

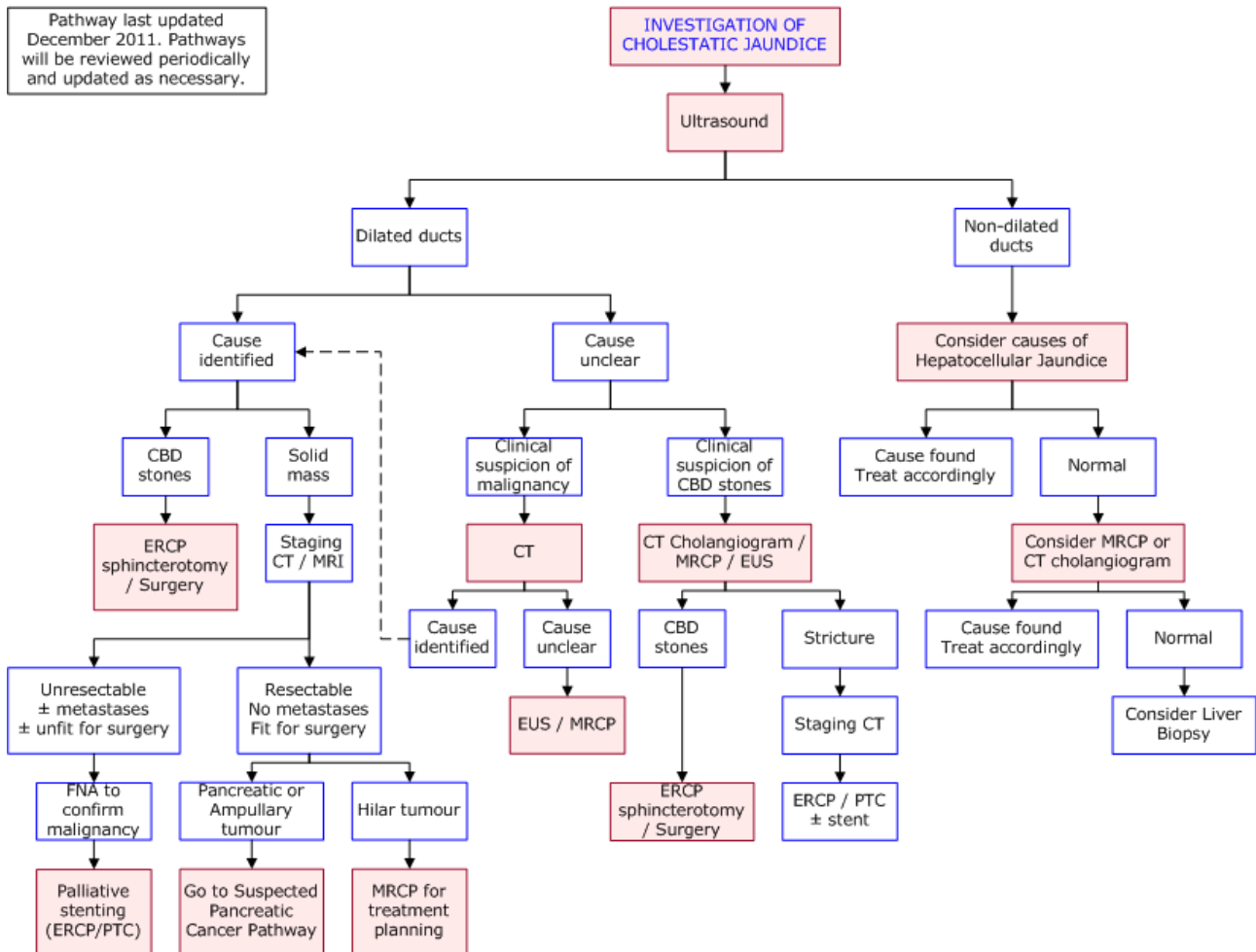


DIAGNOSTIC IMAGING PATHWAYS

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Investigation of Cholestatic Jaundice

Pathway last updated December 2011. Pathways will be reviewed periodically and updated as necessary.



CHOLESTATIC JAUNDICE

- Diagnostic approach for cholestatic jaundice depends on:
 - Clinical probability of whether the most likely cause is benign or malignant
 - Whether the patient is a surgical candidate,
 - Availability of imaging techniques and the expertise with which they are offered. [1](#)

ULTRASOUND

- Initial investigation of choice to determine the cause of cholestasis. [2,3,24](#)
- Determines the presence of cholestatic jaundice by detecting dilated bile ducts (>90% sensitivity and 71-96% specificity). [2,4](#)

- Advantages: non-invasive, no ionising radiation, relatively inexpensive, and can visualise the whole hepatic parenchyma.
- Limitations:
 - Less effective than CT, EUS or direct cholangiography (ERCP or PTC) in determining the site and cause of obstruction. [3,4](#)
 - Less accurate at detecting common bile duct stones (sensitivity 63-75% and specificity 95%). [2,25](#)
 - False negatives due to inability to see the extra-hepatic biliary tree (often because of interposed bowel gas) and absence of biliary dilation in the presence of obstruction. [6](#)

COMPUTED TOMOGRAPHY

- Indications:
 - Cause of obstruction uncertain on US and there is high clinical suspicion of malignant obstruction. [3](#)
 - For staging and surgical planning. [7](#)
- Compared to US, CT provides a more comprehensive examination that permits evaluation of the liver, biliary tree, pancreas, portal and retroperitoneal lymph nodes, and vascular structures. [7](#)
- For the diagnosis of pancreatic adenocarcinoma, spiral CT has a superior sensitivity of 91-97% compared to conventional CT (86%), MRI (84%) and US (76%). [29,30](#)
- 76-88% sensitivity and 98% specificity for common bile duct stones. [5,8](#)
- Limitations: [5,8](#)
 - False negatives due to non-enlarged common bile ducts or small stones.
 - False positives due to pancreatic calcifications.

ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAM

- "Gold standard" for visualising the biliary tract and for defining the cause of obstruction. [2,3,10](#)
- If there is strong suspicion of common bile duct stones and initial imaging investigations are negative or equivocal, then ERCP is indicated. [9](#)
- Preferred in patients who are poor surgical candidates or in whom sclerosing cholangitis is suspected (high likelihood of depicting the biliary tree, diagnoses and treatment of strictures). [10](#)
- Advantages: provides greater range and ease of therapeutic options for relief of the obstruction.

- Disadvantages: invasive procedure with significant risk of complications (pancreatitis, perforation, haemorrhage etc), mortality (<1%) and 3-10% failure rate. [11,12](#)

PERCUTANEOUS TRANSHEPATIC CHOLANGIOGRAPHY

- Alternative if ERCP is technically not feasible or not available.
- Advantages:
 - Permits visualisation of the intra-hepatic and extra-hepatic biliary tree.
 - Enables biliary drainage and interventional procedures if obstruction is found.
- Disadvantages: does not opacify the pancreatic duct, expensive and invasive procedure with significant risk of complications (risk of hepatic puncture, pneumothorax, etc) and mortality. [13](#)

MAGNETIC RESONANCE CHOLANGIOPANCREATOGRAM (MRCP)

- MRCP is more suitable for imaging the biliary tree compared to diagnostic ERCP if hilar obstruction is present on CT or ultrasound.
- Non-invasive alternative if ERCP is unsuccessful or cannot be performed (eg in patients with previous gastroenteric anastomoses). [14-16](#)
- High diagnostic accuracy (>94%) for the diagnosis of bile duct obstruction, choledocholithiasis, and malignant bile duct obstruction. [17-19](#)
- Advantages: non-invasive, no ionising radiation or contrast material and allows diagnosis and treatment planning in many patients without invasive cholangiography.
- Limitations: low spatial resolution, does not offer therapeutic opportunity, availability and cost.

ENDOSCOPIC ULTRASOUND

- Best modality for tumour staging of malignant biliary obstruction (provided mass is not >3cm in size). [4,20,21](#)
- Sensitive for very small tumour detection. [20,22](#)
- Sometimes difficult to interpret following sphincterotomy or previous stenting procedures due to presence of air in the biliary tract, and does not offer therapeutic opportunity.
- Used in patients who are good surgical candidates in order to stage a tumour or identify choledocholithiasis. [10,20,22](#)
- Comparable sensitivity to that of ERCP for extrahepatic cholestasis. [4,10,23](#)
- Superior to US or CT in diagnosis (100% sensitivity) and staging of biliary obstruction. [2,4](#)
- Limitations: limited availability, technically impossible in cases of previous gastric surgery,

SPIRAL COMPUTED TOMOGRAPHY - INTRAVENOUS CHOLANGIOGRAPHY (CT-IVC)

- Spiral CT-IVC is a non-invasive technique that can be utilised to evaluate biliary anatomy and pathology [26](#)
- It may be an alternative to MRCP, given cost and resource allocation issues with MRI techniques
- Cohort studies have validated Spiral CT-IVC when compared to invasive cholangiographic techniques (ERCP or intra-operative cholangiogram). The sensitivity and specificity in the detection of choledocholithiasis has been reported as 95% and 94-97% respectively [27, 28](#)
- A limitation of this modality arises in patients with abnormally high bilirubin levels. A level two to three times normal results in lower opacification of the biliary tree, resulting in difficulties detecting abnormal biliary anatomy and pathology [26, 27, 28](#)
- Advantages: Readily available, non-invasive, high inter-observer correlation for pathology noted
- Limitations: Image degradation in patients with high bilirubin, poor or absent contrast excretion resulting in a low quality scan, need for intravenous contrast

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Further Reading

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Website

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