

# Clinical Laboratory Science (Medical Laboratory Scientist)



Event Category: Health Professions.....

|                                                                  |                                          |                           |
|------------------------------------------------------------------|------------------------------------------|---------------------------|
| <b>Eligible Divisions:</b> Secondary & Postsecondary/ Collegiate | <b>Round One:</b> 50 Q test (60 minutes) | <b>Digital Upload:</b> NO |
| <b>Solo Event:</b> 1 competitor                                  | <b>Round Two:</b> Skill(s) assessment    |                           |



## New for 2026-2027

Medical Laboratory Scientist has been added to the event name. Added two pairs of disposable gloves to the competitors must provide list. Editorial changes have been made.

## TEXAS HOSA

**Make sure to read TEXAS General Rules and Regulations for updated “Electronic Device Policies” and “Extended Stay Preparation”.**

### Area Spring Leadership Conference

Round one online test for Area will be given in December. The top ten (10) competitors will advance to round two (2) in person at the Area Spring Leadership Conference. The top three (3) scores in each Area will advance to State.

### Texas State Leadership Conference

A Round 1 written exam will be used to slate the top ten (10) competitors for Round 2. Both Round 1 and Round 2 for State will be in person in Irving. The top three (3) scores from State will advance to ILC.

## Event Summary

Clinical Laboratory Science (Medical Laboratory Scientist) provides members with the opportunity to gain the knowledge and skills required for a traditional laboratory setting. This competitive event consists of two rounds. Round One is a written, multiple-choice test, and the top-scoring competitors advance to Round Two for the skills assessment. This event aims to inspire members to learn more about clinical/medical laboratory careers.

## Sponsorship

|                                                                                                                            |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HOSA-Future Health Professionals appreciates the sponsorship of this event by <a href="#">Charles River Laboratories</a> . |  |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|

## General Event Information

|                                 |                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General Rules</b>            | Competitors must be familiar with and adhere to the <a href="#">General Rules and Regulations</a> .                                                                                                                                                                                                                                            |
| <b>Dress Code</b>               | Proper business attire or official HOSA uniform. Bonus points will be awarded for <a href="#">proper dress</a> . <ul style="list-style-type: none"><li>• Round One: Proper business attire, official HOSA uniform, or attire appropriate to the occupational area.</li><li>• Round Two: Attire appropriate to the occupational area.</li></ul> |
| <b>Competitors Must Provide</b> | <ul style="list-style-type: none"><li>• <a href="#">Photo ID</a> for both rounds</li></ul>                                                                                                                                                                                                                                                     |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | <ul style="list-style-type: none"> <li>• Two #2 lead pencils (not mechanical) with eraser for the test.</li> <li>• Neon colored foam earplugs, NOT earbuds, for noise control (Rd1-optional)</li> <li>• Safety glasses or goggles</li> <li>• Disposable gown (PPE)</li> <li>• Disposable non-latex gloves (2 pairs)</li> <li>• Full-face shield (or equivalent PPE)</li> <li>• Disposable masks with ties or loops</li> </ul> <p>HOSA Conference Staff will provide equipment and supplies listed in <a href="#">Appendix I</a>.</p>                                                                                                                                                                                                                                         |
| <b>Official References</b> | <p>The references below are used in the development of the test questions and skill rating sheets</p> <ul style="list-style-type: none"> <li>• <a href="#">Estridge and Reynolds. <i>Basic Clinical Laboratory Techniques</i>. Cengage Learning. Latest edition.</a></li> <li>• <a href="#">Simmers, L., Simmers-Nartker, K., Simmers-Kobelak, S. &amp; Morris, L. <i>DHO: Health Science</i>. Cengage Learning. Latest edition.</a> (Skills only)</li> <li>• <a href="#">OneLabREACH</a> <ul style="list-style-type: none"> <li>○ Fundamentals of Bloodborne Pathogens</li> <li>○ Fundamentals of Laboratory Safety</li> <li>○ Fundamentals of Personal Protective Equipment (PPE) in Clinical Laboratories</li> <li>○ Routine Microscopy Procedures</li> </ul> </li> </ul> |

## ROUND ONE- Test

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Instructions</b>            | All competitors will receive a test and answer sheet. The written test will consist of 50 multiple-choice items in a maximum of 60 minutes. See test instructions <a href="#">here</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Time Remaining Announcements</b> | There will be NO verbal announcements for time remaining during ILC testing. All ILC testing will be completed in the Testing Center, and competitors are responsible for monitoring their own time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Written Test Plan</b>            | <p>The written test for CLS/MLS is:</p> <ul style="list-style-type: none"> <li>• Clinical Lab Professions - 8%</li> <li>• Biological Safety - 12%</li> <li>• Laboratory Math - 6%</li> <li>• Hematology &amp; Hemostasis - 14%</li> <li>• Immunology - 16%</li> <li>• Urinalysis - 8%</li> <li>• Clinical Chemistry - 14%</li> <li>• Clinical Microbiology - 14%</li> <li>• Parasitology - 8%</li> </ul>                                                                                                                                                                                                                                                                                                                                                             |
| <b>Sample Test Questions</b>        | <ol style="list-style-type: none"> <li>1. What is the title for a person with a high school diploma or GED that has been trained to collect blood specimens for laboratory testing? (Estridge pp 25-26)             <ol style="list-style-type: none"> <li>A. Medical laboratory assistant</li> <li>B. Laboratory manager</li> <li><b>C. Phlebotomy technician</b></li> <li>D. Medical laboratory technician</li> </ol> </li> <li>2. Which of the following solutions is a common disinfectant used to clean laboratory work surfaces before and after each use? (Estridge pp 56)             <ol style="list-style-type: none"> <li>A. 40% alcohol</li> <li>B. 2% iodine</li> <li>C. 50% formaldehyde</li> <li><b>D. 10% chlorine bleach</b></li> </ol> </li> </ol> |

3. What does 95 mean in N95 respirators? (Lab One PPE Module)
  - A. 95% effective
  - B. removes at least 95% of particulates of a certain size**
  - C. should be worn by laboratory staff 95% of the time
  - D. removes 95% of all particulates

## ROUND TWO- Skills Assessment

1. The top competitors from Round One will advance to Round Two. The number of advancing competitors will be determined by the scores obtained in Round One and the space and time available for Round Two. Round Two finalists will be announced on-site at ILC per the conference agenda.

2. Round Two is a selected skill(s) performance. The Round Two skills approved for this event are:

|                                                                                                                                                      |                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Skill I: Identifying Laboratory Instruments/Equipment</b> ( <i>Including name of instrument/equipment and purpose or use.</i> ) (See table below) | <b>15 minutes</b> |
| <b>Skill II: Infection control and transmission-based precautions</b>                                                                                | <b>5 minutes</b>  |
| <b>Skill III: Using a microscope</b>                                                                                                                 | <b>10 minutes</b> |
| <b>Skill IV: ABO Grouping</b>                                                                                                                        | <b>6 minutes</b>  |
| <b>Skill V-A: Preparing a Blood Film or Smear</b>                                                                                                    | <b>5 minutes</b>  |
| <b>Skill V-B: Staining a Blood Film or Smear</b>                                                                                                     | <b>10 minutes</b> |
| <b>Skill VI: Physical Examination of Urine</b>                                                                                                       | <b>6 minutes</b>  |
| <b>Skill VII: Inoculate and Streak Agar Plate</b>                                                                                                    | <b>5 minutes</b>  |

3. For all skills, body fluids will be simulated products.

Below is the list of instruments/equipment used for the **Skill I: Identifying Laboratory Instruments/Equipment skill**. This skill could be 15 numbered photos or instruments. This skill may be administered with the Round One written test. If this skill is administered with the test, the skill allotted time will be added to the test allotted time.

|                                   |                                            |                                            |                                    |
|-----------------------------------|--------------------------------------------|--------------------------------------------|------------------------------------|
| 24-hr Urine Specimen Container    | Clinical Centrifuge                        | N95 Respirator                             | Single-Use Lancet                  |
| Acetest                           | Coagulation Instrument                     | Needleless Transfer Device                 | Slide Staining Rack                |
| Agar Plate                        | Culture Swabs & Transport Tubes            | Perianal Paddle Kit                        | Sterile Vacuum Tube for Urine      |
| Acrylic Shield                    | Disposable Needle Holder with Safety Guard | pH Indicator Strips                        | Stool Specimen Container           |
| Analytical Balance                | Electric Incinerator                       | pH Meter                                   | Tabletop Autoclave                 |
| Automatic Slide Stainer           | Emergency Eye Wash Station                 | Pipet Aids                                 | Test Tubes                         |
| Bacteriological Incubator         | Erlenmeyer Flask                           | Plastic Vacuum Tubes                       | Top-Loading Balance                |
| Beakers                           | Fume Hood                                  | Platelet Aggregation Profiler              | Tourniquet                         |
| Beral (Transfer) Pipette          | Glucose Meter                              | Point-of-Care Coagulation Analyzer         | Transmission Electronic Microscope |
| Binocular Bright-Field Microscope | Graduated Cylinders                        | Rapid-Latex Agglutination Test for D-Dimer | Urine Particle Analyzer            |
| Blood Collection Tubes            | Hemocytometer                              | Refractometer                              | Urine Reagent Strip                |
| Blood Bank Refrigerator           | Inoculating Loop                           | Saf-T Wing Blood Collection Set            | Urine Sterile Collecting Straw     |
| Candle Jar                        | Manual Differential Cell Counter           | Safety Shower                              | Urine Strip Reader                 |
| Capillary Collection Vials        | Microhematocrit Centrifuge                 | Safety Syringes                            | Urinometer                         |

|                                           |                                        |                              |                  |
|-------------------------------------------|----------------------------------------|------------------------------|------------------|
| Chromatographic Immunoassay for Urine hCG | Microhematocrit Tubes with Sealant Pad | Scanning Electron Microscope | Volumetric Flask |
| Clean-Catch Urine Collection Kit          | Micropipettes                          | Serological Centrifuge       |                  |

- The selected skill(s) will be presented to competitors as a written scenario at the beginning of the round. The scenario will be the same for each competitor. A sample scenario can be found [here](#). Some scenarios may involve the combination of multiple skills. If the event rating sheets are combined, it is not necessary to repeat a task a second time. An example would be competitors would not need to identify the patient twice.
- Timing will begin when the scenario is presented to the competitors and will be stopped at the end of the time allowed. The scenario is a secret topic. Competitors MAY NOT discuss or reveal the secret topic until after the event has concluded or will face penalties per [the GRRs](#).
- Competitors must complete all skill steps listed in the guidelines, even if the steps must be simulated/verbalized. (If the equipment is available, the competitors would complete all skill steps as the scenario warrants. The competitors will simulate/verbalize the steps if the equipment is unavailable.)
- Judges will provide information to competitors as directed by the rating sheets. Competitors may ask questions of the judges while performing skills, if the questions relate to patient's condition and will be included in the scenario or judge script.
- Competitors must use all equipment correctly and safely. Judges will stop a student and not award points for a step if they see a competitor is about to cause a risk of harm or about to damage equipment or other supplies.

## Final Scoring

- The competitor must earn a score of 70% or higher on the combined skill(s) in Round Two-Skills Assessment (excluding the test and ID lab equipment) to be recognized as an award winner at the ILC.
- The final rank is determined by adding the round one test score plus the round two skill score. In the event of a tie, the highest test score will be used to determine the final placement.

## Future Opportunities

The HOSA Scholarship program has funding available for HOSA members who have an interest in various health careers! The application process begins January 1, 2027, and can be found here: <https://hosa.org/scholarships/>.

Graduating from high school or completing your postsecondary/collegiate program does not mean your HOSA journey has to end. As a HOSA member, you are eligible to become a HOSA Lifetime Alumni Member- a free and valuable opportunity to remain connected, give back, and help to shape the future of the organization. Learn more and sign up at [hosa.org/alumni](https://hosa.org/alumni).

# Clinical Laboratory Science (Medical Laboratory Scientist)

## Skill I: Identify Laboratory Instruments/Equipment

Time: 15 minutes

Competitor #: \_\_\_\_\_ Division: \_\_\_\_SS\_\_\_\_PS/C Judge's Signature: \_\_\_\_\_

|                                          | Name of Instrument | Points (1 each for name & spelling) |   |   | Purpose of Use                     | One point for correct purpose/use |   |
|------------------------------------------|--------------------|-------------------------------------|---|---|------------------------------------|-----------------------------------|---|
| 1.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 2.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 3.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 4.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 5.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 6.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 7.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 8.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 9.                                       |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 10.                                      |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 11.                                      |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 12.                                      |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 13.                                      |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 14.                                      |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| 15.                                      |                    | 2                                   | 1 | 0 |                                    | 1                                 | 0 |
| Total ID & Spelling (30 possible): _____ |                    |                                     |   |   | Total Purpose (15 possible): _____ |                                   |   |
| Total Points (45 possible): _____        |                    |                                     |   |   |                                    |                                   |   |

# Clinical Laboratory Science (Medical Laboratory Scientist)

## Skill II: Infection Control & Transmission-Based Precautions

Time: 5 minutes

Competitor #: \_\_\_\_\_ Division: \_\_\_\_SS\_\_\_\_PS/C Judge's Signature: \_\_\_\_\_

|                                                                                                                                               | Skill II: Infection Control & Transmission-Based Precautions                                                                                 | Possible | Awarded |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| 1.                                                                                                                                            | Assembled equipment and PPE (Personal Protective Equipment– including gloves, mask and gown).                                                | 2      0 |         |
| 2.                                                                                                                                            | Removed jewelry and personal items.                                                                                                          | 1      0 |         |
| <b>Note to Judge: If the competitor completed the handwashing steps score #3 a-e. If the competitor used antiseptic handrub score #4 a-b.</b> |                                                                                                                                              |          |         |
| 3.                                                                                                                                            | <b>Washed hands using antiseptic soap:</b>                                                                                                   | 2      0 |         |
|                                                                                                                                               | a. Turned on warm water using a paper towel to turn the faucet handle, then discarded the towel                                              |          |         |
|                                                                                                                                               | b. Dispensed soap into hands, then rubbed fronts and backs of hands and between fingers vigorously for 15 – 30 seconds.                      | 2      0 |         |
|                                                                                                                                               | c. Rinsed hands, fingertips downward, under warm running water.                                                                              | 1      0 |         |
|                                                                                                                                               | d. Used clean towel to dry hands and turn off faucet.                                                                                        | 1      0 |         |
|                                                                                                                                               | e. Disposed of towel, touching only the clean side.                                                                                          | 1      0 |         |
| 4.                                                                                                                                            | <b>Used waterless antiseptic handrub:</b>                                                                                                    | 2      0 |         |
|                                                                                                                                               | a. Applied handrub to palm of hand and rubbed hands together vigorously for at least 15 seconds, covering all surfaces of hands and fingers. |          |         |
|                                                                                                                                               | b. Continued skill until all alcohol has evaporated and hands are completely dry.                                                            | 1      0 |         |
| <b>*Steps for donning PPE must be performed in the order listed below.</b>                                                                    |                                                                                                                                              |          |         |
| 5.                                                                                                                                            | <b>Donning gown:</b>                                                                                                                         | 1      0 |         |
|                                                                                                                                               | a. Slipped arms into the sleeves of a gown, being careful to touch only the inside of the gown.                                              |          |         |
|                                                                                                                                               | b. Secured gown at neck and back of waist, covering clothing completely.                                                                     | 1      0 |         |
| 6.                                                                                                                                            | <b>Donned mask:</b>                                                                                                                          | 1      0 |         |
|                                                                                                                                               | a. Picked up mask and place it over the mouth and nose, being careful not to touch the face with the fingers.                                |          |         |
|                                                                                                                                               | b. Secured the mask by tying or looping over the ears.                                                                                       | 1      0 |         |
| 7.                                                                                                                                            | <b>Donned gloves</b>                                                                                                                         | 2      0 |         |
|                                                                                                                                               | a. Adjusted gloves to cover arm and sleeve of gown.                                                                                          | 2      0 |         |
| <b>*Judge states, "Skill is completed, remove PPE."</b>                                                                                       |                                                                                                                                              |          |         |
| 8.                                                                                                                                            | <b>Removing gown:</b>                                                                                                                        | 2      0 |         |
|                                                                                                                                               | a. Untied the waist ties and loosened the gown at the waist.                                                                                 |          |         |
| 9.                                                                                                                                            | <b>Removing gloves:</b>                                                                                                                      | 2      0 |         |
|                                                                                                                                               | a. Removed the gloves by folding them down and turning them inside out, avoiding touching the outside of the gloves.                         |          |         |
| 10.                                                                                                                                           | Discarded gloves in biohazard receptacle.                                                                                                    | 1      0 |         |

| Skill II: Continued...                                                                                                                                                                             |                                                                                                                | Possible     | Awarded |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------|---------|
| 11.                                                                                                                                                                                                | Untied gown ties at neck                                                                                       | 1 0          |         |
| 12.                                                                                                                                                                                                | Removed gown by pulling down from the neck and slipping hands back into gown sleeve, touching only the inside. | 2 0          |         |
| 13.                                                                                                                                                                                                | Folded the gown down over the arms inside-out and discarded in a biohazard receptacle.                         | 1 0          |         |
| 14.                                                                                                                                                                                                | <b>Removed mask:</b>                                                                                           | 2 0          |         |
|                                                                                                                                                                                                    | a. Untied bottom ties first followed by the top ties or removed from behind ears                               | 2 0          |         |
|                                                                                                                                                                                                    | b. Held the mask by the ties and discarded in biohazard receptacle.                                            | 2 0          |         |
| 15.                                                                                                                                                                                                | Washed hands or used antiseptic hand-rub for hand hygiene.                                                     | 2 0          |         |
| <b>Total Points- Skill II: Handwashing</b><br>70% Mastery for Skill II-Handwashing: 23.1<br><b>Total Points- Skill II: Antiseptic Handrub</b><br>70% Mastery for Skill II-Antiseptic Handrub: 20.3 |                                                                                                                | 33<br><br>29 |         |

# Clinical Laboratory Science (Medical Laboratory Scientist)

## Skill III: Using a Microscope

Time: 10 minutes

**Competitor #:** \_\_\_\_\_ **Division:** \_\_\_\_SS\_\_\_\_PS/C **Judge's Signature:** \_\_\_\_\_

NOTE: For the purpose of this skill performance, a monocular microscope is recommended. If a binocular microscope is used, the normal step of adjusting the oculars to fit the interpupillary distance of the user is omitted because of the need for the judge to see the image as well and to save the time the frequent adjustments would cause.

|     | Skill III: Using a Microscope                                                                                                                                                           | Possible | Awarded |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| 1.  | Washed hands or used alcohol-based hand-rub for hand hygiene.                                                                                                                           | 2 0      |         |
| 2.  | Assembled equipment and materials.                                                                                                                                                      | 1 0      |         |
| 3.  | Used lens paper to clean the eyepiece and the objectives.                                                                                                                               | 1 0      |         |
| 4.  | Used the coarse adjustment to raise the nosepiece unit (if applicable).                                                                                                                 | 1 0      |         |
| 5.  | Raised the condenser as far as possible by adjusting the condenser knob.                                                                                                                | 1 0      |         |
| 6.  | Rotated the low power (10x) objective into position, so it is directly over the condenser.                                                                                              | 1 0      |         |
| 7.  | Turned on the microscope light.                                                                                                                                                         | 1 0      |         |
| 8.  | Opened the iris diaphragm until maximum light comes up through the condenser.                                                                                                           | 1 0      |         |
| 9.  | Placed and secured the prepared slide on the stage (specimen side up).                                                                                                                  | 1 0      |         |
| 10. | Positioned the condenser so it is almost touching the bottom of the slide.                                                                                                              | 1 0      |         |
| 11. | Located the coarse adjustment and looked directly at the stage and low power objective and turned the coarse adjustment until the objective is as close to the slide as it will go.     | 1 0      |         |
| 12. | Looked into the ocular(s) and slowly turned the coarse adjustment in the opposite direction to raise the objective (or lower the stage) until the object on the slide comes into focus. | 1 0      |         |
| 13. | Changed to the fine adjustment and turned the knob until the object came into finest focus.                                                                                             | 1 0      |         |
| 14. | <b>**JUDGE looked in the objective and confirmed the fine focus.</b>                                                                                                                    | 2 0      |         |
| 15. | a. Rotated the high power objective (40X) into position while observing the objective and the slide to see that the objective does not strike the slide.                                | 1 0      |         |
|     | b. Looked through the ocular(s) to view the object on the slide.                                                                                                                        | 1 0      |         |
|     | c. Located the fine adjustment and turned it until the object is in fine focus WITHOUT using the coarse adjustment.                                                                     | 1 0      |         |
| 16. | Rotated the oil-immersion objective slightly to the side.                                                                                                                               | 1 0      |         |
| 17. | Placed one drop of immersion oil on the portion of the slide that will be directly over the condenser.                                                                                  | 1 0      |         |
| 18. | a. Rotated the oil-immersion objective into position, being careful not to rotate the high-power objective through the oil.                                                             | 1 0      |         |
|     | b. Looked to see that the oil-immersion objective is touching the drop of oil.                                                                                                          | 1 0      |         |



| Skill III: Continued...                                     |                                                                                                                                 | Possible |   | Awarded |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------|---|---------|
| 19.                                                         | Looked through the ocular(s) and slowly turned the fine adjustment until the image is in fine focus                             | 1        | 0 |         |
| 20.                                                         | <b>**JUDGE looked in the objective and confirmed the fine focus.</b>                                                            | 2        | 0 |         |
| 21.                                                         | Rotated the low power (10X) objective into position, making sure no other objective comes in contact with the oil on the slide. | 1        | 0 |         |
| 22.                                                         | Removed the slide from the microscope stage, gently blotted the oil from the slide, and returned the slide to the slidebox.     | 1        | 0 |         |
| 23.                                                         | Cleaned the oculars and low and high power objectives with clean lens paper and lens cleaner.                                   | 1        | 0 |         |
| 24.                                                         | Cleaned the oil-immersion objective with lens paper and lens cleaner to remove all oil.                                         | 1        | 0 |         |
| 25.                                                         | Cleaned all oil from the microscope stage and condenser.                                                                        | 1        | 0 |         |
| 26.                                                         | Positioned the nosepiece in the lowest position using the coarse adjustment.                                                    | 1        | 0 |         |
| 27.                                                         | Turned off the microscope light and disconnected the microscope from power source.                                              | 1        | 0 |         |
| 28.                                                         | Centered the stage so it does not project from either side of the microscope and covered the microscope.                        | 1        | 0 |         |
| 29.                                                         | Cleaned the work area with disinfectant.                                                                                        | 2        | 0 |         |
| 30.                                                         | Washed hands or used alcohol-based hand-rub for hand hygiene.                                                                   | 2        | 0 |         |
| Total Points- Skill III:<br>70% Mastery for Skill III: 26.6 |                                                                                                                                 | 38       |   |         |

# Clinical Laboratory Science (Medical Laboratory Scientist)

## Skill IV: ABO Grouping

Time: 6 minutes

Competitor #: \_\_\_\_\_ Division: \_\_\_\_SS\_\_\_\_PS/C Judge's Signature: \_\_\_\_\_

|                                                                  | Skill IV: ABO Grouping                                                                                                   | Possible  | Awarded |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------|---------|
| 1.                                                               | Assembled equipment and materials.                                                                                       | 1 0       |         |
| 2.                                                               | Washed hands or used alcohol-based hand-rub for hand hygiene and put on gloves.                                          | 2 0       |         |
| 3.                                                               | Perform slide grouping as follows:                                                                                       | 2 0       |         |
|                                                                  | a. Obtained a slide with two wells and labeled the slide with the patient's name.                                        | 2 0       |         |
|                                                                  | b. Placed three drops of the patient's blood in each of the A and B wells. Did not allow the dropper to touch the slide. | 2 0       |         |
|                                                                  | c. Placed three drops of the anti-A serum in the A well.                                                                 | 2 0       |         |
|                                                                  | d. Placed three drops of the anti-B serum in the B well.                                                                 | 2 0       |         |
|                                                                  | e. Obtained two toothpicks (or disposable stirrers). Stirred each well with a separate clean stirrer for 30 seconds.     | 2 0       |         |
|                                                                  | f. Stirring motion was effective. Avoided splattering the simulated blood.                                               | 2 0       |         |
|                                                                  | g. Recorded agglutination results on ABO worksheet.                                                                      | 2 0       |         |
|                                                                  | h. Accurately determined the agglutination, blood type, and transfusion responses on the Laboratory Report form.         | 3 0       |         |
| 4.                                                               | Discarded disposable labware into appropriate biohazard receptacle.                                                      | 1 0       |         |
| 5.                                                               | Returned simulated blood, reagents and unused equipment to proper storage.                                               | 2 0       |         |
| 6.                                                               | Removed gloves and discarded into biohazard receptacle                                                                   | 2 0       |         |
| 7.                                                               | Washed hands or used alcohol-based hand-rub for hand hygiene.                                                            | 2 0       |         |
| <b>Total Points- Skill IV:</b><br>70% Mastery for Skill IV: 18.9 |                                                                                                                          | <b>27</b> |         |

Competitor #: \_\_\_\_\_

\*Each competitor will receive a copy of this form to complete during the skill demonstration.

## Clinical Laboratory Science (Medical Laboratory Scientist)

# ABO Laboratory Report

Patient Identification:

DATE:

Blood Type Analysis:

Agglutination Reaction:

| Patient | Anti-A Serum | Anti-B Serum | Blood Type |
|---------|--------------|--------------|------------|
|         |              |              |            |

1. If the patient needed a transfusion, what blood type(s) could this patient safely receive?

\_\_\_\_\_

2. What blood type(s) could safely receive this patient's blood?

\_\_\_\_\_

# Clinical Laboratory Science (Medical Laboratory Scientist)

## Skill V-A: Preparing a Blood Film or Smear

Time: 5 minutes

Competitor #: \_\_\_\_\_ Division: \_\_\_\_\_ SS \_\_\_\_\_ PS/C Judge's Signature: \_\_\_\_\_

|                                                                     | Skill V-A: Preparing a Blood Film or Smear                                                                                      | Possible  | Awarded |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------|---------|
| 1.                                                                  | Assembled equipment and materials.                                                                                              | 1 0       |         |
| 2.                                                                  | Washed hands or used alcohol-based hand-rub for hand hygiene.                                                                   | 2 0       |         |
| 3.                                                                  | Put on gloves, gown, mask or face shield, and protective eyewear.                                                               | 2 0       |         |
| 4.                                                                  | Used an alcohol swab to clean the slide and cover slip.                                                                         | 1 0       |         |
| 5.                                                                  | Checked both for defects and chips                                                                                              | 2 0       |         |
| 6.                                                                  | Placed a small drop of blood on the slide approximately $\frac{3}{4}$ inch from the end of the slide and centered on the slide. | 1 0       |         |
| 7.                                                                  | The blood drop is approximately 2 mm in diameter, or the size of a match head.                                                  | 1 0       |         |
| 8.                                                                  | Placed the edge of the coverslip or spreader slide in front of the blood on the slide.                                          | 1 0       |         |
| 9.                                                                  | Held the spreader slide at a 30-35 degree angle.                                                                                | 1 0       |         |
| 10.                                                                 | Pulled the spreader back until it touches the blood.                                                                            | 1 0       |         |
| 11.                                                                 | Held spreader steady while the blood spreads evenly to the edges of the spreader slide.                                         | 1 0       |         |
| 12.                                                                 | Used a firm, steady movement to push the spreader to the opposite end of the slide.                                             | 1 0       |         |
| 13.                                                                 | Motion was continuous and smooth with spreader in contact with slide at all times.                                              | 1 0       |         |
| 14.                                                                 | Finished by raising the spreader in a smooth, low arc.                                                                          | 1 0       |         |
| 15.                                                                 | Placed disposable coverslip or spreader slide in sharps container.                                                              | 2 0       |         |
| 16.                                                                 | Allowed the slide to air-dry                                                                                                    | 1 0       |         |
| 17.                                                                 | Judge verifies that the smear is approximately 1 $\frac{1}{2}$ inches long, smooth, thin and with even margins on all sides.    | 4 0       |         |
| 18.                                                                 | Labeled the slide with the patient's name, doctor's name and ID number.                                                         | 2 0       |         |
| 19.                                                                 | Cleaned and replaced all equipment.                                                                                             | 2 0       |         |
| 20.                                                                 | Used a disinfectant to wipe the counter and any contaminated area.                                                              | 2 0       |         |
| 21.                                                                 | Removed PPE and discarded properly in an infectious waste bag.                                                                  | 2 0       |         |
| 22.                                                                 | Washed hands or used alcohol based hand-rub for hand hygiene.                                                                   | 2 0       |         |
| <b>TOTAL POINTS – SKILL V-A:</b><br>70% Mastery for Skill V-A: 23.8 |                                                                                                                                 | <b>34</b> |         |

# Clinical Laboratory Science (Medical Laboratory Scientist)

## Skill V-B: Staining a Blood Film or Smear

Time: 10 minutes

Competitor #: \_\_\_\_\_ Division: \_\_\_\_SS\_\_\_\_PS/C Judge's Signature: \_\_\_\_\_

|                                                              | Skill V-B: Staining a Blood Film or Smear                                                                     | Possible | Awarded |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------|---------|
| 1.                                                           | Assembled equipment and materials.                                                                            | 1 0      |         |
| 2.                                                           | Washed hands or used alcohol-based hand-rub for hand hygiene.                                                 | 1 0      |         |
| 3.                                                           | Put on gloves and if splashing of blood is possible put on gown, mask or face shield, and protective eyewear. | 2 0      |         |
| 4.                                                           | Obtained blood smear film.                                                                                    | 1 0      |         |
| 5.                                                           | Placed the slide with the smear side up on the staining rack.                                                 | 1 0      |         |
| 6.                                                           | Made sure the staining rack is level.                                                                         | 1 0      |         |
| 7.                                                           | Stained with Wright's stain.                                                                                  | 1 0      |         |
|                                                              | a. Completely covered the dry smear with staining.                                                            | 1 0      |         |
|                                                              | b. Counted out loud the number of drops of stain used as applied.                                             | 1 0      |         |
|                                                              | c. Verbalized stain left in place and timed for 1 -3 minutes.                                                 | 1 0      |         |
| 8.                                                           | Distilled water or Buffer in equal amount with stain:                                                         | 1 0      |         |
|                                                              | a. Placed distilled water or buffer on slide one drop at a time in equal amount of stain.                     | 1 0      |         |
|                                                              | b. Between drops, blew gently along the length of the slide to mix the stain and water.                       | 1 0      |         |
|                                                              | c. Verbalized allowed to stand and timed for 2 - 4 minutes.                                                   | 1 0      |         |
| 9.                                                           | <b><i>Judge verifies that solution is well mixed as noted by oily, green sheen appearing.</i></b>             | 4 0      |         |
| 10.                                                          | Washed the slide by flooding gently with distilled water.                                                     | 1 0      |         |
| 11.                                                          | Cleaned and replaced all equipment.                                                                           | 2 0      |         |
| 12.                                                          | Used a disinfectant to wipe the counter and any contaminated area.                                            | 2 0      |         |
| 13.                                                          | Removed PPE and discarded properly in an infectious waste bag.                                                | 2 0      |         |
| 14.                                                          | Washed hands or used alcohol based hand-rub for hand hygiene.                                                 | 2 0      |         |
| TOTAL POINTS -- SKILL V-B<br>70% Mastery for Skill V-B: 18.2 |                                                                                                               | 26       |         |

# Clinical Laboratory Science (Medical Laboratory Scientist)

## Skill VI: Physical Examination of Urine

Time: 6 minutes

**Competitor #:** \_\_\_\_\_ **Division:** \_\_\_\_SS\_\_\_\_PS/C **Judge's Signature:** \_\_\_\_\_

|     | <b>Skill VI: Physical Examination of Urine</b>                                                                                       | <b>Possible</b> | <b>Awarded</b> |
|-----|--------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------|
| 1.  | Assembled equipment and materials.                                                                                                   | 1 0             |                |
| 2.  | Washed hands or used alcohol-based hand-rub for hand hygiene.                                                                        | 2 0             |                |
| 3.  | Put on gloves and face protection.                                                                                                   | 2 0             |                |
| 4.. | Obtained recently collected urine specimen.                                                                                          | 1 0             |                |
| 5.  | Completed demographic information on the Laboratory Form, as received in the skill scenario.                                         | 4 0             |                |
| 6.  | Mixed urine by gently swirling & pouring approximately 10 mL into a clear, conical centrifuge tube.                                  | 1 0             |                |
| 7.  | Observed the color of the urine and recorded it on Laboratory Report Form.                                                           | 4 0             |                |
| 8.  | Observed and recorded the transparency of the urine.                                                                                 | 4 0             |                |
| 9.  | Noted the odor of the urine and record it in the comment section of the Laboratory Report Form.                                      | 4 0             |                |
| 10. | Measured specific gravity using the refractometer.                                                                                   |                 |                |
|     | a. Placed 1 drop of distilled water on the glass plate of the refractory and closed gently.                                          | 1 0             |                |
|     | b. Looked through the ocular and read the specific gravity.                                                                          | 1 0             |                |
|     | c. If water does not read 1.000; calibrated the refractometer.                                                                       | 2 0             |                |
|     | d. Disinfected the refractometer glass plate and cover by rinsing with 1 or 2 drops of water and then drying with laboratory tissue. | 2 0             |                |
|     | e. Used a transfer pipette or eye dropper to place 1 drop of well-mixed urine on the glass plate of the refractometer.               | 1 0             |                |
|     | f. Closed the lid gently.                                                                                                            | 1 0             |                |
|     | g. Looked through the ocular and read the specific gravity on the scale.                                                             | 1 0             |                |
| 11. | Recorded the specific gravity accurately on the Laboratory Report Form.                                                              | 4 0             |                |
| 12. | Cleaned refractometer using lens paper with a disinfectant for cleaning and returned to proper storage                               | 2 0             |                |
| 13. | Verbalized disposing of urine specimen.                                                                                              | 2 0             |                |
| 14. | Cleaned the work area with disinfectant.                                                                                             | 2 0             |                |
| 15. | Disposed of PPE appropriately.                                                                                                       | 2 0             |                |
| 16. | Washed hands or used alcohol-based hand-rub for hand hygiene.                                                                        | 2 0             |                |

|                                                                                                                             |           |  |
|-----------------------------------------------------------------------------------------------------------------------------|-----------|--|
| <b>TOTAL POINTS -- SKILL VI: Calibration of refractor</b><br>70% Mastery for Skill VI: Calibration of refractor= 32.2       | <b>46</b> |  |
| <b>TOTAL POINTS -- SKILL VI: No calibration of refractor</b><br>70% Mastery for Skill VI: No calibration of refractor= 30.8 | <b>44</b> |  |

|                                                                                                           |                    |
|-----------------------------------------------------------------------------------------------------------|--------------------|
| Competitor #: _____                                                                                       |                    |
| <b>Clinical Laboratory Science (Medical Laboratory Scientist)</b><br><b>Physical Examination of Urine</b> |                    |
| <b>Patient:</b> _____                                                                                     | <b>DATE:</b> _____ |
| <b>Date of Birth:</b> _____                                                                               |                    |
| <b>Gender:</b> _____                                                                                      |                    |

| Observation                                                                                                                                                                                      | Patient Results                                                                                    | Reference Values     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------|
| Transparency (appearance): <ul style="list-style-type: none"> <li>• Clear</li> <li>• Hazy (slightly cloudy)</li> <li>• Cloudy (turbid)</li> <li>• Milky (opalescent)</li> <li>• Other</li> </ul> | Place an X on the appearance that matches the sample.<br>_____<br>_____<br>_____<br>_____<br>_____ | <i>Clear</i>         |
| Color:                                                                                                                                                                                           | _____                                                                                              | Pale yellow to amber |
| Specific gravity:                                                                                                                                                                                | _____                                                                                              | 1.010-1.025          |

**Comments:**

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# Clinical Laboratory Science (Medical Laboratory Scientist)

## Skill VII: Inoculate and Streak Agar Plate

Time: 5 minutes

Competitor #: \_\_\_\_\_ Division: \_\_\_\_SS\_\_\_\_PS/C Judge's Signature: \_\_\_\_\_

|     | Skill VII: Inoculate and Streak Agar Plate                                                                                                                                                                          | Possible | Awarded |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| 1.  | Assembled materials and equipment.                                                                                                                                                                                  | 1 0      |         |
| 2.  | Used alcohol-based handrub and put on gloves and face protection.                                                                                                                                                   | 2 0      |         |
| 3.  | Selected an agar plate to be inoculated and labeled the bottom with a marker.                                                                                                                                       | 1 0      |         |
| 4.  | Selected an inoculated swab                                                                                                                                                                                         | 1 0      |         |
| 5.  | Placed package of sterile disposable loops within reach.                                                                                                                                                            | 1 0      |         |
| 6.  | Removed pre-inoculated swab from package.                                                                                                                                                                           | 1 0      |         |
| 7.  | Opened the lid of the agar plate just enough to insert the swab.                                                                                                                                                    | 1 0      |         |
| 8.  | Spread the inoculum over the surface of one quadrant of the agar plate.                                                                                                                                             | 1 0      |         |
| 9.  | Replaced the lid on the agar plate.                                                                                                                                                                                 | 1 0      |         |
| 10. | Disposed of swab in biohazard receptacle.                                                                                                                                                                           | 1 0      |         |
| 11. | Picked up a sterile disposable loop and lifted the lid of the agar plate just enough to be able to insert the inoculating loop.                                                                                     | 1 0      |         |
| 12. | a. Streaked the second quadrant of the plate by touching the loop into the first quadrant and streaking all the way across the second quadrant, and                                                                 | 1 0      |         |
|     | b. Made six to eight strokes.                                                                                                                                                                                       | 1 0      |         |
| 13. | Disposed of loop in biohazard receptacle.                                                                                                                                                                           | 2 0      |         |
| 14. | Picked up a sterile disposable loop and lifted the lid of the agar plate just enough to be able to insert the inoculating loop.                                                                                     | 1 0      |         |
| 15. | a. Streaked the third quadrant by touching the loop into the second quadrant and streaking into the third quadrant, and                                                                                             | 1 0      |         |
|     | b. Made six to eight strokes.                                                                                                                                                                                       | 1 0      |         |
| 16. | Disposed of loop in biohazard receptacle.                                                                                                                                                                           | 2 0      |         |
| 17. | Picked up a sterile disposable loop and lifted the lid of the agar plate just enough to be able to insert the inoculating loop.                                                                                     | 1 0      |         |
| 18. | a. Streaked the fourth quadrant in a manner to produce isolated colonies: Touched the loop to the third quadrant and spread the organism into the fourth quadrant using a continuous streak in a "tornado" pattern. | 1 0      |         |
|     | b. Decreased the width of the streaks horizontally and increased the distance between the streaks vertically.                                                                                                       | 1 0      |         |
| 19. | Replaced the lid on the plate.                                                                                                                                                                                      | 1 0      |         |
| 20. | Disposed of loop in biohazard receptacle.                                                                                                                                                                           | 2 0      |         |
| 21. | Placed the agar plate upside down in the 35-37°C incubator.                                                                                                                                                         | 1 0      |         |

| Skill VII: Continued...                                       |                                                                                                     | Possible | Awarded |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------|---------|
| 22.                                                           | Cleaned reusable equipment and returned to proper storage; put disposables in biohazard containers. | 2 0      |         |
| 23.                                                           | Cleaned work area with surface disinfectant.                                                        | 2 0      |         |
| 24.                                                           | Removed gloves and face protection & disposed of it.                                                | 2 0      |         |
| 25.                                                           | Used alcohol-based handrub for hand hygiene.                                                        | 2 0      |         |
| TOTAL POINTS -- SKILL VII:<br>70% Mastery for Skill VII: 25.2 |                                                                                                     | 36       |         |