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Bacteriology and Mycology Scheme Scoring

Guide to schemes included in this information sheet

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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†
Correct genus only	0‡	2
Correct species§	2	2
Correct species but incorrect serotype	0	1
Incorrect species	0	1
Incorrect genus	0	0
Additional unexpected pathogen	-1	-1

* See table 3 for categorisation of core and advanced pathogens
† 'Unnamed anaerobe' or 'unnamed yeast', scored as 1
‡ Correct yeast genus specified, scored as 1
§ 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

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

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Table 4. ***Clostridium difficile*** detection scheme

Report	Intended result		
	C. difficile (toxin positive)	*C. difficile* (toxin negative)	Negative for *C. difficile*
C. difficile negative	**-1**	**-1**	**2**
Toxigenic *C. difficile*	**2**	**-1**	**-1**
Non-toxigenic *C. difficile*	**-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 equivocal*	**1**	**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

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Table 7: Antimicrobial susceptibility testing schemes

Susceptible by both EUCAST and CLSI

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

Resistant by both EUCAST and CLSI

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

Resistant by EUCAST, no CLSI breakpoint

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

Susceptible by EUCAST, no CLSI breakpoint

Reference results EUCAST/CLSI	Concordance	Score
S/-	Combined S and I ≥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 ≥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 EUCAST/CLSI breakpoints

Reference results EUCAST/CLSI (or vice versa)	Concordance	Score
R/I	Combined R and I ≥80%	S score 0*, I score 2, R score 2
R/I	Combined R and I <80%	Do not score

*A score of 0 rather than 1 in recognition of the more serious error of reporting resistant isolates as susceptible (a clear resistant strain reported susceptible would be scored -1).

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Antibiotic reported result scoring

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

β-Lactamases in *Enterobacteriaceae*

Are the following types of β-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 *Mycobacterium* 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

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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

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Table 12: Mycology

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

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