# 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 organisms  Never 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 organisms  Never 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 organisms  Mixed 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) |