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VA MEDICAL CENTER
PATHOLOGY AND LABORATORY MEDICINE SERVICE
3200 VINE STREET, CINCINNATI, OHIO 45220



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POC.Procedure.10 PPM KOH and Scabies Exam

Section: Point of Care\PROCEDURES-POCT\PPM PROCEDURES

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Provider Performed Microscopy (PPM) KOH and SCABIES EXAM

I. Principle of Test and Clinical Significance:

- A. Principle:** The skin is scraped with a #15 blade, or a glass slide and the scrapings are added to a drop of KOH and are observed under the microscope. The purpose of the KOH is to clear out any background keratin or cell membranes that may be confused with hyphal elements. The presence of hyphae or spores indicates the presence of fungal infection.

Scabies is a disease caused by *Sarcoptes Scabiei*, a mite that infests the skin, causing a severe psoriatic eczematous dermatitis “itch”. The female mite burrows beneath the stratum corneum of the fingers, wrists, trunk, and genital skin, where it lays eggs and also deposits feces. Itching is intense, especially at night. Complications are rare, except when lesions are infected by scratching. The mites can be present for several days to weeks before itching begins.

- B. Clinical Significance:** Infections with fungi that cause superficial, cutaneous, or subcutaneous infections of skin, hair and nails may be chronic, but rarely affect the general health of the patient. They can be recovered from the scrapings from the skin lesions they cause.

The skin is scraped with a sharp scalpel and mixed with a drop of mineral oil, and then examined under a microscope for the presence of mites, the eggs or feces. Scabies mites are oval, saclike and less than 1 mm long. The body surface is finely wrinkled and has a number of spines and many triangular scales on the dorsal surface that project backwards.

II. Specimen Collection and Handling:

A. Patient Identification:

Proper patient identification is mandatory. Inpatients must have an armband. The patient’s armband name and social security number must be checked and match patient’s name and social security number in the chart. Outpatient (no armband) identification should be checked by asking the patient to state full name and social security number (per hospital Memo 11-77). The stated name and social security must match information in chart. Make sure to obtain two forms of identification.

B. Sample:

Sample obtained is skin scrapings. No preservatives or special handling is needed.

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III. Reagents and Materials:

A. Reagent.

Potassium Hydroxide (10 %): pre-measured vial for single day's use. Discard at end of day.

Caution: Skin irritation could occur if Potassium Hydroxide comes in contact with the skin.

B. Materials.

1. Cover slip
2. Glass Slide
3. Microscope brightfield or phase/contrast microscope
4. Scalpel or #15 blade
5. Cotton-tip swab
6. Mineral Oil (for scabies exam)

IV. Calibration:

N/A.

V. Quality Control and Quality Assurance:

A. Quality Control.

Upon delivery, each shipment of KOH vials will be examined for signs of deterioration and/or contamination (per manufacturer's package insert).

B. Quality Assurance.

1. Only authorized persons can perform the KOH-Scabies prep examination. Authorized persons are limited to Dermatology Physicians only.
2. Ask the patient to state their full name and full social security number. Crosscheck to match the name and social security number on the chart and documentation sheet.
3. To prevent clerical error, one patient sample will be tested and documented before testing of another patient begins.
4. KOH-Scabies prep should be examined with a microscope having a magnification of at least 40 diameters.
5. External proficiency testing will occur at three times/year from WSLH.

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VI. Procedure:

- A. Wash hands and don gloves.
- B. Scrape the skin with a #15 blade or glass slide and place the scrapings on a slide. Add one drop of mineral oil if performing a scabies test.
- C. Add one to two drops of potassium hydroxide to the skin scrapings.
- D. A cover slide is placed on top.
- E. The slide is examined under a microscope by a board-certified dermatologist for spores and/or hyphae. Use 40x to view the scabies slide.
- F. If scale is thick, light pressure can be applied to the cover slip using a cotton-tip swab.
- G. Results are reported as either present or absent for spores and/or hyphae or scabies mites, eggs or feces.
- H. Disposal
 - 1. dispose of slide and #15 blade in a sharp's container
 - 2. dispose of gloves in a biohazardous waste bag

VII. Maintenance and Troubleshooting:

- A. The microscope used to perform PPM testing should be kept covered when not in use to prevent dust from gathering on the optical surfaces. If immersion oil is used, after each use wipe off the objectives.
- B. To clean optical surfaces, use a lens cleaning fluid and lens paper. Clean gently.
- C. Biomedical Engineering (or a sub-contractor) will be responsible for the yearly cleaning and maintenance of the microscope.

VII. Calculations:

N/A.

IX. Reporting and Interpretation of Results:

- A. Results must be recorded in the patient's chart.
- B. The result should indicate if hyphae, spores, or scabies mites, eggs or feces are present or absent.
- C. Test name and date should be clearly marked in the Provider Note in CPRS along with the name (electronic signature) of person performing the test.

X. Interferences and Limitations of the Test:

None.

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XI. Procedure Performance:

A. Linearity. N/A.

B. Sensitivity: N/A

C. Reference Range: Hyphae or spores are usually not present. If present, they indicate a skin infection by the related fungus.

Scabies: Mites, their eggs and feces are normally absent unless infection has occurred.

D. Critical Values. There are no critical values; however, fungal skin lesions and scabies can be contagious. Patient needs to be given precautionary instructions and should be treated.

XII. References:

A. Fitzpatrick's Textbook of Dermatology, April 2018

B. Package Insert, BBL 10% KOH Reagent Droppers, May 2015.

C. VAMC Cincinnati Patient Identification Memorandum No. 11-77, February 2019.