Scabies

Management of Scabies in Illinois Healthcare & Residential Facilities

These recommendations were developed to provide a rational approach to the prevention and control of sporadic scabies in healthcare facilities, long term care and other residential institutional settings, thus avoiding outbreaks. These recommendations are intended to assist healthcare and residential facility infection control committees in the development of policies and procedures for managing scabies outbreaks.

Scabies prevention and control programs should include the following measures:

1) Healthcare workers and other employees should be suspicious of scabies in persons with a rash or pruritus (itching) that has gradually gotten worse, particularly during the night time hours;
2) Healthcare and residential facilities should establish a policy of examining all newly admitted persons for scabies and questioning new employees for either exposure to or symptoms of scabies;
3) Healthcare workers and other employees should routinely report patients with signs and symptoms of scabies to the infection control practitioner;
4) Healthcare and residential facilities should place patients with signs and symptoms suggestive of scabies in contact isolation until the infestation has been ruled out or appropriately treated;
5) The diagnostic skills of a consultant experienced in recognizing scabies should be used in evaluating difficult or unusual cases;
6) Healthcare workers and other employees should observe and use contact isolation precautions and utilize protective clothing and gloves when providing hands-on care to persons suspected of having scabies;
7) Healthcare workers and other employees should immediately report signs and symptoms of self-infestation to the infection control practitioner;
8) Healthcare facilities and residential facilities should take immediate action when the threshold for a scabies outbreak has been reached;
9) Healthcare and residential facilities should have policies and procedures for investigating and controlling scabies outbreaks and a system for recording epidemiological and clinical information on suspect and confirmed persons;
10) Healthcare facilities should provide training to all physicians, nurses and other healthcare workers such as nursing assistants, technicians and students to recognize and report any patient with signs and symptoms compatible with scabies infestation.

DISEASE INFORMATION

Transmission of Scabies:

Scabies is caused by the human itch mite, *Sarcoptes scabei* (see Photograph 1), and is spread by close personal contact. It is frequently seen in families, sexual partners, day care and school age children, chronically ill patients, and persons in institutional living settings. The mite does not jump from one person to another, but is readily transmitted by direct skin-to-skin contact. Scabies mites do not survive more than 48-72 hours when off of the human body. When living on a person, an adult female mite can live up to a month and lays two to three eggs each day.

An adult female mite is capable of walking on the skin at a rate of 2½ cm or 1 inch per minute and can burrow beneath the skin surface in 2.5 minutes; extending the burrow from ½ to 5 mm per day. The female mite secretes a substance which lyses skin tissue; this substance, fecal pellets and the mite itself are highly allergenic and contribute to the intense itch which accompanies scabies.

Scabies infestations are generally categorized as either "typical" or "crusted" (also known as atypical, keratotic or Norwegian scabies). Persons with typical scabies generally have fewer than 50 live mites on their skin at any given time. Therefore, typical scabies is difficult to transmit from patient-to-healthcare worker unless there is prolonged, unprotected skin-to-skin contact between the infested patient and the non-infested healthcare worker.

Persons with crusted (Norwegian) scabies will have hundreds to millions of mites in multiple skin burrows or in layers of crusted skin lesions and are highly contagious. Healthcare workers who have unprotected skin-to-skin contact with these patients will commonly develop scabies after exposure. In addition, any exposure to contaminated bedding such as sheets or blankets, pillows, clothing, towels, walking belts, creams, lotions or ointments, or upholstered furniture in close proximity to a patient with crusted (Norwegian) scabies may also be a source of transmission.

The incubation period following exposure may be as long as 2-6 weeks before symptoms of scabies infestation become apparent. Symptoms tend to develop much sooner in persons with previous exposure to scabies, even within a few days following exposure. During the incubation period, a newly infested person could become a source of transmission of scabies to other persons. The likelihood of transmission increases over time and until the infested person is identified and treated.

Signs and Symptoms:

Signs and symptoms include pimple-like irritations, burrows or rash of the skin. The rash may vary greatly in appearance according to pre-existing skin conditions and site. The mite burrows into the skin but never below the stratum corneum. The burrows appear as raised serpentine lines up to several centimeters long. The most commonly involved areas include the hands, including interdigital areas and palms; the flexor aspects of wrists; the extensor surfaces of elbows; the anterior axillary folds; the extensor areas of knees; the lateral borders of feet; the ankles and toes; breasts; genitals, particularly the penis and scrotum; buttocks; and, the abdomen, specifically the periumbilical area. Itching is intense, especially at night and over most of the body.

Crusted scabies (also known as Norwegian scabies) is characterized by heavily crusted skin lesions. Thousands to millions of mites may be present in exfoliating scales from these patients, which greatly increases the contagiousness of the infestation (see Photograph 2).

Secondary bacterial infections may develop because of intense scratching caused by the mites. When scabies is complicated by beta-hemolytic streptococcal infection, there is a risk of acute glomerulonephritis.

Diagnosis:

Diagnosis is most commonly made by looking at the burrows or rash. A skin scraping may be taken and observed microscopically to look for mites, eggs, or mite fecal material to confirm the diagnosis. Care should be taken to choose lesions that have not been excoriated by repeated scratching. Prior application of mineral oil facilitates collecting the scrapings and examining them under a cover slip using a microscope (see Appendix A for procedures for performing skin scrapings).

Applying water-soluble or alcohol-soluble ink to the skin and removing the ink will disclose the burrows (see Appendix A, part 2c, for instructions for performing the burrow ink test).

If a skin scraping or biopsy is taken and returns negative, it is possible that a person is still infested with scabies. Since patients with typical scabies are generally infested with relatively few mites at one time, confirmation of an infestation is difficult but should be attempted. At least 6 skin scrapings at different sites should be performed by a physician

or a healthcare worker proficient with the procedure. If all skin scrapings are negative but all other symptoms point to a scabies infestation it may be necessary to proceed with the investigation and control measures based on symptoms rather than a verified diagnosis.

Controlling an Outbreak:

Control of an outbreak involves a choice between treating only symptomatic cases and their known contacts ***(selective or limited treatment)***, or treating all possible contacts, including asymptomatic patients or residents, healthcare workers, volunteers, and visitors ***(mass prophylaxis)***. There is limited published information on which to base any recommendations, so each facility must determine which course of action to take. Treatment of only symptomatic cases and their identified contacts may result in continuous transmission over a sustained period of time and may require re-treatment of all or some of the cases.

Analysis of the surveillance data collected on healthcare workers and patients or residents who were diagnosed with scabies may assist the facility's infection control committee in making the decision about what method of prophylaxis is most applicable to the situation. If the identified source patient was diagnosed with crusted (Norwegian) scabies, has been a hospital patient or facility resident for many days or weeks, and has been transferred between several nursing units and diagnostic services, mass prophylaxis may be necessary. In this situation, many employees in different areas of the facility may begin to present almost simultaneously with symptoms suggestive of scabies.

Limited (confined to a specific area or areas) ***mass*** (covering all those who work in those areas, not just those identified as contacts) ***prophylaxis*** should only be done if there is strong epidemiological evidence that the outbreak is confined to a specific unit, department, or area of a facility. However, because healthcare workers and other ancillary staff float from nursing unit to nursing unit, or from one area of a facility to another, treatment limited according to location may not terminate the outbreak.

Treatment:

Effective treatment of scabies requires the application of a safe, effective scabicide.

<u>Classic scabies</u>: one or more of the following may be used

1. **Permethrin cream 5%**

   Brand name product: Elimite

Permethrin is approved by the US Food and Drug Administration (FDA) for the treatment of scabies. Children aged 2 months or older can be treated with permethrin. Permethrin is safe and effective when used as directed, and is the drug of choice for the treatment of scabies. Permethrin kills the scabies mite and eggs. Two (or more) applications, each about a week apart, may be necessary to eliminate all mites.

2. **Crotamiton lotion 10% and Crotamiton cream 10%**

   Brand name products: Eurax; Crotan

   Crotamiton is approved by the US Food and Drug Administration (FDA) for the treatment of scabies in adults; it is considered safe when used as directed. Crotamiton is not FDA-approved for use in children. Frequent treatment failure has been reported with crotamiton.

3. **Sulfur (5%-10%) ointment (multiple brand names)**

   Sulfur in an ointment base (petrolatum) is used to treat scabies in both adults and children. Although the safety of sulfur ointment for treatment of children has not been demonstrated in clinical trials, in published case reports pediatric patients younger than 2 months of age have been successfully treated. Reported side effects in both adults and children are primarily skin irritation. The odor and cosmetic quality may make it unpleasant to use.

4. **Lindane lotion 1%**

   Brand name products: None available

   Lindane is an organochloride. Although FDA-approved for the treatment of scabies, lindane is **not recommended** as a first-line therapy. Overuse, misuse, or accidentally swallowing lindane can be toxic to the brain and other parts of the nervous system. Use of lindane should be restricted to patients who have failed treatment with or cannot tolerate other medications that pose less risk. Lindane should not be used to treat premature infants, persons with a seizure disorder, women who are pregnant or breast-feeding, persons who have very irritated skin or sores where the lindane will be applied, infants, children, the elderly, and persons who weigh less than 110 pounds.

5. **Ivermectin**

Brand name product: Stromectol

Ivermectin is an oral antiparasitic agent approved for the treatment of worm infestations. Evidence suggests that oral ivermectin may be a safe and effective treatment for scabies; however, ivermectin is not FDA-approved for this use. Oral ivermectin should be considered for patients who have failed treatment with or who cannot tolerate FDA-approved topical medications for the treatment of scabies. If used for classic scabies, two doses of oral ivermectin (200µg/kg/dose) should be taken with food, each between 7-14 days apart. The safety of ivermectin in children weighing less than 15 kg and in pregnant women has not been established.

Note that although ivermectin guidelines recommend taking on an empty stomach, scabies experts recommend taking with a meal to increase bioavailability.

Crusted scabies: both oral and topical agents should be used together

1. **Ivermectin**

   Brand name product: Stromectol

   Ivermectin is an oral antiparasitic agent approved for the treatment of worm infestations. Evidence suggests that oral ivermectin may be a safe and effective treatment for scabies; however, ivermectin is not FDA-approved for this use. The safety of ivermectin in children weighing less than 15 kg and in pregnant women has not been established.

   For crusted scabies, ivermectin should be administered together with a topical agent. Oral ivermectin (200µg/kg/dose) should be taken with food. Depending on infection severity, ivermectin should be taken in three doses (approximately days 1, 2, and 8), five doses (approximately days 1, 2, 8, 9, and 15), or seven doses (approximately days 1, 2, 8, 9, 15, 22, and 29).

2. **Permethrin cream 5% (topical)**

   Brand name product: Elimite

   Permethrin is approved by the US Food and Drug Administration (FDA) for the treatment of scabies in persons who are at least 2 months of age. Permethrin is a synthetic pyrethroid similar to naturally occurring pyrethrins which are extracts from the chrysanthemum flower. Permethrin is safe and effective when used as directed. Permethrin kills the scabies mite and eggs. Permethrin is the drug of choice

for the treatment of scabies. Topical permethrin should be administered every 2-3 days for 1-2 weeks to treat crusted scabies.

3. **Benzyl benzoate 25% (with or without tea tree oil) (topical)**

   Benzyl benzoate may be used as an alternative topical agent to permethrin. However, this agent may cause immediate skin irritation. Lower concentrations may be used in children (10% or 12.5%).

4. **Keratolytic cream (topical)**

   A topical keratolytic cream may also be used to help reduce the crusting of the skin and aid in the absorption of the topical permethrin or benzyl benzoate.

Treatment Schedules:

Once it has been determined whether limited or facility-wide mass treatment is necessary, a treatment schedule should be defined. To prevent "silent" transmission of scabies, all those included in the treatment schedule should be treated in the same 24-hour treatment periods. If nursing units or departments or separate areas of a facility are to be treated in succession it is best to limit rotating staff until all units or areas have completed the treatment.

If possible, all patients or residents should receive their initial treatment on the first or day shift. Healthcare workers who work the first shift can apply the topical medical to themselves and household contacts as soon as possible after they complete the first shift. Healthcare workers working the second or third shift should apply the topical medication before coming to work. Their household contacts should apply the topical medication before going to bed.

All healthcare workers should wear gloves and long sleeve gowns for all patient contacts during the 24-hour treatment period. Gloves should be removed after each patient contact and discarded into trash receptacles. Long sleeve gowns only need to be removed when exiting an isolation room or if the gown becomes soiled. Reusable (e.g., cloth) gowns must be placed into a sealed plastic bag for reprocessing. Frequent reapplication of permethrin to the hands and wrists will be necessary after gloves are removed and hands are washed. Healthcare workers on the first shift should shower in the morning before coming to work. Patients or residents who were treated on the previous day can be bathed or showered on the morning of the day following the treatment period. Healthcare

workers who work the evening or night shift should also shower just prior to reporting to work.

Note: Itching may continue for as long as 2 weeks after adequate therapy (post-scabietic pruritus) until such time as the dead mites, and their eggs and feces are shed from the skin surface. Most areas of the body have a 2 week period in which old skin is shed, but certain areas such as the hands and feet can take as long as 3 months. It is important to consider this point to prevent the overuse of scabicides. Treatment with oral antihistamines, topical corticosteroids, and, rarely in sever cases, a short course of oral prednisone will control itching.

Isolation of Patients:

Healthcare facilities should follow the Centers for Disease Control and Prevention (CDC) Guideline for Isolation Precautions in Hospitals (1996) and use Contact Precautions for patients known or suspected to be infested with scabies. Isolation of asymptomatic patients who are being treated prophylactically is not necessary. Only patients who have symptoms or have positive skin scrapings need to be placed in isolation (i.e., Contact Precautions) and then for only 24 hours following appropriate treatment.

Patients with crusted (Norwegian) scabies should be isolated (i.e., Contact Precautions) until after a second treatment and until skin scraping are negative on three consecutive days or the signs and symptoms of infestation have resolved. Restrict their contact with visitors until the treatment regimen is completed and skin scrapings are negative. Alternatively, visitors must take the same precautions (wearing a gown, gloves and shoe coverings) as employees.

Symptomatic employees should be allowed to return to work the morning following overnight treatment with 5% permethrin cream. Disposable gloves should be used for 2-3 days by symptomatic staff that must provide extensive hands-on care to their patients.

Environmental Control:

Because outbreak reports have implicated laundry and clothes as probable sources of transmission, all bed linens, towels and clothes used by affected persons within 72 hours prior to treatment should be placed in plastic bags inside the patient's or resident's room, handled by gloved and gowned laundry workers and laundered at 50°C (122°F). The hot cycle of a clothes dryer should be used for at least 10-20 minutes. Nonwashable blankets and articles such as stuffed toys can be placed in a plastic bag for 7 days, dry cleaned, or

tumbled in a hot clothes dryer for 20 minutes. It is not necessary to re-wash clean clothing that has not yet been worn.

All bed linens, towels and clothes should be changed daily during the treatment period.

Multiple-use walking belts, skin creams, lotions and ointments can serve as potential reservoirs for mites. Disinfect the walking belt and discard all potentially contaminated (e.g., infested) creams, lotions or ointments used prior to treatment.

Mattresses, pillows, upholstered furniture, floors, rugs and carpeting should be vacuumed on the day of treatment and on the following day.

Routine disinfection procedures are adequate on a daily basis. However, activity tables, therapy mats, shower chairs, commodes, wheelchairs, and all other equipment that might be shared by residents should be cleaned on the day of treatment with an approved phenolic disinfectant or quaternary ammonium compound (QUAT). Careful attention should be paid to cleaning these items in between resident use thereafter.

Evaluation of Control Measures:

If scabies control measures have been successful, an endpoint for the outbreak should be evident within several weeks. However, cases can still occur as late as 6 weeks following the last exposure. An epidemic curve in which known and suspected cases are plotted according to the date of onset of symptoms should assist in characterizing the outbreak.

If cases are still occurring several weeks following prophylaxis, either the source case was not identified, cases were not treated appropriately, or there is a new unidentified source(s) somewhere in the facility. If there are many suspected or diagnosed cases scattered throughout the facility, examination of the epidemic curve for each nursing unit, diagnostic or therapeutic service may provide more clues about the outbreak.

Appendix A: Procedure for Skin Scraping

A physician, or a nurse or other healthcare professional under the direct supervision of a physician who has been trained to perform the procedure, should only do skin scrapings.

1. Obtain the following equipment:

   Gloves and gowns
   Slides and cover slips
   Magnifying lens and light source such as a goose neck lamp
   Alcohol impregnated wipes

Felt tip pen (water-soluble or alcohol-soluble ink, black or green in color)
Clear nail polish
Mineral oil and dropper
Potassium hydroxide
Applicator sticks
Disposable hypodermic needles (18-20 gauge X 1.5-2.0 inches)
Surgical blade handle and #15 surgical blade
Sharps container
Compound microscope

2. Procedure:

    a. Observe patient's skin with a magnifying lens and look for lesions suggestive of scabies infestation. The shoulders, back, abdomen, hands, wrists, elbows, buttocks, axillae, knees, thighs and breasts are common sites for burrows.

    b. Using a hand held magnifying lens and a strong light, look for new burrows or papules. If the burrow or papule is very fresh, a tiny speck (the scabies mite) may be visualized at either end of the burrow on in the papule. The mite will not be found in excoriated, scabbed or infected skin lesions. Preserved, unscratched papules may sometimes be found in a grouping of scratched papules.

    c. Visualize burrows using the "burrow ink test." This test requires a strong light source, magnifying lens and a black or green felt tip pen. (The ink should be either water-soluble or alcohol-soluble, to facilitate removal.) After an unexcoriated, intact wavy, red line (the burrow) is located, ink is rubbed directly over the suspect burrow. The ink will penetrate the burrow very quickly. The ink is then wiped off with a water- or alcohol-impregnated sponge, as appropriate for the ink used. After removing the excess ink, the ink which has penetrated the burrow will remain and appear as a wavy black or green wavy line under magnification.

    d. Select an unexcoriated burrow or papule.

    e. Prepare slides by dipping an applicator slick into mineral oil and transferring 2-3 drops to the center of several clean slides.

    f. Dip a hypodermic needle into the mineral oil and transfer a drop to the site selected for scraping and spread the oil evenly over the intended scraping site.

g. Hold the skin taut with one hand and hold the hypodermic needle at about a 5-10 degree angle with the other hand. If a surgical blade is used, hold the blade at a 90 degree angle.

h. Apply light pressure and scrape the lesion making several movements across the site. Increase the pressure slightly while scraping. A small amount of blood may be visible; however, there should be no frank bleeding.

i. Transfer the skin scraping to the prepared slide and place a cover slip over the scraping.

j. Obtain at least 4-6 scraping per patient, if possible.

k. Examine the entire slide preparation under low power magnification for evidence of mites, eggs or fecal pellets. If a compound microscope is not available at the facility, secure the cover slips with clear nail polish and transport to a clinical laboratory or physician's office.

l. Care should be taken to prevent infection of the scraped skin. Patients with extremely thin skin or skin prone to tearing should not have their skin scraped.