

# EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER  
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

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April 2018 | Vol 4 | Issue 61

## Cat Bite

A 56 year-old female with a past medical history significant for diabetes, hypertension, and alcohol abuse presented to the ED with a 3 day old cat bite on her right forearm. She states that while she was outside, she pet a neighbor's cat who bit her piercing the skin and leaving an open, bleeding wound. She cleaned the wound thoroughly and then noticed over the last few days the wound was increasing in size and redness. The day prior to the ED visit she admitted observing pus flow from the wound. She denied any fever, nausea, vomiting, or itching. She was afebrile with stable vitals. On physical exam, the patient was in no acute distress with 2cm round erythematous and warm lesion with a central scab. CBC was within normal limits. A right arm x-ray showed soft tissue swelling. What is the major pathogen causing infection from a cat bite?

- A. ***Bartonella henselae***
- B. ***Staphylococcal aureus***
- C. **Rabies**
- D. ***Pasteurella multocida***
- E. ***Toxoplasma gondii***



Cellulitis

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Soft tissue infections may present with cellulitis, abscess, or both.

In the USA animal bites account for about 1% of ED visits. The infection rate for dog bites are about 14.6% and for cat bites are 37.1%. Dog bites are more common in men while cat bites are more common in women, although overall animal bites are more common in children.

*EM Case of the Week is a weekly "pop quiz" for ED staff.*

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

**BROWARD HEALTH MEDICAL CENTER**

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**The correct answer is D.** *Pasteurella multocida*. Cats are the source of 60-80% of human *P. multocida* infections and can be found in both healthy and diseased animals.

**Management and Treatment:**

The initial management of a bite wound should include copious irrigation with sterile saline, removal of any visible debris, culture, surgical evaluation if needed, antibiotic prophylaxis, and closure if located on the face or hand and/or if large or disfiguring. Amoxicillin-Clavulanate (Augmentin) is the preferred prophylactic agent and is prescribed for 3-5 days with close follow up.

Tetanus and rabies prophylaxis should be considered in addition to antibiotic use. Tetanus IVIG and tetanus toxoid should be given if the patient did not complete the three primary tetanus immunizations. Toxoid alone can be given if the patient did not receive a recent booster within the last 5 years. Rabies should be discussed with the patient and may be warranted depending on the individual circumstances.

**Discussion:**

When a patient presents with skin or soft tissue infections it is important understand the etiology of the infection and to treat based on the clinical presentation. In the case of a wound inflicted by an animal, knowing the mechanism of transmission helps to identify what the patient has been exposed to. The attached table details the transmission of each organism along with the human and feline symptoms. This table can help indicate what questions to ask the patients to help narrow down the suspected infections in order to choose appropriate prophylactic antibiotics. In addition to antimicrobial treatment, appropriate wound care can significantly reduce the risk or progression of infection. While mild infections can be cleaned and treated with oral antibiotics, deep and severe infections should be placed on appropriate IV antibiotics, sent for surgical debridement if indicated. Plain radiographs or MRI might be warranted. The plain radiographs are

evaluating for bony structure involvement and the presence of foreign bodies, while MRI is used to evaluate for subcutaneous abscess, osteomyelitis, septic arthritis, or tendinitis. Blood cultures should also be obtained if the patient is presenting with fever or other signs of systemic infection.

**Zoonoses cats**

Transmission	Organism	Human symptoms	Feline symptoms	Geographic distribution
Infectious saliva	<i>Bartonella henselae</i>	Cat scratch disease, lymphadenopathy	Asymptomatic even with bacteremia	Worldwide
	<i>Pasteurella</i>	Skin and soft-tissue infections, septic arthritis, osteomyelitis	Asymptomatic	Worldwide
	Rabies	Acute progressive encephalitis	Stages: prodromal, furious, and paralytic	Worldwide
	<i>Capnocytophaga</i>	Skin and soft-tissue infections, sepsis, meningitis	Asymptomatic	Worldwide
	Cowpox	Painful, hemorrhagic pustules or black eschars	Ulcerated, crusted focal skin lesions; systemic illness possible	Europe
Fecal	<i>Salmonella</i> <i>Campylobacter</i> <i>Cryptosporidium</i> <i>Giardia</i>	Asymptomatic or gastroenteritis	Asymptomatic or gastroenteritis	Worldwide
	Multidrug-resistant bacteria (eg, <i>Escherichia coli</i> )	Asymptomatic or gastroenteritis	Asymptomatic or gastroenteritis	Worldwide
	<i>Toxocara cati</i>	Visceral larva migrans and ocular larva migrans	Asymptomatic	Worldwide
	<i>Ancylostoma caninum</i>	Cutaneous larva migrans	Hookworm	Worldwide
	<i>Echinococcus granulosus</i>	Hydatid cysts, echinococcosis	Hydatid cysts, echinococcosis	Worldwide
	<i>Toxoplasma gondii</i>	Lymphadenopathy, cerebral, congenital infection	Asymptomatic, may be associated with co-infection with feline leukemia virus or feline immunodeficiency virus	Worldwide
	<i>Dipylidium caninum</i>	Asymptomatic to abdominal pain, diarrhea, pruritus ani, and urticaria	Tapeworm	Most common in ranching areas of the Mediterranean, South America, and Australia

For a list of educational lectures, grand rounds, workshops, and didactics please visit [BrowardER.com](http://BrowardER.com) and click on the **“Conference”** link.

*All are welcome to attend!*

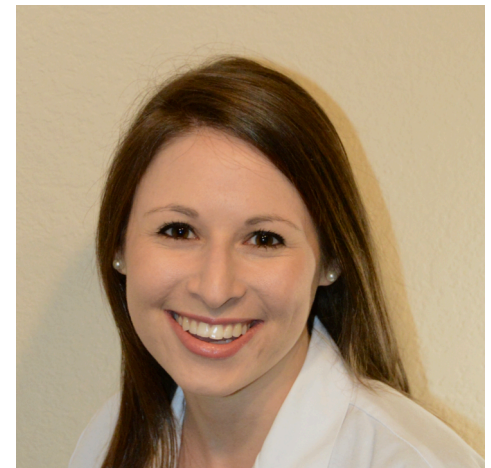
## Zoonoses cats, continued

Transmission	Organism	Human symptoms	Feline symptoms	Geographic distribution
Aerosol	<i>Bordetella bronchiseptica</i>	Asymptomatic to upper respiratory tract infections to pneumonia	Kennel cough	Worldwide
	<i>Coxiella burnetii</i>	Q fever, including a self-limited flu-like illness, +/- pneumonia, +/- hepatitis, +/- endocarditis	Asymptomatic; infection may cause abortion or rapid death of newborn kittens	Worldwide
	<i>Mycobacterium bovis</i>	Tuberculosis	Tuberculosis	Worldwide
Tick or flea bites	<i>B. burgdorferi</i>	Lyme disease	Lyme disease	Worldwide
	<i>Ehrlichia chaffeensis</i> and <i>Anaplasma phagocytophilum</i>	Ehrlichiosis Anaplasmosis	Asymptomatic or similar to human disease	North America Few cases Europe, Africa, Mexico
	<i>Babesia microti</i> (United States); <i>Babesia divergens</i> (Europe)	Babesiosis	Asymptomatic or similar to human disease	Focal areas of United States and Europe
	<i>Yersinia pestis</i>	Plague	Fever, loss of appetite, can have severe illness	Majority in south central United States
	<i>Francisella tularensis</i>	Tularemia	Fever, loss of appetite, can have severe illness	Worldwide In the United States (Arkansas, Missouri Oklahoma)
Direct contact	<i>Sporothrix schenckii</i>	Sporotrichosis	Similar to human disease	Worldwide
	<i>Microsporum canis</i>	Dermatophyte; ringworm	Similar to human disease	Worldwide
	Methicillin-resistant <i>Staphylococcus aureus</i>	Asymptomatic; skin and soft tissue infection	Similar to human disease	Worldwide
Urine	<i>Leptospira interrogans</i>	Leptospirosis, subclinical to severe, potentially fatal illness	Similar to human disease	Worldwide

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## Take Home Points

- Children are at the highest risk for infection due to their close contact with pets.
- Knowing the mechanism of transmission can help isolate what antimicrobial agents to use.
- The predominant organisms in animal bite wounds are the oral flora of the biting animal (notably *pasteurella*, *capnocytophaga*, and anaerobes) as well as human skin flora.
- Antibiotic prophylaxis should be used after copious irrigation. Amoxicillin-Clavulanate (Augmentin) is the preferred agent for dog and cat bites.
- Deep and severe infections might require further imaging and IV antibiotics.
- Tetanus and Rabies treatments should be provided as indicated



## ABOUT THE AUTHOR

This month's case was written by Michelle Hack. Michelle is a 4<sup>th</sup> year medical student from NSU-COM. She did her emergency medicine rotation at BHNMC in March/April 2018. Michelle is beginning her pediatric residency in July 2018 with the hopes of specializing in pediatric emergency medicine

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