# Aim

To provide guidance on the potential significance of bacterial species isolated from clinical specimens.

# Principle

Any organism cultured from normally sterile sites (e.g. blood, csf, deep tissue) should be considered of likely clinical significance with a few exceptions, e.g. skin organisms such as coagulase negative staphylococci grown in cultures from a patient with no prosthetic material or central venous line.

However, from superficial / colonised sites, potentially pathogenic organisms need to be identified from mixed cultures including normal microbial flora.

The following tables provide a guide to significant / important pathogens: however it is only a guide. If not sure, the correct procedure is to fully identify and perform antimicrobial susceptibilities on all cultured organisms from normally sterile specimens.

# References

1. Health Protection Agency, UK SOPs: <http://www.hpa.org.uk/SMI/pdf>.
2. Manual of Clinical Microbiology. 9th Edition (2007). ASM Press.
3. Hawkey, P and Lewis, D. Medical Bacteriology. 2nd Edition (2004). Oxford University Press.

# Risk assessment

Not required.

# Sterile site specimens

| Specimen type | Significant isolates | Comment |
| --- | --- | --- |
| **Blood** | **Any growth considered potentially significant****Important pathogens (see comment):*** Beta-haemolytic streptococci (Grp A/C/G)
* *Burkholderia pseudomallei*
* Coliforms (e.g. *K. pneumoniae* / *E. coli*)
* *Cryptococcus neoformans*
* *Enterococcus* spp.
* *Haemophilus influenzae* (usually type B)
* *Listeria monocytogenes*
* *Neisseria gonorrhoeae* / *meningitidis*
* *Pseudomonas* *aeruginosa*
* *Salmonella* spp. and *S.* Typhi
* *Staphylococcus aureus*
* *Streptococcus pneumoniae*

**Report as “uncertain significance” (no antimicrobial results), unless repeated positives or after discussion:*** Alpha-haemolytic streptococci (not *S. pneumoniae*)
* *Acinetobacter* spp.
* *Burkholderia cepacia*
* *Pseudomonas* spp. (not *P. aeruginosa*)
* Other unusual GNB non-fermenters
* Yeasts (do Germ tube)

**Usually contaminants:*** Coagulase-negative staphylococci
* GPB (diphtheroids, *Bacillus* spp.)
 | Standard procedure is to fully identify and do antimicrobial susceptibility testing on all cultured organismsNever report “no significant growth” for blood cultures |

| Specimen type | Significant isolates | Comment |
| --- | --- | --- |
| **CSF** | **Any growth considered potentially significant****Important pathogens (see comment):*** **<2 months of age**
	+ Group B streptococcus
	+ *Escherichia coli*
	+ *O*ther coliforms (e.g. *K. pneumoniae)*
	+ *Listeria monocytogenes*
* **≥2 months**
	+ *Haemophilus influenzae* (type B)
	+ *Neisseria meningitidis*
	+ *Streptococcus pneumoniae*
	+ *Streptococcus suis*
* **Others**
	+ *Cryptococcus neoformans*
	+ *Mycobacterium tuberculosis*

**Usually contaminants (if white blood cell count normal):*** Coagulase-negative staphylococci
* GPB (diphtheroids, *Bacillus* spp.)
 | Standard procedure is to fully identify and do antimicrobial susceptibility testing on all cultured organismsNever report “no significant growth” for CSF cultures |

| Specimen type | Significant isolates | Comment |
| --- | --- | --- |
| **Pus (sterile site)****Sterile fluids****Tissue** | **Important pathogens (see comment):*** Beta-haemolytic streptococci (Grp A/B/C/G)
* *Burkholderia pseudomallei*
* Coliforms (e.g. *K. pneumoniae* / *E. coli / Salmonella* spp.)
* *Cryptococcus neoformans*
* *Enterococcus* spp.
* *Haemophilus influenzae* (usually type B)
* *Listeria monocytogenes*
* *Neisseria gonorrhoeae* / *meningitidis*
* *Nocardia* spp.
* *Pseudomonas* *aeruginosa*
* *Staphylococcus aureus*
* *Streptococcus anginosus* group (Grp F)
* *Streptococcus pneumoniae*
* Fungi (ID with lactophenol blue prep)
* Yeasts (do Germ tube)

**Note: any growth should be considered significant:*** Coagulase-negative staphylococci and GPB (diphtheroids, *Bacillus* spp.) may only be considered as potential contaminants after discussion on the board round
* GNB non-fermenters (e.g. *Acinetobacter* spp. *Pseudomonas* spp.) should be fully identified and have antimicrobial susceptibility testing done (unless considered likely contaminant on the board round)
 | Standard procedure is to fully identify and do antimicrobial susceptibility testing on all cultured organismsMixed coliforms / enterococci cultured from abdominal surgical specimens (e.g. “acute appendicitis”) may be reported as “mixed growth of faecal flora” without full ID and antimicrobial susceptibility testing |

# Non-sterile site specimens

| Specimen type | Significant isolates | Comment |
| --- | --- | --- |
| **Pus swab****(non-sterile site)****Skin swab****Wound swab** | **Always report:*** *Bacillus anthracis*
* Beta-haemolytic streptococci (Grp A/C/G)
* *Burkholderia pseudomallei*
* *Corynebacterium diphtheriae* / *ulcerans*
* *Haemophilus influenzae*
* *Staphylococcus aureus*

**Always report (important in selected specimens):*** *Capnocytophaga* spp., *Eikenella* spp., *Pasteurella* spp. (bites)
* *Aeromonas* spp., *Vibrio* spp. (water exposure)
* *Pseudomonas aeruginosa* (burns)
* *Listeria monocytogenes*, *Neisseria gonorrhoeae* (neonates)
* *Streptococcus anginosus* group (Grp F), *Streptococcus pneumoniae*, *Nocardia* spp. (abscesses)

**Only report if pure and / or heavy:*** Coliforms (e.g. *K. pneumoniae* / *E. coli*)
* *Enterococcus* spp.
* GNB non-fermenters (e.g. *Pseudomonas* spp.)
* Yeasts (report as “yeasts”)
 |  |

| Specimen type | Significant isolates | Comment |
| --- | --- | --- |
| **Ear swab****Eye swab** | **Always report:*** Beta-haemolytic streptococci (Grp A/C/G)
* *Burkholderia pseudomallei*
* *Haemophilus influenzae*
* *Moraxella catarrhalis*
* *Neisseria gonorrhoeae* (eye swabs only)
* *Pseudomonas* *aeruginosa*
* *Staphylococcus aureus*
* *Streptococcus pneumoniae*
* Fungi (ID with lactophenol blue prep)

**Report at a lower ID level:*** Coliforms should be reported as “coliforms”: do not ID or do antimicrobial susceptibilities
* Non-*P. aeruginosa* pseudomonads should be reported as “pseudomonads”: do not ID or do antimicrobial susceptibilities
* Yeasts should be reported as “yeasts”
 |  |

| Specimen type | Significant isolates | Comment |
| --- | --- | --- |
| **Sputum****ETT aspirate** | **Always report:*** Beta-haemolytic streptococci (Grp A/C/G)
* *Burkholderia pseudomallei*
* *Haemophilus influenzae*
* *Moraxella catarrhalis*
* *Staphylococcus aureus*
* *Streptococcus pneumoniae*
* Fungi (ID with lactophenol blue prep)

**Only report if pure and / or heavy:*** Coliforms (e.g. *K. pneumoniae* / *E. coli*)
* Gram negative non-fermenters (e.g. *Acinetobacter* spp., *B. cepacia*, *Stenotrophomonas maltophilia*)
* *Pseudomonas* spp. (incl. *P. aeruginosa*)
 | Heavily mixed cultures should be interpreted with caution (in conjunction with Gram stain result): presence of many epithelial cells implies upper respiratory tract contamination |
| **Throat swab** | **Always report:*** Beta-haemolytic streptococci (Groups A / C / G)
* *Burkholderia pseudomallei*
* *Corynebacterium diphtheriae* / ulcerans
* *Neisseria gonorrhoeae*
* Yeasts (report as “yeasts”) – if SAB plate
 | Do not report other organisms |

| Specimen type | Significant isolates | Comment |
| --- | --- | --- |
| **Faeces** | **Always report:*** *Salmonella* spp.
* *Shigella* spp.
 |  |
| **Urine** | **If >105 cfu/ml (pure / mixed) or 104-105 cfu/ml (pure):*** Beta-haemolytic streptococci (Group B)
* *Burkholderia pseudomallei*
* Coliforms (e.g. *K. pneumoniae* / *E. coli*)
* *Enterococcus* spp.
* *Staphylococcus aureus*
* *Staphylococcus saprophyticus*
* *Pseudomonas* spp. (incl. *P. aeruginosa*)
 | If >2 organisms, report “mixed growth of >2 organisms”Other organisms may be reported if in significant numbers |
| **Vaginal swab** | **Always report:*** Beta-haemolytic streptococci (Grp A/C/G)
* *Burkholderia pseudomallei*
* *Haemophilus ducreyi*
* *Neisseria gonorrhoeae*
* Yeasts (report as “yeasts”)

**Only report if pure and / or heavy:*** Coliforms (e.g. *K. pneumoniae* / *E. coli*)
* *Staphylococcus aureus*
* Upper respiratory organisms (e.g. *H. influenzae*, *M. catarrhalis*, *S. pneumoniae*)

**Only report if request form states “pregnant”:*** Beta-haemolytic streptococci (Group B)
 | Report heavy mixed growths of coliforms as “heavy growth of coliforms” (do not ID or do antimicrobial susceptibilities) |