

# GASTRO-INTESTINAL TRACT INFECTIONS - ANTIMICROBIAL MANAGEMENT

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## **1. INTRODUCTION**

Infections of the gastro-intestinal tract can occur as a result of a primary intra- abdominal septic condition (such as acute cholecystitis), as a complication of a general surgical procedure (post-op sepsis) or as a result of an enteric infection affecting the bowel (such as salmonella or campylobacter infection).

The management of patients with *Clostridium difficile* infections can be found in a separate policy ([PAT IC 26. V3 Clostridium difficile](#))

## **2. ACUTE CHOLECYSTITIS AND CHOLANGITIS**

2.1 *Acute cholecystitis* is characterised by:

- Local signs of inflammation including localised abdominal tenderness in the right upper quadrant (RUQ)
- Systemic signs of inflammation including fever plus raised inflammatory markers (CRP and WCC)
- Characteristic findings on imaging

2.2 *Acute Cholangitis* is characterised by:

- History of biliary disease
- Charcot's triad (fever, jaundice, abdominal pain – upper/RUQ)
- Suggestive findings on imaging (biliary dilatation, stricture or stone)

An assessment should be made of the severity of the cholecystitis or cholangitis - at their most severe they may be accompanied by multi- organ dysfunction.

2.3 Investigations required:

- FBC, U&E, CRP, LFT
- Amylase
- Blood culture
- Arterial blood gas (if severe)
- Abdominal x-ray
- Other urgent imaging may be required
- Bile fluid culture (if this is drained or aspirated)

## 2.4 Antimicrobial Management

- A senior surgical assessment of disease severity should be undertaken.

		ANTIBIOTIC	Oral switch	Course length	Comments
First line		‡ Co-amoxiclav IV 1.2g tds	Co-amoxiclav 625mg tds	5 – 7 days depending on severity and progress	‡ = adjust dose in impaired renal function. Discuss with Pharmacist
If >65 years <b>AND</b> has received co-amoxiclav or cephalosporins in the previous 2 weeks		‡ Piperacillin + tazobactam IV 4.5g tds			
Penicillin allergy	non-anaphylaxis	‡ Cefuroxime IV 1.5g tds	Cefalexin 500mg tds	Consider switch to oral at 48 – 72 hrs	
	anaphylaxis	‡ Ciprofloxacin IV 400mg bd	‡ Ciprofloxacin 500mg bd		

### 3. ACUTE DIVERTICULITIS

3.1 The aetiology of acute diverticulitis is not clear, but is likely to be an inflammatory process. Up to 25% of patients with diverticulosis (presence of diverticula in the colon) will develop diverticulitis. The sigmoid colon is most commonly affected. Not all patients with diverticulitis require antibiotics and patients should be assessed for evidence of sepsis before commencing antibiotics.

3.2 *Acute diverticulitis* is characterised by:

- Constant abdominal pain – usually left lower quadrant.
- May be associated with fever, chills, nausea, vomiting, diarrhoea or constipation.
- May be complicated by abscess, fisture, perforation or bowel obstruction.

3.3 Investigations required:

- FBC, U&E, CRP
- Blood Culture
- MSU
- Arterial blood gas (if suspected sepsis or complicated disease)
- Abdominal x-ray
- CT abdomen may be indicated

3.4 *Antimicrobial Management*

**Senior surgical review** is required to determine the need for antimicrobial treatment

UNCOMPLICATED		ANTIBIOTIC			
First line		Antibiotics not normally indicated. Individual patient assessment required.			
COMPLICATED/SEPSIS		ANTIBIOTIC	Oral switch	Course length	Comments
First line		‡ Co-amoxiclav IV 1.2g tds	Co-amoxiclav 625mg tds	5 days dependent on clinical response	‡ = adjust dose in impaired renal function. Discuss with Pharmacist
If >65 years <b>AND</b> has received co-amoxiclav or cephalosporins in the previous 2 weeks		‡ Piperacillin + tazobactam IV 4.5g tds			
Penicillin allergy	non-anaphylaxis	‡ Cefuroxime IV 1.5g tds + metronidazole 500mg tds IV	Cefalexin 500mg tds + metronidazole 400mg tds	Consider switch to oral at 48 – 72 hrs	
	anaphylaxis	‡ Ciprofloxacin IV 400mg bd+ metronidazole 500mg tds IV	‡ Ciprofloxacin 500mg bd + metronidazole 400mg tds		

## 4. ACUTE APPENDICITIS

4.1 This is the commonest surgical cause of acute abdominal pain, caused by obstruction of the lumen of the appendix by faecoliths or lymphoid tissue. It may be complicated by perforation, leading to generalised peritonitis, or abscess formation. Diagnosis is made clinically.

4.2 *Acute appendicitis* is characterised by:-

- Colicky peri-umbilical pain, moving to right iliac fossa and becoming sharper.
- Tenderness in RIF with localised evidence of peritoneal irritation (guarding and rigidity)
- May be complicated (peritonitis, abscess) with evidence of sepsis
- Can be difficult to diagnose, especially in women

4.3 Investigations required:

- FBC, U&E, CRP
- MSU
- Blood culture if febrile
- Others (including imaging) – as clinically indicated

4.4 *Antimicrobial Management*

*Appendicectomy* is the definitive management and should be undertaken without delay, with appropriate prophylactic cover (see *Policy for Antimicrobial Prophylaxis for Surgical Procedures*).

Pre-operative antibiotics should only be given if there is evidence of sepsis and/or complicated disease (peritonitis/abscess), in which case a course of antibiotics is indicated:-

		ANTIBIOTIC	Oral switch	Course length	Comments
First line		‡Co-amoxiclav IV 1.2g tds	Co-amoxiclav 625mg tds	5 days  Consider switch to oral at 48 – 72 hrs	‡ = adjust dose in impaired renal function. Discuss with Pharmacist
If >65 years <b>AND</b> has received co-amoxiclav or cephalosporins in the previous 2 weeks		‡ Piperacillin + tazobactam IV 4.5g tds			
Penicillin allergy	non-anaphylaxis	‡ Cefuroxime IV 1.5g tds + metronidazole 500mg tds IV	Cefalexin 500mg tds + metronidazole 400mg tds		
	anaphylaxis	‡ Ciprofloxacin IV 400mg bd+ metronidazole 500mg tds IV	‡ Ciprofloxacin 500mg bd + metronidazole 400mg tds		

## 5. ACUTE PANCREATITIS

### 5.1

- Acute pancreatitis is an inflammatory rather than an infective condition and antibiotic prophylaxis is not recommended.
- Infection of necrosis is the most serious local complication of pancreatitis but antibiotics are unlikely to affect the outcome in patients without extensive necrosis.
- It is particularly important that the *underlying cause* of the pancreatitis is treated. Eradication of gallstones prevents the risk of recurrence and for an attack of mild acute pancreatitis early definitive surgery should be undertaken. If the pancreatitis is severe then cholecystectomy should be undertaken after resolution of pancreatitis.

For further information see “Treat the Cause. A review of the quality of care provided to patients treated for acute pancreatitis. *National Confidential Enquiry into Patient Outcome and Death (2016)*”

### 5.2 *Antimicrobial management*

- Antibiotic treatment should be considered **ONLY** in patients with CT evidence of **more than 30% necrosis** of the pancreas **AND** persistence or deterioration of symptoms after 7 days of hospitalisation and in those with smaller areas of necrosis and clinical suspicion of sepsis.
- CT-guided fine needle aspiration (FNA) for microscopy and culture to guide use of appropriate antibiotics is advisable. Discuss with the Consultant Surgeon.
- Choice of empiric antibiotics should be discussed with a Microbiologist.
- Antibiotic treatment of an extra-pancreatic infection (e.g. cholangitis, urinary tract infections, pneumonia etc.) in a patient with pancreatitis should be in accordance with Trust guidelines.

## 6. PERITONITIS AND POST-OPERATIVE INTRA-ABDOMINAL INFECTION

6.1 If a patient becomes unwell post-operatively with evidence of sepsis, this should be investigated appropriately with:-

- FBC, U&E, CRP, LFT
- Blood cultures
- MSU
- Wound swab
- Samples from drainage sites or pus collections
- Imaging to exclude collections

6.2 Antimicrobial management

*Initial empiric therapy pending outcome of investigations:-*

		ANTIBIOTIC	Oral switch	Course length	Comments
First line		‡ Co-amoxiclav IV 1.2g tds	Co-amoxiclav 625mg tds	5 days dependent on clinical response	‡ = adjust dose in impaired renal function. Discuss with Pharmacist
If >65 years <b>AND</b> has received co-amoxiclav or cephalosporins in the previous 2 weeks		‡ Piperacillin + tazobactam IV 4.5g tds			
Penicillin allergy	non-anaphylaxis	‡ Cefuroxime IV 1.5g tds + metronidazole 500mg tds IV	Cefalexin 500mg tds + metronidazole 400mg tds	Consider switch to oral at 48 – 72 hrs	
	anaphylaxis	‡ Ciprofloxacin IV 400mg bd+ metronidazole 500mg tds IV	‡ Ciprofloxacin 500mg bd + metronidazole 400mg tds		



## 7. LIVER ABSCESS

7.1 May be bacterial, fungal or parasitic. Patients typically present with fever, RUQ pain and tenderness but may also have nausea/vomiting and weight loss.

- Investigations should be as section 6.1.
- Diagnosis is confirmed by imaging (ultra-sound/CT) with aspiration and culture of the abscess material.
- Abscesses should be drained either by percutaneous catheter or needle aspiration, depending on size of abscess (repeat needle aspiration may be required)

### 7.2 Antimicrobial management

COMPLICATED/SEPSIS		ANTIBIOTIC	Oral switch	Course length	Comments
First line		‡ Co-amoxiclav IV 1.2g tds	Co-amoxiclav 625mg tds	Minimum 4-6 weeks, with progress monitored by imaging.	‡ = adjust dose in impaired renal function. Discuss with Pharmacist.  <b>Antibiotics should be modified based on sensitivity results</b>
If >65 years <b>AND</b> has received co-amoxiclav or cephalosporins in the previous 2 weeks		‡ Piperacillin + tazobactam IV 4.5g tds	Discuss with the Microbiologist		
Penicillin allergy	non-anaphylaxis	‡ Cefuroxime IV 1.5g tds + metronidazole 500mg tds IV	‡ Levofloxacin 500mg bd + metronidazole 400mg tds		
	anaphylaxis	‡ Levofloxacin IV 500mg bd+ metronidazole 500mg tds IV			

## 8. SUPERFICIAL WOUND INFECTION

COMPLICATED/SEPSIS	ANTIBIOTIC	Course length
First line	Flucloxacillin IV/po 500mg – 1g qds	5 days depending on nature of infection
Penicillin allergy	Clarithromycin IV/po 500mg bd	

## 9. INFECTIOUS GASTROENTERITIS

Causative organisms include *Salmonella*, *Shigella*, *Campylobacter*, *E.coli* O157. These infections are self-limiting and rarely require antibiotics. Antibiotics are contra-indicated in *E. coli* O157 infection as they are likely to increase the risk of complications such as haemolytic-uraemic syndrome and may prolong carriage of *Salmonella*. Patients causing concern should be discussed with the Microbiologist.

## 10. SPONTAENEOUS BACTERIAL PERITONITIS (SBP)<sup>3</sup>

### 10.1

This is ascitic fluid infection without a surgical intra-abdominal source. It usually occurs in patients with cirrhosis and ascites. Most common causative organisms include *E.coli* and streptococci, including pneumococci and enterococci. Mortality has been reduced to 20% with early diagnosis and treatment. It may be asymptomatic or may present with:-

- Fever
- abdominal pain, vomiting
- altered mental status
- should also be suspected in those presenting with hepatic encephalopathy,
- impaired renal function or unexplained leucocytosis

### 10.2 Investigations required:-

- Blood cultures
- FBC, U&E, CRP
- Abdominal paracentesis – 10-20 mls of ascitic fluid should be placed into blood culture bottles and an EDTA tube and sent **urgently** to the laboratory **>250 neutrophils/ml is diagnostic of SBP in the absence of a perforated viscus or inflammation of an intra-abdominal organ**

*Note – multiple organisms growing in ascitic fluid is suggestive of perforated bowel*

### 10.3 Antimicrobial Management

All patients with ascitic fluid counts of > 250 neutrophils/ml should commence empiric antibiotic therapy with:-

TREATMENT		ANTIBIOTIC	Oral switch	Course length	Comments
First line		‡ Co-amoxiclav IV 1.2g tds	Co-amoxiclav 625mg tds	5 days dependent on clinical response	If ascitic fluid neutrophil counts do not fall by >25% by 48 hours of therapy then discuss alternative antibiotics with a Microbiologist
If >65 years <b>AND</b> has received co-amoxiclav or cephalosporins in the previous 2 weeks		‡ Piperacillin + tazobactam IV 4.5g tds			
Penicillin allergy	non-anaphylaxis	‡ Cefuroxime IV 1.5g tds	Cefalexin 500mg tds	Consider switch to oral at 48 – 72 hrs	‡ = adjust dose in impaired renal function. Discuss with Pharmacist
	anaphylaxis	‡ Levofloxacin IV 500mg bd + metronidazole 500mg tds IV	‡ Levofloxacin 500mg bd + metronidazole 400mg tds		

PROPHYLAXIS	ANTIBIOTIC	Course length
Only recommended for patients who have had a previous episode of SBP	Ciprofloxacin 500mg od (po) <b>OR</b> (if allergic to Ciprofloxacin) Co-Trimoxazole 960mg od(po)	Long-term

## 11. REFERENCES

1. Early Antibiotic Treatment for Severe Acute Necrotising Pancreatitis: A Randomised, Double-Blind, Placebo-controlled Study. 2007. *Annals of Surgery*. 245(5):674-683
2. Antibiotic Therapy for Prophylaxis against Infection of Pancreatic Necrosis in Acute Pancreatitis. Villatoro E et al. *Cochrane Database of Systematic Reviews* 2010, Issue 5.
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