

Appendix 3:

Positive BC Cheat Sheet (Adults): Gram positive cocci

?Streptococci

Also called: "Gram positive cocci ?Strep" or "Gram positive cocci in chains"

Likely organisms and associated infections

Organism Group	Relative frequency*	Associated infections, and other clinical comments
Beta-haemolytic Streptococci e.g. Group A, B, C, G	28%	Skin and soft tissue (e.g. cellulitis, necrotising fasciitis), bone and joint, neonatal sepsis <i>Less frequently:</i> Pharyngitis, respiratory tract, UTI
Enterococci e.g. E. faecalis and E. faecium	32% <i>Faecalis: 15%</i> <i>Faecium: 7%</i> <i>VRE: 2.5%</i>	Urinary tract infection, biliary tract infection, other intra-abdominal infection. Associated with infective endocarditis (more common with E. faecalis) and colorectal malignancy. <i>Review for risk factors and signs/symptoms of infective endocarditis, and consider echocardiogram and colonoscopy.</i>
Streptococcus pneumoniae	19%	Respiratory tract infections <i>Less frequently:</i> meningitis, endocarditis <i>HIV testing advised</i>
Streptococcus viridans group e.g. S. mitis/oralis, S. salivarius	8%	Dental infections, infective endocarditis (subacute). S. mutans, S. gordonii, S. sanguinis and S. mitis/oralis are most strongly associated with IE. Occasional contaminants.
Streptococcus anginosus group e.g. S. anginosus, S. intermedius	7%	Abscesses (particularly liver, brain), peritonitis, intra-abdominal infection. <i>Associated with oral cavity and GI tract.</i> <i>Anaerobic co-infection common.</i>
Streptococcus bovis group e.g. S. gallolyticus, S. infantarius	4%	Associated with infective endocarditis and colorectal malignancy. <i>Review for risk factors and signs/symptoms of infective endocarditis, and consider echocardiogram and colonoscopy.</i>
Others e.g. Abiotrophia, Granulicatella, Gemella	<2%	Rare causes of endocarditis or opportunistic infections. Occasional contaminants.

* As a proportion of Streptococcal bacteraemias within NHS D&G from Sept 2020-2025

Predicted susceptibilities

- Refer to [Empirical Antibiotic Guidelines for Secondary Care \(Adults\)](#) for condition-specific antibiotic recommendations: <https://tinyurl.com/NHSDG-EmpiricalAbxGuidance>. Many empiric choices will cover for potential streptococcal infections associated with that particular syndrome:

Examples of commonly used antibiotics with **NO (OR UNRELIABLE) ACTIVITY** against GPC ?Streptococci

- Gentamicin
- Aztreonam
- Temocillin
- Ciprofloxacin
- Trimethoprim
- Co-trimoxazole

Tigecycline: active, but NOT appropriate as monotherapy for bacteraemia

- ALWAYS review past microbiology results** for potentially relevant results. Examples include:
 - Wound swabs, for e.g. beta-haemolytic streptococci)
 - MSUs, for e.g. Enterococci
 - Previous blood cultures with e.g. ?Endocarditis
 - Multi-drug resistant organisms e.g. Vancomycin Resistant Enterococci

Organism group	Likely to be susceptible to: Percentage refers to the proportion of isolates sensitive within the listed organism group.
Beta-haemolytic Streptococci e.g. Group A, B, C, G	Amoxicillin, Benzylpenicillin, Flucloxacillin [#]), Cephalosporins. Vancomycin, Linezolid Clindamycin (70%), Clarithromycin (70%), Co-trimoxazole (98%)
Enterococci e.g. E. faecalis and E. faecium	Amoxicillin and tazocin (E. faecalis only) Vancomycin/Teicoplanin (not VRE), Linezolid, Daptomycin Resistant to: Penicillin, Gentamicin, Cephalosporins, Co-trimoxazole, Meropenem
Streptococcus pneumoniae	Penicillin, Amoxicillin, Cephalosporins, Clarithromycin (90%), Vancomycin, Levofloxacin (100%) , Co-trimoxazole (85%)
Streptococcus viridans group e.g. S. mitis/oralis, S. salivarius	Penicillins (95%), Cephalosporins, Vancomycin, Clindamycin (85%)
Streptococcus anginosus group e.g. S. anginosus, S. intermedius	As for viridans
Streptococcus bovis group e.g. S. gallolyticus, S. infantarius	As for viridans
Others e.g. Abiotrophia, Granulicatella, Gemella	Penicillin, cephalosporins, vancomycin

[#] Flucloxacillin has unpredictable activity against Group B streptococci, though patients often respond with 2g QDS IV dosing.

Suggested initial actions when BC with GPC ?Streptococcus phoned through

A wide variety of different organisms and clinical diagnoses are possible.
Beta-haemolytic Streptococci and Streptococcus pneumoniae are the most likely to cause acute life-threatening illness.

- **Review patient.** Determine clinical status, likely focus of infection, current antibiotics
- **If NEWS score ≥ 7 , request senior review**
- **Review past microbiology results** for potentially relevant results. Examples include:
 - Wound swabs, for e.g. beta-haemolytic streptococci)
 - MSUs, for e.g. Enterococci
 - Previous blood cultures with e.g. ?Endocarditis
 - Multi-drug resistant organisms e.g. Vancomycin Resistant Enterococci (VRE)
- **If working diagnosis is infective endocarditis OR implant infection (e.g. cardiac, vascular, orthopaedic):**
 - Are there any clinical signs on examination that suggest device/implant infection?
 - Take 2 further sets of blood cultures 20 minutes apart, from different sites – even if stable
 - Review dentition and oral health – if required, involve max-fax / dentistry
 - *Seek advice from specialist teams if implant/device infection suspected*
- **If there is doubt about the likely clinical significance of the positive blood culture result e.g. unclear source of infection, contaminant?**
 - Take 1-2 further sets of blood cultures 20 minutes apart, from different sites – even if stable
- **Consider whether antibiotic adjustment is required.** Suggested actions to consider are listed below:

If... your patient is on an antibiotic regimen likely to provide sufficient empirical cover for GPC ?Streptococci AND clinically stable


➔ Change in treatment is unlikely to be required at this stage.

If... your patient is NOT ON ANTIBIOTICS as there is no clinical evidence of infection

- ➔ **Repeat blood cultures:**
 - At least 1 further set:
 - Cardiac/orthopaedic/vascular implants: 2 further sets, 20 min apart, different sites
- ➔ **Hold off any changes in current treatment**
- ➔ **If patient develops sepsis** before further information is available:
 - Re-assess for source of infection AND re-culture
 - **Treat the most likely clinical source.** Refer to [Empirical Antibiotic Guidelines for Secondary Care \(Adults\)](#) for condition-specific antibiotic recommendations.
 - Many empiric choices cover potential streptococcal infections associated with that particular syndrome. **Cross-reference antibiotic regimen with the “List of commonly used antibiotics with NO (OR UNRELIABLE) ACTIVITY against GPC ?Streptococci”**
 - If no cover: **add IV vancomycin**, and review when significance of blood culture has been clarified.

If... your patient is on an antibiotic regimen likely to provide sufficient empirical cover likely to provide GPC ?Streptococci BUT clinically deteriorating / acutely unwell

- ➔ **Seek urgent senior clinical review**
- ➔ **Undertake antimicrobial review**, including:
 - *Current therapy*: route, dosing, administration
 - *Source control*: is there a deep-seated infection that needs draining? Is there an infected device that needs removal? Consider imaging/surgical input
- ➔ **Consider adding IV vancomycin**
 - **Many empiric choices appropriately cover potential streptococcal infections.**
 - **Consider adding IV vancomycin.** The benefit of this may be limited, and depends on:
 - *Likely streptococcal organism group involved*, which depends on the infection syndrome being managed. Predicted susceptibilities table will help provide insight into gaps of antibiotic coverage.
 - *Known VRE colonisation*
 - If severe sepsis AND deteriorating: consider IV Daptomycin 10-12mg/kg/24h (normal renal function). IV Linezolid is an alternative.
 - *Travel history*: *S. pneumoniae* is usually penicillin sensitive, but there is increasing penicillin resistance in certain areas e.g. Spain, France, Parts of Asia.
 - **Other reasons for deterioration / absence of response that are not related to antibiotic-spectrum (i.e. resistance) should be strongly considered** e.g. source control
- ➔ Further escalation options and management advice is available within:



“The “Life Jacket”: Urgent Antimicrobial Management for Acutely Deteriorating Adult Patients ≥16 years old when Immediate Microbiology Consultant Advice Is Unavailable”