

P13 Clinical microbiology II

To study: Infections of various organs and organ systems (from textbooks, www etc.)

From the spring term: Microscopy, culture, biochemical identification

Task 1: Search for respiratory pathogens in clinical microbiology

With the help of your teacher and the slideshow, describe the following picture. Use the knowledge from this picture in the Task 2 and Task 3.

disc containing _____

possible pathogen _____

possible pathogens: _____

disc containing _____ and _____

possible pathogen (tiny, colourless colonies, haemolysis) _____

possible pathogen (something larger, white colonies, haemolysis) _____

line of _____

because of _____

Common pharyngeal flora consists mostly of

a) _____ appearance: _____

b) _____ appearance: _____

Task 2: Case A

For this casuistic, documented by the order form, try to examine the corresponding specimen (sputum), to find a possible pathogen, make a conclusion and interpret the result. Step by step, fill in the individual fields in “the screen of laboratory information system”.

Kód pojistovny 1 1 1	požaduje dl A	IČP 7 2 1 2 3 4 5 6 Odbornost 7 8 9 1 5 1 2 0 8	Datum	Čís. dokladu	Poř. č.
POUKAZ NA VYŠETŘENÍ / OŠETŘENÍ					
Pacient Linda Green		Accute bronchopneumonia, 38.5 °C, heavy diabetes			
Č. pojistěnce	*1932	Variabilní symbol			
Odeslán ad:		Kód náhrady			
Požadováno: sputum for bacteriological examination					
Poznámka:					
72 123 456	Dr. Michal Teplý generální praktičer Compositive 8, Brno				
razítko a podpis lékaře					
VZP-06/1999					
Dne:				razítko a podpis	

Patient: Linda Green *1932 Dg.: Pneumonia					
Specimen: Sputum			Ordered by: Dr. Microbe Terrible		
Bacterium A: description	Conclusion:	Interpretation	Microscopy result: Epithelial cells: _____ WBC-s _____ Bacteria (describe): _____		
Bacterium B: description	Conclusion:	Interpretation			
Bacterium C: description	Catalase	10 % NaCl	Hyaluronidase	Conclusion:	Interpretation
Antibiotic susceptibility test (bacterium C)			Final conclusion and recommendation for treatment: _____ _____ _____		

a) Microscopy of sputum

Look at the smear prepared from your specimen. Try to find the individual objects (bacteria, host cells). Fill in the field "Microscopy result":

- +++ = more than 10 objects in the observation area
- ++ = less than 10 objects in the observation area
- + = only rare objects (one or less per an observation area)
- 0 = none

b) Description of bacteria

On the blood agar, describe the size, colour and haemolytic properties of the grown bacteria. Do not describe other characteristics. Take into account that there was no growth visible on Endo agar. Bacteria A and B should be bacteria considered to be parts of normal flora. Bacterium C will be a pathogenic bacterium that will be tested in detail in parts c) and d)

c) Further tests

Fill in the results of the catalase test, hyaluronidase test and of the growth on blood agar with 10 % NaCl for Bacterium C.

d) Antibiotic susceptibility

Fill in the antibiotic susceptibility test for Bacterium C. Always write down the name of the antibiotics and "S" or "R" (susceptible or resistant). Reference zones are written on your table.

e) Final conclusion

Try to formulate several words for the general practitioner. Especially try to find out (with the help of your teacher) which antibiotics would be the best choice.

Task 3: Case B

Similarly as in the previous case, there is an order form. Try to examine the corresponding specimen (throat swab) to find a possible pathogen, make a conclusion and interpret the result. Step by step, fill in the individual fields in "the screen of laboratory information system". The way of doing it is the same as in the previous task.

Kód pojišťovny 1 1 1	posílá dle díl A	IČP 7 2 1 2 3 4 5 6	Datum 7 8 9 1 5 1 2 0 8	Čís. dokladu	Poř. č.
POUKAZ NA VYŠETŘENÍ / OŠETŘENÍ				provedl díl B	
Pacient Martin Blue	Č. pojistěnce *1991			accute tonsillitis, 38.8 °C	
Variabilní symbol	Kód náhrady			IČP	
Odeslán ad:				Odbornost	
Požadováno:	throat swab for bacteriological examination			Var. symbol	
Poznámka:	72 Dr. Microbe Terrible 123 general practitioner 456 Champositive 8, Brno			Datum	
	razítko a podpis lékaře			Kód	
	VZP-06w/1999			Poč.	
	Dne:			1	
	razítko a podpis			2	
				3	
				4	
				5	
				6	
				7	
				8	
				9	
				10	
				11	
				12	
				13	
				14	

Patient: Martin Blue		*1991		Dg.: Accute tonsillitis		
Specimen: Throat swab		Ordered by: Dr. Microbe Terrible				
Bacterium A: description	Conclusion:	Interpretation				
Bacterium B: description	Conclusion:	Interpretation				
Bacterium C: description	Cata-lase	Bile- -aesc.	PYR	CAMP	Conclusion:	Interpretation
Antibiotic susceptibility test (bacterium C)				Final conclusion and recommendation for treatment:		

Task 4: Case C

In the case of a wound swab, there is no “common flora”. That is the main difference between this task and the previous ones: it is not necessary to search for a pathogen among the normal flora.

On the other hand, we mostly use more culture media to detect all possible pathogens, even if they would be in a mix. Besides blood agar and Endo agar we usually use also blood agar with 10 % NaCl and blood agar with amikacin in order to search for streptococci and enterococci (but none of these media is used in our task).

Fill in the form again.

Kód pojišťovny 1 1 1	požaduje díl A	IČP 7 2 1 2 3 4 5 6 Odbornost 7 8 9	Datum 1 5 : 1 2 : 0 8	Čís. dokladu	Poř. č.
POUKAZ NA VYŠETŘENÍ / OŠETŘENÍ				provedl M B	
Pacient Lucy Yellow	Dg: Suppurating wound of planta pedis			IČP	
Č. pojištění *1983	Variabilní symbol			Odbornost	
Odeslán ad:	Kód náhrady			Var. symbol	
Požadováno: Wound with pus on planta pedis, caused by stepping on a tin in a pond; the pus appeared after two days				Datum	Kód Poč.
Poznámka:					
72 123 456	Dr. Microbe Terrible generální praktička Čampositivní 8, Brno				
razítko a podpis lékaře					
VZP-06x/1999					
Dne:					
razítko a podpis					

Patient: Lucy Yellow *1984 Dg.: wound of planta pedis					
Specimen: wound swab* Ordered by: Dr. Microbe Terrible					
*note: suppurating wound on planta pedis, contracted during bathing in a pond					
Growth on blood a. (incl. smell)	Endo agar:	MH agar:	Oxidase:	Conclusion:	Interpretation
Antibiotic susceptibility test				Final conclusion and recommendation for treatment:	

Task 5: Case D

In the case of cystitis, there is one difference: the urine is examined (semi)quantitatively. Before solving the problem, try to fill in the following table (for finding only one species).

Number of colonies on agar	Number of bacteria in one microliter (µl)	Number of bacteria in one milliliter (ml)	Interpretation
<10			
10–100			
>100			

Kód pojišťovny 1 1 1	požaduje díl A	IČP 7 2 1 2 3 4 5 6	Datum	Čís. dokladu	Poř. č.
		Odbornost 7 8 9	1 5 : 1 2 0 8	provedl díl B	

POUKAZ NA VYŠETŘENÍ / OŠETŘENÍ

Pacient	Carolina Red				
Č. pojistěnce	*1952	Dg.: acute cystitis			
Variabilní symbol					
Odeslán ad:					
	Kód náhrady				
Požadováno:	urine (commonly sampled) for bacteriological examination				

Poznámka:

72	Dr. Michal Jemelka				
123	generální praktička				
456	Čampositivě 8, Brno				

razítko a podpis lékaře

Dne:

razítko a podpis

1	2	3	4	5	6	7	8	9	10	11	12	13	14

Form for results of Enterotest 16:

ONPG	1H	1G	1F	1E	1D	1C	1B	1A	2H	2G	2F	2E	2D	2C	2B	2A
+	black	blue	red	blue	red	green	black	blue	blue	yellow	yellow	yellow	yellow	yellow	yellow	yellow
-	colourless	green	yellow	green	yellow	yellow	colourless	yellow	yellow	green	green	green	green	green	green	green
?																
1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2
Code:		Identification					Probability %					T index				

Patient: Carolina Red *1952 Dg.: accute cystitis			
Specimen: normal urine Ordered by: Dr. Microbe Terrible			
Growth on Blood agar:	Growth on Endo agar:	Conclusion:	Interpretation
Quantity:	Enterotest 16 result:		
Antibiotic susceptibility test		Final conclusion and recommentation for treatment	