



2.9.1 Introduction

There is a very wide range of conditions of the gastrointestinal tract and associated organs that may have aviation safety implications. The greater majority are compatible with certification after appropriate assessment and management. This section provides guidance on common conditions of the gastrointestinal tract, liver and pancreas that may be presented to a DAME. It does not cover GI malignancy. All malignancy related advice is addressed in the Section [2.14 Malignancy](#) of this handbook.

2.9.2 Alimentary System Standard – CASR Part 67

[CASR 67](#) The alimentary system standards are found in the following paragraphs of [CASR Part 67](#):

CASR 67.150	For medical standard 1	CASR 67.150(7) , Table 67.150 1.14
CASR 67.155	For medical standard 2	CASR 67.155(7) , Table 67.155 2.13
CASR 67.160	For medical standard 3	CASR 67.160(7) , Table 67.160 3.13

2.9.3 Gastro-Oesophageal Reflux Disease (GORD)

GORD is a very common condition. GORD and Irritable Bowel Syndrome are the two most common GI diagnoses in the Australian pilot population. Underlying pathology that is severe or progressive is unlikely. However, the possibility of cardiological cause of the symptoms should always be borne in mind, particularly where there is resistance to treatment. Where there is chest pain with uncertain aetiology, it is imperative to exclude a cardiac cause before moving to GI or other systems.

Around 50% of all patients diagnosed with GORD have no findings on endoscopy. This is often described as nervous or non-ulcer dyspepsia (NUD) but in reality this is endoscopy negative symptomatic gastro-oesophageal reflux that might be revealed by other techniques, such as oesophageal pH monitoring. NUD refers to symptoms that occur in a group of people without endoscopic or physiological evidence of an acid-peptic complaint. These people usually have a limited or zero response to acid suppressing medication.

Treatment can commence based on symptoms and endoscopy conducted, when response to treatment is poor, "alarm" symptoms occur (eg bleeding, dysphagia) or long term treatment appears to be indicated. Medication is generally very successful, especially with the development of Acid/Proton Pump Inhibitors (PPIs). These drugs have a low side effect profile. Bleeding from reflux oesophagitis while on PPIs is very rare. In theory, intense gastric acid suppression by PPIs may increase susceptibility to gastrointestinal infection, as the internal environment of the stomach is less hostile to ingested organisms. Those who have been treated and are symptom free are generally suitable for certification. Where there are persisting symptoms, treatment should continue, with regular reviews. High-risk 'alarm' symptoms such as dysphagia indicate endoscopy. After short term treatment symptoms may return, sometimes with a rebound effect after stopping a PPI. Ongoing treatment may be indicated. However, 'on demand' treatment is becoming more popular. This should not present difficulties with aviation duties.

Selective Serotonin Reuptake Inhibitors (SSRIs) are fairly commonly prescribed along with PPIs for non-ulcer dyspepsia. This is not a risk in itself, but caution is required with the use of SSRIs. Refer to the Section [2.6 Psychiatry](#) in this handbook. Cisapride and SSRIs have a risk of cardiac arrhythmia. Treatment with cisapride is mostly limited to treatment of gastroparesis and therefore cisapride is likely to be withdrawn from the Australian market.

Other medications that may be used include H₂ receptor antagonists. There is some sedation associated with these medications, and a ground trial period is advised. Metaclopramide may on occasions alter the level of consciousness and should not be used for ongoing treatment.

Barrett's Oesophagus

- **Long Segment:** Second-yearly endoscopy will generally be required.
- **Short Segment:** Five-yearly endoscopy will generally be required but current approaches vary.

2.9.4 Peptic Ulcer Disease

Management of peptic ulcer disease (PUD) has changed comprehensively following the identification of helicobacter pylori as the most common cause of ulcers. The vast majority of peptic ulcer disease is now known to be due to helicobacter or NSAIDs. Smoking is a further independent risk factor. PUD may be 'silent' and not cause symptoms but the risk of a sudden acute bleed in an asymptomatic person is small. "Silent" ulcers are more common and more likely to cause morbidity in those taking NSAIDs including COX-2 inhibitors.

Duodenal PUD

Symptomatic PUD with helicobacter pylori. With the onset of symptoms, the DAME should impose a period of no flying or controlling. In this case, there is a requirement to undertake clearance of the infection prior to return to flying. A negative urea breath test is usually taken to be definitive proof of clearance when performed around two months after treatment. Where the DAME is satisfied that that symptoms have resolved and there will be compliance with the rest of the treatment, there may be a return to flying or controlling. Such return must be on the understanding that evidence of clearance of infection is required within three months of completing treatment. Definitive proof of clearance is usually currently obtained by a urea breath test around two months after treatment. A period of at least seven days off PPIs is necessary prior to the test. Should the infection still be present, the risk of recurrence of symptoms is high (around 80% in the first year). Failed eradication usually indicates the need for further treatment. Without eradication after the follow up test, further treatment is required. Where this second attempt at clearance is unsuccessful, the pilot or controller will usually be grounded until eradication is proven. Where there is symptomatic duodenal PUD only without complication, there is no requirement for a second endoscopy to prove ulcer healing. Once eradication has occurred, the lifetime risk of recurrence is only around 3 to 5%.

Symptomatic PUD without helicobacter pylori. The cause of the PUD needs to be identified and corrected. This is most commonly NSAIDs. The usual treatment for the ulcer in this case is a PPI for around six to eight weeks.

Complicated duodenal PUD. Where there are complications of PUD such as bleeding or perforation the pilot should be grounded during treatment. Endoscopic proof of ulcer healing will usually be required prior to clearance to return to flying or controlling. Approximately 80% of all ulcers are healed after one month. Therefore, the second endoscopy is best scheduled for around this time. Furthermore, when helicobacter infection has been detected and treated, proof of clearance will be required either by a urea breath test or endoscopic gastric biopsies for rapid urea testing (eg CLO/HUT tests) or histology.

Chronic duodenal ulcer without eradication of Helicobacter pylori. Consideration will be given to certification of pilots or controllers who have not eradicated Helicobacter pylori, either due to not undertaking eradication or failure of the eradication. Applicants must be on long-term maintenance therapy with a proton pump inhibitor and without symptoms.

Gastric Ulcer

Gastric ulcers should be treated in a similar way to complicated duodenal ulcers. A second endoscopy, usually at one month after beginning treatment, is required to demonstrate healing of the ulcer prior to consideration of return to flying. The underlying cause of the ulceration needs to be identified and corrected wherever possible.

2.9.5 Hepatitis

Acute

Acute hepatitis may be due to a number of causes, predominantly infectious but may also be toxic or immunological. The individual is usually too sick to function adequately and is not physically able to fly. The enterically mediated causes, mainly Hepatitis A and E, and other causes such as CMV and EBV generally result in a full recovery. Initial work up should include routine blood tests, LFTs, FBE, infectious hepatitis serology, and an upper abdominal ultrasound. Return to flying is based on evidence of clinical recovery. Some episodes of hepatitis are followed by a prolonged phase when the patient remains jaundiced but otherwise recovers. No further investigation is recommended until six months after presentation, unless the episode is fulminant. In this case, patients may progress from walking to moribund in 24 to 48 hours, but thankfully this extremely fulminant presentation is rare.

Chronic

The main causes of chronic hepatitis of aeromedical concern are Hepatitis B and Hepatitis C. These may be slowly progressive and may lead to cirrhosis and hepatic decompensation. There is unlikely to be an acute presentation, unless unexpected decompensation occurs secondary to portal hypertension causing haematemesis or ascites with infection.

Transmission of infection is not an issue in civilian aviation. The presence of Hepatitis D in particular should raise the prospect of intravenous drug use.

Treatment for Hepatitis C. Current treatment protocol for progressive Hepatitis C infection is combined Interferon and Ribavirin. Both of these medications have significant aeromedical issues, with interferon occasionally causing neuropsychiatric symptoms, which may occur intermittently and unpredictably throughout treatment. Most people also experience significant malaise. Ribavirin produces a significant anaemia in many patients. Thus, there should be no flying or controlling during the course of treatment. There may be consideration of return to duties once off medication and any anaemia has resolved.

Progressive hepatitis There is no one measure of the progression of chronic hepatitis and cirrhosis. Bilirubin, albumin and prothrombin time/INR are the best independent laboratory measures. These should be considered together with the presence of ascites and encephalopathy. Each case needs to be individually assessed, particularly for the presence of portal hypertension and hepatic encephalopathy, including minimal (stage 1) hepatic encephalopathy (MHE). While there is no overt deterioration in cognitive or affective functioning, there will not be a restriction on flying, but increased surveillance will be necessary.

Abnormal LFTs that have been noted for greater than 12 months indicates the potential for chronic liver disease and cirrhosis.



Liver biopsy. A liver biopsy provides very useful diagnostic and prognostic information but can cause serious complications such as intra-abdominal haemorrhage. The decision to recommend biopsy will usually be delayed for at least six months after presentation depending on the degree to which liver enzymes and function are abnormal. Many patients with abnormal liver enzymes, even over a long period, will not have an absolute indication for liver biopsy. The timing of liver biopsy, if necessary, can be based on clinical progression and the level of concern expressed by the patient regarding diagnosis and prognosis.

2.9.6 Abnormal Liver Function Tests

Liver function tests are frequently found to be abnormal, with small elevations in one or two liver enzyme parameters. Given that the normal range by definition comprises two standard deviations from the mean, some 5% of all truly normal results will be classified as being abnormal—that is, falsely abnormal results. Where there is a real abnormality, the most common causes are Gilbert's Syndrome (slightly raised unconjugated bilirubin, most common manifestation), non-alcoholic fatty liver disease (NAFLD), and minor alcohol effects.

In the absence of other clinical clues, slightly abnormal LFTs are best repeated after around one month. If they remain elevated, then the following is recommended:

1. Assessment of alcohol intake.
2. Family history of liver disease.
3. Blood Tests: Hepatitis B & C; Iron studies including ferritin; Copper studies; α_1 antitrypsin; hepatic autoantibodies.
4. Upper abdominal ultrasound.

Definitive diagnosis of a fatty liver can only be achieved by liver biopsy, but it is usually diagnosed based on clinical picture only. Alcoholic disease and diabetes mellitus should be included in the differential diagnosis. Ultrasound is moderately reliable for fatty liver, with increased echogenicity/altered hepatic texture most likely to be due to fat. However, fibrosis or cirrhosis could also be present and difficult to detect.

There should be regular reviews of aircrew with continuing abnormal LFTs. Where transaminase is <100, repeat testing should be every six to 12 months. If the transaminase is above 100, testing should be every three to six months.

2.9.7 Alcoholic Liver Disease

This section will not discuss alcohol related illness. Rather, there will be a discussion of the effects of alcohol on the GI system.

There are no definitive tests that can demonstrate clearly that alcohol is the cause of liver disease. In the end it comes down to honest reporting. Blood tests can help; MCV, γ GT and AST>ALT are suggestive. Liver biopsy is not definitive as many other causes can produce similar findings. Carbohydrate deficient transferrin is becoming used, but it remains largely a research tool. It can be useful as a confirmation, and to monitor progress within that individual.

Relapsing hepatic decompensation, gastritis, neurological signs, including cerebellar signs are all useful as part of a broader picture in advanced cases of alcoholic liver disease when cognitive and physical incapacity are present. DUI convictions may also be indicative.

Screening tests have not been found to be particularly valuable. The AUDIT is probably the most widely used. The tests are aimed at the severe end of the alcoholic spectrum. In practice, concern should be raised where the drinking exceeds the NH&MRC recommended limits of four standard drinks per day for men and two standard drinks per day for women.

Approximately 1:5 people who drink excessively will have liver abnormalities. It is the most reversible form of liver disease in the early stages. Stopping drinking will usually reverse abnormalities within around six months. The alcoholism is more important than the alcoholic liver disease, and the focus should be put on the alcoholism. Until there is a secondary effect from liver damage, there should be no impact on flying from the liver disease. The impact on flying will be from the alcoholism.

2.9.8 Gallstones And Gall Bladder Diseases

Asymptomatic gallstones (chance finding). It appears that the risk of cholecystitis in the presence of asymptomatic gallstones, where there has never been symptoms, is low, and almost certainly is below 1% per annum, although there is little data to work from. Gallstones ranging from a single large stone to multiple small stones may be detected by ultrasound. There is a slightly increased risk of biliary colic, pancreatitis and other hepatobiliary symptoms with small gallstones but the outcome of expectant versus prophylactic cholecystectomy is no different. There will generally be no change to flying status unless gallstones become symptomatic. In those who are asymptomatic there is no requirement to remove the gall bladder for fitness to fly.

Acute cholecystitis. Generally the pilot will be too sick to fly.

Following single episode of cholecystitis. Often after a single episode, patients are treated expectantly and wait to see if another episode occurs. However, the risk of a further episode is around 5% per annum. Therefore, it would be expected that there is no return to flying until the gall bladder is removed. There may be the option of multi-crew certification for Class 1 or 2, or no solo controlling for Class 3 pending definitive resolution.

Stones in bile duct. The presence of stones in the bile duct is not compatible with flying or controlling. There is a significant risk of ascending cholangitis or pancreatitis, and the stones must thus be removed prior to returning to any duties.

2.9.9 Haemochromatosis

Haemochromatosis is a genetic disease that is often found incidentally, mainly through liver function testing or iron studies. The presence of the relevant genes in the Australian population is around 1:200. Around 50% of these will develop significant iron loading but not all genetically affected individuals develop liver or other organ injury (ie, phenotypic variation in disease expression). Organ injury depends on the severity of iron loading and co-factors such as significant alcohol consumption or other co-existent causes of liver injury. Should iron loading be prevented (usually by early detection and venesection treatment) then permanent liver injury (fibrosis/cirrhosis) usually does not occur. The best measure of iron stores in this context is serum ferritin.

Screening is possible, but to date has not been recommended in the Australian population. This may be by transferrin saturation, or by HFE genetic testing. There is no requirement to screen for haemochromatosis in the aviation context unless there is a family history of the disease.

Late diagnosis can be a problem, with progression to cirrhosis, pancreatic injury (diabetes mellitus), heart (arrhythmias, heart failure) and pituitary involvement. Males usually present in the 5th decade, females in the 6th decade due to their generally lower rate of iron load. If, at age 40 years the ferritin level is less than 1000 ugm/l and LFTs are normal, the risk of permanent liver damage is negligible. Cardiac assessment should include the presence of conduction defects and cardiomyopathy.

Treatment is via regular phlebotomies/venesection. Pilots and controllers should not exercise the privileges of their certificates for 24 hours after each venesection due to possible cardiovascular instability.

2.9.10 Pancreatitis

Pancreatitis is sometimes diagnosed in the setting of a small increase in serum lipase. However, for the diagnosis to be made there should be a significant increase in lipase together with acute abdominal pain.

The main risk factors are

- **Gall stones.** If gallstones are found, where there are no other risk factors, the gall bladder should be removed.
- **Alcohol.** This usually produces a relapsing picture.
- Hypercalcaemia.
- Hyperlipidaemia.

Where there is no obvious cause, there may be abnormalities in anatomy. Assessment is usually by MRCP first, followed by ERCP.

Risk of recurrent attacks is highly individual. Idiopathic pancreatitis may be expected to have one to two attacks per year.

Single episode. Following a single episode, where there are no ongoing symptoms and any predisposing factors have been addressed, the individual will usually be able to return to flying.

Recurring pancreatitis. While symptomatic the individual is very unwell, usually requiring narcotic analgesia. Recurrent pancreatitis is generally not compatible with continued flying or controlling.

Chronic pancreatitis. Generally the individual is too sick or has too much ongoing abdominal pain to contemplate flying. A CT scan can be performed to look for the presence of a pseudocyst or abscess. It is unlikely that anyone suffering from chronic pancreatitis will be fit for flying or controlling duties.

There is an association with the development of diabetes; a fasting blood sugar should be obtained as part of the workup.

2.9.11 Coeliac Disease

Coeliac disease can produce severe symptoms of bloating, diarrhoea, abdominal pain and anaemia, but mostly symptoms are mild and presentation is now usually in mid-life. Treatment with a gluten-free diet is usually effective, and should not be an aviation safety issue. People non-compliant with dietary modifications will continue to be symptomatic and some patients will exhibit refractory disease; these cases should be considered on their merits.

Coeliac disease should be thought of as a potential marker for other immunologically mediated diseases, such as type 1 diabetes mellitus and thyroid disease.

2.9.12 Irritable Bowel Syndrome

Irritable bowel syndrome is a very common diagnosis in the Australian pilot population. Some 20% of adult females and 10% of adult males have some symptoms consistent with this diagnosis. Most common symptoms are of abdominal pain, bloating, diarrhoea and constipation. It is unusual to get acute, severe symptoms.

There is a high co-morbidity with obsessive and depressive illness and SSRIs are often used.

Most people can be managed without drugs, using diet.

Diarrhoeal symptoms may be treated with loperamide. This drug does not usually have any central nervous system side effects. Diphenoxylate should not be the first drug of choice for aircrew or controllers, due to its potential neuropsychological effects. If it is necessary, this should be discussed with Aviation Medicine Section doctors.

Colicky abdominal pain and more general abdominal discomfort can be treated with anticholinergics such as donnatal or mebeverine. Bloating will tend to persist despite treatment. Caution is required regarding anticholinergic side effects, particularly to vision.

Constipation can be treated with high fibre and simple laxatives, with osmotic laxatives such as magnesium sulphate or lactulose preferred in the longer term.

For refractory symptoms, tricyclic antidepressants are the most effective. Tricyclic antidepressants have significant potential aeromedically adverse effects. Refer to Section [2.6 Psychiatry](#) for further guidance.

Most applicants will be fit to hold a certificate. Surveillance may be required annually in the more severe cases.

2.9.13 Inflammatory Bowel Disease

It is often assumed that Ulcerative Colitis and Crohn's disease are versions of the same disease or are even interchangeable. However, they do have differing natural histories, with Crohn's disease tending to be worse, with relapse being the rule.

It should be assumed from the outset that Inflammatory Bowel Disease (IBD) will impinge on certification. However, most sufferers are able to obtain certification with regular surveillance.

High-dose systemic steroids should not be used while flying due to the risk of neuropsychological side effects.

If the disease is unstable the person should be grounded, due to diarrhoea, pain and poor nutrition. Stabilisation is usually over several months during treatment with aminosalicylate drugs (eg, sulphasalazine, mesalazine, olsalazine) and either systemic or rectal corticosteroid treatment. Immunomodulatory medication (such as azathioprine or 6-mercaptopurine) is used to prevent disease relapse in more severe cases. There is a higher risk of skin cancer on azathioprine. Methotrexate can damage the liver.

CASR 67.265 Flare-ups tend to occur in a subacute manner, with warning often over several days. Acute incapacitation is unlikely, unless there is a clear pattern of such already established. Fitness to fly during flare-ups should be handled as a transient event with clearance to return to flight duties according to CASR 67.265.

Ulcerative Colitis

Ulcerative Colitis may be severe, but is often a relatively mild disease. This is especially so of treated ulcerative colitis of the rectum and sigmoid. The disease may 'burn out' in the 50s. With proctitis alone, risk of cancer is no different to the general population.

Crohn's Disease

Almost all Crohn's sufferers receive surgery at some stage. Systemic symptoms are more common with febrile disease and acute abdomen amongst the more common manifestations.

For mild disease, Full Blood Examination, C-reactive Protein, Liver function tests and rectosigmoid examination should be carried out annually. LFT should be more often if taking methotrexate.

When there has been pancolitis, regular annual or biennial colonoscopy will improve early detection of colorectal neoplasia beginning eight to ten years after initial diagnosis of colitis.

2.9.14 Chronic Diarrhoea

There are many potential causes of chronic diarrhoea. Most commonly there is irritable bowel syndrome. However, it is important to rule out an infective cause. Medications may also be a cause, such as weight loss treatments including xenical.

In general, diagnosis should be by exclusion of treatable GI disorders, and then treated as for IBS.

2.9.15 Diverticulitis

Diverticulosis of itself is not an issue for aviation safety. A single episode of diverticulitis is generally not of significant concern. Where there is chronic symptoms or recurrence, it is important to evaluate for risk of further symptoms. Partial colonic resection may be required. Each case will be considered on its merits.

2.9.16 Colonic Polypectomy

Following polypectomy by colonoscopy, there is an approximate risk of 1:300 to 1:500 that a significant colonic bleed from the polypectomy site will occur in the first two weeks. The risk is higher if anti-platelet drugs or anti-coagulants are taken after colonoscopy. During this time, therefore, it is best not to fly, due to the risk to safety and lack of access to care. However, it may be reasonable to consider flying operations other than single pilot operations or no solitary controlling.

2.9.17 Bowel Obstruction

Bowel obstruction will result in severe pain and vomiting. A history of bowel obstruction indicates a high risk of recurrence. A single band or hernia can be repaired and certification is usual after recovery. However, recurrent obstruction is of grave concern for certification. Generally, the more episodes of obstruction, the greater the risk of subsequent episodes. Certification will be on a case-by-case basis, with a surgical opinion as to the cause and likelihood of recurrence.

2.9.18 Stomas

In this section the underlying illness or event leading to creation of an “-ostomy” is not addressed. Stoma bags are generally vented and filtered to avoid any risk of trapping of gas or odours becoming an issue.

Colostomy

Generally, patients with a colostomy manage well. Most are due to surgery for colon cancer, and the oncology issues are more important. See section [2.14 Malignancy](#) of this handbook. A total colectomy for functional problems often results in small bowel functional problems.

Ileostomy

The major issue with ileostomy is dehydration. Electrolyte disorders are fairly common, with hyponatraemia and bicarbonate loss. Fluid that is usually reabsorbed will be lost through the stoma, and an additional litre of fluid may be required.

The great majority of applicants with a stoma will not be restricted on the basis of the stoma.

2.9.19 Haemorrhoids

Haemorrhoids will occur with a relatively high frequency in the pilot population, due to poor low fibre diet, inadequate seating and dehydration. It is rarely a cause of acute incapacitation.

Rectal bleeding should be investigated to exclude other causes, especially carcinoma, even in the presence of haemorrhoids. Only with the exclusion of other causes should the haemorrhoids be regarded as the cause.

An acute clot in an external haemorrhoid often causes marked discomfort, but should not be sufficient to cause incapacitation.

The presence of haemorrhoids should not in general hold up certification.

2.9.20 Anal Fissure

As for haemorrhoids, the presence of bleeding should result in investigation to exclude other more serious causes. The fissure may be distracting but not to the extent of incapacitation.

2.9.21 Abdominal Hernias

Abdominal hernias are of concern due to the risk of acute intestinal obstruction. Where the hernia is amenable to repair and there is a risk of obstruction, it should be treated. If no treatment is planned, a justification based on likelihood of becoming symptomatic should accompany any application. While waiting for repair, the need to restrict the applicant will depend on clinical circumstances. Where there is a bowel loop in a hernia, restriction is likely.

Hiatus hernias only infrequently require repair. A rolling hiatus hernia is at greater risk of obstruction. Generally symptoms can be managed through the use of proton pump inhibitors or H₂ antagonists.

2.9.22 GI Bleeding of Unknown Cause

Where there is an iron deficiency anaemia that has been investigated, and endoscopy and colonoscopy are reported as normal, the source of bleeding is likely to be from the small bowel. Often iron deficiency occurs in those who have had long-term aspirin or NSAID treatment. At present, in the absence of 'red flags' (eg, systemic symptoms such as unexplained weight loss, fevers, night sweats, persistent significant change in bowel habit, abdominal pain or symptoms of overt GI bleeding such as malaena) to suggest a serious cause, the patient will not be further investigated, and iron supplements used. If supplements are successful, then a cause will probably never be found.

Where iron supplements are used and anaemia progresses, further investigation is required; this may be enteroscopy using a similar procedure to endoscopy, 'capsule endoscopy' and/or CT scan. A thorough work up is mandatory to exclude significant disease.

It should not be necessary to ground pilots except those whose anaemia progresses and haemoglobin drops below 10.

If the Hb recovers, then surveillance should be of regular Hb levels, at least every two months for 6-monthly and subsequent testing depending on progress. Restoration of body iron stores (as documented by a progressively normalising serum ferritin taken during a period when iron supplements have been stopped for at least one week) by treatment with oral iron supplements usually takes three to six months minimum, usually with the Hb having returned to normal at an earlier time.

A presentation of malaena is a very different proposition. A cause will need to be identified as there is a high risk of recurrence and of severe causes. The individual should not fly until the cause has been identified and risk of recurrence quantified.

Designated Aviation Medical Examiner's Handbook

2. Medical Aspects

2.9 Gastroenterology

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