Actinomycosis

**D:** caused by infection with *Actinomyces* spp.; characterised by indolent abscesses and chronic sinuses

**A:** *Actinomyces* spp. are G⁺ve anaerobes; part of normal buccal flora; often found in association with G⁻ve; disease most often due to *A. israelii*, *A. naeslundii*, *A. propionicum* & *A. viscosus*

**A/R:** recent dental work; poor dental hygiene; trauma; human bites; IUCD (rare)

**E:** worldwide; rare

**H:** constitutional upset; abscess or sinus formation; symptoms of local infiltration, e.g. haemoptysis

**E:** soft, relatively non-tender head & neck swellings → grow slowly → discharge externally; abscesses are cold; 25–50% involve an internal organ

**P:** abscess formation → cross-fascial planes; may spread via blood

**I:** discharge/pus/sections – macroscopically for sulphur granules, H & E, silver or G stain for organisms, culture & sensitivity; blood cultures

**M:** prolonged high-dose antibiotics – penicillins, sulphonamides, erythromycin, chloramphenicol or tetracycline; surgical drainage & debridement

**C:** abdominal organ involvement (25–50%); myopericardial invasion (rare)

**P:** myopericardial invasion fatal, otherwise good; prevention – improved dental hygiene
Adenoviruses

**D:** infections with adenoviruses cause sore throat, diarrhoea, conjunctivitis, haemorrhagic cystitis or URTI

**A:** adenoviruses are unenveloped DNA viruses; 40 & 41 → diarrhoea; 1, 2, 5 & 6 → endemic URTI; 3, 4 & 7 → epidemics of URTI; 3 & 7 → pharyngoconjunctivitis; 7, 11 & 21 → haemorrhagic cystitis; 8 → conjunctivitis

**A/R:** infants; military recruits; immunocompromised

**E:** worldwide distribution; 40 & 41 cause 4-8% of infantile gastroenteritis; temperate regions ↑ URTI in autumn/winter

**H:** 40 & 41: IP 8–10/7 → diarrhoea, no pus or blood; symptoms of URTI; eye pain & redness; haematuria

**E:** signs of pharyngitis, tonsillitis or conjunctivitis

**P:** acute lytic infection & chronic latent disease

**I:** blood/urine/stool/tissue – culture; immunofluorescence

**M:** usually self-limiting; consider Ig if compromised host

**C:** intussusception; meningoencephalitis

**P:** extremely low mortality for diarrhoea; respiratory infection may rarely prove life-threatening in compromised host or neonates
infections due to alphaviruses are named for the viruses that cause them – CHIK, Sindbis, W/E/VEE

alphaviruses are RNA viruses; spread by mosquito – CHIK & VEE Aedes & Culex spp., Sindbis Culex spp., EEE Culex & Culiseta spp., WEE Culex, Culiseta, Aedes & Anopheles

infants; young males; rural environment; malnutrition; occupational exposure

CHIK – Africa, India, S.E. Asia; Sindbis – Africa, India, tropical Asia, Australia; WEE – N.W. America; EEE – USA, C. & S. America; VEE – S. America

CHIK: IP 2–12/7 → biphasic illness Sindbis: (only occasionally overt disease in humans) → fever, rash, arthralgia, myalgia, malaise, headache W/E/VEE: IP 2–14/7 → short, sharp febrile attack → malaise, headache, stiffness, drowsiness → possible 2nd phase – excitability, somnolence, delirium, convulsions, paralysis, coma; EEE more severe than others

CHIK – rash is maculopapular, pruritic W/E/VEE – 2nd stage meningoencephalitic signs (stiff neck, drowsiness)

Ab neutralisation of virus after short illness; 2nd stage virus → nervous system → invades cells (grey matter) → destruction

virus can be isolated from blood in acute stage; Ab titres ↑ in convalescent sera

supportive

CHIK – arthralgia, arthritis
W/EEE – neurological complications in young children

majority recover completely → immunity; W/EEE 10% mortality, some permanent neurological sequelae in survivors; CHIK mortality up to 3% if < 1-year-old or > 50; prevention – avoid mosquito bites; vaccine available for selected populations
Amoebiasis

**D:** infection with *Entamoeba histolytica* causing diarrhoea or extragastrointestinal diseases such as liver abscesses

**A:** *E. histolytica* is a parasite; transmission of cysts is faecal–oral

**A/R:** very young; malnutrition; immunocompromised; pregnancy

**E:** Asia, Africa, Middle East, C. & S. America; 480 million cases with annual mortality of 100,000

**H:** travel to endemic area; variable IP → asymptomatic or insidious onset abdominal discomfort, diarrhoea → ↑ severity, bloody, mucoid, tenesmus (50%)

**E:** frequently tender over caecum & colon; may have tender hepatomegaly

**P:** colitis of large intestine; possible mucosal ulceration; invasive amoebae may ingest RBCs

**I:** FBC → ↑ WBC, ↓ Hb; U & E → picture of dehydration; stool × 3 → microscopy, culture & sensitivity; anti-amoeba Abs; +/- AXR; +/- sigmoidoscopy & biopsy

**M:** rehydrate if necessary; metronidazole then diloxanide furoate to eliminate cysts plus broad-spectrum if peritonitis

**C:** dehydration; fulminant colitis; amoeboma in colon; chronic amoebiasis; amoebic liver abscess

**P:** good if managed well
Anaerobes

D: anaerobes cause abscess formation as well as GI & RT disease

A: part of normal GIT & oral flora; *Fusobacterium necrophorum* causes Lemierre’s syndrome, internal jugular vein septic thrombophlebitis; *Bacteroides fragilis, Clostridia, Peptostreptococcus & Prevotella* cause abscess formation, malabsorption, aspiration pneumonia & empyema

A/R: immunocompromised; starvation; alcoholism; diabetes; scleroderma; ileal bypass & blind loops of bowel; colonic cancer

E: worldwide

H: predisposing factors; abdominal or chest symptoms; sore throat (before Lemierre’s)

E: signs of abscess; chest signs suggestive of pneumonia; tender neck; lymphadenopathy

P: abscess formation

I: blood/pus – microscopy, culture & sensitivity

M: surgical drainage; penicillin or metronidazole

C: necrotising jugular septic thrombophlebitis; septicaemia

P: mortality high in compromised & colon cancer
Anthrax

**D:** mostly a disease of domestic herbivores (rare in man) caused by *Bacillus anthracis*

**A:** *B. anthracis* is an aerobic G +ve rod; produces heat and drying resistant spores; lives in topsoil; transmission is via direct inoculation via skin, inhalation or ingestion

**A/R:** wool workers are relatively immune due to high exposure; used as a biological weapon

**E:** worldwide; rare in humans

**H:** cutaneous: skin inoculation → IP 2–3/7 → small skin papule → vesicles around central lesion which ulcerates & forms painless eschar → spreads to involve vesicles → resolution over 2–6/52

pulmonary: spores from contaminated hides → short IP → fever, chills, cyanosis, SOB

intestinal: spores from contaminated meat → non-specific vomiting, diarrhoea, fever → occasionally haematemesis, dysenteric stools

**E:** cutaneous: lesions usually on head and neck

pulmonary: fluid-filled lungs; pleural effusion; mediastinitis

intestinal: no obvious signs

**P:** organisms dwell in capillaries → vasculitis, necrosis

**I:** FBC – ↑ WBC; scraping/aspiration – microscopy, culture & sensitivity; blood cultures; CXR – mediastinal widening

**M:** penicillin; prophylaxis ciprofloxacin

**C:** cutaneous: bacteraemia; massive oedema → respiratory obstruction

pulmonary: bacteraemia

intestinal: bacteraemia; haemorrhage; shock

**P:** cutaneous: uncomplicated is non-life-threatening

pulmonary: fatal if not diagnosed/treated early

intestinal: most patients recover spontaneously

prevention: vaccine available
Aspergillosis

**D:** infection with *Aspergillus* spp. causing a spectrum of disease

**A:** *Aspergillus* spp. are fungi; important species are *A. fumigatus*, *A. flavus* & *A. niger*; spores found in soil, dust, decaying vegetable matter; infection is via inhalation of spores

**A/R:** immunocompromised (invasive disease); structural lung abnormality (aspergilloma); atopy (ABPA)

**E:** worldwide

**H:** ABPA: asthma, chronic cough
aspergilloma: cavitating lung disease in past, e.g. TB; intermittent cough; may develop haemoptysis
invasive: history of immunocompromise; symptoms of invasion

**E:** ABPA: wheeze

**P:** ABPA: hypersensitivity reaction
aspergilloma: formation of a fungal ball
invasive: invasion of lung, paranasal sinuses, CNS, kidney, bone, etc. by fungus

**I:** ABPA: CXR – more severe appearance than expected; peripheral shadowing aspergilloma: CXR/CT chest – SOL within a cavity with halo; sputum microscopy, culture & sensitivity
invasive: blood cultures; Ag detection; tissue biopsy

**M:** ABPA: steroids
aspergilloma: surgical excision
invasive: amphotericin or voriconazole; try and reverse/decrease immunocompromise

**C:** local invasion; bone erosion

**P:** high risk of fatality with invasive disease
Atypical mycobacteria

D: mostly incidental and opportunistic infections due to *Mycobacterium avium* & *Mycobacterium intracellulare* but also cutaneous granulomatous skin diseases

A: environmental saprophytes; Buruli ulcer – *Mycobacterium ulcerans*; swimming pool or fish tank granuloma – *Mycobacterium marinum*

A/R: predisposing lung lesion, e.g. COPD, old TB, CF; HIV; congenital immune deficiencies; ♂ > ♀

E: worldwide

H: pulmonary: insidious onset cough, weight loss in healthy/compromised lymphadenopathy: < 5 years of age, healthy/compromised post-inoculation: Buruli ulcer; swimming pool granuloma disseminated: HIV or congenital immune deficiency

E: few signs

P: invasion of macrophages → immune response → granuloma formation

I: CXR; sputum/biopsy/excision – microscopy with Z–N stain, culture & sensitivity

M: antibiotics depend on site, severity, underlying condition, sensitivities, e.g. combinations of clarithromycin, doxycycline, rifampicin, ethambutol, isoniazid; surgical excision of lesion/lymph nodes/skin

C: dissemination

P: excellent in children with cervical adenitis; poor in immunocompromised
**Babesiosis**

**D:** zoonotic infection with *Babesia* spp.

**A:** *Babesia* spp. are protozoan parasites of domestic & wild animals; transmission is via tick bite; mostly *B. bovis*, *B. microti*, *B. divergens*

**A/R:** splenectomy

**E:** rare; Europe mostly *B. divergens* spread by *Ixodes ricinus*; N. America mostly *B. microti* spread by *Ixodes dammini*

**H:** *divergens/bovis*: IP 1–4/52 → vague unwellness → fever, prostration, jaundice, fatigue

*microti*: IP 1–3/52 → mostly subclinical or anorexia, fatigue, fever, sweating, rigors, myalgia

**E:** *divergens/bovis*: splenectomy scar

*microti*: fever, mild splenomegaly +/– hepatomegaly

**P:** red cell infiltration & lysis

**I:** FBC – ↑ WBC, ↓ Hb; U & E ↑ urea; ↑ bilirubin (unconjugated); urinalysis – haematuria, proteinuria; blood film for parasites; consider IFA, PCR

**M:** *divergens*: anecdotal – diminazene (used in animals); co-trimoxazole + pentamidine; massive exchange transfusion + clindamycin + oral quinine

*microti*: quinine + clindamycin + blood or RBC exchange transfusion

**C:** ARF; haemolytic anaemia

**P:** *divergens/bovis*: untreated, splenectomised → death

*microti*: usually mild → spontaneous recovery
**Bacillus cereus**

- **D:** cause of food poisoning with vomiting, diarrhoea or both
- **A:** *Bacillus cereus* is a G\(^+\)ve aerobe; can form spores; ubiquitous in soil; forms heat stable emetic toxin & heat labile enterotoxin
- **A/R:** rice boiled in bulk and reheated, e.g. Chinese restaurants
- **E:** worldwide; emetic toxin formed in food; enterotoxin formed in food but also in gut
- **H:** emetic toxin: IP 1–5 h → vomiting; may have history of Chinese meal or similar
  enterotoxin: IP 8–16 h → diarrhoea, abdominal pain
- **E:** non-specific abdominal tenderness
- **P:** non-specific
- **I:** stool sample – microscopy, culture & sensitivity; also test food samples
- **M:** supportive
- **C:** dehydration
- **P:** symptoms generally do not persist beyond 24 h