ARRT Radiography Exposure & Positioning Study Sheet

Exposure factors · grid conversion · dose limits · positioning landmarks · image quality · patient care

Free ARRT Radiography sample exam: **passprofessor.com/arrt-radiography-exam-prep/**

EXPOSURE FACTORS

Item	Reference
kVp effects	increasing kVp raises average photon energy and penetrability and increases the half-value layer; lower kVp gives greater differential absorption and higher subject contrast, higher kVp a longer-scale, lower-contrast image with more scatter reaching the receptor
mAs and beam quantity	photon quantity is directly proportional to mAs — doubling mAs doubles the photons produced; maximum photon energy is set by kVp
Inverse square law	intensity varies inversely with the square of the distance: doubling distance quarters intensity (80 mR at 100 cm → 20 mR at 200 cm); halving distance multiplies intensity by 4
15% rule	a 15% increase in kVp approximately doubles receptor exposure; to hold exposure, pair it with halving the mAs (80 kVp / 80 mAs → 92 kVp / 40 mAs)
Filtration	added filtration preferentially removes low-energy photons, hardening the beam and raising the half-value layer; total filtration of 2.5 mm aluminum equivalent is required for operation above 70 kVp, verified by half-value-layer measurement
Grid ratio & conversion	ratio = height of the lead strips ÷ width of the interspace (2.4 mm strips, 0.3 mm interspace = 8:1)
Grid conversion	$mAs_2 = mAs_1 \times$ (new grid factor ÷ old grid factor); factors: 5:1 → 2 · 8:1 → 4 · 10:1 → 5 · 16:1 → 6
Collimation	close collimation to the anatomy of interest reduces irradiated volume, patient dose, and scatter, and improves contrast

RADIATION PROTECTION

Item	Reference
ALARA	keep doses as low as reasonably achievable, minimizing dose below the limits; rotating personnel during lengthy cases applies the time principle
Occupational effective dose limit	50 mSv per year; monitoring is required when a worker is likely to receive more than 10% of that limit in a year (5 mSv)
Cumulative occupational limit	10 mSv × the worker's age (a 40-year-old: 400 mSv)
Lens / skin / public limits	lens of the eye 150 mSv per year · skin and extremities 500 mSv per year · public, continuous/frequent exposure, 1 mSv per year

Item	Reference
Declared-pregnancy embryo-fetus limit	5 mSv for the entire gestation; monthly dose kept near 0.5 mSv
Dosimeter placement	primary dosimeter at the collar, outside the apron, during fluoroscopy; fetal monitor at the waist, under the apron
Fluoroscopic protective aprons	at least 0.5 mm lead equivalent
Area postings	"Radiation Area": over 0.05 mSv in one hour at 30 cm · "High Radiation Area": over 1 mSv in one hour at 30 cm

Dose limits above are the NCRP Report No. 116 values cited by the ARRT question bank.

© PassProfessor · passprofessor.com

POSITIONING & ANATOMY LANDMARKS

Projection	Reference
AP axial (Towne) skull	central ray 30° caudad, orbitomeatal line perpendicular to the receptor; dorsum sellae projected within the foramen magnum
PA axial (Caldwell) skull	central ray 15° caudad, exiting at the nasion; petrous ridges into the lower third of the orbits; the PA direction also lowers lens dose versus AP — the lens sits on the attenuated exit side

Projection	Reference
PA chest, erect	shoulders rolled forward (scapulae out of the lung fields); centered at T7; 72-inch SID; AP thoracic spine also centers at T7, near the inferior angle of the scapula
AP abdomen, supine	centered at the iliac crests; field includes the pubic symphysis through the diaphragm; upright: centered about 5 cm (2 in.) above the crests to include the diaphragm

IMAGE-QUALITY FACTORS & PATIENT CARE

Item	Reference
Anode heel effect	beam intensity is greatest toward the cathode end and weakest toward the anode end; place the thicker part toward the cathode end
Focal spot selection	small focal spot for detail; large focal spot permits higher tube current (higher load) and shorter exposure times; by the line-focus principle the effective focal spot is smaller than the actual focal spot because of the anode angle
Geometry and magnification	a longer SID limits magnification (72-inch SID on PA chest); a receptor close to the patient keeps geometric sharpness
Deviation index	a reading of +3 means the receptor received about twice the target exposure; reduce technique for the next similar exposure
Quantum mottle & dose creep	a grainy image with lost detail and an exposure indicator far below target is gross underexposure — repeat with increased exposure factors; dose creep is the opposite failure: digital rescaling normalizes brightness, so gradually rising exposures go unnoticed unless indicators are monitored

Item	Reference
Patient identification & consent	confirm two identifiers, such as full name and date of birth, against the order immediately before an exposure; informed consent means explaining the procedure, material risks, benefits, and alternatives, and confirming understanding before the competent patient signs
Contrast extravasation	stop the injection immediately, elevate the limb, assess the site, notify the radiologist, and document the event
Mobile examination, bystanders	announce the exposure before exposing so others can step away or be shielded; shield or maximize distance for patients who cannot be moved; droplet precautions (influenza) = surgical mask within close range, plus standard precautions

WHAT THIS SHEET DOESN'T COVER

- Image evaluation: critiquing real radiographs for positioning and technique errors.
- Blueprint-weighted application across all four content areas.
- Timed, full-length exam simulation.
- An explanation for every answer — why the right answers are right and the wrong ones are wrong.
- A fresh set of questions on every attempt, so practice never repeats itself.

Start with free ARRT Radiography sample questions: passprofessor.com/arrt-radiography-exam-prep/

The ARRT Radiography examination: 200 scored items plus 30 unscored pilot items, 230 minutes, at Pearson VUE; passing is a scaled score of 75. The bank follows the ARRT content specifications implemented January 1, 2022; facts are from its verified explanations.

© PassProfessor · passprofessor.com