Hong Kong Institute of Medical Laboratory Sciences
Quality Assurance Programme Limited

Medical Microbiology

Panel Members

- Mr Raymond Leung – QMH (Head)
- Mr Wai Ting Hui – PMH (Deputy head)
- Mr Hoo Wing Lo – QEH
- Ms Ami Fung – QMH
- Mr Hon Kit Chui – QMH
- Mr Kin Hung Chan – QMH

Introduction

- First introduced in 1990
- Consists of 2 sections: bacterial identification and antimicrobial susceptibility testing (AST)
- 4 surveys per year
- 4 lyophilised samples per survey
- 3 for bacterial identification and 1 for antimicrobial susceptibility testing

United Kingdom National External Quality Assessment Service (UK NEQAS)

Freeze-drying - lyophilisation

- More convenient for transport
- Conserve bacteria with long period time
- Mix culture (pathogen with normal flora)
- Same bacterial count
- *Limit number of sample in each preparation*
- *Homogeneity test, sample for retest*
- *Old machine*

Interpretative Quality Assurance Program (IQAP)

- Collaborated with the Hong Kong College of Pathologists
- Consisted of clinical questions set on 2 bacterial identification samples on each survey
- Monitoring the standard of practising microbiologists
- Only those laboratories already registered with the College of Pathologists participated in this programme

The number of participants in different programs for Year 2014

	AFB	AP	CC	HS	HI	MM	JQ	NGST	VS	VNAT
No. of new participants	-	-	-	2	-	1	-	-	-	1
No. of withdrawal	-	-	2	4	1	-	-	-	1	-
No. in Year 2014	35	19	37	45	7	34	9	26	44	11

Number and types of laboratories for 2012

	Hong Kong	Macau	Overseas
Government Laboratory	1	1	1
Public Hospital Laboratory	9	0	0
Private Laboratory	11	0	0
Private Hospital Laboratory	9	1	0
Total	**30**	**2**	**1**

Survey Report

Hong Kong Institute of Medical Laboratory Sciences
Quality Assurance Programme Limited

Medical Microbiology

Survey Four (2013) - Final Report

Dispatch Date: 2 November 2013
Date of report: 15 February 2014

Laboratory Code: «**174**»

Prepared by: Mr Leung Ho-Kwan Raymond, Medical Microbiology Panel Head of HKIMLSQAP
(Contact through HKIMLSQAP)

Authorized by: Mr. Albert LI, Chairman of HKIMLSQAP
(Contact through HKIMLSQAP)

Scoring Table for Bacterial Identification

Genus	Species	Score allocated	Comment
Correct	Correct	2	Satisfactory
Correct	Not specified[@]	1	Pay attention
Correct	Incorrect but may not affect patient management[@]	1	Pay attention
Correct	Incorrect but affect patient management	0 or –1 (e.g. Report Salmonella typhi instead of Salmonella typhimurium)	Need improve
Incorrect (usually contaminant which not affect patient management, e.g. Bacillus, E.coli in stool, etc)	Incorrect	0	Need improve
Unexpected pathogens that affect patient management		-1	Need immediate evaluation

Scoring Table for Bacterial Identification

- Blood sample: (Intended Result: *Salmonella cholerasuis*)
- *Salmonella* Gp C $\Rightarrow$ score of 1 because blood culture is a critical sample.
- If it is a stool sample, then a score of 2 is given.
- *Salmonella cholerasuis* - easily differentiated from other *Salmonella* species biochemically besides serological typing.
- As a blood culture specimen is a critical sample, some serogroups (e.g. *S. typhi, S. paratyphi A, S. paratyphi B, S. paratyphi C and S. cholerasuis*) should be ruled out before reporting as *Salmonella* group only.

Scoring Table for Bacterial Identification

Table 3.8.1–5 Biochemical differentiation of selected members of the *Salmonella* group[a]

Test	Serogroup Choleraesuis	Serogroup Paratyphi A	Serogroup Typhi	Other
Salmonella group	C	A	D	A–E
Arabinose fermentation	−	+	−	+
Citrate utilization	V	−	−	+
Glucose gas production	+	+	−	+
Lysine decarboxylase	+	−	+	+
Ornithine decarboxylase	+	+	−	+
Rhamnose fermentation	+	+	−	+
Trehalose fermentation	−	+	+	+

[a] Symbols: −, ≤9% of strains positive; V, 10 to 89% of strains positive; +, ≥90% of strains positive.

Scoring Sample

Result	Score allocated	No. of responses	Correct percentage	Comment
Vibrio cholerae O1 biotype El Tor Serotype Inaba	2	24	48%	Satisfactory
Vibrio cholerae O1	2	10	20%	Satisfactory
Vibrio cholera, send to reference Lab.	2	5	10%	Satisfactory
Gram Negative Bacilli, send to reference Lab.	2	2	4%	Satisfactory
Vibrio cholera	1	2	4%	Pay attention
Vibrio species	0	1	2%	Need improve
No enteric Pathogens	0	2	4%	Need improve
Vibrio species other than cholerae O1#	-1	2	4%	Need immediate evaluation
Unexpected pathogens @	-1	2	4%	Need immediate evaluation

Vibrio cholerae non-O1, 1; and Vibrio parahaemolyticus, 1.
@Salmonella group C, 1; and Aeromonas hydrophila, 1.

Survey Report

Specimen MM 1313

A 66 years old man was admitted to the intensive care unit for postoperative care after a major intra-abdominal surgery. He was given meropenem for 5 days for the treatment of ventilator-associated pneumonia. There was not much clinical and radiological improvement despite antibiotic therapy. A bronchoalveolar lavage was taken and sent for culture.

Identification of the organism(s) from simulated BAL (Bronchoalveolar lavage) was requested.

The specimen contained ***Pseudomonas aeruginosa.***

Your Result: ***Pseudomonas aeruginosa.***

Refer to Reference Lab.: **No**

Your Score: **2**

Results	Refer to Reference Lab.	No of Response	Your placement	Score	Percentage of Correct
Pseudomonas aeruginosa	Yes / No	24	⇔	*2*	90%
Pseudomonas species	Yes	3		*2*	
Pseudomonas species	No	2		*1*	6.7%
Pseudomonas putida	No	1		*0*	3.3%
Late return		1		*Not scored*	

Score	Comment	Score	Comment
2	Satisfactory	0	Need improvement
1	Pay attention	-1	Need immediate evaluation

Late Return

The specimen contained ***Pseudomonas aeruginosa.***

Your Result: ***Pseudomonas aeruginosa (Late return).***

Refer to Reference Lab.: **No**

Your Score: **Not scored.**

Results	Refer to Reference Lab.	No of Response	Your placement	Score	Percentage of Correct
Pseudomonas aeruginosa	Yes / No	24		*2*	90%
Pseudomonas species	Yes	3		*2*	
Pseudomonas species	No	2		*1*	6.7%
Pseudomonas putida	No	1		*0*	3.3%
Late return		1	⇔	*Not scored*	

Not Return

Hong Kong Institute of Medical Laboratory Sciences
Quality Assurance Programme Limited

Medical Microbiology

SURVEY REPORT: FOUR (2013)

Sample Codes: MM 1313 MM 1314 MM 1315 MM 1316

Your report: No Result Submitted

Thank you for participating in this EQA Programme. Listed below is the analysis of other participants' return.

BACTERIAL IDENTIFICATION RESULT

Specimen MM 1313

A 66 years old man was admitted to the intensive care unit for postoperative care after a major intra-abdominal surgery. He was given meropenem for 5 days for the treatment of ventilator-associated pneumonia. There was not much clinical and radiological improvement despite antibiotic therapy. A bronchoalveolar lavage was taken and sent for culture.

Identification of the organism(s) from simulated BAL (Bronchoalveolar lavage) was requested.

The specimen contained ***Pseudomonas aeruginosa.***

Results	Refer to Reference Lab.	No of Response	Score	Percentage of Correct
Pseudomonas aeruginosa	Yes / No	24	*2*	90%
Pseudomonas species	Yes	3	*2*	
Pseudomonas species	No	2	*1*	6.7%
Pseudomonas putida	No	1	*0*	3.3%
Late return		1	*Not scored*	

Survey Report – Not Score

Your Score: **Not scored (Low consensus rate due to too low bacterial count in the samples)**

Results	Refer to Reference Lab.	No of Response	Your placement	Intended Score	Percentage of Correct
Campylobacter jejuni	Yes / No	15	⇔	*2*	60%
Campylobacter species	Yes	3		*2*	
Campylobacter species	No	4		*1*	13.3%
No growth / No Pathogen found	Yes / No	7		*0*	26.7%
Fusobacterium nucleatum	No	1		*0*	
Late return		1		*Not scored*	

Survey Report – Not Score

- **Low consensus (<70%) exclude same strain with high consensus in previous survey**
- **Difficult strain (Educational purpose)**
- **Poor sample preparation (e.g. Low bacterial count, contamination)**

Survey Report – AST

Sample Code : **MM 1316**

Organism : ***Haemophilus influenzae*** **(Sputum)**

		Score	No of Response	Percentage of Correct	Your placement
Ampicillin	Sensitive	0	3	10%	
	Intermediate	0	3	10%	
	Resistant	1	24	80%	⇔
	Late return	N	1	*Not scored*	
	Not Tested	N	0	*Not scored*	
Augmentin	Sensitive	0	4	13.3%	
	Intermediate	0	0	0%	
	Resistant	1	26	86.7%	⇔
	Late return	N	1	*Not scored*	
	Not Tested	N	0	*Not scored*	
Cefuroxime	Sensitive	0	1	3.3%	
	Intermediate	0	0	0%	
	Resistant	1	29	96.7%	⇔
	Late return	N	1	*Not scored*	
	Not Tested	N	0	*Not scored*	

HKIMLS QAP

Annual Report

Survey Sample	Intended Result	Scores of Reporting Laboratories					Total No. of Laboratories
		2	1	0	-1	N	
MM 1201	***Cronobacter (Enterobacter) sakazakii***	29 (85.3%)	5 (14.7%)	0	0	0	34
MM 1202	***Cryptococcus neoformans***	26 (76.5%)	0	5 (14.7%)	3 (8.8%)	0	34
MM 1203	***Yersinia enterocolitica***	32 (94.2%)	1 (2.9%)	1 (2.9%)	0	0	34
MM 1205	***Serratia liquefaciens***	28 (82.4%)	1 (2.9%)	1 (2.9%)	4 (11.8%)	0	34
MM 1206	***Bacteroides fragilis***	27 (81.8%)	3 (9.1%)	2 (6.1%)	1 (3.0%)	1*	33 + 1*
MM 1207	***Brevundimonas diminuta***	28 (82.4%)	2 (5.9%)	1 (2.9%)	3 (8.8%)	0	34
MM 1209	***Chromobacterium violaceum)***	30 (90.9%)	0	3 (9.1%)	0	0	33
MM 1210	***Streptococcus suis***	26 (78.8%)	0	3 (9.1%)	4 (12.1)	0	33
MM 1211	***Listeria ivanovii***	28 (84.8%)	2 (6.1%)	1 (3.0%)	2 (6.1%)	0	33
MM 1213	***Haemophilus influenzae***	33 (100%)	0)	0	0	0	33
MM 1214	***Corynebacterium urealyticum***	26 (78.8%)	1 (3.0%)	5 (15.2%)	1 (3.0%)	0	33
MM 1215	***Salmonella cholera-suis***	29 (87.9%)	0	0	4 (12.1%)	0	33

HKIMLS QAP

Annual Report

Survey Sample	Test Organism	Test Agent	Intended Result	Number of Laboratories		
				Correct	Incorrect	@ Not Tested
MM 1204	*Haemophilus influenzae*	Ampicillin	Resistant	34 (100%)	0	0
		Augmentin	Sensitive	33 (97%)	1 (3%)	0
		Chloramphenicol	Resistant	27 (79%)	3 (9%)	4 (12%)
		Tetracycline	Resistant	30 (88%)	3 (9%)	1 (3%)
		Cefotaxime	Sensitive	28 (82.4%)	0	6 (17.6%)
		Cefuroxime	Sensitive	32 (94%)	1 (3%)	1 (3%)
		β-lactamase	Positive	27 (79.4%)	4 (11.8%)	3 (8.8%)
MM 1208	*Klebseilla pneumoniae*	Ampicillin	Resistant	31 (96.9%)	1 (3.1%)	0
		Cefuroxime	Resistant	29 (90.6%)	2 (6.3%)	1 (3.1%)
		Gentamicin*	Not Scored	N	N	N
		Imipenem	Sensitive	30 (93.7%)	2 (6.3%)	0
		Cefotaxime	Resistant/Intermediate	30 (88.2 %)	0	4 (11.8%)
		Ceftazidime	Resistant	33 (97%)	0	1 (3%)
		ESBL-producing	Positive	32 (94%)	0	2 (6%)
MM 1212	*Enterococcus faecalis*	Ampicillin	Sensitive	32 (97%)	1 (3%)	0
		Vancomycin	Sensitive	30 (91%)	3 (9%)	0
		High Content Gentamicin	Sensitive	21 (64%)	2 (6%)	10 (30%)
		High Content Amikacin	Sensitive	16 (48%)	0	17 (52%)
MM 1216	*Enterobacter cloacae*	Ampicillin	Resistant	33 (100%)	0	0
		Cefuroxime	Resistant	32 (97%)	0	1 (3%)
		Ceftazidime	Resistant	33 (100%)	0	0
		Gentamicin	Sensitive	33 (100%)	0	0
		Co-trimoxazole	Sensitive	31 (94%)	0	2 (6%)
		Imipenem	Sensitive	30 (90.9%)	0	3 (9.1%)

@ Antibiotics not tested are excluded in the performance analysis

Performance Analysis

$$\frac{\text{Cumulative score of the lab examining the same specimen} \quad \textbf{minus} \quad \text{Mean cumulative score of all labs. examining the same specimen.}}{\text{Standard deviation of the cumulative score of all laboratories examining the same specimen}}$$

- Positive rating - better than average
- Rating of 0 - same as average
- Negative rating - worse than average
- **-1.96** standard deviation below the mean were considered to have performed **significantly worse** than average

Individual laboratory performance report

HONG KONG MEDICAL TECHNOLOGY ASSOCIATION
QUALITY ASSURANCE PROGRAMME

MEDICAL MICROBIOLOGY

EVALUATION OF LABORATORY PERFORMANCE (2012)

Laboratory code : **XXX**

Bacterial identification :

Total number of specimens investigated by your laboratory	:	12
Your cumulative score for the above specimens	:	24
Mean cumulative score of all labs. examining same specimens	:	20.53
The standard deviation of cumulative score of all labs.	:	5.52

Your cumulative score is **0.63** standard deviations **above** the mean.

Antibiotic susceptibility testing :

Total number of antibiotic susceptibility tests performed by your laboratory	:	23
Your cumulative score for the above tests	:	21
Your percentage of correct for the above tests	:	91.3%
The mean percentage of correct among all labs.	:	97.18%
The standard deviation of the percentage of correct among all labs.	:	4.674

Your percentage of correct is **1.26** standard deviations **below** the mean.

END OF REPORT

Individual laboratory performance report

Bacterial identification :

Total number of specimens investigated by your laboratory	:	12
Your cumulative score for the above specimens	:	24
Mean cumulative score of all labs. examining same specimens	:	20.53
The standard deviation of cumulative score of all labs.	:	5.52

Your cumulative score is **0.63** standard deviations **above** the mean.

Individual laboratory performance report

Antibiotic susceptibility testing :

Total number of antibiotic susceptibility tests performed by your laboratory	:	23
Your cumulative score for the above tests	:	21
Your percentage of correct for the above tests	:	91.3%
The mean percentage of correct among all labs.	:	97.18%
The standard deviation of the percentage of correct among all labs.	:	4.674

Your percentage of correct is **1.26** standard deviations **below** the mean.

Thank You