SOP ON OPERATION, CARE, AND MAINTENANCE OF STUDENT LIGHT MICROSCOPES

DEPARTMENT OF ANATOMY

FACULTY OF MEDICINE

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STANDARD OPERATING PROCEDURE (SOP) ON OPERATION, CARE, AND MAINTENANCE OF STUDENT LIGHT MICROSCOPES

(1). Issued By

- Department of Anatomy, Faculty of Medicine, Uva Wellassa University of Sri Lanka

(2). Purpose & SCOPE

- To ensure standard, safe operation, routine care, and preventative maintenance of student light microscopes for teaching and laboratory purposes.
- Applicable to all undergraduate student practical laboratories, anatomy/pathology teaching labs, and departmental facilities utilizing student-grade compound light microscopes.

(3). Responsibilities

- Anatomy Department Staff: Handling microscopes with care, adhering with preoperational, operation, and post operation guidelines.
- Technical Officers: Supervising proper handling and focusing techniques during practical sessions.
- Faculty Members: Supervise procedures. Ensure safety.
- Support Staff: Responsible for maintaining inventory of cleaning consumables and ensuring lab workstations are tidy.

(4). MATERIALS REQUIRED

4.1 Cleaning & Maintenance Consumables

- Lens cleaning paper and specialized lens cleaning solution



4.2 Lint-free optical wipes

- Used to clean delicate lenses without scratching or leaving fibers.



4.3 Specialized microscopy immersion oil

- This is placed in between a glass slide and a 100 x lens to eliminate light scattering and maximize microscopic resolution.



4.4 Protective dust covers



(5). Equipment & Accessories

5.1 Binocular or monocular student compound light microscopes



5.2 Mechanical stage slides and stage clips



5.3 Integrated LED/halogen substrate illuminators and power cords



(6). PROCEDURE

6.1 Step 1: Pre-Operation Transport & Inspection

- Always carry the microscope upright using two hands—one hand gripping the curved arm handle and the other supporting the base underneath.



- Proper carriage prevents mechanical misalignment of internal prism assemblies and avoids dropping structural components.
- Check that the electrical cord is free from frayed insulation before plugging it into the mains outlet.

6.2 Step 2: Setup & Stage Positioning

- Place the microscope on a stable, flat workbench away from edge hazards. Use the coarse adjustment knob to lower the mechanical stage completely.



- Lowering the stage provides sufficient clearance to prevent accidental collision between glass specimen slides and high-power objective lenses.

6.3 Step 3: Objective Alignment & Specimen Loading

- Rotate the revolving nosepiece until the lowest magnification objective (4x) clicks firmly into the central optical path.
- Secure the glass microscope slide onto the stage using the mechanical stage clip, centering the specimen over the condenser aperture using stage translation knobs.



6.4 Step 4: Focusing Workflow

- Coarse Focusing: Looking sideways from the bench level, use the coarse adjustment knob to raise the stage until the specimen is nearly in focus.



- Fine Focusing: Look through the ocular eyepieces and use only the fine adjustment knob to achieve a sharp, clear image.



- Magnification Progression: Switch progressively to higher power objectives (10x, then 40x).

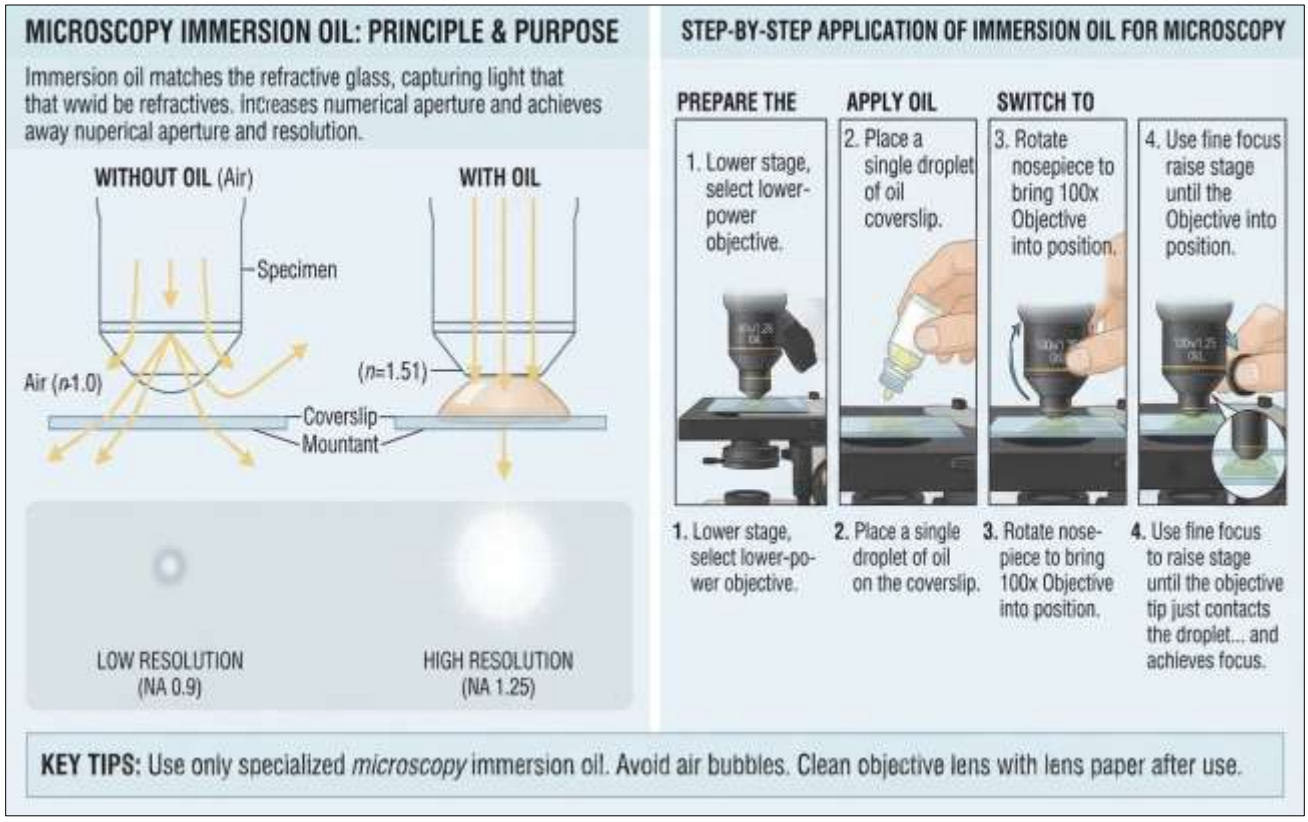
❖ CRITICAL RULE: Never use the coarse adjustment knob with the 40x or 100x oil immersion lenses to prevent scratching glass slides or damaging objective glass elements.



6.5 Step 5: Oil Immersion Usage (If Applicable)

- Apply only specialized microscopy immersion oil when utilizing the 100x objective lens.

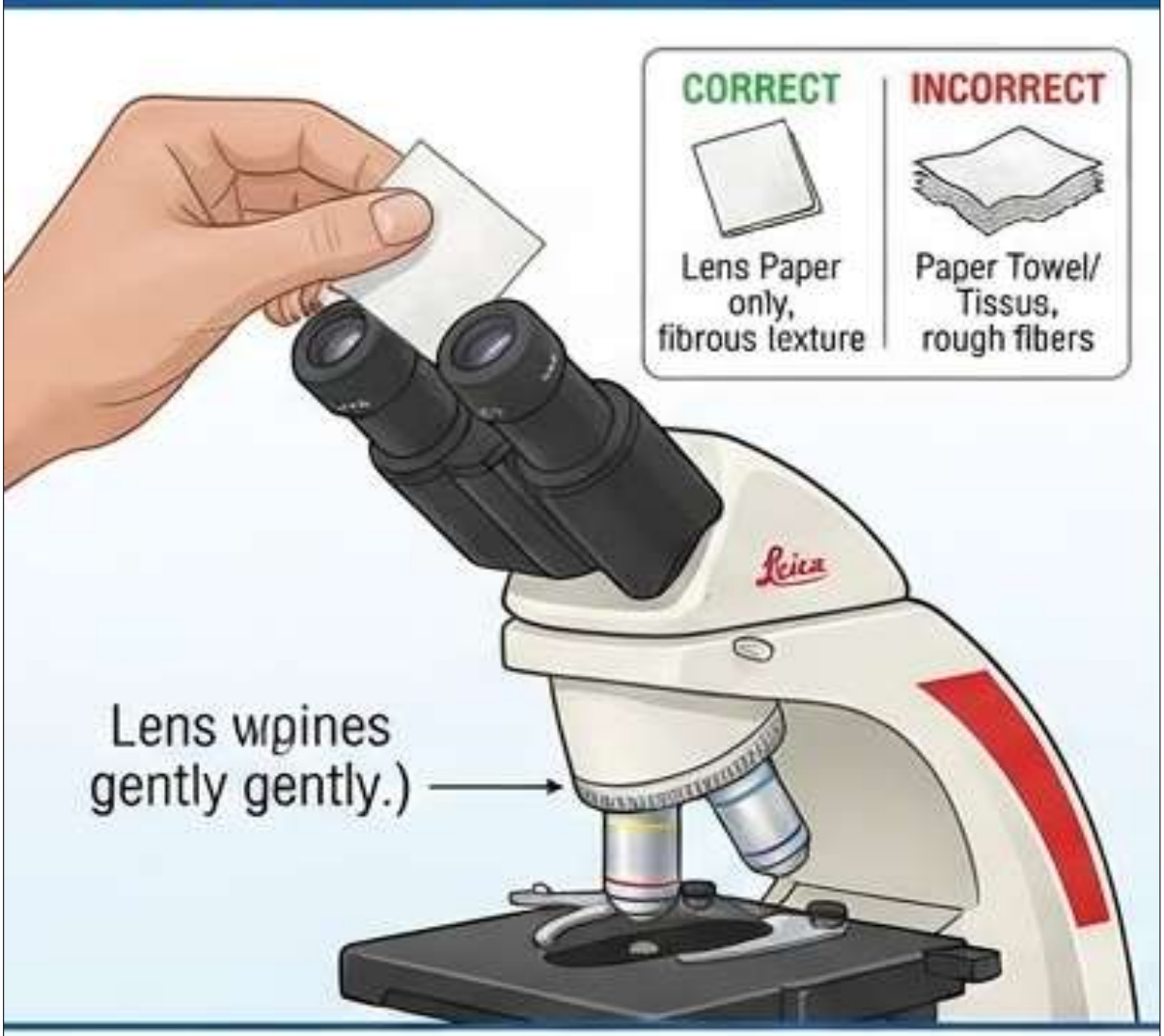
Immersion oil matches the refractive index of glass, capturing light rays that would otherwise be refracted away at high magnifications.



6.6 Step 6: Post-Operation Cleaning

- Optical Cleaning: Clean glass oculars and objective lenses strictly using certified lens cleaning paper. Never use paper towels, facial tissues, or clothing, as abrasive wood fibers scratch optical coatings.
- Oil Cleanup: Immediately clean the 100x oil immersion lens tip using lens paper moistened with approved solvent to prevent oil hardening.
- Body Cleanup: Wipe down the stage and frame with a clean, dry, lint-free cloth to remove dust or liquid residue.

OPTICAL CLEANING



1. Clean glass oculars and objective lenses strictly using certified lens cleaning paper.
   - **Never** use paper towels, facial tissues, or clothing; abrasive fibers scratch optical coatings.

OIL CLEANUP



2. Immediately clean the 100x oil immersion lens tip using lens paper moistened with approved solvent.

- **Note:** Prevents immersion oil from hardening on the lens.

BODY CLEANUP

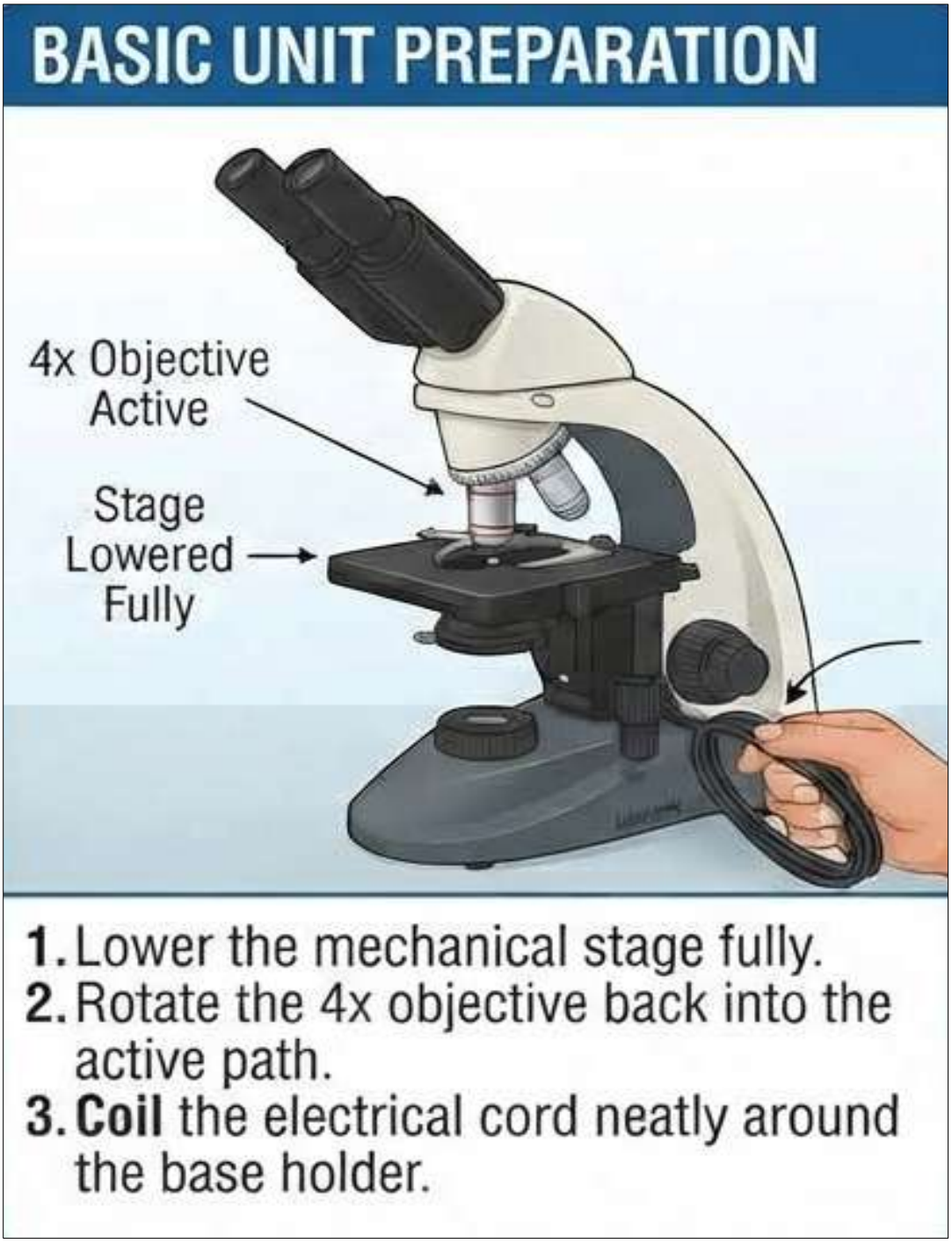


3. Wipe down the stage and frame with a clean, dry, lint-free cloth.

- **Note:** Removes dust, oil residue, and fingerprints; keep the instrument clean.

6.7 Step 7: Storage & Shutdown

- Lower the mechanical stage fully, rotate the 4x objective back into the active path, coil the electrical cord neatly around the base holder, and cover the unit with its protective dust cover.
- Ensures optical longevity and protects internal optics from airborne dust and moisture accumulation.



DUST CAP APPLICATION



4. Securely fit the 2UUL Dust Caps (model 2UUL ScopeCap MS81) onto both ocular lenses to ensure a perfect seal.

REASONS FOR PROTOCOLS



Ensures Optical Longevity

Prevents misalignment and mechanical wear.



Protects Internal

Blocks Airborne Dust and Moisture

The 2UUL ScopeCap's precision seal prevents fine dust from entering the prism system.

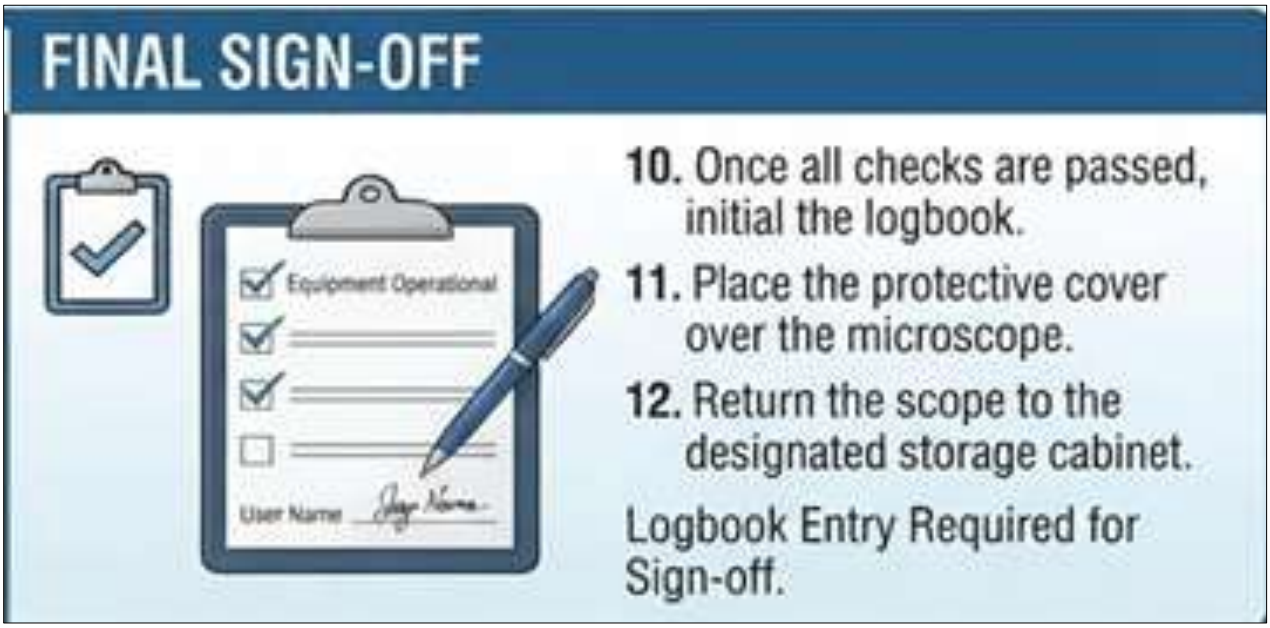
(7). QUALITY CONTROL

- Ensure optical lenses are free from fingerprints, smudges, and residual immersion oil after sessions.
- Confirm smooth mechanical movement of coarse/fine focus knobs and stage translation controls.
- Verify proper electrical illumination and adjustable brightness levels before signing off equipment.









(8). SAFETY PRECAUTIONS

- Always handle electrical cords with dry hands; report any electrical burning smells, flickering bulbs, or frayed wires immediately to laboratory staff.
- Handle immersion oil and lens cleaning solvents in well-ventilated areas.
- Carry heavy microscopes with two hands to prevent physical strains or laboratory drops.


ELECTRICAL SAFETY
ELECTRICAL BURNING SMELL
Always handle electrical cords with dry hands. Report any electrical burning smells, flickering bulbs, or frayed wires immediately to laboratory staff.


OIL & SOLVENT HANDLING
VENTILATION SIGNEGES
Handle immersion oil and lens cleaning solvents in well-ventilated areas.


MICROSCOPE TRANSPORT
AVOID STRAIN & DROPS
Carry heavy microscopes with two hands to prevent physical strains or laboratory drops.

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