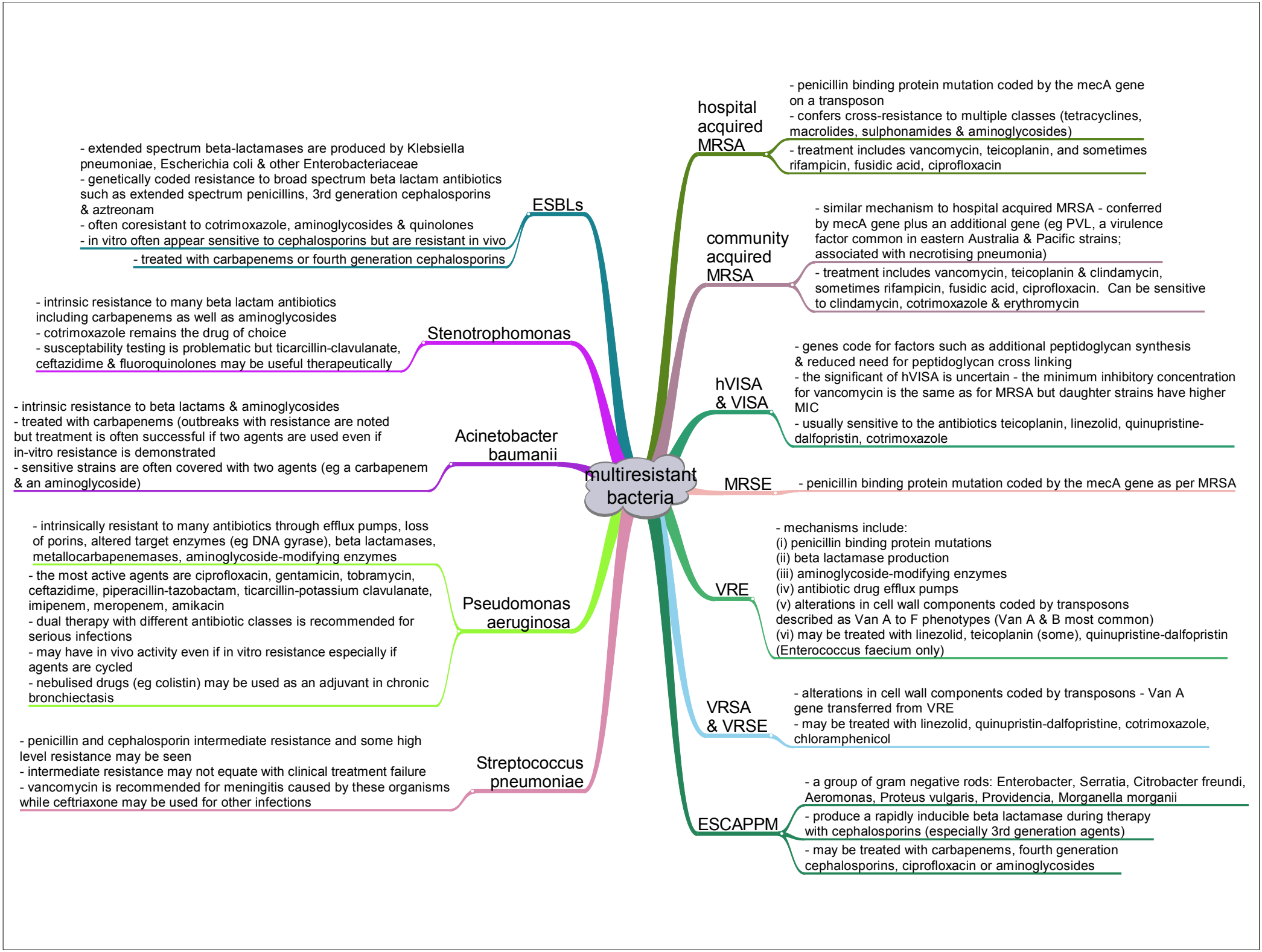
multiresistant bacteria
ESBLs
- extended spectrum beta-lactamases are produced by Klebsiella pneumoniae, Escherichia coli & other Enterobacteriaceae
- genetically coded resistance to broad spectrum beta lactam antibiotics such as extended spectrum penicillins, 3rd generation cephalosporins & aztreonam
- often coresistant to cotrimoxazole, aminoglycosides & quinolones
- in vitro often appear sensitive to cephalosporins but are resistant in vivo
- treated with carbapenems or fourth generation cephalosporins
Stenotrophomonas
- intrinsic resistance to many beta lactam antibiotics including carbapenems as well as aminoglycosides
- cotrimoxazole remains the drug of choice
- susceptability testing is problematic but ticarcillin-clavulanate, ceftazidime & fluoroquinolones may be useful therapeutically
Acinetobacter baumanii
- intrinsic resistance to beta lactams & aminoglycosides
- treated with carbapenems (outbreaks with resistance are noted but treatment is often successful if two agents are used even if in-vitro resistance is demonstrated
- sensitive strains are often covered with two agents (eg a carbapenem & an aminoglycoside)
Pseudomonas aeruginosa
- intrinsically resistant to many antibiotics through efflux pumps, loss of porins, altered target enzymes (eg DNA gyrase), beta lactamases, metallocarbapenemases, aminoglycoside-modifying enzymes
- the most active agents are ciprofloxacin, gentamicin, tobramycin, ceftazidime, piperacillin-tazobactam, ticarcillin-potassium clavulanate, imipenem, meropenem, amikacin
- dual therapy with different antibiotic classes is recommended for serious infections
- may have in vivo activity even if in vitro resistance especially if agents are cycled
- nebulised drugs (eg colistin) may be used as an adjuvant in chronic bronchiectasis
Streptococcus pneumoniae
- penicillin and cephalosporin intermediate resistance and some high level resistance may be seen
- intermediate resistance may not equate with clinical treatment failure
- vancomycin is recommended for meningitis caused by these organisms while ceftriaxone may be used for other infections
hospital acquired MRSA
- penicillin binding protein mutation coded by the mecA gene on a transposon
- confers cross-resistance to multiple classes (tetracyclines, macrolides, sulphonamides & aminoglycosides)
- treatment includes vancomycin, teicoplanin, and sometimes rifampicin, fusidic acid, ciprofloxacin
community acquired MRSA
- similar mechanism to hospital acquired MRSA - conferred by mecA gene plus an additional gene (eg PVL, a virulence factor common in eastern Australia & Pacific strains; associated with necrotising pneumonia)
- treatment includes vancomycin, teicoplanin & clindamycin, sometimes rifampicin, fusidic acid, ciprofloxacin. Can be sensitive to clindamycin, cotrimoxazole & erythromycin
hVISA & VISA
- genes code for factors such as additional peptidoglycan synthesis & reduced need for peptidoglycan cross linking
- the significant of hVISA is uncertain - the minimum inhibitory concentration for vancomycin is the same as for MRSA but daughter strains have higher MIC
- usually sensitive to the antibiotics teicoplanin, linezolid, quinupristine-dalfopristin, cotrimoxazole
MRSE
- penicillin binding protein mutation coded by the mecA gene as per MRSA
VRE
- mechanisms include:
(i) penicillin binding protein mutations
(ii) beta lactamase production
(iii) aminoglycoside-modifying enzymes
(iv) antibiotic drug efflux pumps
(v) alterations in cell wall components coded by transposons described as Van A to F phenotypes (Van A & B most common)
(vi) may be treated with linezolid, teicoplanin (some), quinupristine-dalfopristin (Enterococcus faecium only)
VRSA & VRSE
- alterations in cell wall components coded by transposons - Van A gene transferred from VRE
- may be treated with linezolid, quinupristin-dalfopristine, cotrimoxazole, chloramphenicol
ESCAPPM
- a group of gram negative rods: Enterobacter, Serratia, Citrobacter freundi, Aeromonas, Proteus vulgaris, Providencia, Morganella morganii
- produce a rapidly inducible beta lactamase during therapy with cephalosporins (especially 3rd generation agents)
- may be treated with carbapenems, fourth generation cephalosporins, ciprofloxacin or aminoglycosides