

**Q8 Compare and contrast the mechanism of action, spectrum of activity and adverse effects of benzyl penicillin, metronidazole and clindamycin (March 2013)**

	Benzylpenicillin	Metronidazole	Clindamycin
Mechanism	Impairs cell wall synthesis → Beta-lactam antibiotics inhibit the growth of sensitive bacteria by inactivating transpeptidase enzymes located in the bacterial cell membrane, inhibiting crosslinkage of peptidoglycans and thus impairing cell wall synthesis	Impairs DNA synthesis → binds to and breaks bacterial DNA strands (exact mechanism unclear)	Impairs protein synthesis → binds to the ribosomal 50S subunit to prevent RNA translation
Spectrum	Narrow spectrum penicillin with broad Gram positive cover (including staph, strep and enterococcus species), Gram negative cocci (N.Gonorrhoea, N.Meningitidis) and some Gram negative bacilli.	Active against anaerobes (including clostridium, N.Gonorrhoea, N.Meningitidis, Bacterioides and Fusobacterium) and protozoa (trichomonas, Giardia)	Good gram positive cover (Staph. Strep, E.Faecalis) and anaerobic cover (Clostridia, bacterioides)
Adverse effects	GIT – abdominal pain, N/V/D, pseudomembranous colitis, hepatitis HAEM – agranulocytosis CNS – confusion, seizure, encephalopathy HYPERSENSITIVITY – rash, anaphylaxis	GIT – abdominal pain, N/V/D, jaundice, pancreatitis HAEM – leukopenia CVS – T wave flattening, QT prolongation CNS – ataxia, seizures, insomnia, paraesthesia HYPERSENSITIVITY – rash OTHER – metallic taste	GIT – abdominal pain, N/V/D, abnormal LFTs, jaundice, pseudomembranous colitis HAEM – transient neutropaenia, thrombocytopenia HYPERSENSITIVITY – erythema multiforme, rash OTHER – dysgeusia, thrombophlebitis