**VET 433A Atypical Bacteria**

| Genera | Characteristics | Transmission/Pathogenesis | Clinical Signs/<br>How to differentiate dz | Treatment |
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| ***Actinomyces*** | Gram-positive filamentous, branching bacteria<br>Opportunistic<br>Chronic pyogranulomatous inflammatory lesions<br>Sulfur granules<br>Sporadic disease<br><br>Obligate anaerobe<br>Normal GI and oropharyngeal inhabitant<br><br>Not in the environment<br>Breaches in mucous membranes<br>*FOXTAILS<br><br>NOT acid-fast | Penetrating material contaminated in the oropharynx > migrates from airways or GIT to thoracic and abdominal cavities<br><br>Bite wound inoculation<br><br>CNS actinomycosis: hematogenous spread or extension from head/neck | Common<br><br>Young adult to middle-aged large breed dogs<br><br>Immune competent<br><br>Seasonal problem due to foxtails<br><br>Fever, anorexia, weight loss<br><br>Pleural effusion and pyogranulomatous pneumonia<br><br>Abdominal involvement (organomegaly, mass lesions, distention)<br>Retroperitoneal space (spinal pain, pelvic limb paresis/paralysis)<br>CNS signs (hyperesthesia and tetraparesis) | Prolonged tx with high doses of antimicrobials<br><br>Cutaneous infect: 1-3mo<br>Pulmonary: 6 mo<br>Systemic: 12 mo<br><br>Drain abscess or pyothorax<br><br>Penicillin derivatives<br>Cure rate ~ 90% |
| ***Nocardia*** | Gram-positive filamentous, branching bacteria<br>Opportunistic<br>Chronic pyogranulomatous inflammatory lesions<br>Sulfur granules<br>Sporadic disease | Inhalation > Systemic spread<br><br>Bite, scratch, surgical, or foreign body wound > SQ nocardiosis<br><br>Hematogenous dissemination to other organs (CNS, eyes, joints, bones, kidney and heart) | Uncommon to rare<br><br>Cats or young adult dogs<br><br>Many dogs are immunosuppressed<br><br>Fever, anorexia, weight loss | Prolonged tx with high doses of antimicrobials<br><br>Cutaneous infect: 1-3mo<br>Pulmonary: 6 mo<br>Systemic: 12 mo<br><br>Drain abscess or pyothorax |

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| | Aerobe<br>Ubiquitous soil saprophyte<br><br>House dust, beach sand, garden soil, swimming pools<br><br>Variably acid-fast | | Pleural effusion and pyogranulomatous pneumonia<br><br>Abdominal involvement (organomegaly, mass lesions, distention)<br>Retroperitoneal space (spinal pain, pelvic limb paresis/paralysis)<br>CNS signs (hyperesthesia and tetraparesis) | TMS<br>Guarded prognosis |
| ***Mycobacterium MTBC*** | Gram positive, aerobic, nonmotile<br><br>Acid-fast<br><br>Resistant in the environment<br>Inactivated by direct sunlight and dilute household bleach | MTBC:<br>*M.tuberculosis* and *M. bovis*<br><br>Zoonotic Public Health Concern!<br><br>Highly pathogenic<br>Obligately or facultatively Intracellular<br><br>Reverse zoonosis<br><br>Survives 1-2 weeks in the environment | *M. tuberculosis*<br>Pulmonary predilection<br>Dogs and cats can be infected after prolonged exposure to human resp. secretions<br>Dogs > Cats<br><br>*M. bovis*<br>Cattle reservoir hosts<br>Ingestion of unpasteurized milk or uncooked meat/offal, predation<br>GIT in cats, resp. in dogs<br>Rare in US | Fluoroquinolone<br>Macrolide/azalide<br>Rifamycin<br><br>Consider E-tube<br>Monitor liver enzymes<br>Treat for a minimum of 3 months, 2 months beyond resolution of signs<br><br>70-80% recover with proper tx |
| **Non-tuberculous mycobacteria**<br><br>**Slow growing: *M. avium*** | Saprophytic, survive >2 years in the environment<br><br>Gram positive, aerobic, nonmotile<br><br>Acid-fast | Non-tuberculous mycobacteria<br>Slow growing: M. avium<br><br>Multiply intracellularly at inoculation site and local LN<br>Tend to be disseminated | Resp infections<br>GI involvement<br>Disseminated disease<br>Lymphadenopathy, anorexia, fever, weight loss, organomegaly, effusions, neurologic signs, ocular | Triple therapy as for MTBC<br><br>Various combinations<br>Paradofloxacin, macrolides/azalides, rifampin +/- doxycycline |

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| | *M. avium* complex (MAC)<br>In acid soils higher in organic matter<br>Not spread from animals to people<br>Lesions resemble TB<br>Cats and dogs are fairly resistant to infection (mini schnauzers, bassett hounds, FIV-infected cats)<br>Inbred cats | Defective CMI leads to persistent or dissemination | dz, osteomyelitis, nonhealing skin lesions | Remove immunosuppression<br>Rarely surgical |
| **Non-tuberculous mycobacteria**<br><br>**Rapid growing: *M. fortunitum, M. smegmatis, M. chelonae*** | Saprophytic, survive >2 years in the environment<br><br>Gram positive, aerobic, nonmotile<br><br>Acid-fast | Inoculated into skin via trauma<br><br>Enhanced pathogenicity in adipose (think of liposuction case example) | Most animals are immune-competent<br><br>Cats are most susceptible, especially females age 3-11<br>Younger dogs<br><br>Cutaneous and SQ granulomas<br>-especially in the inguinal area due to contact with the ground (fat)<br>Resemble cat fight abscesses, later ulcerate and drain<br><br>No systemic signs<br>Skin lesions<br><br>Pyogranulomatous inflammation | High-dose fluoroquinolones or doxycycline<br><br>3-6 months of doxy. or FQ<br><br>Rarely, lifelong treatment |
| **Lepromatous mycobacteria**<br><br>***M. leprae, M. lepraemurium,*** | | Canine leproid granuloma syndrome (CLGS) | GLGS<br>Ca, Australia<br>Short-coated breeds, usually head, pinnae, never cultured | High-dose fluoroquinolones or doxycycline<br><br>3-6 months of doxy. or FQ |

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| | | Localized cutaneous nodules which may ulcerate and sometimes disseminate<br><br>Difficult or impossible to culture | Pyogranulomatous inflammation | Rarely, lifelong treatment |