

# Effectiveness of antibiotics for Panton-Valentine leukocidin-positive *Staphylococcus aureus* (PVL-SA) associated pneumonia

A rapid systematic review

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### Main messages

- 1. This rapid systematic review (search up to 13 September 2024) aimed to identify and summarise evidence relating to the effectiveness of antibiotics to treat Panton-Valentine leukocidin-positive *Staphylococcus aureus* (PVL-SA) associated pneumonia.
- 2. In total, 1,947 records from 5 databases were screened. No studies were identified for inclusion in this review.
- 3. In summary, no published randomised controlled trials, non-randomised control trials or observational studies (case control or cohort studies) were identified looking at the effectiveness of antibiotics in treating PVL-SA associated pneumonia.

## Purpose

The purpose of this rapid systematic review was to identify and summarise the available evidence that discussed the effectiveness of antibiotics to treat Panton-Valentine leukocidin-positive *Staphylococcus aureus* (PVL-SA) associated pneumonia.

The review question was:

1. What is the effectiveness of antibiotics in treating people with Panton-Valentine leukocidin *Staphylococcus aureus* (PVL-SA) associated pneumonia?

### **Methods**

A rapid systematic review was conducted, following streamlined systematic methods to accelerate the review process (<u>1</u>). A protocol was produced before the literature search was conducted, including the review question, the eligibility criteria, and all other methods. Full details of the methodology are provided in the protocol in <u>Annexe A</u>. There were no deviations from the protocol.

A literature search was undertaken to look for relevant interventional studies (randomised controlled trials, non-randomised controlled trials and cross over studies) and observational studies (case control and cohort studies) published up to 13 September 2024. The reference list of one systematic review identified during screening was also checked for any additional relevant primary studies.

The population of interest was adults or children with laboratory confirmed PVL-SA pneumonia through a polymerase chain reaction (PCR) test, in inpatient settings. For this review, treatment could consist of any antibiotic or a combination of antibiotics, or antibiotic with immunoglobulin

(an antibody used by the immune system to recognise bacteria and viruses) used as treatment for PVL-SA pneumonia through any route of administration. This was compared to other antibiotics, treatments such as supportive care, or placebo. Primary outcomes of interest were mortality, morbidity and intensive care or high dependency unit admission. Adverse events, serious adverse events, or withdrawal due to adverse events ascribed to taking antibiotics were secondary outcomes that would have only been extracted from studies that had at least one of the primary outcomes.

Screening on title and abstract was undertaken in duplicate by 2 reviewers for 20% of the eligible studies, with the remainder completed by one reviewer. Screening on full text was undertaken by one reviewer and checked by a second.

#### Evidence

In total, 1947 studies were screened at title and abstract and 53 studies were screened at full text. Of these, no studies met the inclusion criteria. A PRISMA diagram showing the flow of studies through the review is shown in <u>Annexe B</u>, and studies excluded at full text screening are available in <u>Annexe C</u> with the reasons why they were excluded. The main reasons for excluding records at full text were being in the wrong population (n=24), wrong study type (n=11), or no comparator (n=8).

### **Health inequalities**

Groups more likely to experience health inequalities, such as those with existing health conditions, children or young people were explicitly defined within the inclusion criteria in the review protocol. However, no studies were identified for inclusion in this review and therefore health inequalities could not be assessed.

## Limitations

This rapid systematic review used streamlined systematic methods to accelerate the review process. Sources of evidence searched included databases of peer-reviewed and preprint research, but an extensive search of other sources was not conducted and most article screening was completed without duplication, so it is possible relevant evidence may have been missed.

## **Evidence gaps**

No studies were identified for inclusion in this review highlighting a clear evidence gap relating to the effectiveness of antibiotics to treat PVL-SA pneumonia.

# Conclusion

The aim of this review was to identify and assess available evidence that evaluated the effectiveness of antibiotics in treating people with PVL-SA pneumonia. However, no relevant evidence (from interventional, case control or cohort studies) was identified and therefore this review is unable to inform on the effectiveness of antibiotics in treating this population.

## Acknowledgments

We would like to thank colleagues within the All Hazards Public Health Response division who either reviewed or input into aspects of the review.

# Disclaimer

UKHSA's rapid systematic reviews and evidence summaries aim to provide the best available evidence to decision makers in a timely and accessible way, based on published peer-reviewed scientific papers, and papers on preprint servers. Please note that the reviews:

- use accelerated methods and may not be representative of the whole body of evidence publicly available
- have undergone an internal independent peer review but not an external peer review
- are only valid as of the date stated on the review

In the event that this review is shared externally, please note additionally, to the greatest extent possible under any applicable law, that UKHSA accepts no liability for any claim, loss or damage arising out of, or connected with the use of, this review by the recipient or any third party including that arising or resulting from any reliance placed on, or any conclusions drawn from, the review.

## References

- 1. Tricco AC and others. '<u>Rapid reviews to strengthen health policy and systems: a practical guide</u>' 2017
- 2. Aromataris E and others. 'JBI Manual for Evidence Synthesis. JBI' 2024
- 3. Group TGW. '<u>GRADE handbook for grading quality of evidence and strength of</u> recommendations. Updated October 2013' 2013

# **Annexe A. Protocol**

#### **Review question**

The review question is:

1. What is the effectiveness of antibiotics in treating people with Panton-Valentine leukocidin *Staphylococcus aureus* (PVL-SA) associated pneumonia?

A search for primary evidence to answer this review question will be conducted up to 13<sup>th</sup> September.

#### Eligibility criteria

#### Table A.1 Inclusion and exclusion criteria

	Included	Excluded
Population	Adults and children with laboratory confirmed PVL-SA pneumonia (through polymerase chain reaction test)	Animals
Context	Any context	
Settings	Hospital inpatient settings only	Laboratory settings
Intervention or exposure	Any antibiotic or combination of antibiotics, or antibiotic with immunoglobulin taken as treatment for PVL-SA pneumonia	Any form of treatment that does not include an antibiotic (such as monotherapy immunoglobulin)
Comparator	Comparison to other antibiotics or treatments such as supportive care, or placebo	
Outcomes	<ul> <li>Primary outcomes:</li> <li>mortality (as reported by the study)</li> <li>morbidity, as measured by the following (and directly linked to having the infection):</li> <li>intensive care or high dependency unit admission</li> </ul>	

Included	Excluded
<ul> <li>need for intubation and ventilation</li> <li>need for vasopressors</li> <li>clinical support with oxygen</li> <li>end organ dysfunction</li> <li>need for renal replacement therapy (to include dialysis and renal transplant)</li> </ul>	
<ul> <li>evidence of acute liver failure</li> <li>diagnosis of disseminated intravascular coagulation (DIC)</li> </ul>	
<ul> <li>Secondary outcomes (these will be extracted only from studies that have at least one of the primary outcomes):</li> <li>prevalence, incidence, risk (relative or absolute), or count data (individual or total) of any adverse event or serious adverse event or withdrawal due to adverse events ascribed to taking antibiotics for treatment of PVL-SA pneumonia even if not stated as outcome of interest of the study</li> </ul>	
Types of outcome as defined by the European Medicines Agency for adverse events (any unfavourable and unintended sign (including an abnormal laboratory finding, for example), symptom, or disease temporally associated with the use of a medicinal product, whether or not considered related to the medicinal product)	
Or:	
Serious adverse events (an adverse reaction that results in death, is life-	

	Included	Excluded
	prolongation of existing hospitalisation, results in persistent or significant disability or incapacity or is a birth defect) Or:	
	As described by the review	
Language	English	Non-English language studies
Date of publication	Up to 13 September 2024	
Study design	Interventional studies (Randomised Controlled Trials, Non-randomised controlled trials, cross over studies). Observational studies including case- control and cohort studies will only be included if there is no sufficient evidence presented in RCTs. Observational studies will still be included in the title and abstract stage of the review.	<ul> <li>systematic or narrative reviews</li> <li>modelling studies</li> <li>laboratory studies</li> <li>case reports</li> <li>case series</li> <li>cross sectional studies</li> <li>qualitative research</li> <li>single arm trials</li> </ul>
Publication type	Peer-reviewed published research	<ul> <li>conference abstracts</li> <li>editorials</li> <li>letters</li> <li>news articles</li> <li>grey literature</li> <li>preprints</li> <li>books</li> </ul>

#### Identification of studies

The following databases and trial registries will be searched for studies published up to 13 September 2024: Medline, Embase, Scopus, CINAHL and Cochrane Central Register of Randomised Controlled Trials. The search strategy is presented <u>below</u>.

Details of references that are included following full text screening will be used for backwards and forwards citation searching. Citation searching will be carried out using the Lens.org database via <u>CitationChaser</u>.

#### Screening

Title and abstract screening will be undertaken in duplicate by 2 reviewers for at least 20% of the eligible studies, with the remainder completed by one reviewer. Disagreement will be resolved by discussion or with involvement of a third reviewer where necessary.

Screening on full text will be undertaken by one reviewer and checked by a second.

Results of citation searching will be screened by one reviewer.

#### Data extraction

Summary information for each study will be extracted and reported in tabular form. Information to be extracted will include country, study period, study design, intervention, participants, results, and any relevant contextual data (including choice of antibiotic/regime according to any antibiotic resistance identified). This will be undertaken by one reviewer and checked by a second.

#### Risk of bias assessment

We will perform risk of bias assessment at the primary study level using the relevant JBI checklist (2). Risk of bias will be assessed by 2 reviewers independently with disagreements resolved through discussion or with a third reviewer.

#### Quality of evidence

The quality of evidence identified within this review will be assessed using a modified version of the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) framework (3). Quality of evidence will be assessed at the outcome level, and be rated as one of 4 levels:

- very low (the true effect is probably different from the estimated effect)
- low (the true effect might be different from the estimated effect)
- moderate (the true effect is probably close to the estimated effect)
- high (the authors are confident that the true effect is similar to the estimated effect)

The quality of evidence will be assessed for each outcome across 4 domains:

1. Risk of bias: where results may not represent the true effect because of limitations in the design or conduct of the study. This will be measures as described under <u>Risk of bias</u> <u>assessment.</u>

- 2. Inconsistency: where studies show different effects for the same outcome of interest. This will be assessed where there are 2 or more studies measuring the same outcome. Inconsistency will be rated down if the point estimates are not similar, or the confidence intervals do not overlap. If there is only one study for the outcome of interest, then inconsistency will not be assessed. Inconsistency will be assessed by one reviewer and checked by a second.
- 3. Indirectness: where elements of the study differ from the intended elements in the review question (for example, the outcome of interest has not been directly measured). This will be rated down if the population, intervention, comparator, or outcome of interest have not been directly measured. Indirectness will be assessed by one reviewer and checked by a second.
- 4. Imprecision: a measure of how uncertain the estimate is. Imprecision will be rated down if the confidence intervals cross the line of no effect, or if the reviewer judges that the confidence intervals are overly wide and so the true effect is likely to be different at the upper versus the lower end of the confidence interval. Imprecision will be assessed by one reviewer and checked by a second.

Because the JBI checklist will be used to assess risk of bias, evidence from randomised controlled trials will start at high quality, and evidence from observational studies will start at low quality. Evidence may be downgraded one or 2 levels following the assessment of quality, or upgraded if there is a large magnitude of effect or clear dose-response gradient.

## Synthesis

Where studies are similar enough to combine and present data in a consistent format, a narrative synthesis will be produced to interpret the findings. The number of studies, the number of participants in each study, effect size and variance and a summary of the risk of bias across studies reporting each outcome will be summarised and presented. Alternatively, if studies present methodological differences that would make synthesis inappropriate, a narrative summary of each study will be provided.

### Health inequalities

Variations across individuals with health inequalities will be considered, as these may produce different outcomes following treatment with antibiotics for PVL-SA associated pneumonia (such as those with existing health conditions, or children or young people).

#### Search strategy

#### Ovid MEDLINE(R) ALL <1946 to September 13, 2024>

- 1. Leukocidins/ (1746)
- 2. leukocidin\*.tw,kf. (2230)
- 3. leucocidin\*.tw,kf. (558)
- 4. leukotoxin\*.tw,kf. (995)
- 5. leucotoxin\*.tw,kf. (53)
- 6. Panton Valentine.tw,kf. (2318)
- 7. PVL.tw,kf. (5099)
- 8. (LukS\* or Luk S\*).tw,kf. (460)
- 9. (LukF\* or Luk F\*).tw,kf. (351)
- 10. (Luk pv\* or LukPV\*).tw,kf. (76)
- 11. (LukSF\* or Luk SF\*).tw,kf. (54)
- Bacterial Toxins/ and (exp Staphylococcal Infections/ or exp Staphylococcus aureus/) (3579)
- 13. (bacteri\* toxin\* and (staph\* or S\* aureus)).tw,kf. (367)
- 14. or/1-13 (10052)
- 15. Pneumonia/ (56181)
- 16. Pneumonia, Staphylococcal/ (2089)
- 17. Pneumonia, Necrotizing/ (130)
- 18. pneumoni\*.tw,kf. (242597)
- 19. ((lung or lungs or pulmonary) adj2 infection\*).tw,kf. (24552)
- 20. ((lung or lungs or pulmonary) adj2 inflam\*).tw,kf. (24015)
- 21. exp Lung/ and Necrosis/ (1375)
- 22. ((pulmonary or lung\*) adj3 necro\*).tw,kf. (2307)
- 23. ((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) adj3 h?emorrhag\*).tw,kf. (6209)
- 24. ((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) adj3 bleed\*).tw,kf. (1694)
- 25. ((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) adj3 blood).tw,kf. (22548)
- 26. (multi lobar infiltrat\* or multilobar infiltrat\*).tw,kf. (76)
- 27. Respiratory Distress Syndrome/ (25950)
- 28. exp Respiratory Insufficiency/ (70159)
- 29. (respiratory adj (collapse\* or distress or insufficiency or failure)).tw,kf. (105804)
- 30. (lung\* adj (collapse\* or distress or insufficiency or failure)).tw,kf. (1827)
- 31. (pulmonary adj (collapse\* or distress or insufficiency or failure)).tw,kf. (2842)
- 32. Influenza, Human/ (60166)
- 33. influenza\*.tw,kf. (142388)
- 34. Hemoptysis/ (6824)
- 35. h?emoptysis.tw,kf. (13213)
- 36. Leukopenia/ or Neutropenia/ (27458)
- 37. leukopeni\*.tw,kf. (14900)
- 38. neutropeni\*.tw,kf. (49139)

- 39. Oxygen Saturation/ (994)
- 40. Oxygen/ and exp Blood/ (9945)
- 41. oxygen saturation.tw,kf. (35590)
- 42. (blood adj (oxygen or o2)).tw,kf. (10159)
- 43. SPo2.tw,kf. (8925)
- 44. or/15-43 (724551)
- 45. 14 and 44 (981)

#### Embase (1974 to 13 September 2024)

- 1. leukocidin/ (1005)
- 2. leukotoxin/ (985)
- 3. Panton Valentine leukocidin/ (2748)
- 4. leukocidin\*.tw,kf. (2738)
- 5. leucocidin\*.tw,kf. (643)
- 6. Panton Valentine.tw,kf. (2891)
- 7. leukotoxin\*.tw,kf. (1076)
- 8. leucotoxin\*.tw,kf. (65)
- 9. PVL.tw,kf. (7799)
- 10. (LukS\* or luk S\*).tw,kf. (618)
- 11. (LukSF\* or Luk SF\*).tw,kf. (66)
- 12. (LukF\* or Luk F\*).tw,kf. (441)
- 13. (Luk pv\* or LukPV\*).tw,kf. (89)
- 14. (exp Staphylococcus aureus/ or exp Staphylococcus infection/) and bacterial toxin/(1537)
- 15. (bacteri\* toxin\* and (staph\* or S\* aureus)).tw,kf. (448)
- 16. or/1-15 (12712)
- 17. exp pneumonia/ (421763)
- 18. exp staphylococcal pneumonia/ (1175)
- 19. necrotizing pneumonia/ (1233)
- 20. pneumoni\*.tw,kf. (349680)
- 21. ((lung or lungs or pulmonary) adj2 infection\*).tw,kf. (38035)
- 22. ((lung or lungs or pulmonary) adj2 inflam\*).tw,kf. (34903)
- 23. exp lung/ and exp necrosis/ (9757)
- 24. ((pulmonary or lung\*) adj3 necro\*).tw,kf. (3431)
- 25. ((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) adj3 h?emorrhag\*).tw,kf. (10524)
- 26. ((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) adj3 bleed\*).tw,kf. (3045)
- 27. ((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) adj3 blood).tw,kf. (30167)
- 28. (multi lobar infiltrat\* or multilobar infiltrat\*).tw,kf. (133)
- 29. exp respiratory distress/ (150916)
- 30. exp respiratory failure/ (140623)
- 31. (respiratory adj (collapse\* or distress or insufficiency or failure)).tw,kf. (165168)
- 32. (lung\* adj (collapse\* or distress or insufficiency or failure)).tw,kf. (2747)
- 33. (pulmonary adj (collapse\* or distress or insufficiency or failure)).tw,kf. (3751)
- 34. exp influenza/ (114285)

- 35. influenza\*.tw,kf. (162565)
- 36. exp hemoptysis/ (34342)
- 37. H?emoptysis.tw,kf. (23138)
- 38. exp leukopenia/ or exp neutropenia/ (263641)
- 39. leukopeni\*.tw,kf. (23095)
- 40. neutropeni\*.tw,kf. (94175)
- 41. oxygen saturation/ (91548)
- 42. arterial oxygen saturation/ (13032)
- 43. oxygen/ and exp blood/ (25884)
- 44. oxygen saturation.tw,kf. (54244)
- 45. (blood adj (oxygen or o2)).tw,kf. (12991)
- 46. SPo2.tw,kf. (18684)
- 47. or/17-46 (1416486)
- 48. 16 and 47 (1681)
- 49. limit 48 to conference abstract (319)
- 50. 48 not 49 (1362)

#### **CINAHL** Complete

#	Query	Results
S1	leukocidin*	(289)
S2	leucocidin*	(80)
S3	leukotoxin*	(38)
S4	leucotoxin*	(2)
S5	"Panton Valentine"	(348)
S6	PVL	(755)
S7	LukS* OR Luk S*	(79)
S8	LukF* OR luk F*	(70)
S9	"Luk pv*" OR Lukpv*	(4)
S10	(MH "Bacterial Toxins")	(1,586)
S11	(MH "Staphylococcus Aureus+")	(12,572)
S12	S10 AND S11	(269)
S13	"luk SF*" OR LukSF* OR ("bacteri* toxin*" AND (staph* OR "S* aureus"))	(327)
S14	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S12 OR S13	(1,173)
S15	(MH "Pneumonia+")	(34,618)
S16	(MH "Pneumonia, Necrotizing")	(21)
S17	pneumoni*	(61,053)

#	Query	Results
S18	((lung or lungs or pulmonary) N2 infection*)	(3,996)
S19	((lung or lungs or pulmonary) N2 inflam*)	(3,564)
S20	(MH "Lung+")	(27,479)
S21	(MH "Necrosis")	(6,535)
S22	S20 AND S21	(117)
S23	((pulmonary or lung*) N3 necro*)	(376)
S24	((Alveolar* or airway* or respiratory* or lung* or bronch*) N3 (haemorrhag* OR hemorrhag*))	(1,515)
S25	((Alveolar* or airway* or respiratory* or lung* or bronch*) N3 bleed*)	(401)
S26	((Alveolar* or airway* or respiratory* or lung* or bronch*) N3 blood)	(7,751)
S27	("multi lobar infiltrat*" or "multilobar infiltrat*")	(8)
S28	(MH "Respiratory Distress Syndrome, Acute")	(8,809)
S29	(MH "Respiratory Failure+")	(17,493)
S30	((lung* OR pulmonary OR respiratory) N1 (collapse* distress or insufficiency or failure))	(17,647)
S31	(MH "Influenza, Human+") OR (MH "Influenza+")	(21,540)
S32	influenza*	(35,580)
S33	(MH "Hemoptysis")	(1,565)
S34	hemoptysis OR haemoptysis	(3,109)
S35	(MH "Leukopenia+")	(6,980)
S36	(MH "Neutropenia+")	(5,204)
S37	leukopeni*	(2,245)
S38	neutropeni*	(11,630)
S39	(MH "Oxygen Saturation")	(5,867)
S40	(MH "Oxygen+")	(14,045)
S41	(MH "Blood+")	(81,416)
S42	S40 AND S41	(416)
S43	"oxygen saturation"	(12,325)
S44	(blood N1 (oxygen or o2))	(7,176)
S45	SPo2	(2,258)
S46	S15 OR S16 OR S17 OR S18 OR S19 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S42 OR S43 OR S44 OR S45	(167,396)

#	Query	Results
S47	S14 AND S46	

#### Scopus

Date of search: 16 September 2024

TITLE-ABS-KEY(leukocidin\*) OR TITLE-ABS-KEY(leucocidin\*) OR TITLE-ABS-KEY(leukotoxin\*) OR TITLE-ABS-KEY(leucotoxin\*) OR TITLE-ABS-KEY("Panton Valentine") OR TITLE-ABS-KEY(PVL) OR TITLE-ABS-KEY(LukS\* OR "Luk S\*") OR TITLE-ABS-KEY(LukF\* OR "Luk F\*") OR TITLE-ABS-KEY("Luk pv\*" OR lukPV\*) OR TITLE-ABS-KEY("Luk SF\*" OR lukSF\*) OR TITLE-ABS-KEY("bacteri\* toxin\*" and (staph\* or "S\* aureus"))

And:

TITLE-ABS-KEY(pneumoni\*) OR TITLE-ABS-KEY(((lung or lungs or pulmonary) W/1 inflam\*)) OR TITLE-ABS-KEY(((pulmonary or lung\*) W/2 necro\*)) OR TITLE-ABS-KEY(((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) W/2 h\*emorrhag\*)) OR TITLE-ABS-KEY(((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) W/2 bleed\*)) OR TITLE-ABS-KEY(((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) W/2 bleed\*)) OR TITLE-ABS-KEY(((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) W/2 bleed\*)) OR TITLE-ABS-KEY(((Alveolar\* or airway\* or respiratory\* or lung\* or bronch\*) W/2 bleed\*)) OR TITLE-ABS-KEY(("multi lobar infiltrat\*" or "multilobar infiltrat\*")) OR TITLE-ABS-KEY(influenza\*) OR TITLE-ABS-KEY(h\*emoptysis) OR TITLE-ABS-KEY(leukopeni\*) OR TITLE-ABS-KEY(neutropeni\*) OR TITLE-ABS-KEY(respiratory W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(pulmonary W/1 (collapse\* or distress or insufficiency or failure)) OR TITLE-ABS-KEY(blood W/1 (oxygen or o2)) OR TITLE-ABS-KEY(SPO2)

1,719 results

#### Cochrane CENTRAL

Date of search:16 September 2024

ID	Search	Hits
#1	MeSH descriptor: [Leukocidins] explode all trees	9
#2	leukocidin*	20
#3	leucocidin*	5
#4	leukotoxin*	2
#5	leucotoxin*	0
#6	"Panton Valentine"	20

ID	Search	Hits
#7	PVL	474
#8	(LukS* or Luk NEXT S*)	188
#9	(LukF* or Luk NEXT F*)	7
#10	(Luk NEXT pv* or LukPV*)	0
#11	(LukSF* or Luk NEXT SF*)	1
#12	MeSH descriptor: [Bacterial Toxins] this term only	144
#13	MeSH descriptor: [Staphylococcal Infections] explode all trees	1551
#14	MeSH descriptor: [Staphylococcus aureus] explode all trees	1186
#15	#13 OR #14	2036
#16	#12 AND #15	14
#17	(bacteri* toxin* AND (staph* OR S* aureus))	98
#18	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #16	684
#19	MeSH descriptor: [Pneumonia] this term only	3044
#20	MeSH descriptor: [Pneumonia, Staphylococcal] this term only	45
#21	MeSH descriptor: [Pneumonia, Necrotizing] this term only	1
#22	pneumoni*	26401
#23	((lung or lungs or pulmonary) NEAR/2 infection*)	3111
#24	((lung or lungs or pulmonary) NEAR/2 inflam*)	1846
#25	MeSH descriptor: [Lung] explode all trees	6496
#26	MeSH descriptor: [Necrosis] this term only	702
#27	#25 AND #26	4
#28	((pulmonary or lung*) NEAR/3 necro*)	196
#29	((Alveolar* or airway* or respiratory* or lung* or bronch*) NEAR/3 (hemorrhag* OR haemorrhag*))	916
#30	((Alveolar* or airway* or respiratory* or lung* or bronch*) NEAR/3 bleed*)	479
#31	((Alveolar* or airway* or respiratory* or lung* or bronch*) NEAR/3 blood)	6467
#32	(multi lobar infiltrat* or multilobar infiltrat*)	28
#33	MeSH descriptor: [Respiratory Distress Syndrome] this term only	2117
#34	MeSH descriptor: [Respiratory Insufficiency] explode all trees	3997
#35	(respiratory NEXT (collapse* or distress or insufficiency or failure))	16757
#36	(lung* NEXT (collapse* or distress or insufficiency or failure))	494
#37	(pulmonary NEXT (collapse* or distress or insufficiency or failure))	208

ID	Search	Hits
#38	MeSH descriptor: [Influenza, Human] this term only	3620
#39	influenza*	11661
#40	MeSH descriptor: [Hemoptysis] this term only	47
#41	hemoptysis OR haemoptysis	950
#42	MeSH descriptor: [Leukopenia] this term only	642
#43	MeSH descriptor: [Neutropenia] this term only	2119
#44	leukopeni*	6125
#45	neutropeni*	16693
#46	MeSH descriptor: [Oxygen Saturation] explode all trees	129
#47	MeSH descriptor: [Oxygen] explode all trees	7647
#48	MeSH descriptor: [Blood] explode all trees	21338
#49	#47 AND #48	240
#50	oxygen saturation	19604
#51	(blood NEXT (oxygen or o2))	2762
#52	SPo2	7671
#53	#19 OR #20 OR #21 OR #22 OR #23 OR #24	29907
#54	#28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46	56897
#55	#49 OR #50 OR #51 OR #52	24877
#56	#27 OR #53 OR #54 OR #55	99114
#57	#18 AND #56	206

### **Annexe B. Study selection flowchart**

#### Figure B.1. PRISMA diagram



#### Text version of Figure B.1. PRISMA diagram

A PRISMA diagram showing the flow of studies through this review, ultimately including 0 studies.

From identification of studies via databases and registers, n=4,301 records identified from databases:

- Ovid Medline (n= 981)
- Ovid Embase (n= 1,362)
- CINAHL (n = 136)
- Scopus (n = 1,719)
- CENTRAL (n = 103)

From these, records removed before screening:

• duplicate records removed using Deduklick (n =2,354)

n=1,947 records screened, of which n=1,894 were excluded, leaving n=53 papers sought for retrieval, of which n=0 were not retrieved.

No studies were identified from identification of studies via other methods.

Of the n=53 papers assessed for eligibility, n=53 reports were excluded:

- no comparator (n = 8)
- wrong intervention (n= 5)
- wrong population (n= 24)
- wrong publication type (n = 5)
- wrong study type (n = 11)

n=0 papers included in the review.

## **Annexe C. Excluded full texts**

#### No comparator (8 studies)

Carrillo-Marquez and others. '<u>Staphylococcus aureus pneumonia in children in the era of</u> <u>community-acquired methicillin-resistance at Texas Children's Hospital</u>' Pediatric Infectious Disease Journal 2011: volume 30, issue 7, pages 545 to 550

Imauven and others. '<u>Paediatric and adult patients from New Caledonia Island admitted to the</u> <u>ICU for community-acquired Panton-Valentine leucocidin-producing *Staphylococcus aureus* <u>infections</u>' Scientific Reports 2022: volume 12, issue 1, article number 11,024</u>

Khanafer and others. '<u>Severe leukopenia in *Staphylococcus aureus*-necrotizing, communityacquired pneumonia: risk factors and impact on survival</u>' BMC Infectious Diseases 2013: volume 13, article number 359

Lopez-Aguilar and others. '<u>Association between the presence of the Panton-Valentine</u> <u>leukocidin-encoding gene and a lower rate of survival among hospitalized pulmonary patients</u> <u>with staphylococcal disease</u>' Journal of Clinical Microbiology 2007: volume 45, issue 1, pages 274 to 276

Rajova and others. '<u>Necrotizing pneumonia due to clonally diverse *Staphylococcus aureus* strains producing Panton-Valentine leukocidin: the Czech experience' Epidemiology and Infection 2016: volume 144, issue 3, pages 507 to 515</u>

Sicot and others. '<u>Methicillin resistance is not a predictor of severity in community-acquired</u> <u>Staphylococcus aureus necrotizing pneumonia: results of a prospective observational study</u>' Clinical Microbiology and Infection 2013: volume 19, issue 3, pages E142 to E148

Tadros and others. 'Epidemiology and outcome of pneumonia caused by methicillin-resistant <u>Staphylococcus aureus (MRSA) in Canadian hospitals</u>' PLoS ONE [Electronic Resource] 2013: volume 8, issue 9, article e75171

Zhong and others. '<u>Molecular epidemiology of community-acquired methicillin-resistant</u> <u>Staphylococcus aureus and clinical characteristics of different sites of infection</u>' Infection and Drug Resistance 2023: volume 16, pages 1,485 to 1,497

#### Wrong intervention (5 studies)

Ahoyo and others. 'Epidemiology and prevention of nosocomial pneumonia associated with Panton-Valentine leukocidin (PVL) producing *Staphylococcus aureus* in Departmental Hospital Centre of Zou Collines in Benin' Ghana Medical Journal 2012: volume 46, issue 4, pages 234 to 240

Gillet and others. '<u>Association between Staphylococcus aureus strains carrying gene for</u> <u>Panton-Valentine leukocidin and highly lethal necrotising pneumonia in young</u> <u>immunocompetent patients</u>' Lancet 2002: volume 359, issue 9,308, pages 753 to 759

Rasigade and others. '<u>A history of Panton-Valentine leukocidin (PVL)-associated infection</u> protects against death in PVL-associated pneumonia' Vaccine 2011: volume 29, issue 25, pages 4,185 to 4,186

Song and others. '<u>Antimicrobial resistance and molecular characterization of *Staphylococcus aureus* causing childhood pneumonia in Shanghai' Frontiers in Microbiology 2017: volume 8, page 455</u>

Zhang and others. '<u>Presence of the Panton-Valentine leukocidin genes in methicillin-resistant</u> <u>Staphylococcus aureus is associated with severity and clinical outcome of hospital-acquired</u> <u>pneumonia in a single center study in China</u>' PLoS ONE [Electronic Resource] 2016: volume 11, issue 6, article e0156704

## Wrong population (24 studies)

Bybeck Nielsen and others. '<u>Clinical manifestations in children with staphylococcal bacteremia</u> positive for Panton-Valentine leucocidin: a nationwide survey in a low methicillin-resistance setting' Pediatric Infectious Disease Journal 2020: volume 39, issue 9, pages e274 to e276

Campo and others. '<u>Panton-Valentine leukocidin exotoxin has no effect on the outcome of</u> <u>cancer patients with methicillin-resistant *Staphylococcus aureus* (MRSA) infections</u>' Medicine 2011: volume 90, issue 5, pages 312 to 318

Doudoulakakis and others. '<u>Community-associated Staphylococcus aureus pneumonia among</u> <u>Greek children: epidemiology, molecular characteristics, treatment, and outcome</u>' European Journal of Clinical Microbiology and Infectious Diseases 2016: volume 35, issue 7, pages 1,177 to 1,185

Elabbadi and others. '<u>Lower respiratory tract infection with *Staphylococcus aureus* in sickle-cell adult patients with severe acute chest syndrome: the STAPHACS study</u>' Haematologica 2021: volume 106, pages 3,236 to 3,239

Ellington and others. '<u>Clinical and molecular epidemiology of ciprofloxacin-susceptible MRSA</u> <u>encoding PVL in England and Wales</u>' European Journal of Clinical Microbiology and Infectious Diseases 2009: volume 28, issue 9, pages 1,113 to 1,121 Haysom and others. '<u>Methicillin-resistant *Staphylococcus aureus* skin and soft tissue infections</u> <u>in young people in custody in New South Wales</u>' Journal of Paediatrics and Child Health 2019: volume 55, issue 2, pages 224 to 228

Heltshe and others. '<u>Outcomes and treatment of chronic methicillin-resistant *Staphylococcus aureus* differs by staphylococcal cassette chromosome mec (SCCmec) type in children with cystic fibrosis' Journal of the Pediatric Infectious Diseases Society 2015: volume 4, pages 225 to 231</u>

Joo and others. '<u>Community-associated Panton-Valentine leukocidin-negative meticillin-</u> resistant <u>Staphylococcus aureus clone (ST72-MRSA-IV) causing healthcare-associated</u> pneumonia and surgical site infection in Korea' Journal of Hospital Infection 2012: volume 81, issue 3, pages 149 to 155

Laterre and others. 'CAL02, a novel antitoxin liposomal agent, in severe pneumococcal pneumonia: a first-in-human, double-blind, placebo-controlled, randomised trial' The Lancet Infectious Diseases 2019: volume 19, issue 6, pages 620 to 630

Lemaitre and others. '<u>Necrotizing pneumonia in children: report of 41 cases between 2006 and</u> <u>2011 in a French tertiary care center</u>' Pediatric Infectious Disease Journal 2013: volume 32, issue 10, pages 1,146 to 1,149

Linde and others. '<u>Healthcare-associated outbreaks and community-acquired infections due to</u> <u>MRSA carrying the Panton-Valentine leucocidin gene in south-eastern Germany</u>' European Journal of Clinical Microbiology and Infectious Diseases 2005: volume 24, issue 6, pages 419 to 422

McDanel and others. '<u>Association between microbial characteristics and poor outcomes among</u> patients with methicillin-resistant *Staphylococcus aureus* pneumonia: a retrospective cohort <u>study</u>' Antimicrobial Resistance and Infection Control 2015: volume 4, article number 51

Mendes and others. '<u>Genotypic characterization of methicillin-resistant *Staphylococcus aureus* recovered at baseline from Phase 3 pneumonia clinical trials for ceftobiprole</u>' Microbial Drug Resistance-Mechanisms Epidemiology and Disease 2016: volume 22, issue 1, pages 53 to 58

Muttaiyah and others. '<u>Incidence, risk factors, and outcomes of Panton-Valentine leukocidin-positive methicillin-susceptible *staphylococcus aureus* infections in Auckland, New Zealand' Journal of Clinical Microbiology 2010: volume 48, pages 3,470 to 3,474</u>

Pasquale and others. '<u>Emergence of methicillin-resistant *Staphylococcus aureus* USA300 genotype as a major cause of late-onset nosocomial pneumonia in intensive care patients in the USA' International Journal of Infectious Diseases 2013: volume 17, issue 6, e398 to 403</u>

Peetermans and others. '<u>Use of intravenous immunoglobulins in patients with suspected toxin-</u> mediated shock requiring extracorporeal membrane oxygenation' Shock 2020: volume 54, issue 2, pages 209 to 212

Peyrani and others. '<u>Severity of disease and clinical outcomes in patients with hospital-acquired</u> pneumonia due to methicillin-resistant *Staphylococcus aureus* strains not influenced by the presence of the Panton-Valentine leukocidin gene' Clinical Infectious Diseases 2011: volume 53, issue 8, pages 766 to 771

Qiao and others. '<u>Hospital- and community-associated methicillin-resistant *Staphylococcus* <u>aureus: a 6-year surveillance study of invasive infections in Chinese children</u>' Acta Paediatrica 2013: volume 102, issue 11, pages 1,081 to 1,086</u>

Qu and others. '<u>Epidemiological and clinical features of Panton-Valentine leukocidin positive</u> <u>Staphylococcus aureus bacteremia: a case-control study</u>' PLoS ONE [Electronic Resource] 2022: volume 17, issue 3, e0265476

Thomas and others. '<u>Community-acquired methicillin-resistant Staphylococcus aureus</u> pneumonia: a clinical audit' Respirology 2011: volume 16, pages 926 to 931

Tilouche and others. '<u>Staphylococcus aureus ventilator-associated pneumonia: a study of</u> <u>bacterio-epidemiological profile and virulence factors</u>' Current Microbiology 2021: volume 78, issue 7, pages 2,556 to 2,562

Walraven and others. '<u>Site of infection rather than vancomycin MIC predicts vancomycin</u> <u>treatment failure in methicillin-resistant *Staphylococcus aureus* bacteraemia</u>' Journal of Antimicrobial Chemotherapy 2011: volume 66, issue 10, pages 2,386 to 2,392

Zhang and others. '<u>Molecular epidemiological analysis of methicillin-resistant *Staphylococcus* <u>aureus isolates from Chinese pediatric patients</u>' European Journal of Clinical Microbiology and Infectious Diseases 2009: volume 28, issue 7, pages 861 to 864</u>

Arshad and others. '<u>USA600 methicillin-resistant *Staphylococcus aureus* in ICU patients with pneumonia: a case-control study design to evaluate epidemiology and outcomes of an emerging strain' Infectious Diseases in Clinical Practice 2014: volume 22, pages 85 to 88</u>

### Wrong publication type (5 studies)

Dabrera and others. '<u>Risk factors for fatality in Panton-Valentine leukocidin-producing</u> <u>Staphylococcus aureus pneumonia cases, England, 2012-2013</u>' Journal of Infection 2014: volume 69, issue 2, pages 196 to 199

Dotel and others. '<u>CASSETTE-clindamycin adjunctive therapy for severe *Staphylococcus aureus* treatment evaluation: study protocol for a randomised controlled trial' Trials [Electronic Resource] 2019: volume 20, issue 1, article number 353</u>

Jacquot and others. '<u>Epidemiology of post-influenza bacterial pneumonia due to Panton-</u> Valentine leucocidin positive *Staphylococcus aureus* in intensive care units: a retrospective nationwide study' Intensive Care Medicine 2019: volume 45, issue 9, pages 1,312 to 1,314

Turtle and others. '<u>Severe pneumonia caused by ciprofloxacin-resistant Panton-Valentine</u> <u>leukocidin producing community acquired meticillin-resistant *Staphylococcus aureus*' Journal of Infection 2009: volume 58, issue 1, pages 86 to 87</u>

Jancin. '<u>Four syndromes suggest life-threatening PVL-positive *S. aureus* infection</u>' Chest Physician 2018: volume 13, issue 9, pages 26 to 26

### Wrong study type (11 studies)

Hoppe and others. '<u>Severe infections of Panton-Valentine leukocidin positive Staphylococcus</u> <u>aureus in children</u>' Medicine 2019: volume 98, issue 38, article e17185

Li and others. '<u>Factors associated with the outcome of life-threatening necrotizing pneumonia</u> <u>due to community-acquired Staphylococcus aureus in adult and adolescent patients</u>' Respiration 2011: volume 81, issue 6, pages 448 to 460

Monecke and others. '<u>Microarray-based characterisation of a Panton-Valentine leukocidin-positive community-acquired strain of methicillin-resistant *Staphylococcus aureus*' Clinical Microbiology and Infection 2006: volume 12, issue 8, pages 718 to 728</u>

Nygaard and others. '<u>Fatal SARS-CoV-2-associated Panton-Valentine leukocidin-producing</u> <u>staphylococcal bacteremia</u>' Pediatric Infectious Disease Journal 2022: volume 41, pages E142 to E145

Peppard and others. '<u>Evidence based approach to the treatment of community-associated</u> <u>methicillin-resistant *Staphylococcus aureus*</u>' Infection and Drug Resistance 2009: volume 2, pages 27 to 40

Rouzic and others. 'Prompt and successful toxin-targeting treatment of 3 patients with necrotizing pneumonia due to *Staphylococcus aureus* strains carrying the Panton-Valentine leukocidin

genes' Journal of Clinical Microbiology 2010: volume 48, issue 5, pages 1,952 to 1,955

Scribel and others. '<u>Clinical and molecular epidemiology of methicillin-resistant Staphylococcus</u> <u>aureus carrying SCCmecIV in a university hospital in Porto Alegre, Brazil</u>' Diagnostic Microbiology and Infectious Disease 2009: volume 65, pages 457 to 461

Sligl and others. '<u>Severe community-acquired pneumonia</u>' Critical Care Clinics 2013: volume 29, pages 563 to 601

Teare and others. '<u>Outbreak of Panton-Valentine leucocidin-positive meticillin-resistant</u> <u>Staphylococcus aureus in a regional burns unit</u>' Journal of Hospital Infection 2010: volume 76, pages 220 to 224

Alvarez-Lerma and others. '<u>Successful treatment of Panton-Valentine leukocidin-positive</u> methicillin-resistant *Staphylococcus aureus* pneumonia with high doses of linezolid administered in continuous infusion' Medicina Intensiva 2017: volume 41, issue 1, pages 56 to 59

Nguyen and others. '<u>Community-acquired methicillin-resistant *Staphylococcus aureus* pneumonia radiographic and computed tomography findings' Journal of Thoracic Imaging 2008: volume 23, pages 13 to 19</u>

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