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Microbiology Clinical Competency Checklist - MLS 3316 Advanced Clinical Microbiology

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LABORATORY CLINICAL EXPERIENCE OBJECTIVES

At the completion of the MLS 3316 course, the student will have successfully completed the following:

1. **Primary plating.** Processing clinical specimens to include: appropriate methods of logging specimens, choosing appropriate media, and proper plating techniques.
2. **Gram Stains.** Prepare and interpret direct gram stains to include: screening appropriate from inappropriate specimens for culture, and giving the physician the maximum amount of information possible.
3. **Plate Reading.** Reading of primary plates to include: interpretation of initial growth, sub culturing of initial growth if indicated, and performing identification, susceptibility testing and interpretation as needed.
4. **Antibiotic Susceptibility Testing.** Performing antibiotic susceptibility testing by individual laboratory methods. To include one or more of the following: Disk diffusion susceptibility testing, broth microdilution, and automated methods.
5. **Automated Instrumentation.** Perform testing on any automated instrumentation used by the laboratory.
6. **Microbiology Serological Testing.** Perform testing using serological methods used by the laboratory.
7. **Molecular Testing.** Observe any molecular testing performed by the laboratory.
8. **Quality Control.** Perform daily and weekly quality control to include quality control on any automated instrumentation available.

Students should work with their respective mentors to complete the listed objectives. Accuracy, precision, timely reporting of results and demeanor must comply with the laboratory's acceptable standards. While working in the laboratory, the student must meet laboratory standards for work habit skills in patient confidentiality, communication skills, laboratory safety, universal precautions, waste disposal, equipment, and work area maintenance. It is requested that the student's laboratory competency evaluation be completed by the clinical mentor **in the presence of the student**, so as to allow verbal feedback to the student regarding the student's progress and performance. It is understood that not all laboratories will offer the same clinical experience, but mentors should try to accomplish all items in the checklist if the services are available at that location.

**Note:** As part of the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) accreditation regulations, no student may engage in **service work** during his/her clinical experience. All laboratory test results generated by students during their clinical hours must be directly supervised by clinical laboratory staff. While the student is performing their clinical hours, they must be performing duties as a student, and not an employee.

Course Instructor: \_\_\_\_\_

Mentors (list all for this course): \_\_\_\_\_

Facility: \_\_\_\_\_

1: Discussed: Process was discussed, principle explained, student acknowledges an understanding of the process or principle.

2: Demonstrated: Process has been performed and demonstrated by the practicum instructor. Student has observed demonstration and has been allowed to ask questions as needed. The student acknowledges an understanding of the process or principle by verbally explaining the process or principle back to the practicum instructor.

3: Practiced: Student has ***practiced*** the process under the direction and maximum supervision of the practicum instructor. The student demonstrates knowledge of how to perform the process or task by actual performance under direct, maximum supervision, but without having to demonstrate any particular competency at that task or process.

4: Maximum Supervision: The student has performed the process under the direct, maximum supervision of the practicum instructor, and with the level of competency required by the laboratory for that task or process.

5: Minimum Supervision: The student can perform the process satisfactorily with only minimum or non-direct supervision by the practicum instructor, and the performance meets the level of competency required by the laboratory for that task or process.

N/A: Not Available: The nature of the laboratory does not allow the student access to the equipment/test method.

Note: The competencies will be graded for a total of 100 pts. Points will be deducted for competency categories that are not met. If an item is not available at the lab, please N/A that area so the student does not lose points. If something is not available, but was discussed with the student, please write, "1 – N/A". Students must achieve a minimum of 80% on their competency checklist in order to pass. **N/A is not acceptable with criteria denoted as Mandatory, which is indicated with an "M" in the mandatory column.**

Please note that the goal of the lab competencies is for your mentor to feel comfortable with your ability in the micro lab. If your mentor does not feel that the minimum required time is adequate, you should work out a schedule with them to spend more time in the microbiology lab.

**Please have all mentors print their name, initial, sign and date below.**

Mentor Printed Name	Initials
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**Mentor Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

[illegible]

**Mentor Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

<b>Mentor Printed Name</b>	<b>Initials</b>
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**Mentor Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

Comments:

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Student: \_\_\_\_\_ Wildcat ID # \_\_\_\_\_

<b>Orientation and lab safety</b>	<b>Mandatory</b>	<b>Expected Score</b>	<b>Student Score</b>	<b>Date</b>	<b>Mentor initial</b>
Discuss Standard Precautions for microbiology.	M	1			
Discuss biosafety laboratory levels and precautions and PPE required at the facility	M	1			
<b>Basic laboratory skills</b>					
Demonstrate pipette accuracy and precision	M	5			
Identify components and cleaning/maintenance of microscope	M	3			
Demonstrate use of different objectives and focusing of scope	M	5			
Demonstrate proper biosafety cabinet procedures	M	5			
<b>Specimen set up &amp; incubation</b>					
Select proper primary media for specimens including plated media for aerobic culture, broth media, anaerobic, fungal media (if available), and slides for Gram stains	M	5			
Understand specimen collection & rejection criteria	M	5			
Incubate specimens properly including anaerobic and fungal cultures	M	5			
<b>Inoculation</b>					
Perform plate streaking for isolation & quantitative streaking for urines		5			
Subculture 10 samples with adequate isolation	M	5			
<b>Quality control</b>					
Perform quality control procedures in accordance with institutional policies for new media, reagents, and stock culture organisms		4			
Understand documentation and actions taken when results are not within acceptable limits		4			
<b>Gram staining</b>					
Discuss sputum rejection criteria		1			
Perform Gram stain procedure until proficient with minimal supervision	M	5			
Evaluate Gram stains, including sputum samples, wounds, CSF, body fluids and positive blood cultures until results are acceptable.	M	5			
Demonstrate proficiency in recognizing somatic cells in Gram stains	M	5			
Demonstrate proficiency in recognizing various Gram-positive cocci in Gram stains	M	5			
Demonstrate proficiency in recognizing various Gram-negative bacilli in Gram stains	M	5			
Demonstrate proficiency in recognizing various anaerobic bacteria in Gram stains					
<b>Evaluation of primary cultures</b>					
Evaluate cultures and discuss how to recognize what is resident flora and what is significant		4			
Evaluate throat cultures & recognize next course of action		4			
Evaluate urine cultures to decide when identification and susceptibility testing is warranted		4			
Evaluate stool cultures & discuss next course of action		4			
Evaluate body fluid cultures for potential pathogens		4			
Evaluate wound cultures, recognize what is significant, & select next course of action		4			
Evaluate respiratory cultures, including sputum cultures. Discuss respiratory flora & potential pathogens		4			
<b>Blood culture processing</b>					
Demonstrate procedure for processing positive blood cultures including subcultures, Gram stains, and proper reporting of results		4			
Demonstrate rapid identification and resistance marker detection from positive blood cultures		2			
<b>ID of organisms</b>					
Recognize and identify Streptococcus and Enterococcus species	M	4			

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Student: \_\_\_\_\_ Wildcat ID # \_\_\_\_\_

<b>ID of organisms (Continued)</b>	<b>Mandatory</b>	<b>Expected Score</b>	<b>Student Score</b>	<b>Date complete</b>	<b>Mentor initial</b>
Recognize and identify Staphylococcus species	M	4			
Recognize and identify Neisseria species		4			
Recognize and identify Gram negative bacilli	M	4			
Perform manual identification panels (e.g. API, RapID)	M	4			
Perform MALDI-TOF MS		4			
Perform automated identification systems		4			
Perform Spot Tests	M	4			
Recognize and identify Gram-positive bacilli in cultures	M	4			
Recognize and identify non-fermentative bacilli in cultures	M	4			
<b>Antimicrobials</b>					
Select appropriate pathogens to perform antimicrobial susceptibility testing. Setup and interpret antimicrobial tests i.e. disk diffusion, automated systems (Microscan, Vitek, etc.)		4			
Discuss guidelines for MIC and disk diffusion breakpoint ranges	M	1			
Discuss antimicrobial resistance: VRE, MRSA, VRSA, ESBL, CRE, CRAB, and CRPA	M	1			
<b>Anaerobic Bacteria</b>					
Select the proper anaerobic media for plating of specimens for anaerobic culture		4			
Discuss proper specimen collection, handling, and transport conditions pertaining to anaerobic bacteria		1			
Identify anaerobes in clinical specimens to the extent performed at your facility		3			
<b>Mycobacteria</b>					
Process mycobacteria specimens to the extent available at your facility		3			
Read acid-fast smears		3			
Observe mycobacterial molecular testing (DNA probes, GeneXpert, etc.)		2			
Observe weekly culture checks		2			
Discuss identification of the most common organisms		1			
<b>Viruses</b>					
Discuss cell culture		1			
Process specimens for viral procedures		3			
Perform RSV and Influenza testing		4			
<b>Parasites</b>					
Process and read specimens for O&P exams to the extent available at your facility		4			
Perform testing for Giardia antigen, <i>C. difficile</i> toxins, and other stool pathogen testing (as available at your facility)		3			
Evaluate specimens for blood parasites, including malaria antigen and stain (if available)		2			
<b>Mycology</b>					
Discuss proper specimen collection and transport issues related to Mycology		1			
Process specimens for fungal culture to the extent performed at this facility		3			
Observe Cryptococcal antigen detection testing (if available)		2			
<b>Interpretation and acceptance of results</b>					
Discuss recording, reporting, and documenting results		1			
Discuss which organisms are reportable to the State Health Department (state dependent)		1			
Discuss reporting and recording of critical/alert values		1			
<b>Molecular testing</b>					
Review molecular testing at your facility if available		1			

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Student: \_\_\_\_\_ Wildcat ID # \_\_\_\_\_

<b>Molecular Testing: (Continued)</b>		<b>Expected Score</b>	<b>Student Score</b>	<b>Date complete</b>	<b>Mentor initial</b>
Demonstrate MALDI-TOF testing		5			
Demonstrate the proper use of micropipettes		5			
Perform molecular detection, rapid methods		4			
Observe molecular detection, extraction, and real-time PCR		2			
Observe molecular detection, automated, high-volume platforms		2			
Observe sequencing prep and analysis		2			
<b>Student demonstrates honesty by:</b>					
Maintaining strict patient confidentiality	M	5			
Accepting control values only when within acceptable limits	M	5			
Properly performing and documenting daily & weekly maintenance procedures, preventative maintenance, temperature checks, etc.	M	5			
Completing all procedures in adherence to laboratory SOPs, taking no shortcuts or unauthorized modifications of procedure	M	5			
<b>Student demonstrates personal interactive skills and proper professional behavior by:</b>					
Working with co-workers in a positive manner, promoting productive workflow	M	5			
Refraining from making statements or actions that represent sexual, ethnic, racial, or homophobic harassment	M	5			
Willingly and consistently using appropriate personal safety devices when handling caustic, infectious, or hazardous materials	M	5			
Completing all required tasks and remaining in the work area when scheduled	M	5			
Being punctual whenever scheduled	M	5			
Adhering to current dress and appearance in the laboratory setting	M	5			
Cleaning the work area when leaving the laboratory, returning supplies to appropriate storage location, & disinfecting all work areas used by the student	M	5			
<b>Student demonstrates professional responsibility by:</b>					
Correctly reporting all patient test values, as well as recognizing and correctly reporting all patient critical test values	M	5			
Resolving discrepancies in specimen labeling, handling, or collection before reporting results	M	5			
<b>Hours completed by student:</b>		<b>Required Hours</b>	<b>Student Hours</b>	<b>Date Complete</b>	<b>Mentor Initial</b>
Note: The minimum time required in microbiology is 80 hours. However, mentors are encouraged to increase the number of hours dependent on individual student need. Please verify the number of hours your student spent in the lab:	M	80 hours			