Avian Radiographs 101
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Introduction to radiology

- Five distinct densities are used to describe images and provide information about the nature of an abnormality (e.g. differentiate a metallic foreign body in the gut from ingested bone)
  - In order of lightest (white) to darkest (black): metal, bone, soft tissue, fat, air

  - The greater the difference in density of two adjacent structures, the greater the contrast
    - For example, soft tissue structures in the coelom (intestines, spleen, pancreas) are difficult to differentiate from one another because their densities are similar but air sacs are easy to discern from surrounding soft tissue due to the different densities

- Symmetry, markers and orthogonal (right angle) views are crucial for accurate interpretation and diagnosis
  - VD = ventrodorsal (beam enters ventrally, exits dorsally)
  - DV = dorsoventral (beam enters dorsally, exits ventrally)
  - Lateral = side (marker should note which side is down and which limbs are forward)
  - PA = posterioranterior (beam enters trailing edge of wing, exits leading edge)
  - AP = anteriorposterior (beam enters leading edge of wing, exits trailing edge)
    - Orthogonal views for the body and legs seen on VD (or DV) and lateral
    - Orthogonal views for the wings seen on VD (or DV) and PA (or AP)

- Safety is crucial
  - X-rays alter cell structure and function and can lead to permanent tissue damage
  - Use lead shields (vest, thyroid shield +/- gloves) or physical lead barrier if you have to be in the room when the x-ray is taken
  - Stand at least 6 feet from the beam if you do not have to be in the room
Tarsometatarsus
D1 (hallux)
D2
D3
D4

Trachea
Heart
Air sacs
Everything else
Liver
Stomachs
Intestines
Pancreas
Kidneys
Gonads...
Lesions

- When an abnormality is seen, consider the following to identify and describe the lesion
  - Symmetry
  - Size
  - Shape
  - Number
  - Location
  - Margination
  - Opacity
- Always read the entire image
  - Easy to focus on the primary lesion and miss others
- For digital images, try quickly flipping the image back and forth to catch subtleties, adjusting the contrast or inverting the light
- Some lesions take time to manifest radiographically
  - Repeat radiographs in 7-10d
- Bone lesions
  - Fractures (complete and greenstick (folding fractures))
  - Luxations
  - Osteomyelitis (bone infection)
  - Sclerosis (abnormal thickening of the bone – indicates chronic lesion)
  - Sequestra (non-viable bone fragments)
  - Malunion or non-union
- Soft tissue lesions
  - Bruising and swelling
  - Increased density in respiratory tract
  - Foreign bodies