Abdominal masses are commonly encountered on abdominal radiographs. Determining the origin of the masses is important for formulating a differential diagnosis list and ultimately making a diagnosis.

The first, vastly important, step in abdominal radiography is a making high quality radiographs. Please make at least two (2) orthogonal radiographs. We routinely make right lateral and ventrodorsal (VD) radiographs. Adding a left lateral radiograph is often useful, especially when evaluating gastrointestinal structures. The abdomen extends from the cranial aspect of the diaphragm to the pelvic inlet. For large dogs, it may be necessary to make 2 lateral and 2 VD projections to include the entire abdomen. Ideally, abdominal radiographs are made after withholding food for 12 hours and giving enemas. However, this is no longer routine. Finally, one piece of sage advice from a colleague, “Making only lateral radiographs of the abdomen often asks more questions than it answers”.

Abdominal masses usually displace adjacent organs away from the masses. When the margins of the mass are easily seen, it is easier to detect the lesion. However, sometimes the margins of the mass are not clear and all that is seen is organ displacement. The latter situation is termed a mass effect.

Once an abdominal mass or mass effect is seen, divide the abdomen into regions and then determine in which region the mass resides. The abdomen is divided into cranial, middle or caudal; dorsal or ventral; and left or right. Larger masses involve more than one region. Once the mass is assigned to a region(s), what “lives” in that region?

**Abdominal regions**

- Right, cranial, dorsal – liver, cranial pole of right kidney
- Right, cranial, ventral – liver, gallbladder, pylorus (stomach), body of stomach, pancreas
- Left, cranial, dorsal – liver, fundus (stomach), body of stomach
- Left, cranial, ventral – liver, fundus (stomach), body of stomach
- Right, middle, dorsal – right kidney, right adrenal gland, spleen, duodenum, small intestines, cecum, ascending colon, transverse colon, mesenteric lymph nodes, omentum, uterine horns, ovary
- Right, middle, ventral – right kidney, right adrenal gland, spleen, duodenum, small intestines, cecum, ascending colon, transverse colon, mesenteric lymph nodes, omentum, uterine horns
- Left, middle, dorsal – left kidney, left adrenal gland, spleen, small intestines, large intestine (colon), mesenteric lymph nodes, omentum, uterine horns
- Left, middle, ventral – spleen, small intestines, large intestine (colon), mesenteric lymph nodes, omentum, uterine horns
- Right, caudal, dorsal – spleen, small intestines, large intestine (colon), sublumbar lymph nodes, omentum, rectum, uterus, urinary bladder, prostate
- Right, caudal, ventral – spleen, small intestines, large intestine (colon), sublumbar lymph nodes, omentum, rectum, uterus, urinary bladder, prostate
- Left, caudal, dorsal – spleen, small intestines, large intestine (colon), sublumbar lymph nodes, omentum, rectum, uterus, urinary bladder, prostate
- Left, caudal, ventral – spleen, small intestines, large intestine (colon), sublumbar lymph nodes, omentum, rectum, uterus, urinary bladder, prostate

**Masses from specific organs**

**Liver**
Caudal displacement of the stomach. May cause caudal displacement of the right or left kidney and the head of the spleen. Rule outs – neoplasia (primary or metastatic), nodular hyperplasia, hematoma, abscess, granuloma

**Stomach**
Caudal displacement of the intestines, kidneys and spleen. Rule outs – Full stomach, food bloat, GDV, aerophagia, gastric outflow obstruction (neoplasia, wall hypertrophy)

**Spleen**
Cranial displacement of stomach. Intestinal displacement depends on what part of the spleen contains the mass. Rule outs – neoplasia (hemagiosarcoma, hemangioma, lymphoma), hematoma, hyperplasia, folding upon itself
Kidneys
Ventral, medial and caudal displacement of the intestines. Rule outs – hydronephrosis, neoplasia, cysts, work related hypertrophy, perinephric pseudocysts
Intestine
Displacement depends on what part of the intestines are involved. Mechanical obstruction is often present oral to the lesion. Rule outs – foreign bodies, neoplasia (adenocarcinoma, lymphoma), abscess, granuloma.
Urinary bladder
Cranial displacement of small intestines. Dorsal displacement of distal large intestines/rectum. Rule outs – animal needs to urinate, urinary obstruction due to neoplasia, calculi, or cystitis
Prostate
Cranial displacement of small intestines and urinary bladder. Dorsal displacement of distal large intestines/rectum. Rule outs – benign prostatic hyperplasia (BPH), neoplasia, prostatitis, prostatic cyst
Uterus
Sublumbar lymph nodes
Increased soft tissue opacity ventral to the caudal lumbar spine and/or sacrum. Ventral displacement of the colon and/or rectum. Rule outs – metastatic neoplasia, lymphoma, reactive lymphadenopathy.
Other lymph nodes
Intestinal displacement depends on the location of the affected lymph nodes. Rule outs – reactive lymphadenopathy, lymphoma, metastatic lymphadenopathy.

Further imaging
- Ultrasound is often the next step for further imaging of the abdomen. One can determine the origin of the mass, possibly narrow the list of differential diagnoses, evaluate other organs for pathology not seen on abdominal radiographs, and guide (fine needle aspirate) FNA or biopsy. A FNA or biopsy is warranted for definitive diagnosis.
- Abdominal computed tomography (CT) is become more available and more common. A CT examination eliminates the superimposition of abdominal organs and makes it easier to determine the origin of the abdominal mass.
- Contrast procedures may be performed. Upper GI studies are warranted for gastrointestinal disease. Excretory urogram (a.k.a., EU, IVP, IVU) is warranted for studies of the kidneys and ureters. Double contrast cystogram for urinary bladder. Urethrogram for urethra.
- In some instances, abdominal surgery is warranted
- If neoplasia is suspected, radiographing the thorax to look for pulmonary metastasis is warranted.