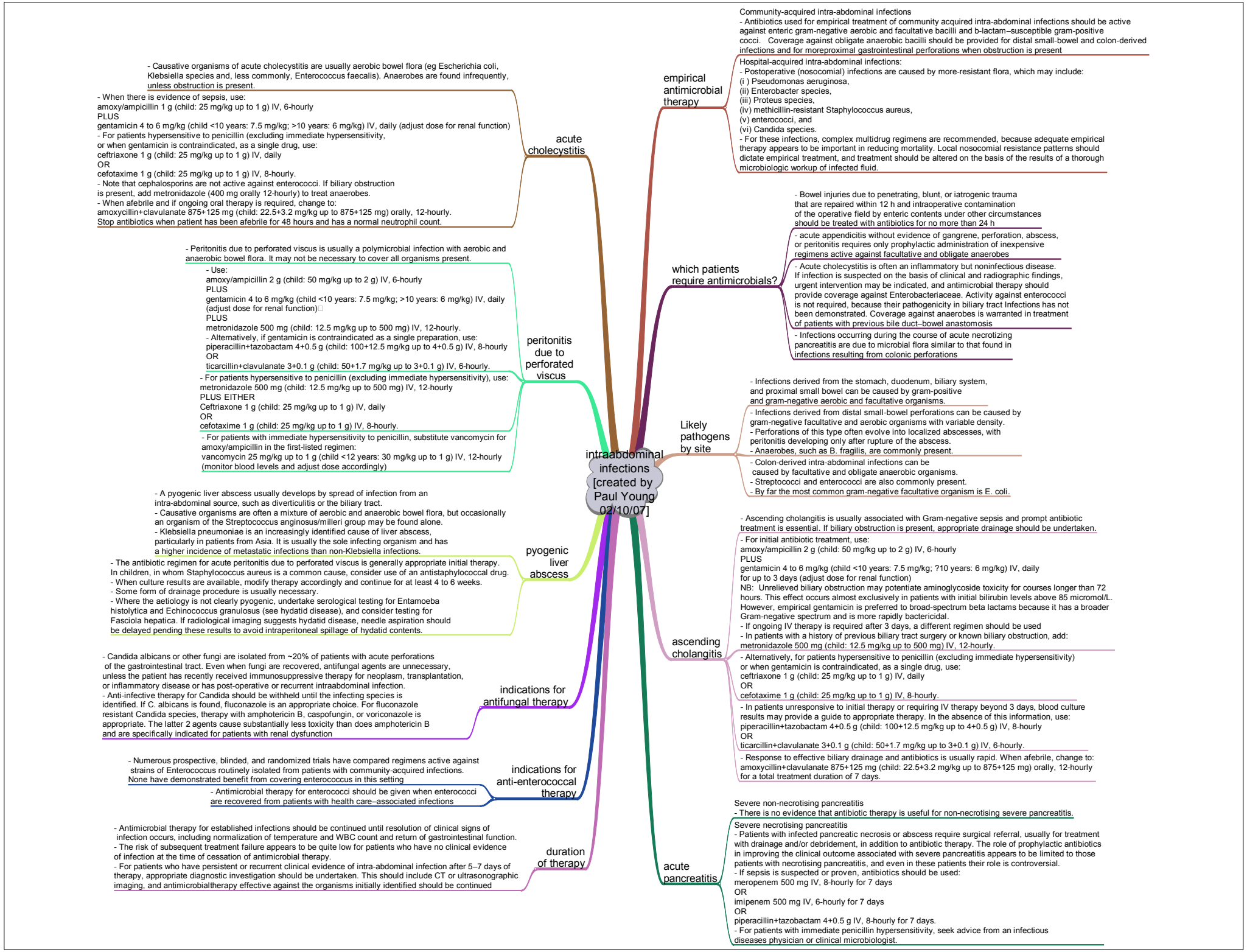
intraabdominal infections [created by Paul Young 02/10/07]
empirical antimicrobial therapy
Community-acquired intra-abdominal infections
- Antibiotics used for empirical treatment of community acquired intra-abdominal infections should be active against enteric gram-negative aerobic and facultative bacilli and b-lactam–susceptible gram-positive cocci. Coverage against obligate anaerobic bacilli should be provided for distal small-bowel and colon-derived infections and for moreproximal gastrointestinal perforations when obstruction is present
Hospital-acquired intra-abdominal infections:
- Postoperative (nosocomial) infections are caused by more-resistant flora, which may include:
(i ) Pseudomonas aeruginosa,
(ii) Enterobacter species,
(iii) Proteus species,
(iv) methicillin-resistant Staphylococcus aureus,
(v) enterococci, and
(vi) Candida species.
- For these infections, complex multidrug regimens are recommended, because adequate empirical therapy appears to be important in reducing mortality. Local nosocomial resistance patterns should dictate empirical treatment, and treatment should be altered on the basis of the results of a thorough microbiologic workup of infected fluid.
which patients require antimicrobials?
- Bowel injuries due to penetrating, blunt, or iatrogenic trauma that are repaired within 12 h and intraoperative contamination of the operative field by enteric contents under other circumstances should be treated with antibiotics for no more than 24 h
- acute appendicitis without evidence of gangrene, perforation, abscess, or peritonitis requires only prophylactic administration of inexpensive regimens active against facultative and obligate anaerobes
- Acute cholecystitis is often an inflammatory but noninfectious disease. If infection is suspected on the basis of clinical and radiographic findings, urgent intervention may be indicated, and antimicrobial therapy should provide coverage against Enterobacteriaceae. Activity against enterococci is not required, because their pathogenicity in biliary tract Infections has not been demonstrated. Coverage against anaerobes is warranted in treatment of patients with previous bile duct–bowel anastomosis
- Infections occurring during the course of acute necrotizing pancreatitis are due to microbial flora similar to that found in infections resulting from colonic perforations
Likely pathogens by site
- Infections derived from the stomach, duodenum, biliary system, and proximal small bowel can be caused by gram-positive and gram-negative aerobic and facultative organisms.
- Infections derived from distal small-bowel perforations can be caused by gram-negative facultative and aerobic organisms with variable density.
- Perforations of this type often evolve into localized abscesses, with peritonitis developing only after rupture of the abscess.
- Anaerobes, such as B. fragilis, are commonly present.
- Colon-derived intra-abdominal infections can be caused by facultative and obligate anaerobic organisms.
- Streptococci and enterococci are also commonly present.
- By far the most common gram-negative facultative organism is E. coli.
ascending cholangitis
- Ascending cholangitis is usually associated with Gram-negative sepsis and prompt antibiotic treatment is essential. If biliary obstruction is present, appropriate drainage should be undertaken.
- For initial antibiotic treatment, use:
amoxy/ampicillin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly
PLUS
gentamicin 4 to 6 mg/kg (child <10 years: 7.5 mg/kg; ?10 years: 6 mg/kg) IV, daily
for up to 3 days (adjust dose for renal function)
NB: Unrelieved biliary obstruction may potentiate aminoglycoside toxicity for courses longer than 72 hours. This effect occurs almost exclusively in patients with initial bilirubin levels above 85 micromol/L. However, empirical gentamicin is preferred to broad-spectrum beta lactams because it has a broader Gram-negative spectrum and is more rapidly bactericidal.
- If ongoing IV therapy is required after 3 days, a different regimen should be used
- In patients with a history of previous biliary tract surgery or known biliary obstruction, add:
metronidazole 500 mg (child: 12.5 mg/kg up to 500 mg) IV, 12-hourly.
- Alternatively, for patients hypersensitive to penicillin (excluding immediate hypersensitivity) or when gentamicin is contraindicated, as a single drug, use:
ceftriaxone 1 g (child: 25 mg/kg up to 1 g) IV, daily
OR
cefotaxime 1 g (child: 25 mg/kg up to 1 g) IV, 8-hourly.
- In patients unresponsive to initial therapy or requiring IV therapy beyond 3 days, blood culture results may provide a guide to appropriate therapy. In the absence of this information, use:
piperacillin+tazobactam 4+0.5 g (child: 100+12.5 mg/kg up to 4+0.5 g) IV, 8-hourly
OR
ticarcillin+clavulanate 3+0.1 g (child: 50+1.7 mg/kg up to 3+0.1 g) IV, 6-hourly.
- Response to effective biliary drainage and antibiotics is usually rapid. When afebrile, change to:
amoxycillin+clavulanate 875+125 mg (child: 22.5+3.2 mg/kg up to 875+125 mg) orally, 12-hourly
for a total treatment duration of 7 days.
acute pancreatitis
Severe non-necrotising pancreatitis
- There is no evidence that antibiotic therapy is useful for non-necrotising severe pancreatitis.
Severe necrotising pancreatitis
- Patients with infected pancreatic necrosis or abscess require surgical referral, usually for treatment with drainage and/or debridement, in addition to antibiotic therapy. The role of prophylactic antibiotics in improving the clinical outcome associated with severe pancreatitis appears to be limited to those patients with necrotising pancreatitis, and even in these patients their role is controversial.
- If sepsis is suspected or proven, antibiotics should be used:
meropenem 500 mg IV, 8-hourly for 7 days
OR
imipenem 500 mg IV, 6-hourly for 7 days
OR
piperacillin+tazobactam 4+0.5 g IV, 8-hourly for 7 days.
- For patients with immediate penicillin hypersensitivity, seek advice from an infectious diseases physician or clinical microbiologist.
duration of therapy
- Antimicrobial therapy for established infections should be continued until resolution of clinical signs of infection occurs, including normalization of temperature and WBC count and return of gastrointestinal function.
- The risk of subsequent treatment failure appears to be quite low for patients who have no clinical evidence of infection at the time of cessation of antimicrobial therapy.
- For patients who have persistent or recurrent clinical evidence of intra-abdominal infection after 5–7 days of therapy, appropriate diagnostic investigation should be undertaken. This should include CT or ultrasonographic imaging, and antimicrobialtherapy effective against the organisms initially identified should be continued
indications for anti-enterococcal therapy
- Numerous prospective, blinded, and randomized trials have compared regimens active against strains of Enterococcus routinely isolated from patients with community-acquired infections. None have demonstrated benefit from covering enterococcus in this setting
- Antimicrobial therapy for enterococci should be given when enterococci are recovered from patients with health care–associated infections
indications for antifungal therapy
- Candida albicans or other fungi are isolated from ~20% of patients with acute perforations of the gastrointestinal tract. Even when fungi are recovered, antifungal agents are unnecessary, unless the patient has recently received immunosuppressive therapy for neoplasm, transplantation, or inflammatory disease or has post-operative or recurrent intraabdominal infection.
- Anti-infective therapy for Candida should be withheld until the infecting species is identified. If C. albicans is found, fluconazole is an appropriate choice. For fluconazole resistant Candida species, therapy with amphotericin B, caspofungin, or voriconazole is appropriate. The latter 2 agents cause substantially less toxicity than does amphotericin B and are specifically indicated for patients with renal dysfunction
pyogenic liver abscess
- A pyogenic liver abscess usually develops by spread of infection from an intra-abdominal source, such as diverticulitis or the biliary tract.
- Causative organisms are often a mixture of aerobic and anaerobic bowel flora, but occasionally an organism of the Streptococcus anginosus/milleri group may be found alone.
- Klebsiella pneumoniae is an increasingly identified cause of liver abscess, particularly in patients from Asia. It is usually the sole infecting organism and has a higher incidence of metastatic infections than non-Klebsiella infections.
- The antibiotic regimen for acute peritonitis due to perforated viscus is generally appropriate initial therapy. In children, in whom Staphylococcus aureus is a common cause, consider use of an antistaphylococcal drug.
- When culture results are available, modify therapy accordingly and continue for at least 4 to 6 weeks.
- Some form of drainage procedure is usually necessary.
- Where the aetiology is not clearly pyogenic, undertake serological testing for Entamoeba histolytica and Echinococcus granulosus (see hydatid disease), and consider testing for Fasciola hepatica. If radiological imaging suggests hydatid disease, needle aspiration should be delayed pending these results to avoid intraperitoneal spillage of hydatid contents.
peritonitis due to perforated viscus
- Peritonitis due to perforated viscus is usually a polymicrobial infection with aerobic and anaerobic bowel flora. It may not be necessary to cover all organisms present.
- Use:
amoxy/ampicillin 2 g (child: 50 mg/kg up to 2 g) IV, 6-hourly
PLUS
gentamicin 4 to 6 mg/kg (child <10 years: 7.5 mg/kg; >10 years: 6 mg/kg) IV, daily (adjust dose for renal function)
PLUS
metronidazole 500 mg (child: 12.5 mg/kg up to 500 mg) IV, 12-hourly.
- Alternatively, if gentamicin is contraindicated as a single preparation, use:
piperacillin+tazobactam 4+0.5 g (child: 100+12.5 mg/kg up to 4+0.5 g) IV, 8-hourly
OR
ticarcillin+clavulanate 3+0.1 g (child: 50+1.7 mg/kg up to 3+0.1 g) IV, 6-hourly.
- For patients hypersensitive to penicillin (excluding immediate hypersensitivity), use:
metronidazole 500 mg (child: 12.5 mg/kg up to 500 mg) IV, 12-hourly
PLUS EITHER
Ceftriaxone 1 g (child: 25 mg/kg up to 1 g) IV, daily
OR
cefotaxime 1 g (child: 25 mg/kg up to 1 g) IV, 8-hourly.
- For patients with immediate hypersensitivity to penicillin, substitute vancomycin for amoxy/ampicillin in the first-listed regimen:
vancomycin 25 mg/kg up to 1 g (child <12 years: 30 mg/kg up to 1 g) IV, 12-hourly (monitor blood levels and adjust dose accordingly)
acute cholecystitis
- Causative organisms of acute cholecystitis are usually aerobic bowel flora (eg Escherichia coli, Klebsiella species and, less commonly, Enterococcus faecalis). Anaerobes are found infrequently, unless obstruction is present.
- When there is evidence of sepsis, use:
amoxy/ampicillin 1 g (child: 25 mg/kg up to 1 g) IV, 6-hourly
PLUS
gentamicin 4 to 6 mg/kg (child <10 years: 7.5 mg/kg; >10 years: 6 mg/kg) IV, daily (adjust dose for renal function)
- For patients hypersensitive to penicillin (excluding immediate hypersensitivity, or when gentamicin is contraindicated, as a single drug, use:
ceftriaxone 1 g (child: 25 mg/kg up to 1 g) IV, daily
OR
cefotaxime 1 g (child: 25 mg/kg up to 1 g) IV, 8-hourly.
- Note that cephalosporins are not active against enterococci. If biliary obstruction is present, add metronidazole (400 mg orally 12-hourly) to treat anaerobes.
- When afebrile and if ongoing oral therapy is required, change to:
amoxycillin+clavulanate 875+125 mg (child: 22.5+3.2 mg/kg up to 875+125 mg) orally, 12-hourly.
Stop antibiotics when patient has been afebrile for 48 hours and has a normal neutrophil count.