Principles for rational prescribing

1. Is an antibiotic indicated?
2. Cultures before administering AB in hospitalised patients or patients with recurrent infections
3. Choose an appropriate empiric antibiotic
4. Correct dose and route of administration
5. Start AB rapidly in severe infections
6. Practice early and effective source control
7. Evaluate appropriateness everyday

When is an antibiotic indicated?

Depend on diagnosis?

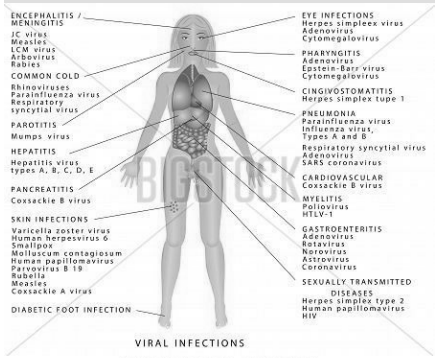
> Fever

> Leukocytosis

> Raised inflammatory markers

> Specific organ dysfunction

When is an antibiotic indicated?



Antibiotics Indicated:

P= prophylactic treatment

> Prevention of new/recurrent infections

E= empirical treatment

> treat for most likely infective organism (no culture results yet)

D= Definitive treatment

> treat w/ AB as per results of microbial culture and sensitivity (MCS)

Leukocytes&Inflammatory Markers:

Haematology		
White Cell count	4-11/L	+
Erythrocyte sedimentation rate	0-22mm/hr (men)	+
	0-29mm/hr (women)	
Platelets	140-440/L	-
C-reactive protein	0-10	+

Prophylactic treatment:

Infective endocarditis (patients with prosthetic heart valves/valvular disease)

> Dental, oral or URT procedures

> GU surgery / GI procedures

Rheumatic fever (reoccurrence)

Meningococcal disease (contacts)

Surgical

TB (high risk individuals / contacts)

HIV (high risk individuals / contacts)

Empiric antibiotic is indicated:

Choose by assessing:

1. Source of infection:

Community acquired Before or less than 48 hours of admission to hospital. Microorganism expected? Wild/non-resistant mo's. 1st line antibiotics. Less side effects.

Hospital acquired >48 hours after admission or within 30 days of discharge. Microorganisms expected? Mutated / resistant microorganisms. Second line antibiotics. More side-effects.

Recurrent

2. Site of infection:

Peripheral line sepsis=skin/soft tissue. Likely pathogen. Staph. aureus. Coagulase negative staphylococci, strep. spp.

Cutaneous Abscess:

Definition
Deep inflammatory nodule extending into subcutaneous tissue that develops from preceding folliculitis

Common aetiologies
S. aureus

Tests
None

Management
All cases require surgical drainage.

Uncomplicated cases
- No antibiotics required

Complicated cases (surrounding cellulitis, located on face, systemic symptoms)
- Flucloxacillin 500 mg po 6-hourly for 5 days or co-amoxiclav 1g po 12-hourly
- In penicillin allergy use clindamycin 450 mg po 8 hourly

Osteomyelitis:

Bacterial infection of bone due to contaguous spread from soft tiss haematogenous seeding or direc inoculation.

Common aetiologies

– S aureus. – Coagulase---neg staphylococc

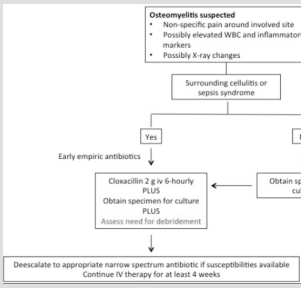
Occasional

– Streptococci. - Enterococci. - Gram---negative bacilli.

Other

– M tuberculosis. – Fungal infections.

Osteomyelitis (cont)



Diagnosis and Treatment

Osteomyelitis (cont.)

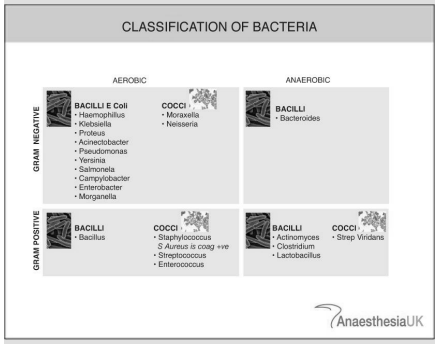
Notes:
- May need to continue IV therapy for 6 weeks or longer
- Do not add rifampicin in cases without foreign material
- Consider tuberculosis if culture-negative or no clinical imp
- Vancomycin is used for health care-associated osteomyeli MRSA (loading dose 23 – 30 mg/kg followed by 15 – 20 mg maintain trough levels 15 – 20 mg/mL)
- See Chapter 18 for management of open fractures
- Infections associated with prosthetic material should be d expert

Diagnosis and treatment notes.

Empiric Treatments:

Most likely pathogen for site of infection	
> Gram + cocci:	Skin
> Gram - bacilli:	Urethras
> Gram + and -, anareobes:	Large intestine

Classification of Bacteria:



Empiric Treatment: drug distribution:

	CSF	Lung	Soft tissue	Urinary tract
Ampicillin	Good (in high doses)	Good	Good	Good
Cloxacillin	Inadequate data	Fair	Good	No data
Clindamycin	Poor	No data	Good	No data
Co-amoxiclav	Poor	Good	Good	Fair
Ceftriaxone	Good (in high doses)	Good	Good	Good
Aminoglycosides	Poor	Poor	Fair	Good (if normal GFR)
Ciprofloxacin	Good (in high doses)	Good	Good	Good
Co-trimoxazole	Good	Good	Good	Good
Ertapenem	Poor	Good	Good	Good
Meropenem	Good (in high doses)	Good	Good	Good
Imipenem	Good*	Good	Good	Good
Vancomycin	Poor	Fair	Poor	Good
Linezolid	Good	Good	Good	Good
Daptomycin	Poor	Poor	Good	Good

*Associated with higher risk of seizures

Will AB reach site of infection?

Definitive Treatment:

Microbial culture and sensitivity results done.

Culture of:
> Urine
> Sputum
> Cerebrovascular fluid
> Nasal secretions
> Wound / throat swab
> Blood

Microbial Culture:

Growing microbe to identify the type of bacteria.

Microbial Sensitivity:
Identify which antibiotics inhibits the growth of the microorganism

Microbial Culture (cont.):

	Oral absorption (%)	Comments
Penicillin VK	Moderate	Take without food
Amoxicillin	Good	
Flucloxacillin	Good	Take on empty stomach
Clindamycin	Good	
Co-amoxiclav	Good	
Ciprofloxacin	Good	Do not give via NGT or with antacids
Doxycycline	Excellent	Take with food, do not co-administer with antacids
Azithromycin	Poor	Take without food
Metronidazole	Excellent	
Co-trimoxazole	Good	
Linezolid	Excellent	

routes of administration.

Microbial Culture (cont.):

Duration	Indication
3 days	Uncomplicated UTI (quinolone ONLY), Shigellosis (without bacteraemia, quinolone ONLY)
5 - 7 days (or 3 days after normalization of fever)	Uncomplicated UTI (non-quinolone), Otitis Media, Pneumonia, Meningococcal meningitis, Tick bite Fever (7)
10 (– 14 days)	Sinusitis, Pneumococcal meningitis, Pyelonephritis, pharyngitis (S. pyogenes), Complicated UTI, Prostatitis (acute), Shigellosis (with bacteraemia), Helicobacter eradication (14), Gonococcal arthritis
21 days	Meningitis (Listeria or Gram-negative)
4 weeks	Endocarditis (prosthetic valve 6 weeks), Osteomyelitis, Septic arthritis, Prostatitis (chronic), Brucellosis (6 weeks)

Recommended duration of definitive treatment.

Case study questions:

Rationalise if an antibiotic is indicated?

What pharmacological / non-pharmacological treatment would you recommend?

How would you monitor the efficacy and safety of the treatment once initiated?

What is a possible complication of a sore throat? - Otitis media (spread of infection to the middle ear) Meningitis (spread of infection to the lining of brain and spinal canal) Pneumonia (lung infection)

Road Map: