



## Medicine for Managers

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# Anatomy of the Abdomen

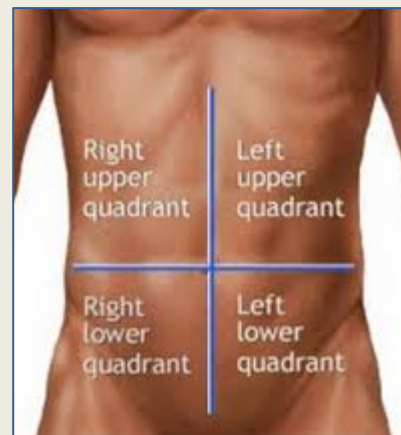
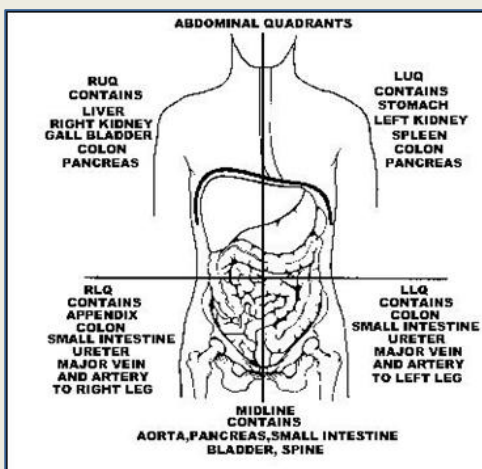
I have to confess that, on occasion, I watch a quiz show on the television and medical questions are always popular. A recurring theme is ‘pinning the organ on the abdomen’ where contestants are asked to place organs in the correct area on a diagram of an abdomen. Some of the positions are certainly fanciful and, for many, the contents of the abdomen is a complete mystery. Time to demystify.

There are a considerable number of major structures in the abdomen. For the doctor confronted with someone suffering from abdominal pain, it is unsurprisingly essential to know where everything is in order to assist in the localisation of the cause.

The abdomen is bounded by the diaphragm above, which separates it from the thorax (chest cavity) and by the pelvic inlet below (the

bony part of the hips). At the back of the abdomen are the vertebral column and the powerful muscles, psoas (pronounced so-ass) and quadratus lumborum.

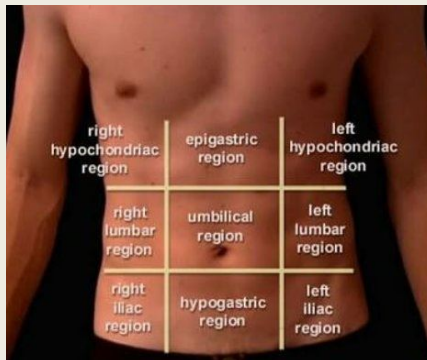
For descriptive purposes, the abdomen is divided into four areas. They are the upper left and right quadrants and the lower left and right quadrants. The diagram shows the way in which



the abdomen is divided and the structures that are found in each quadrant.

Medical notes might therefore state that there was, for example, “pain in the lower right quadrant” or “swelling in the upper left quadrant”.

It can also be divided into nine regions.



To do so allows more accurate and specific descriptive localisation of organs or symptoms. The diagram is American. It refers to upper left and right 'hypochondriac' regions. In the UK we describe them as the left and right hypochondrium (hi-po-con-dree-um).

### ***The Digestive System***

The oesophagus enters the abdomen through the diaphragm in the epigastric region. The rest



of the gut is within the abdomen. The oesophagus joins the stomach and from there bowel food contents travel through the duodenum, jejunum and ileum (shown as small pale pink coils) and then into the large bowel (shown as the darker segmented area) and out through the rectum and anus. The small bowel, from the stomach to the ilio-caecal junction,

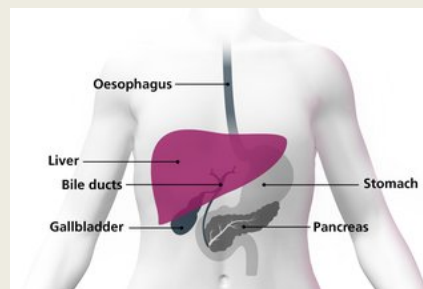
where the small and large bowels meet, is between six and seven metres (20-23 feet) long.

The large bowel, which extends from the ilio-caecal junction to the anus, is about 1.5 metres (5 feet) long. It consists of a caecum, an ascending colon, a transverse colon, a descending colon, a sigmoid (S-shaped) colon, the rectum and the anus. The appendix (described as vermiform or worm shaped) is a finger-shaped hollow tube protruding from the start of the colon in the right iliac region.

The gut, in which digestion occurs, may cause symptoms for a diverse range of conditions including infection, obstruction, inflammation and dysfunction. It is important to be able to know which part of the bowel may be responsible, although pain is often poorly located in the abdomen if the gut is the cause because the nerve supplies are from scattered sources.

### ***Liver and Gall Bladder***

The liver is principally in the upper right quadrant of the abdomen although it extends across the midline towards the left side. It is the largest of the abdominal organs



It has two principal lobes and beneath it is the gall bladder. Its functions include production of bile, breakdown of toxins, metabolism of fats, proteins and carbohydrates, activation of enzymes, storage of glycogen, vitamins and minerals and manufacture of plasma proteins. It is essential to know its shape and position because examination of the abdomen may

reveal, tenderness, enlargement or nodularity indicative of various diseases.

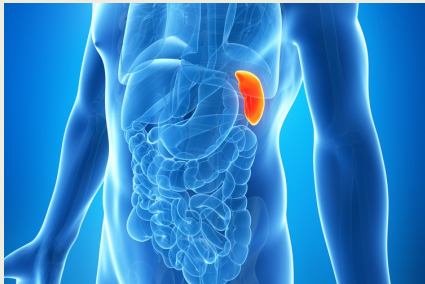
The bile duct, through which bile leaves the gallbladder to enter the gut, may become obstructed by gallstones. As the gallbladder contracts to push out the bile past the blockage the pain produced is very severe and called biliary colic. There is marked tenderness below the midline of the ribs on the right.

### ***The Pancreas***

The pancreas lies towards the centre of the abdomen (epigastric region) below the liver. It manufactures pancreatic enzymes which break down fat, protein and starches. The enzymes pass into the duodenum through the pancreatic duct. It is also an endocrine gland manufacturing hormones, principally insulin, which lowers blood sugar and glucagon, which raises blood sugar.

### ***The Spleen***

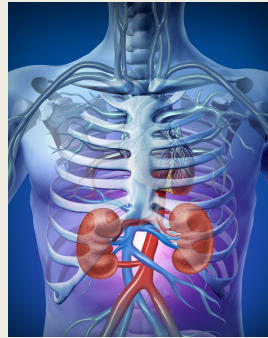
A large lymphoid organ, the spleen is found below the ribs on the left (hypochondrium) of the abdomen. It may be enlarged in malaria,



cystic fibrosis, blood diseases, heart failure and cirrhosis. It may then be felt during a digital examination by the doctor.

### ***The kidneys***

Paired bean-shaped organs, they are situated against the back muscles in the upper part of the abdomen. The right kidney is situated beneath the diaphragm and behind the liver,



whereas the left kidney is below the diaphragm behind the spleen. Pain may occur as a result of infection or other kidney diseases and is usually felt in the flank either on one side or, less commonly, on both sides. Pain can be

elicited from the kidney if the side of the abdomen is examined with one hand on the back of the affected side of the abdomen and one hand on the front of the affected side. The kidney is therefore trapped between the hands and pressure elicits pain.

It should be noted that the kidneys and the ureters (tubes leading to the bladder) are behind the abdominal covering (the peritoneum) and, as such, are considered by some to be outside the abdomen.

### ***Other structures***

The abdomen contains other structures, including lymph nodes, blood vessels and mesentery (folds of membrane that hold the intestine to the abdominal wall to provide support)



The abdominal contents have fascinated physicians for centuries. We have come such a long way, first with dissection,

then microscopy radiography, electron microscopy and the development of scans and ultrasound.

Four hundred years ago, it was all so different!!!

### ***Anatomy lesson of Dr Willem van der Meer 1617***