## CONTAGIOUS ECTHYMA/ “ORF”

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<th>Animal Group(s) Affected</th>
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<td>Domestic sheep and goats; wild artiodactylids; humans; rarely, domestic cat and dog.</td>
<td>Direct contact with vesiculo-proliferative lesions or scab material.</td>
<td>Minor to severe: skin proliferative lesions generally confined to skin of lips and muzzle, but can affect other skin and mucocutaneous areas.</td>
<td>Typically mild and self-limiting in domestic animals, but can cause fatalities in severe cases particularly in young animals and in sensitive species like musk oxen.</td>
<td>Generally, no treatment is required. Supportive care and treatment of secondary infections in severe cases. Treatment with cidofovir systemically or topically, is possibly beneficial.</td>
<td>Isolate infected animals. Transmitted through damaged skin; dispose of scab material and contaminated bedding. Wear latex gloves and other protective clothing when working with known infected animals. Autogenous vaccine sometimes used.</td>
<td>Yes.</td>
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Fact Sheet compiled by: James M. Rasmussen  
Sheet completed on: 30 March 2011; updated 11 February 2013  
Fact Sheet Reviewed by: Arno Wünschmann, Andres de la Concha-Bermejillo  

### Susceptible animal groups:  
Ruminants (ovids, caprids, cervids typically but experimental transmission to calves, monkeys) and possibly dogs.

### Causative organism:  
Highly infectious epitheliotropic double-stranded DNA enveloped virus in the family Poxvidae, subfamily *Chordopoxvirinae* genus *Parapoxvirus* which includes the closely related bovine popular stomatitis virus, pseudocowpox virus, parapox virus of reindeer, parpapoxvirus of red deer in New Zealand, and parapoxvirus of seals.

### Zoonotic potential:  
Yes, orf virus is readily transmitted to humans. Infection typically occurs when abraded skin contacts infected animals or fomites.

### Distribution:  
Orf virus has a worldwide distribution and is a common cause of disease in domestic sheep and goats and can affect a wide range of wild artiodactylids.

### Incubation period:  
2-3 days experimentally, 6-8 days under natural conditions

### Clinical signs:  
**Humans:** Generally cause wart-like lesions on the hands and arms of people handling infected animals. Lesions progress quickly from macule, papule, vesicle, pustule until they become crusty lesions. As with animals, secondary bacterial infection may occur. In uncomplicated cases they will heal in 2-6 weeks without scarring.

**Animals:** Similar to humans in rapid progression from macule through crusty proliferative papillomatous growths. Generally start on mucocutaneous regions of the muzzle around nares and lip commissures, but can affect periorbital area, udder, legs/coronal region, and oral cavity. Periorbital lesions may lead to visual impairment and/or mechanical trauma to cornea. Lesions on the muzzle in oral cavity may reduce feed intake particularly in young suckling animals. Secondary, bacterial infections and myiasis may also occur. In uncomplicated cases scabs generally fall off in 4-6 weeks, but may persist for months.
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<th>Post mortem, gross, or histologic findings:</th>
<th>Histologically, mature lesions demonstrate epidermal hyperplasia with ballooning degeneration of keratinocytes of the stratum spinosum, ulceration, and intracytoplasmic inclusion bodies. Oftentimes, secondary bacterial infections are present.</th>
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<td>Diagnosis:</td>
<td>Electron microscopy of fresh or frozen lesion biopsies will typically demonstrate morphologically distinct ovoid-shaped parapoxvirus virions approximately 260nm x 160nm. Scab is not a preferred sample as it generally does not contain large numbers of virus. PCR and sequencing of viral DNA is required to differentiate Orf virus from other parapox viruses. Real time PCR can be performed on formalin fixed, paraffin embedded samples if fresh/frozen tissue is unavailable.</td>
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<td>Material required for laboratory analysis:</td>
<td>Biopsies of lesion- fresh/frozen and formalin fixed.</td>
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<td>Relevant diagnostic laboratories:</td>
<td>Laboratories capable of performing electron microscopy of biopsy samples can identify to the level of parapox virus. Sequencing of viral DNA is required for more specific identification.</td>
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<td>Treatment:</td>
<td>Lesions are generally self-limiting, but in some severe cases supportive care and antibacterial therapy for secondary infections is indicated. The antiviral drug cidofovir has been used with some success in the treatment of some pox virus infections. However, little if any benefit was subjectively noted during a course of intravenous treatment of cidofovir in two musk ox calves as compared to an untreated herdmate. A topical cream preparation of cidofovir is now available as well. In severe, unresponsive cases euthanasia should be considered before secondary complications cause significant morbidity.</td>
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<td>Prevention and control:</td>
<td>Vaccination should not be used in areas where the disease has not occurred. In endemic areas sheep and goats may be vaccinated with live virus vaccine which can be obtained from Colorado Serum Company- P.O. Box 16428- Denver Colorado, 80216- (800)525-2065 (<a href="http://www.colorado-serum.com">http://www.colorado-serum.com</a>). The vaccine is an attenuated live virus product which can cause disease in naïve animals and in susceptible species and people. Trial work has been done with DNA vaccines in China. Neither natural infection nor vaccination confers long-term immunity, but subsequent infections are generally less severe. Infected animals should be isolated as long as scab material is present. Virus may persist in the environment for years in cool dry areas when encrusted in scab or organic material.</td>
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<td>Suggested disinfectant for housing facilities:</td>
<td>Removal and incineration or burial of organic material. Sunlight, heat and humidity leads to more rapid inactivation of virus, but virus may persist for months to years if frozen or present in cool, dry locations. Fairly resistant to disinfectants, but phenolics, quaternary ammonium compounds and iodophors can be effective disinfectants with proper concentration and contact time. Organic debris will decrease disinfectant efficacy. Steam sterilization and dry heat may also be utilized for disinfection.</td>
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<td>Notification:</td>
<td>Public health officials may need to be notified if zoonotic transmission occurs, depending on the state.</td>
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<td>Measures required under the Animal Disease Surveillance Plan:</td>
<td>Currently none</td>
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<td>Measures required for introducing animals to infected animal:</td>
<td>Maintain infected animals in a quarantine situation until lesions have healed and scabs have been lost. If feasible may want to bathe infected animal in order to remove all virus from fur. Do not introduce infected animal to an animal with a compromised immune system.</td>
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<td>Conditions for restoring disease-free status after an outbreak:</td>
<td>Wait for all scabs to be lost from infected animals. Remove bedding and biological material to the extent possible and disinfect with phenolic or quaternary ammonia disinfectants.</td>
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| Experts who may be consulted: | Dr. Andrés de la Concha-Bermejillo  
Texas Veterinary Medical Diagnostic Laboratory  
Texas A&M University System  
1 Sippel Road  
College Station, TX 77843 |
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References: