

Imaging Selection and Safety Guide

Diagnostic Imaging and Instrumentation

Choice of modality

- Plain radiography is appropriate for selected fractures and chest complaints; it may miss early or subtle pathology.
- Ultrasound is non-ionizing and useful for many biliary, pelvic, obstetric, vascular and soft-tissue questions, with operator and habitus limitations.
- CT provides rapid cross-sectional detail but uses ionizing radiation; MRI is excellent for selected soft-tissue and neurological questions and requires device/metal screening.

Safety and contrast

- Use pregnancy-aware pathways and balance diagnostic benefit against radiation when relevant; do not withhold urgent indicated imaging reflexively.
- Screen for prior contrast reactions, kidney risk factors and relevant local policies before iodinated contrast; gadolinium risk considerations depend on agent and renal function.
- MRI safety requires checking implants, foreign bodies and compatibility, never assuming all implants are safe.

Clinical pathways

- Suspected stroke, pulmonary embolism, head injury and appendicitis use validated context-specific clinical pathways; urgent assessment comes first when unstable.
- Avoid routine imaging for uncomplicated low back pain without red flags; progressive neurological deficit or cauda equina symptoms require urgent evaluation.
- Use ultrasound first in many pediatric or pregnancy indications when diagnostically suitable.

Reading and communicating results

- Read imaging reports for indication, key findings, uncertainty, incidental findings, recommendations and comparison studies.
- Communicate unexpected significant results and arrange closed-loop follow-up.
- Recognize imaging may be nondiagnostic or have incidentalomas; integrate results with pretest probability.

Case exercise: Case: A patient has new urinary retention, saddle anesthesia and bilateral leg weakness. Arrange emergency evaluation for possible cauda equina syndrome rather than routine elective spine radiography.

Educational material only. Use current authoritative guidelines and local standards for clinical decisions; numerical laboratory intervals vary by laboratory.