Supplementary File 2: Key Anatomical Landmarks (Stations)

Thoracic stations: The Posterior Mediastinum
Important for chest disease, mediastinal mass on cross sectional imaging, UGI referrals such as mediastinal / duplication cyst, lesions intrinsic to the oesophageal wall and UGI cancer staging.

Cricopharynx 15-18cm then cervical oesophagus 18-25cm
- Azygous
- Superior vena cava
- Great vessels above arch of the aorta

Mid thoracic oesophagus 25-32cm
- Arch of the aorta, eg upper border 23cm, lower border 25cm
- Aorta ascending & descending
- Aortopulmonary (AP) window, station 4L on lung cancer staging
- Left atrium 30cm and pulmonary veins
- Trachea bifurcation
- Sub carinal (SC) space 29cm, station 7

Lower thoracic 32-38cm

Cardiac chambers
- Left atrium level, right outflow tract
- Mitral valve, left ventricle
- Aortic root, pulmonary outflow tract
- Right atrium, tricuspid valve, right pulmonary artery
- Vena cava

Oesophagus
- 4 wall layer structure (serosa absent)

Abdominal oesophagus lies approximately from 38–40cm

Key landmarks for EUS clinicians and photo documentation from the following
- Aortic arch, descending aorta
- AP window
- Bifurcation of the Trachea
- Sub Carinal space
- Lymph node stations
- 4x Wall layer structure of the oesophagus
- Right atrium and inferior vena cava & superior vena cava,
- Left atrium and aortic valve, aortic root

Video
Abdominal Stations (Gastric): Station 1 Cardia

Station 1: Cardia (fundus of the stomach/OG Junction) Liver to Midline
“Base Station” 40cm at the GOJ to 41cm 1cm beyond
- Left lobe of the liver
- IVC / Right atrium
- Intra hepatic portion of the IVC
- Confluence of the hepatic veins into IVC (Common variability of right hepatic vein)
- Caudate process

Clockwise rotation at this juncture brings the echoendoscope onto the aorta/crus however forward progression by 2-3mm following the intra hepatic IVC brings the echoendoscope to the liver hilum.

Liver hilum
- (Right) Hepatic artery in cross section
- Portal Vein Confluence
- Common Hepatic Duct (CHD) – bile duct
- Intra hepatic left and right bile ducts and Intra hepatic portal venous branches

Clockwise rotation at this juncture brings the echoendoscope onto the aorta/crus and the following:
- Descending aorta & crus of the diaphragm
- Origin of coeliac artery in longitudinal view
- Origin of SMA in longitudinal view
- Left renal vein in cross section
- Coeliac ganglia

Progression of the echoendoscope by 3-5mm following the course of the coeliac artery (40.5-41cm):
- Mid Body of the Pancreas parenchyma
- Main Pancreatic Duct (MPD)
  - Rotation anticlockwise brings the echoendoscope back towards liver hilum or...
  - Rotation clockwise brings the echoendoscope toward the L adrenal (next page)
- Adjacent mesenteric vessels
  - Splenic artery (courses in and out of view around pancreas)
  - Splenic Vein (unlike SA, usually has a straight course) and superior mesenteric vein

Anticlockwise torque
- Portal venous confluence
- SMA
- MPD as it courses into the pancreatic neck (genu) then head / ampulla
- CHD as it courses deeper towards the head of pancreas and the ampulla
- Confluence of the SMV and SV into the Portal Vein
- Pulling back onto the portal vein by 3-6mm: brings echoendoscope back to the...
- Left lobe of the liver

Key landmarks for EUS clinicians and photo documentation
- L lobe liver, Intra hepatic portion of the IVC and hepatic veins
- Liver hilum with PV confluence, hepatic artery (in cross section) and common hepatic duct
- Aorta / Crus and Origins of the coeliac and superior mesenteric arteries
- Pancreas parenchyma and MPD
- Confluence of SMV & SV to PV as it courses to the liver hilum
Station 1 (continued): Cardia (fundus of the stomach/OG Junction) Midline to Spleen

“Base Station”: 40cm at the GOJ to 41cm 1cm beyond. Find the following:

- Left lobe of the liver, Intra hepatic portion of the IVC
- Liver hilum, then clockwise torque to...
- Aorta / origins of CA and SMA

Rotate echoendoscope clockwise by 5-10 degrees

- Left Adrenal Gland

Inferiorly (push in) and brief clockwise torque

- Left Kidney
- Renal hilum

Superiorly (withdraw and “tip up”) with additional clockwise torque

- Spleen
- Splenic hilum
- Tail of pancreas
- MPD

Anticlockwise torque to follow pancreas tail, to distal and mid body

- Body of pancreas parenchyma
- MPD
- Splenic artery and Splenic Vein
- Pancreatic genu
- Santorini duct
- MPD entering into the papilla with the CBD

Continue

Anticlockwise torque

- Portal venous confluence
- SMA
- MPD as it courses into the pancreatic neck (genu) then head / ampulla
- CHD as it courses deeper towards the head of pancreas and the ampulla
- Confluence of the SMV and SV into the Portal Vein
- Pulling back onto the portal vein by 3-6mm: brings echoendoscope back to the...
- Left lobe of the liver

Key landmarks for EUS clinicians and photo documentation

- Pancreas parenchyma & MPD
- Spleen and splenic hilum
- Left adrenal
- Left kidney and renal hilum
- Splenic artery and splenic vein
- Aorta / Crus and Origins of the coeliac and superior mesenteric arteries
- Confluence of SMV & SV to PV as it courses to the liver hilum
- Liver hilum with PV confluence, hepatic artery (in cross section) and common hepatic duct
Abdominal Stations (Gastric): Stations Body & Antrum

Insertion of the echoendoscope towards but not intubating the pyloric canal

**Scope is in a “long” position**
- Gall Bladder and Wall layer structure
- Lower 1/3 of the bile duct (Common Bile Duct)
- Portal Venous Confluence
- IVC
- Body of Pancreas
- Common hepatic artery

Gastric wall
- 5x layered structure

Lymph node stations
- Hepatic / porta hepatis
- Left gastric
- Gastrohepatic ligament
- More superiorly: splenic, coeliac

From D1 bulb: the echoendoscope slips back into the stomach. **Scope is in a “short position”**

Similar anatomical findings

**Key landmarks for EUS clinicians and photo documentation**
- Gall Bladder
- Gastric wall layer structure
- Pancreas parenchyma & MPD
- Portal vein & PV confluence (SMV & SV)
- IVC
- Location of lymph node stations
- Liver hilum with PV confluence, hepatic artery (in cross section) and common hepatic duct

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4613806/#:~:text=Examination%20of%20the%20C
BD%20is,%3B%20and%20(5)%20antrum](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4613806/#:~:text=Examination%20of%20the%20CBD%20is,%3B%20and%20(5)%20antrum).

Abdominal Stations (Duodenum): Station 3 Duodenal Bulb

“Base position”
Intubate D1/Bulb
- Gall Bladder
- Cystic duct
Insert scope further
- Common Bile Duct (CBD) – mid duct
- Pancreas Duct
- Pancreas parenchyma
- Portal Vein

From base position: Torque clockwise
- Scope veers inferiorly and right of midline towards D2
- Trace the lower 1/3 of the CBD
- CBD and MPD converge towards the major papilla
- Confluence of the SV and SMV into the PV
- Head of pancreas
- Intra-duodenal part of the CBD within the papilla itself
- Ampulla (from D1)
- Uncinate process (from D1)

From base position: Torque anticlockwise
- Cystic duct and its insertion point into the CBD
- GB
- The upper 1/3 of the common hepatic bile duct (above the cystic duct insertion point)
- Liver hilum
- PV confluence enters liver parenchyma at the liver hilum
- Hepatic artery in cross section
- Division of the CHD into the Right and Left hepatic ducts

Key landmarks for EUS clinicians
- Common hepatic and common bile duct
- GB and cystic duct including insertion point into CBD
- Portal vein confluence and feeding veins: SMV & SV
- Pancreas parenchyma & MPD
- Confluence of SMV & SV to PV as it courses to the liver hilum
- Liver hilum with PV confluence, hepatic artery (in cross section) and common hepatic duct
Abdominal Stations (Duodenum): Station 4 D2 & D3

“Base position” D3
- Bifurcation of the Aorta and common iliacs
- Abdominal Aorta
- IVC and portal vein
- Para aortic lymph node stations
- Inferior pole of right kidney

Slow withdrawal back into D2
From D3 into D2
- Uncinate process of the pancreas
- Accessory pancreatic duct
- MPD as it enters the papilla
- CBD as it enters the papilla
- Ampulla
- Right kidney
- IVC
- Duodenal wall layer structure

Further withdrawal
- Trace CBD up towards CHD
- Division of the CHD into the right and left hepatic ducts
- PV confluence
- Trace MPD into the pancreatic neck (genu)
- Liver hilum

Key landmarks for EUS clinicians
- Aorta
- IVC
- Uncinate process
- MPD and CBD coursing into the major papilla
- Common bile duct traced into the common hepatic
- Liver hilum
- Portal vein confluence and feeding veins: SMV & SV
- Pancreas parenchyma
- MPD can be traced into the pancreatic neck (genu)