LearnInfection
a learning platform for infection trainees

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Acinetobacter

Background:
- Genus of gram negative bacteria with 38 species
- ***A. baumannii*** most significant cause of infections in humans but others including *A. lwoffi*, *A. calcoaceticus*, *A. johsonii* and *A. juii* have been associated with disease.
- Name derived from Greek α + κίνητο + βακτηρ(ία) meaning non-moving rod

Acinetobacter on blood agar. Image from microbe-canvas.com

Microbiology and identification
- Smooth round colonies on blood agar
- Gram negative coccobacilli in pairs, but appears rod shaped during rapid growth
- Has tendency to retain crystal violet and may be misidentified as gram positive
- Non motile (occasionally demonstrates twitching motility on wet prep)
- Strictly aerobic (helps differentiate from Enterobacteriaceae)
- Oxidase negative (helps differentiate from *Moraxella* and *Neisseria*)
- Also Indole negative, Catalase positive, Lactose non fermenter

Sources:
PHE SMI 17
Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases 7th edition

Epidemiology
- Naturally inhabits water and soil (near 100% of soils samples will yield *Acinetobacter*)
- In humans can **colonise** skin, wounds, respiratory and GI tracts
- Some strains **can survive weeks in environment** promoting fomite transmission in hospitals
- This combined with its **resistance to many major antibiotic classes** has led to it emerging as a significant cause of nosocomial infections particularly in ICUs
- **Risk factors for infection** include mechanical ventilation, recent surgery, central vascular access, tracheostomy, enteral feeding and prior use of broad spectrum antibiotics.

Clinical manifestations
- Able to cause infections in almost every body system, but **usually opportunistic**
- Most frequent clinical manifestation is **ventilator-associated pneumonia and blood stream infection** (usually associated with vascular catheters)
- Due to its ability to colonise humans there may be **difficulty in distinguishing between colonisation and true infection**.
- May cause a severe community acquired pneumonia associated with immunocompromised and certain geographic regions (SE Asia and Australia)

Antimicrobial therapy and resistance
- Increasing levels of resistance to fluroquinolones, cephalosporins, carbapenems and aminoglycosides has been observed in *Acinetobacter*
- This has made traditional empiric therapy with carbapenems or cephalosporins +/- an aminoglycoside unreliable and treatment should be based on individual susceptibilities
- The beta lactamase inhibitor sulbactam (usually available in combination with ampicillin) has direct antibacterial activity against *Acinetobacter*
- Mechanisms of resistance include intrinsic AmpC (inducible), acquisition of serine and metallo beta lactamases and aminoglycoside modifying enzymes and efflux pumps