 6/11 and 2/3 respectively.

actively requested by ward clinicians and only 1 of these 4 samples was positive



Heat mapping outward sections of post-codes from patients with a positive PVL result revealed 2 distinct areas of clustering in the NWLP catchment.



Wound cultures (n=68) were the most common sample type referred and had the greatest proportion of positives (42/68). 5/15 blood culture and 4/13 respiratory samples were positive, suggestive of life-threatening invasive disease. Testing for 4/28 blood and respiratory samples was

## References

1. Shallcross LJ et al. The role of the Panton-Valentine leucocidin toxin in *staphylococcal disease*: a systematic review and meta-analysis. *Lancet Infect Dis.* 2013 Jan; 13(1): 43–54.
2. Holmes A et al. *Staphylococcus aureus* isolates carrying Panton-Valentine leucocidin genes in England and Wales: frequency, characterization, and association with clinical disease. *J Clin Microbiol* 2005; 43: 2384-90.
3. PVL sub-group of the Steering Group on Healthcare Associated Infection. Guidance on the diagnosis and management of PVL-associated *Staphylococcus aureus* infections (PVL-SA) in England

## Conclusions

- A high proportion of positive results from samples referred for PVL toxin detection suggests it is a clinical issue with under-testing at NWLP hospitals. The laboratory SOP will be updated to assist in PVL referral for future samples
- A high ratio of positives from blood and respiratory samples supports the need to raise awareness for PVL in the setting of invasive *Staphylococcal aureus*.
- There is heterogeneity amongst specialties in testing for PVL in North West London. Targeting ward/community clinicians for education on possible cases would be beneficial.
- Identifying two regions of PVL *Staphylococcus aureus* clustering will inform prevention strategies in the NWLP catchment.