SIMULATION CAPABILITIES

The simulation capabilities define the core simulation functions available within the X-rau Suite. Use this overview to set clear expectations about what the simulation tools can and cannot do during your work

As of version v1.9.0

PATIENT & ANATOMY

Exam choice	☑	Students can choose exams by anatomical region, and case type, e.g., 'Pelvic - Healthy' or 'Pelvic - distal femur fracture'
Multiple projections	☑	Our simulations support over 60 standard projections across all available exams, and students can attempt additional projections thanks to the interactive nature of the simulation.
Patient positioning	☑	Each simulation has specific preconfigured patient positions, such as erect, supine, prone, or seated, with options to adjust rotation from AP to lateral based on the procedure
In-Plane Patient Adjustment	☑	Patient positioning includes the ability to move forward and backward within the plane, allowing for more accurate alignment based on procedural needs
Joint mobility	☑	Each simulation includes a specific set of moveable joints, allowing students to adjust and position the patient as needed
Anatomy and bones	☑	Each patient features either high-quality bones with trabecular structures and landmarks or simplified bones with clear landmarks - both support radiography positioning training
Bone pathology and cases	☑	All simulations include a healthy patient case. Some simulations also feature trauma or pathological conditions to support adjustments in the exam approach when relevant

X-RAY SUITE

X-RAY TUBE

Full tube movement	☑	The tube can move in any X, Y, and Z plane, as well as tilt and rotate in single-degree intervals
Tube detent	☑	The tube can detent into position at the wall bucky or radiographic table along vertical and horizontal axes for accurate imaging alignment
Collimation	☑	Collimation is adjustable, with collimation size estimates shown on the tube display (based on tube-to-detector distance and beam angle)
Source-image distance (SID)	☑	The tube automatically measures and displays the source-image distance on the tubes digital display

RADIOGRAPHIC TABLE AND WALL BUCKY

Partial table control	☑	The radiographic table comes equipped with vertical movement controls for select cases where it supports positioning.
Full table control	☑	The simulated X-ray suite comes equipped with a height adjustable floating tabletop
Interactive table bucky	☑	The simulated X-ray suite comes equipped with a sliding table bucky
Interactive wall bucky	☑	The simulated X-ray suite comes equipped with a height adjustable wall bucky
Grid	☐	Both the wall and table bucky feature an integrated adjustable grid for improved image quality.

IMAGING RECEPTOR

Dedicated detector plates	☑	The simulated X-ray suite features select detector plates, either 17 × 17 in (43 × 43 cm) or 14 × 17 in (36 × 43 cm), for specific imaging simulations.
Multiple detector sizes	☐	The system supports various imaging receptor sizes and technologies: CR (8 × 10 in, 10 × 12 in, 14 × 17 in) and DR (10 × 12 in, 14 × 17 in, 17 × 17 in) for diverse imaging needs.
Left and right markers	☑	Interactive L and R markers available to be placed on receptor plate or wall bucky

SANITATION STATION

Sanitation station	☑	The simulated X-ray suite has a handwashing station where students can practice washing their hands and putting on gloves

CONTROL ROOM

Adjust technical factors	☑	The control room lets students adjust kVp and mAs to observe how changes affect exposure outcomes
Bone visualization	☑	The control room features a button that removes the skin overlay from the patient, allowing students to focus on positioning the bones directly
Simple image post processing	☑	The control room allows simple post-processing of images, including 90 degree clockwise or counter clockwise rotation
Core image post processing	☐	The control room allows basic post-processing of images, including adjustments to brightness, contrast, cropping, and rotation

EXPOSURE RESPONSE

Raw image response	☑	The image shows a raw response with quality changes based on kVp and mAs, helping students understand how technical factors affect image quality.
Digital image response	☐	Using CR or DR receptors, the image will display a digital response with enhanced quality, including DI and EI values, allowing students to critique based on index values.
Realistic bone details	☑	Depending on the selected exam, the exposure response will reflect realistic bony details such as anatomical landmarks as well as trabecular, marrow and cortical bone structure
Central ray alignment	☑	The exposure realistically reflects central ray alignment, meaning that both large and small errors in tube angulation, tube positioning or patient positioning is shown in the image.
Responds correctly to kVp	☑	The exposure provides a realistic response to changes in kVp, allowing for both optimal but also over- or under exposed images. Image response depends on method (film or digital)
Responds correctly to mAs	☑	The exposure provides a realistic response to changes in mAs, allowing for both optimal but also low- or high beam density images. Image response depends on method (film or digital)

Planned for development

Are we missing simulation capabilities?
Report it on the roadmap here.