Computerized Axial Tomography
or
COMPUTED TOMOGRAPHY

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AGENDA

1. Computerized (Axial)Tomography
2. Clinical Applications: CT
3. Optical Coherence Tomography
4. Clinical Applications: OCT
5. Ultrasound _maybe
INTRODUCTION TO IMAGING AND IMAGE ANALYTICS

Medical Imaging

CLINICAL APPLICATIONS

X-RAYS

TRANSMISSION DETECTION X-RAYS

FULCRUM

PRINCIPLES CT

Tomography
RADIOLOGY
PRINCIPLE OF FULCRUM IN TOMOGRAPHY
Horses get sick too!
MECHANICS OF CT

• Lie on a narrow table that slides into the center of the CT scanner
• X-ray beam rotates around you
• Must be still for 30 seconds to a few minutes
• Computer creates separate images of the body area, called slices
  • Stored
  • Viewed on a monitor
  • Printed on film
  • Three-dimensional models
MECHANICS OF CT

1988
Single “slice” CT

1992
Multiple “slice” CT
MECHANICS OF CT

Full Speed CT 1min
TYPES OF DIAGNOSIS MADE FROM HEAD CT

- Birth (congenital) defect of the head or brain
- Brain infection
- Brain tumor
- Buildup of fluid inside the skull (hydrocephalus)
- Injury (trauma) to the brain, head, or face
- Stroke or bleeding in the brain
WHAT HAPPENS TO MAKE CT

• Contrast can be given through a vein (IV) in your hand or forearm
  • Slight burning feeling
  • Metallic taste in the mouth
  • Warm flushing of the body
• Must be still for 30 seconds to a few minutes
• Caution about:
  • Reaction to contrast.
  • Medications
  • Kidney function
  • Weight
INDICATIONS FOR HEAD CT

• Abnormal head size in children
• Changes in thinking or behavior
• Fainting
• Headache
• Hearing loss (in some people)
• Symptoms of damage to part of the brain,
ABNORMAL HEAD CT

- Abnormal blood vessels (arteriovenous malformation)
- Bulging blood vessel in the brain (aneurysm)
- Bleeding (for example, subdural hematoma or bleeding in the brain tissue)
- Bone infection
- Brain abscess or infection
- Brain damage due to injury
- Brain tissue swelling or injury
- Brain tumor or other growth (mass)
- Loss of brain tissue (cerebral atrophy)
- Fluid collecting inside the skull (hydrocephalus)
- Problems with the hearing nerve
- Stroke or transient ischemic attack (TIA)
QUESTIONS

Guest Lecturer after Lunch from NC TraCS

If we have time next week will review some clinical CTs
Time for Lunch?