

# Bacteriology and Mycology Scheme Scoring

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**Table 1. General Bacteriology - single 'core' or 'advanced' pathogen**  
(for specimens containing *C. difficile* see table 4)

Response	Core*	Advanced*
Unexpected pathogen	-1	-1
Negative result	0	0
Unnamed/unspecified micro-organism	0	0 <sup>†</sup>
Correct genus only	0 <sup>‡</sup>	2
Correct species <sup>§</sup>	2	2
Correct species but incorrect serotype	0	1
Incorrect species	0	1
Incorrect genus	-1	0
Additional unexpected pathogen	-1	-1

\* See table 3 for categorisation of core and advanced pathogens

<sup>†</sup> 'Unnamed anaerobe' or 'unnamed yeast', scored as 1

<sup>‡</sup> Correct yeast genus specified, scored as 1

<sup>§</sup> With or without the correct serotype / toxin result

**Table 2. General Bacteriology - Mixed 'core' and 'advanced' pathogen**

Response	Core	Advanced
Unexpected pathogen	-1	-1
Negative result	0	0
Unnamed/unspecified micro-organism	0	0
Correct genus for both	0	2
Correct species for both	2	2
One incorrect species for either	0	1
Incorrect species for both pathogens	0	0
Incorrect genus for one pathogen	0	0
Only one pathogen isolated	0	0
Additional unexpected pathogen	-1	-1

**Rationale:**

Organisms categorised as '**core**' can be readily identified in-house without the requirement for specialist methodology or expertise.

Organisms categorised as '**advanced**' normally referred to a reference or expert laboratory for confirmation and/or specialist testing

**Table 3.** List of bacteria and fungi distributed as pathogens and categorised as ‘core’ or ‘advanced’ organisms in accordance with the **General Bacteriology** scoring scheme criteria in tables 1 and 2 above.

BACTERIA and FUNGI	
Core	Advanced
<i>Acinetobacter lwoffii</i>	<i>Actinomadura madurae</i>
<i>Acinetobacter baumannii</i>	<i>Actinomyces israelii</i>
<i>Aeromonas hydrophila</i>	<i>Actinomyces odontolyticus</i>
<i>Arcanobacterium haemolyticum</i>	<i>Aerococcus urinae</i>
<i>Bacteroides fragilis</i> group	<i>Agrobacter radiobacter</i>
Beta-haemolytic streptococcus group A, B, C, G	<i>Aspergillus flavus</i> species complex
<i>Campylobacter coli</i> *	<i>Aspergillus fumigatus</i> species complex
<i>Campylobacter jejuni</i> *	<i>Aspergillus niger</i> species complex
<i>Candida albicans</i>	<i>Aspergillus terreus</i> species complex
<i>Nakaseomyces (Candida) glabrata</i>	<i>Bacillus cereus</i> group
<i>Candida nivariensis</i>	<i>Bacillus subtilis</i>
<i>Citrobacter koseri</i>	<i>Bergeyella zoohelcum</i> [Educational]
<i>Clostridioides difficile</i>	<i>Bordetella parapertussis</i>
<i>Clostridium bifermentans</i>	<i>Bordetella pertussis</i>
<i>Clostridium histolyticum</i>	<i>Burkholderia cepacia</i>
<i>Clostridium innocuum</i>	<i>Candida krusei</i>
<i>Clostridium perfringens</i>	<i>Candida parapsilosis</i>
<i>Clostridium septicum</i>	<i>Candida tropicalis</i>
<i>Clostridium sporogenes</i>	<i>Capnocytophaga canimorsus</i>
<i>Clostridium tetani</i>	<i>Cardiobacterium hominis</i>
<i>Corynebacterium diphtheriae</i>	<i>Chryseobacterium gleum</i> [Educational]
<i>Corynebacterium jeikeium</i>	<i>Clostridium novyi</i>
<i>Corynebacterium striatum</i>	<i>Corynebacterium pseudodiphtheriticum</i>
<i>Corynebacterium ulcerans</i>	<i>Cronobacter</i> spp
<i>Cryptococcus neoformans</i>	<i>Eikenella corrodens</i>
<i>Enterobacter cloacae</i> complex	<i>Elizabethkingia meningoseptica</i> [Educational]
<i>Enterococcus faecalis</i> *	<i>Fusobacterium necrophorum</i>
<i>Enterococcus faecium</i> *	<i>Granulicatella adiacens</i> [Educational]
<i>Enterococcus gallinarum</i> *	<i>Kingella kingae</i>
<i>Erysipelothrix rhusiopathiae</i>	<i>Lactobacillus acidophilus</i>
<i>Escherichia coli</i> O157 (non-toxigenic)	<i>Lactobacillus paracasei</i>
<i>Escherichia coli</i>	<i>Lactobacillus rhamnosus</i>
<i>Haemophilus influenzae</i>	<i>Legionella pneumophila</i>
<i>Haemophilus parainfluenzae</i>	<i>Leptotrichia buccalis</i> [Educational]
<i>Klebsiella oxytoca</i>	<i>Leuconostoc mesenteroides</i> [Educational]
<i>Klebsiella pneumoniae</i>	<i>Listeria ivanovii</i>
<i>Moraxella catarrhalis</i>	<i>Listeria monocytogenes</i>
<i>Morganella morganii</i>	<i>Mycobacterium</i> spp.
<i>Neisseria gonorrhoeae</i>	<i>Nocardia (Cyriaciageorgica) asteroides</i>
<i>Neisseria meningitidis</i>	<i>Peptostreptococcus anaerobius</i>
<i>Pasteurella multocida</i>	<i>Peptostreptococcus asaccharolyticus</i>
<i>Plesiomonas shigelloides</i> [Educational]	<i>Peptostreptococcus (Finegoldia) magnus</i>
<i>Prevotella intermedia</i>	<i>Porphyromonas endodontalis</i>
<i>Prevotella melaninogenica</i>	<i>Propionibacterium acnes</i>
<i>Proteus mirabilis</i>	<i>Rhodococcus equi</i>
<i>Proteus vulgaris</i>	<i>Roseomonas</i> spp. [Educational]
<i>Pseudomonas aeruginosa</i> *	<i>Rothia dentocariosa</i>
<i>Pseudomonas putida</i> *	<i>Sphingomonas paucimobilis</i>
<i>Pseudomonas stutzeri</i> *	<i>Vibrio alginolyticus</i>
<i>Ralstonia mannitolilytica</i>	<i>Vibrio vulnificus</i>
<i>Ralstonia pickettii</i>	<i>Vibrio fluvialis</i>
<i>Rothia mucilaginosa</i>	
<i>Salmonella</i> spp.	
<i>Shigella boydii</i>	
<i>Shigella flexneri</i>	
<i>Serratia marcescens</i>	
<i>Serratia liquefaciens</i>	
<i>Shigella sonnei</i>	
<i>Staphylococcus aureus</i>	
<i>Staphylococcus epidermidis</i>	
<i>Staphylococcus haemolyticus</i>	
<i>Staphylococcus lugdunensis</i>	
<i>Staphylococcus saprophyticus</i>	
<i>Stenotrophomonas maltophilia</i>	
<i>Streptococcus anginosus</i> group	
<i>Streptococcus bovis</i>	
<i>Streptococcus milleri</i> group	

**Table 3 contd.**

<b>BACTERIA and FUNGI</b>	
<b>Core</b>	<b>Advanced</b>
<i>Streptococcus mutans</i> group	
<i>Streptococcus oralis</i>	
<i>Streptococcus pneumoniae</i>	
<i>Vibrio cholerae</i>	
<i>Vibrio parahaemolyticus</i>	
<i>Yersinia enterocolitica</i>	
<i>Yersinia pseudotuberculosis</i>	

\*reporting to genus level is acceptable, dependent on site

**Table 4. *Clostridioides difficile* detection scheme**

Report	Intended result		
	<i>C. difficile</i> (toxin positive)	<i>C. difficile</i> (toxin negative)	Negative for <i>C. difficile</i>
Specimen negative for <i>C. difficile</i>	-1	-1	2
<i>C. difficile</i> negative	-1	-1	2
Toxigenic <i>C. difficile</i> (culture)	2	-1	-1
Non-toxigenic <i>C. difficile</i> (culture)	-1	2	-1
Specimen CDT positive	2	-1	-1
Specimen CDT negative	-1	2	2
Indeterminate	NS	NS	NS
GDH negative	-1	-1	2
GDH pos & CDT indeterminate*	1	1	-1
GDH positive & CDT negative	-1	2	-1
GDH positive & CDT not tested	-1	1	1
Specimen negative for toxigenic <i>Clostridioides difficile</i> (molecular)	-1	2	2
Specimen negative for toxigenic <i>Clostridioides difficile</i> (molecular) CDT not tested	-1	0	1
Specimen positive for toxigenic <i>Clostridioides difficile</i> (molecular)	2	-1	-1
Specimen positive for toxigenic <i>Clostridioides difficile</i> (molecular) CDT not tested	0	-1	-1

\* Equivocal is accepted as a valid response only where this is a specific recommendation for interpretation of a test result as stated in a commercial kit insert by the manufacturer

**Table 5: MRSA** detection scheme

Report	MRSA positive specimen	MRSA negative specimen
MRSA detected	2	-1
MRSA not detected	-1	2

**Table 6: Urinary antigens** scheme

Report	Urinary antigen positive specimen	Urinary antigen negative specimen
Urinary antigen detected	2	-1
Urinary antigen not detected	-1	2

**Table 7: Antimicrobial susceptibility testing schemes**

Isolates are referred to two independent reference laboratories for antimicrobial susceptibility testing. In the case where the MIC's reported by the two reference laboratories result in a difference in the interpretation of an antimicrobial agent, the result will not be scored.

#### Susceptible by both EUCAST and CLSI

Reference results EUCAST/CLSI	Concordance	Score
S/S	Combined S and I $\geq$ 80%	S score 2, I score 1, R score 0
S/S	Combined S and I <80%	Do not score

#### Susceptible, increased exposure (I) by EUCAST and Intermediate (I) by CLSI

Reference results EUCAST/CLSI	Concordance	Score
I/I	Combined S and I $\geq$ 80%	S score 1, I score 2, R score 1
I/I	Combined S and I <80%	Do not score

#### Resistant by both EUCAST and CLSI

Reference results EUCAST/CLSI	Concordance	Score
R/R	$\geq$ 80%	S score -1, I score 1, R score 2
R/R	<80%	Do not score

#### Resistant by EUCAST, no CLSI breakpoint

Reference results EUCAST/CLSI	Concordance	Score
R/-	$\geq$ 80%	S score -1, I score 1, R score 2

#### Susceptible by EUCAST, no CLSI breakpoint

Reference results EUCAST/CLSI	Concordance	Score
S/-	Combined S and I $\geq$ 80%	S score 2, I score 1, R score 0
S/-	Combined S and I <80%	Do not score

#### Reference result was S/I because of slight variation in reference MICs or differences in EUCAST/CLSI breakpoints

Reference results EUCAST/CLSI (or vice versa)	Concordance	Score
S/I	Combined S and I $\geq$ 80%	S score 2, I score 2, R score 1
S/I	Combined S and I <80%	Do not score

Reference result was R/I because of slight variation in reference MICs or differences in CLSI breakpoints

Reference results EUCAST/CLSI (or vice versa)	Score
R/I	Do not score

NOTE: Microorganisms against an antibiotic that do have established break points following EUCAST guidelines, will not be scored.

Antibiotic reported result scoring

Intended result	Reported result		
	Susceptible	Intermediate	Resistant
S	2	1	0
I	1	2	1
R	-1	1	2

$\beta$ -Lactamases in *Enterobacterales*

Are the following types of $\beta$ -lactamases present? (Answer: Negative/Positive)	
ESBL (traditional definition)	Resistant to extended-spectrum cephalosporins and resistance reversed by clavulanic acid, or ESBL detected by genotypic methods
AmpC (plasmid or chromosomal)	Resistant to extended-spectrum cephalosporins, and AmpC detected by phenotypic or genotypic methods
Carbapenemase	Reduced susceptibility to any carbapenem, and carbapenemase detected by phenotypic or genotypic methods

A correct result will be allocated a score of 2 and an incorrect result a score of 0



**Table 8: Mycobacteria** detection scheme

Report	Mtb positive specimen	*Non-Mtb/Mtb complex present	Mycobacteria negative specimen
Mtb or Mtb complex	2	-1	-1
AAFB or <i>Mycobacterium</i> unspecified	2	2	-1
Mycobacteria other than Mtb or Mtb complex:			
Correct species*	0	2	-1
Incorrect species*	0	1	-1
Negative for mycobacteria	0	0	2

Mtb = *Mycobacterium tuberculosis*

**Table 9: AAFB microscopy** scheme

Report	AAFB positive specimen	AAFB negative specimen
AAFB present by ZN alone, fluorescence alone or both	2	-1
AAFB present by fluorescence but negative by ZN	Not applicable	2
AAFB not seen	0	2

**Table 10: Mycology schemes**

Fungi are categorised as core, advanced and genus only (see table 12)

Response	Core	Advanced	Genus only
Negative result	0	0	0
Unnamed fungus	0	0	0
Correct genus	1	2	2
Correct species	2	2	-
Incorrect species	0	1	-
Incorrect genus	0	0	0

'Core' pathogen – fungi commonly encountered and characterised in-house.

'Advanced' pathogen – fungi commonly referred to a reference laboratory for full characterisation or confirmation.

'Genus only' – fungi of special interest generally as emerging pathogens but isolated relatively infrequently and commonly referred to a reference laboratory for full characterisation. (Fungi in this category may be deemed advanced pathogens at a future time after due consideration by NQAAP and with prior notice to participants).

**Table 11: Antifungal susceptibility testing scheme**

Intended result	Reported result		
	S	I/SDD	R
Susceptible (S)	2	1	0
Intermediate (I) / SDD	1	2	1
Resistant	-1	1	2

SDD = susceptible dependent on dose

**Table 12: Mycology**

<b>FUNGI</b>		
List of Fungi distributed and categorised as 'core, 'advanced' or 'genus only' organisms in accordance with the <b>mycology</b> scoring scheme criteria.		
<b>Core</b>	<b>Advanced</b>	<b>Genus only</b>
<i>Aspergillus flavus</i> species complex	<i>Aphanoascus keratinophilus</i> ( <i>Chrysosporium keratinophilum</i> )	<i>Acremonium</i> spp.
<i>Aspergillus fumigatus</i> species complex	<i>Aspergillus candidus</i> species complex	<i>Alternaria</i> spp.
<i>Aspergillus niger</i> species complex	<i>Aspergillus clavatus</i> species complex	<i>Bioplaris</i> spp.
<i>Aspergillus terreus</i> species complex	<i>Aspergillus glaucus</i> species complex	<i>Cladosporium</i> spp.
<i>Candida albicans</i>	<i>Aspergillus nidulans</i> species complex	<i>Curvularia lunata</i>
<i>Candida auris</i>	<i>Aspergillus versicolor</i> species complex	<i>Curvularia</i> ( <i>Bipolaris</i> ) <i>australiensis/hawaiiensis</i>
<i>Candida dubliniensis</i>	<i>Arthroderma benhamiae</i>	<i>Exophiala</i> spp.
<i>Candida glabrata</i> ( <i>Nakaseomyces</i> )	<i>Candida guilliermondii</i>	<i>Exserohilum rostratum</i>
<i>Candida kefyr</i>	<i>Candida famata</i>	<i>Geotrichum</i> spp.
<i>Candida krusei</i> ( <i>Pichia kudriavzevii</i> )	<i>Candida lipolytica</i>	<i>Fusarium</i> spp.
<i>C. nivariensis</i>	<i>Candida lusitanae</i>	<i>Haematonectria haematococca</i>
<i>Candida orthopsilosis</i>	<i>Cunninghamella bertholletiae</i>	<i>Mucor</i> spp.
<i>Candida parapsilosis</i>	<i>Lictheimia</i> ( <i>Absidia</i> , <i>Mycocladius</i> ) <i>corymbifera</i>	<i>Phoma</i> spp.
<i>Candida tropicalis</i>	<i>Lomentospora prolificans</i> ( <i>Scedosporium prolificans</i> )	<i>Rasamsonia argillacea</i> species complex
<i>Cryptococcus neoformans</i>	<i>Microsporum audouinii</i>	<i>Sarocladium</i> spp. ( <i>Acremonium</i> spp.)
<i>Epidermophyton floccosum</i>	<i>Microsporum persicolor</i>	<i>Talaromyces</i> spp ( <i>Penicillium</i> spp.)
<i>Microascus</i> ( <i>Scopulariopsis</i> ) <i>brevicaulis</i>	<i>Neoscytalidium dimidiatum</i>	<i>Ulocladium</i> spp.
<i>Microsporum canis</i>	<i>Neoscytalidium dimidiatum</i> var <i>hyalinum</i> ( <i>Scytaalidium hyalinum</i> )	<i>Verruconis</i> ( <i>Ochroconis</i> ) <i>gallopava</i>
<i>Microsporum fulvum</i>	<i>Pleurostomophora</i> ( <i>Philophora</i> ) <i>richardsiae</i>	
<i>Microsporum gypseum</i>	<i>Purpureocillium lilacinum</i> ( <i>Paecilomyces lilacinus</i> )	
<i>Paecilomyces variotii</i>	<i>Rhizomucor pusillus</i>	
<i>Pichia kudriavzevii</i>	<i>Rhizopus arrhizus</i>	
<i>Saccharomyces cerevisiae</i>	<i>Rhizopus microsporus</i>	
<i>Trichophyton interdigitale</i>	<i>Saprochaete capitata</i> ( <i>Magnusiomyces</i> )	
<i>Trichophyton mentagrophytes</i>	<i>Scedosporium auranticum</i> ( <i>apiospermum</i> )	
<i>Trichophyton rubrum</i>	<i>Sporothrix schenckii</i>	
<i>Trichophyton tonsurans</i>	<i>Trichophyton erinacei</i>	
	<i>Trichophyton terrestre</i>	
	<i>Trichophyton verrucosum</i>	
	<i>Trichophyton violaceum</i>	
	<i>Trichosporon asahii</i> ( <i>beigelii</i> )	
	<i>Trichosporon mucoides</i>	

**Table 13: Fungal Biomarkers** scheme

Report	Galactomannan antigen positive specimen	Galactomannan antigen negative specimen
Galactomannan antigen detected	2	-1
Galactomannan antigen not detected	-1	2

**Table 14: Cryptococcal antigen** detection scheme

Report	Cryptococcal antigen positive specimen	Cryptococcal antigen negative specimen
Cryptococcal antigen positive	2	-1
Cryptococcal antigen negative	-1	2