

Diagnostic Imaging Pathways - Upper Quadrant Pain (Chronic Right)

Population Covered By The Guidance

This pathway provides guidance on imaging in adult patients with non-acute right upper quadrant abdominal pain in whom a biliary cause is suspected.

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Quick User Guide

Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

Clicking on the **PINK** text box will bring up the full text.

The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

SYMBOL	RRL	EFFECTIVE DOSE RANGE
	None	0
	Minimal	< 1 millisieverts
	Low	1-5 mSv
	Medium	5-10 mSv
	High	>10 mSv

Pathway Diagram

Date reviewed: September 2014
 Please note that this pathway is subject to review and revision

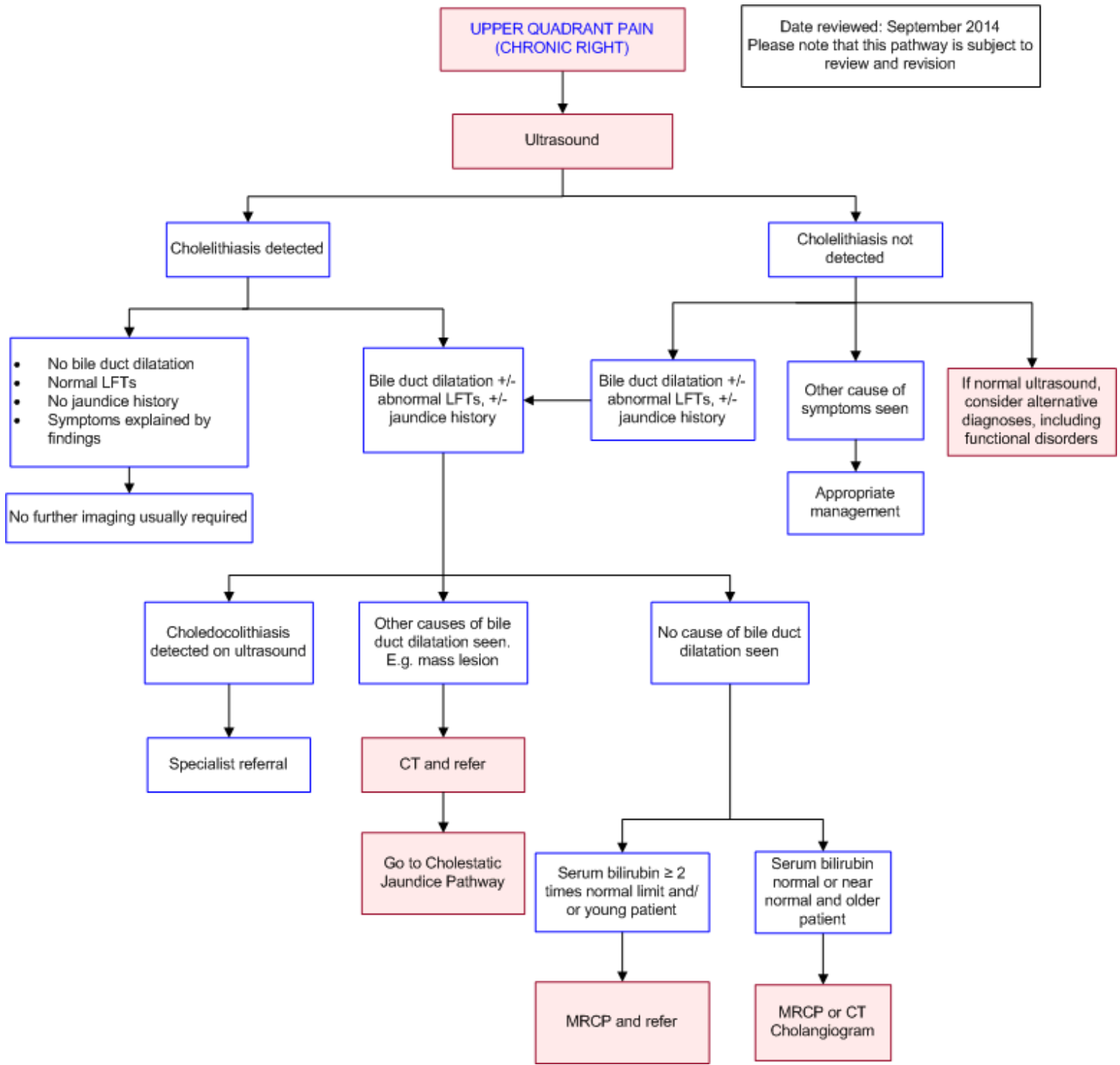


Image Gallery

Coming Soon

Teaching Points

- Ultrasound is the initial imaging modality of choice in the assessment of Chronic Right Upper Quadrant pain
- The presence of bile duct dilatation on initial imaging, abnormal liver function tests or a history of

- jaundice will usually require further imaging
- Where a cause for bile duct dilatation, such as a mass, is suspected on initial imaging CT is recommended for better delineation of the cause
 - Where no cause for bile duct dilatation is detected and serum bilirubin is greater than or equal to two times the normal limit or the patient is young then Magnetic Resonance Cholangiopancreatography (MRCP) is recommended
 - CT Cholangiography is indicated where no cause for bile duct dilatation is seen and serum bilirubin levels are normal or near normal/ the patient is older. The use of CT Cholangiography in patients with high bilirubin levels can result in sub optimal imaging making it difficult to characterise biliary anatomy and the causative aetiology for bile duct dilatation
 - Most authorities agree that ERCP should be largely reserved for therapeutic interventions (such as sphincterotomy, extraction of stones from the bile duct or stenting) after the diagnosis has been established by non-invasive imaging such as CT Cholangiogram or MRCP

Chronic Right Upper Quadrant Pain

- Chronic Right Upper Quadrant pain can be caused by a wide variety of organic and functional causes including [1](#)
 - Cholelithiasis
 - Peptic ulcer
 - Pancreatitis
 - Gastroesophageal reflux
 - Tumours
 - Functional disorders as detailed in the ROME III criteria pertaining to Functional Gallbladder and Sphincter of Oddi Disorders [2](#)

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 [6](#)
- 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 [7,8](#)
- 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 [6,7](#)
- 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

Computed Tomography

- Indications
 - Cause of obstruction uncertain on US and there is high clinical suspicion of malignant obstruction [9](#)
 - For staging and surgical planning [10](#)

- 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 [10](#)
- For the diagnosis of pancreatic adenocarcinoma, spiral CT has a superior sensitivity of 91-97% compared to MRI (84%) and US (76%) [12](#)
- 76-88% sensitivity and 98% specificity for common bile duct stones [13,14](#)
- Limitations [13,14](#)
 - False negatives due to non-enlarged common bile ducts or small stones
 - False positives due to pancreatic calcifications
- For more general consumer information on CT [InsideRadiology](#)

Ultrasound

- In patients with chronic right upper quadrant or biliary type pain Ultrasound (US) should be the initial imaging choice
- Where cholelithiasis is suspected US has good ability to detect this with a sensitivity of 0.84 and specificity of 0.99 [3](#)
- The sensitivity of US to detect ductal masses and mural thickening in hilar and extrahepatic cholangiocarcinoma ranges from 87 percent [4](#) to 96 percent [5](#)
- For more general consumer information on ultrasound [InsideRadiology](#)

Magnetic Resonance Cholangiopancreatography (MRCP)

- MRCP is more suitable for imaging the bile ducts compared to diagnostic ERCP if hilar obstruction is present on CT or ultrasound
- Non-invasive alternative to ERCP. [15-17](#) Most authorities agree that ERCP should be largely reserved for therapeutic interventions (such as sphincterotomy, extraction of stones from the bile duct or stenting) after the diagnosis has been established by non-invasive imaging such as CT Cholangiogram or MRCP
- High diagnostic accuracy (>94%) for the diagnosis of bile duct obstruction, choledocholithiasis, and malignant bile duct obstruction [18-20](#)
- 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

Functional Disorders

- Functional Gallbladder and Sphincter of Oddi Disorders are a category of Functional Gastrointestinal Disorders (FGID). FGIDs are common and occur as a result of abnormal functioning of the gastrointestinal tract and are not caused by biochemical or structural abnormalities. As a result all investigations seeking to clarify symptoms experienced by patients with FGIDs are invariably normal
- Conditions in this spectrum include Functional Gallbladder Disorder, Functional Biliary Sphincter of Oddi Disorder and Functional Pancreatic Sphincter of Oddi Disorder
- For more information on the specific criterion that must be met to satisfy these conditions [Rome III Diagnostic Criteria for Functional Gastrointestinal Disorders](#)

References

Date of literature search: September 2014

The search methodology is available on request. [Email](#)

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. [Download the document](#)

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Information for Consumers

Information from this website	Information from the Royal Australian and New Zealand College of Radiologists' website
Radiation Risks of X-rays and Scans Computed Tomography (CT) Magnetic Resonance Imaging (MRI) Ultrasound	Computed Tomography (CT) Iodine-Containing Contrast Medium Magnetic Resonance Imaging (MRI) Ultrasound

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