SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai

DEPARTMENT OF CARDIAC TECHNOLOGY

COURSE NAME : CARDIAC CATHETERIZATION LABORATORY BASICS

UNIT : EQUIPMENT AND MOVEMENT IN CATH LAB

TOPIC : BASICS OF TABLE MOVEMENT CONTROLS

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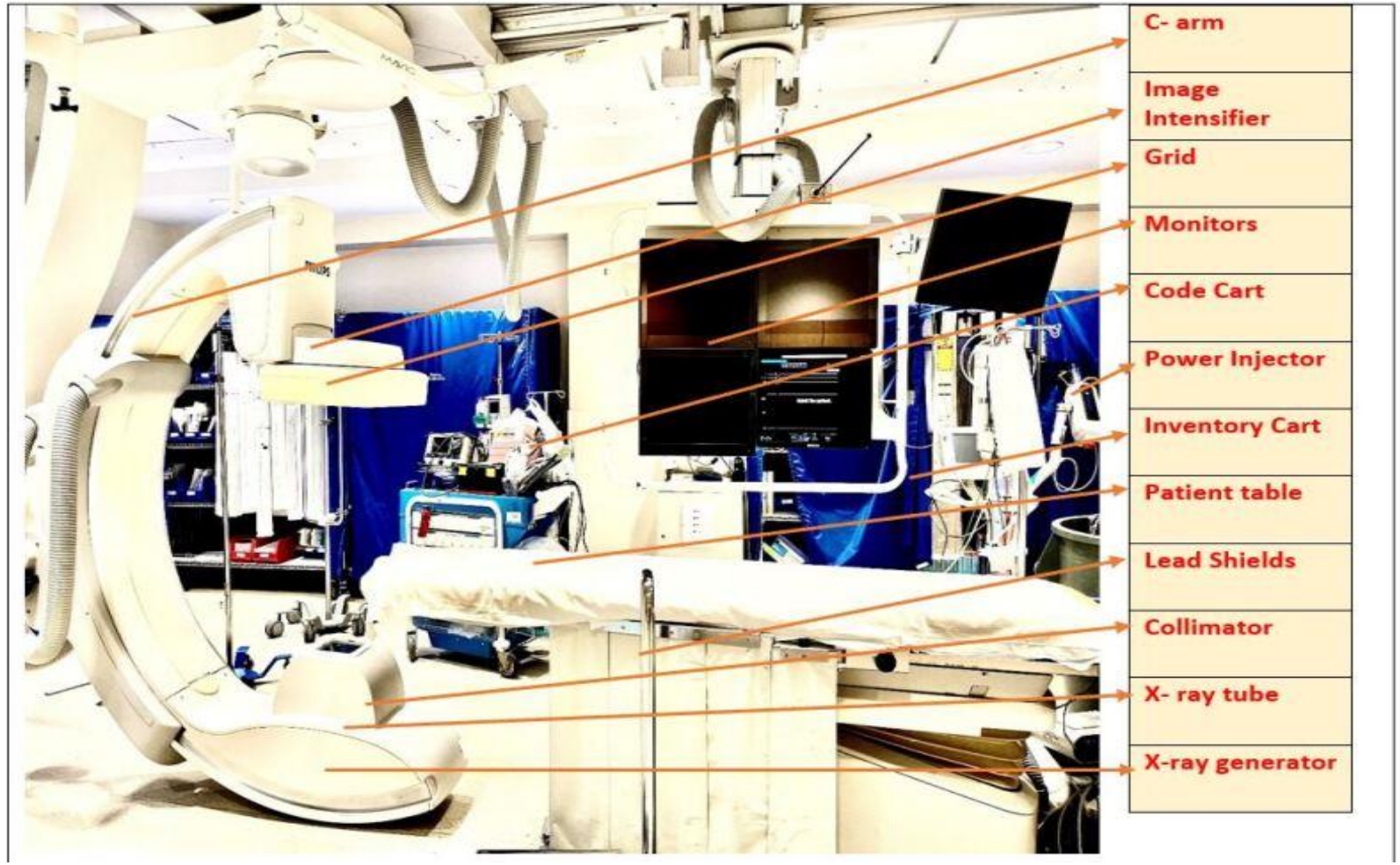
Basics of Table Movement Controls

- The patient table in a modern cardiac catheterization laboratory is a specialized, radiolucent (X-ray transparent) floating tabletop designed for precise positioning during procedures.



Basics of Table Movement Controls

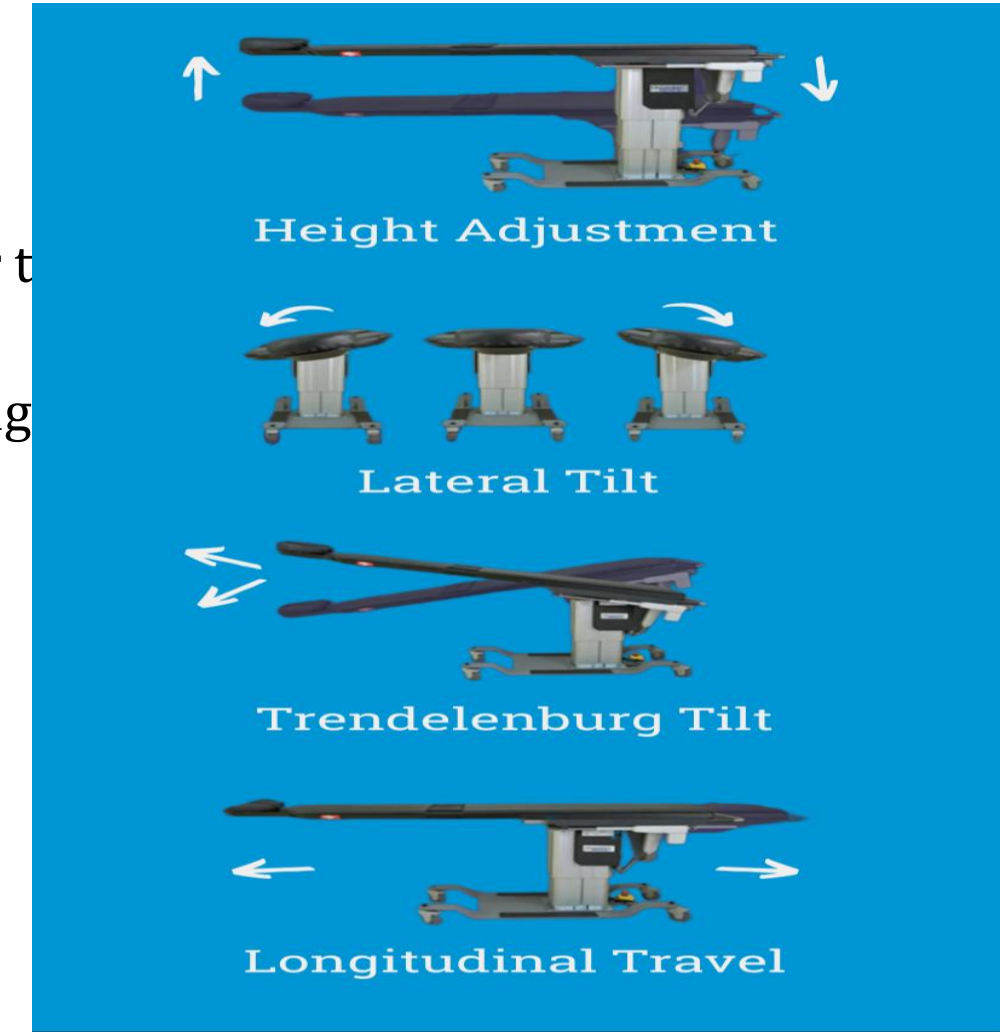
Common table movements include:

- **Longitudinal (head-to-foot):** Moves the table along the patient's long axis to align structures like the coronary ostia or bypass grafts.
- **Lateral (side-to-side):** Shifts the table transversely for better centering, especially useful in obese patients or for panning during injections.
- **Height adjustment:** Raises or lowers the table for operator comfort and to optimize distance from the image intensifier (closer distance improves image quality by reducing magnification and scatter).

Basics of Table Movement Controls

- **Trendelenburg/Reverse Trendelenburg tilt:** Tilts the table head-down or head-up for hemodynamic support or t clear air bubbles.
- **Panning:** Combined longitudinal/lateral movement during fluoroscopy to follow contrast flow without moving the C-arm.

Tips: *Always return the table to a neutral position for CPR if needed, as extended positions can make the table unstable. Modern tables often have memory positions for quick recall of standard setups.*



Basics of Table Movement Controls

- It allows movement in multiple directions to center the heart and coronary arteries in the X-ray field of view while minimizing radiation exposure and optimizing image quality.
- Controls are typically available at tableside (joysticks or pedals) and in the control room.

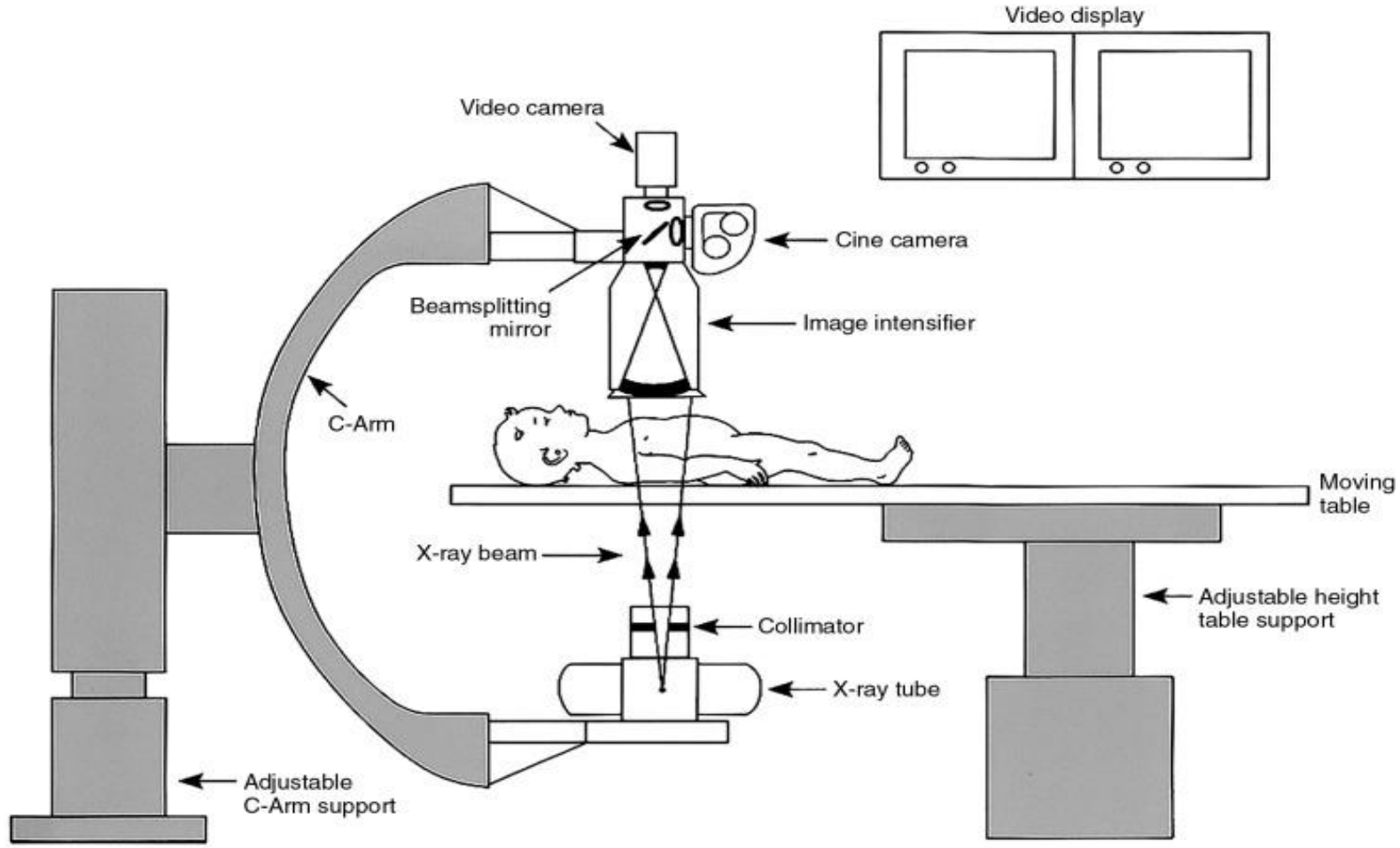


Image Intensifier Positioning (C-Arm Movements)

- The imaging system uses a C-arm (or gantry) with an X-ray tube below the table and an image intensifier (or flat-panel detector in modern systems) above.
- Positioning creates different angiographic projections to separate overlapping vessels and avoid foreshortening.

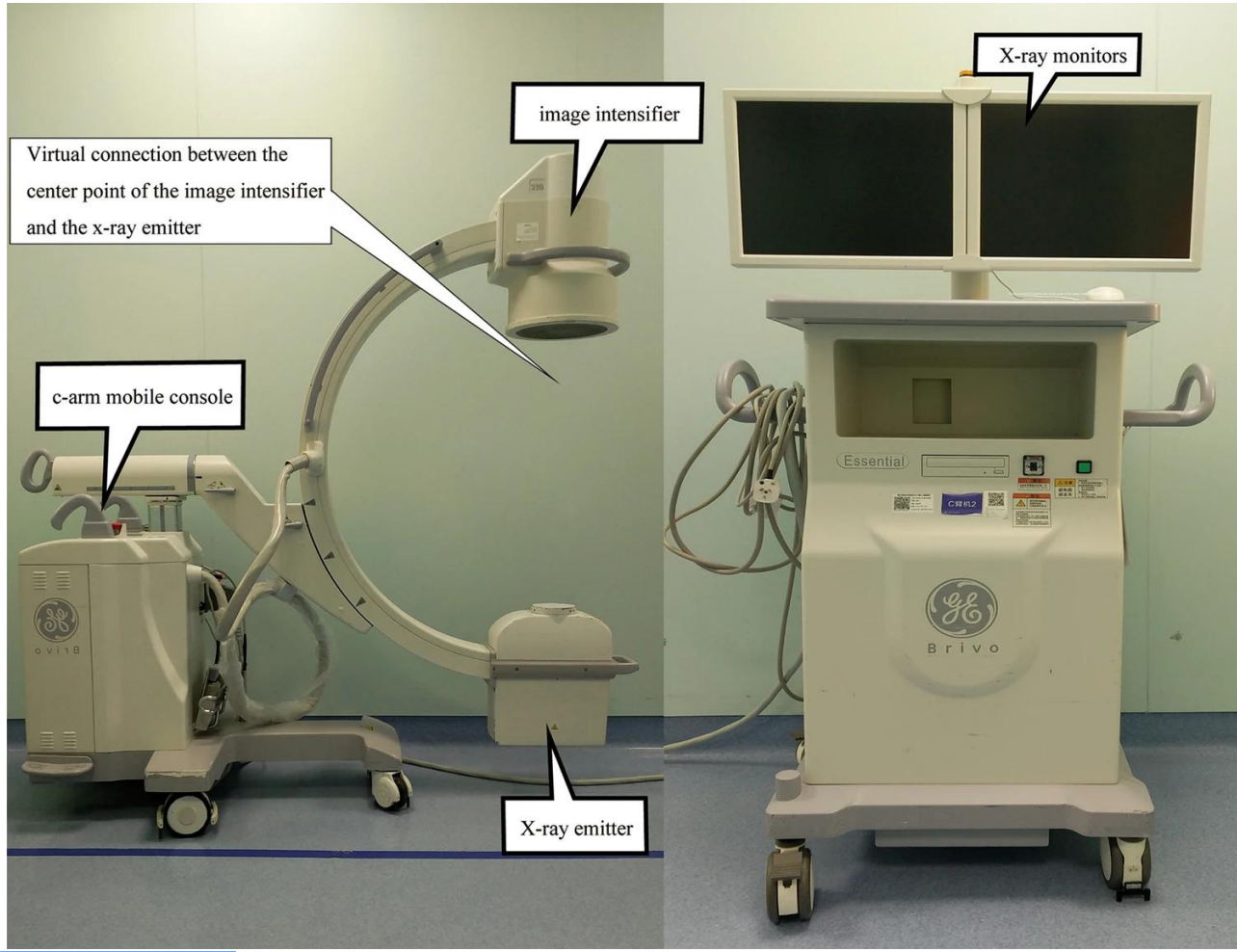


Image Intensifier Positioning (C-Arm Movements)

Key terms:

- **RAO (Right Anterior Oblique)**: Image intensifier over the patient's right side (spine on left of image).
- **LAO (Left Anterior Oblique)**: Image intensifier over the patient's left side (spine on right of image).
- **Cranial**: Intensifier tilted toward the patient's head (opens LAD and diagonals).
- **Caudal**: Intensifier tilted toward the patient's feet (opens circumflex and RCA bifurcation).

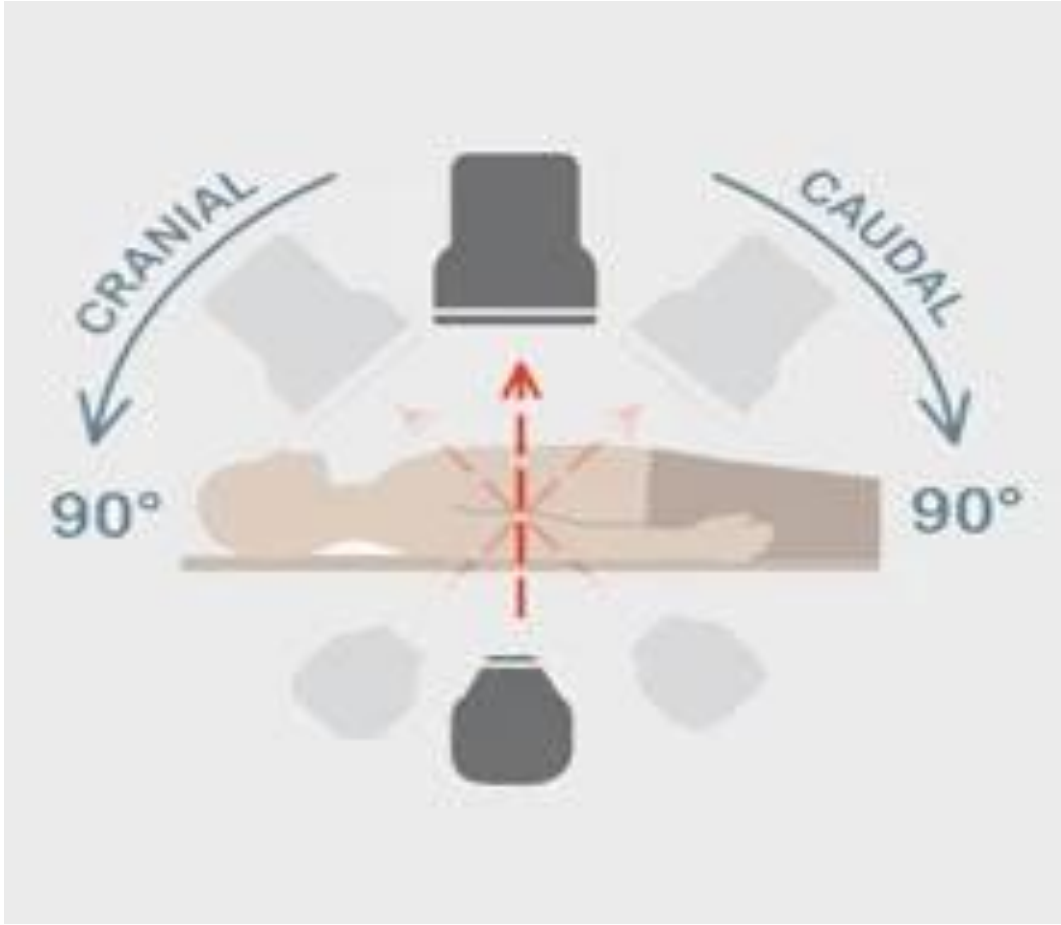


Image Intensifier Positioning (C-Arm Movements)

Movements:

- **Rotation:** Around the patient's long axis (LAO/RAO, typically -90° to +90°).
- **Angulation:** In the cranio-caudal plane (up to ±45°).
- **Orbital rotation:** In some systems, additional arcs.

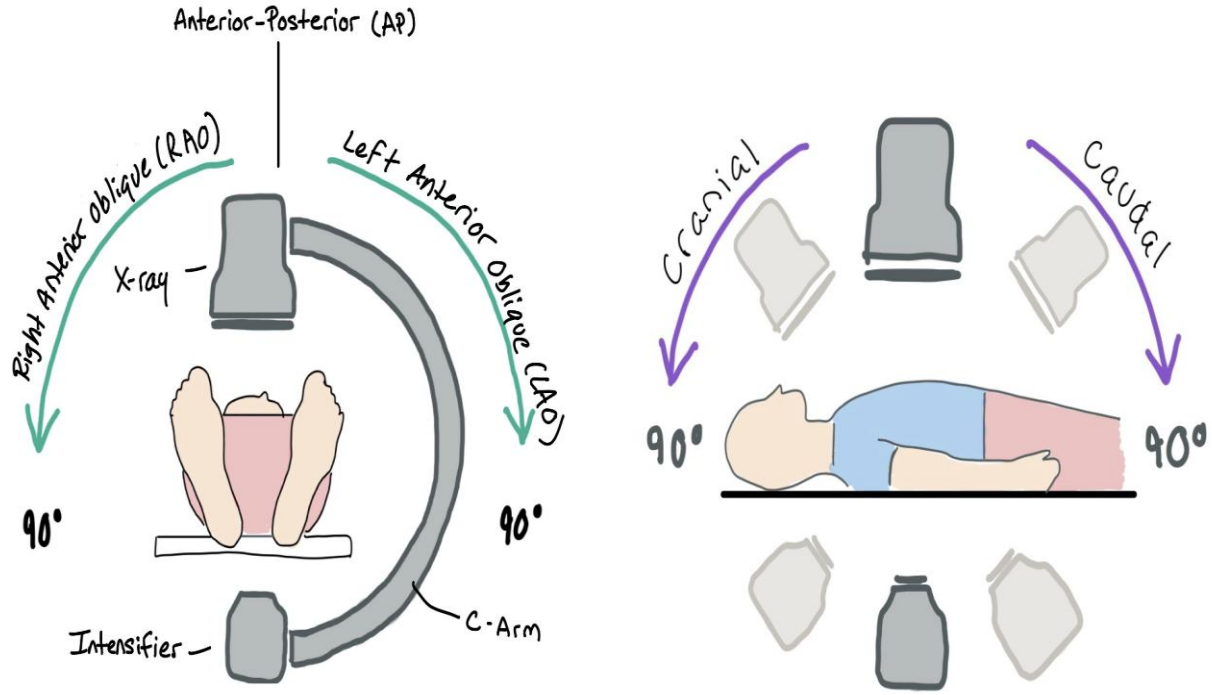


Figure 6 shows the different X-ray views available in the cath lab. The X-ray machine can rotate 90° right or left of the patient, as well as 90° towards the patient's head or feet (cranial vs caudal, respectfully. This allows us to get different views of the coronary arteries.

Image Playback and Review Techniques

- Images in the cath lab are acquired as **cine runs** (cineangiography): high-frame-rate sequences (typically 15–30 frames/second) during contrast injection for dynamic vessel visualization.
- Fluoroscopy uses lower rates for guidance.

Image Playback and Review Techniques

Review techniques on the workstation:

- **Loop playback:** Continuous forward/backward looping of cine runs to assess flow, stenoses, or collaterals.
- **Frame-by-frame advance:** Step through individual frames for precise lesion measurement or eccentricity evaluation.
- **Side-by-side comparison:** Display multiple views (e.g., pre- and post-PCI) or different angles simultaneously.

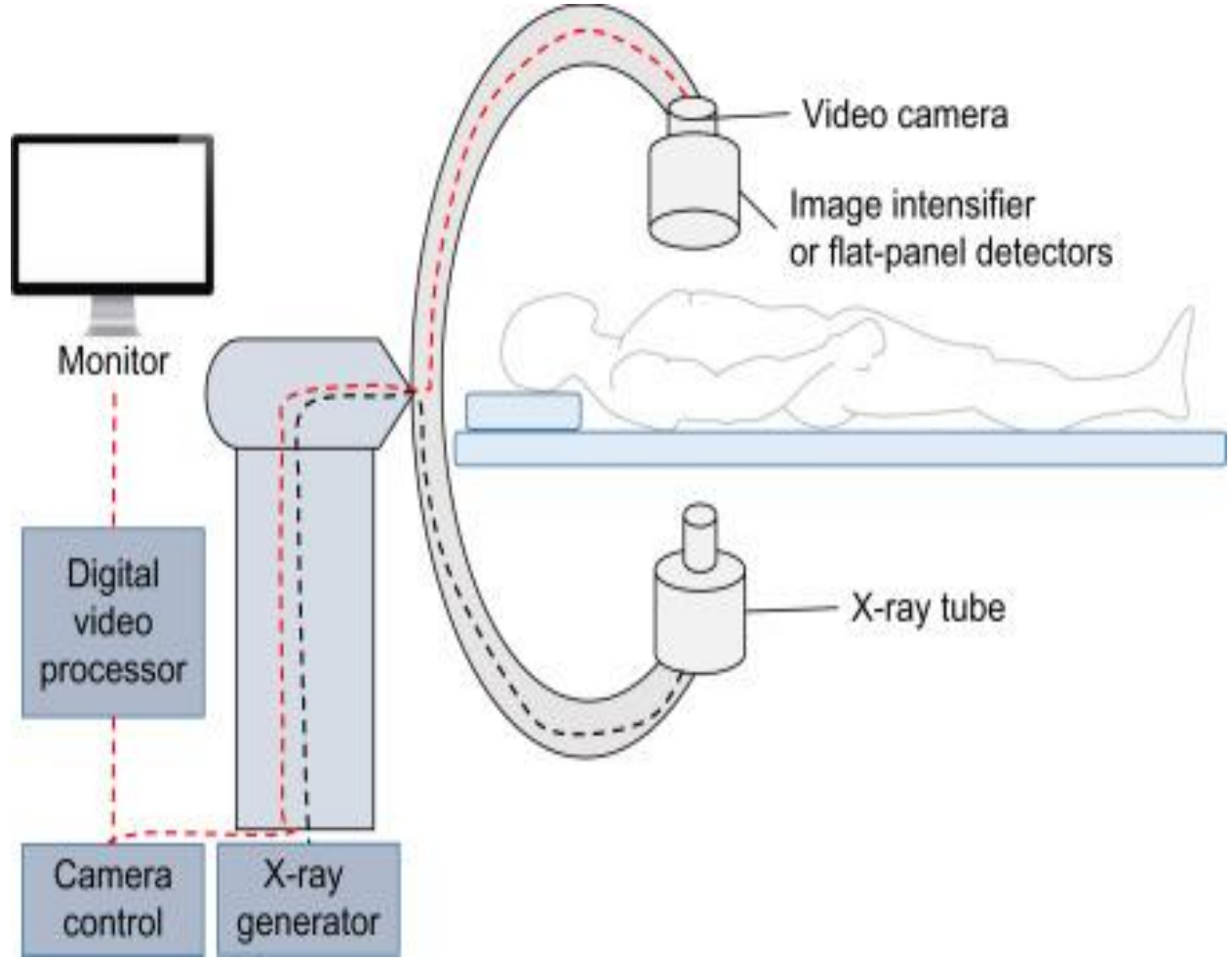


Image Playback and Review Techniques

- **Quantitative Coronary Angiography (QCA):** Automated edge detection for stenosis percentage, minimal lumen diameter, and reference vessel size.
- **Roadmapping:** Overlay prior cine on live fluoroscopy for guidance.
- **Zoom, contrast/brightness adjustment, edge enhancement:** Post-processing to highlight details.
- **Last image hold / fluoro save:** Review static fluoro images without additional radiation.

Summary Table

Topic	Key Functions	Controls / Movements	Clinical Importance
Table Movement Controls	Patient positioning	Longitudinal, lateral, vertical, tilt	Accurate imaging, patient safety, reduced radiation
Image Intensifier Positioning	Image acquisition	C-arm angulation, rotation, detector distance	Optimal image quality, dose reduction
Image Playback & Review	Image evaluation	Play, pause, loop, frame analysis, zoom	Diagnosis, treatment planning, documentation

References

- **Kern's Cardiac Catheterization Handbook (8th Edition, 2024)**

Primary Chapter: Chapter 3 – **Coronary Angiography and Ventriculography**

- **Grossman & Baim's Cardiac Catheterization, Angiography, and Intervention (9th Edition, 2020)**

Primary Section: Section IV – **Angiographic Techniques**