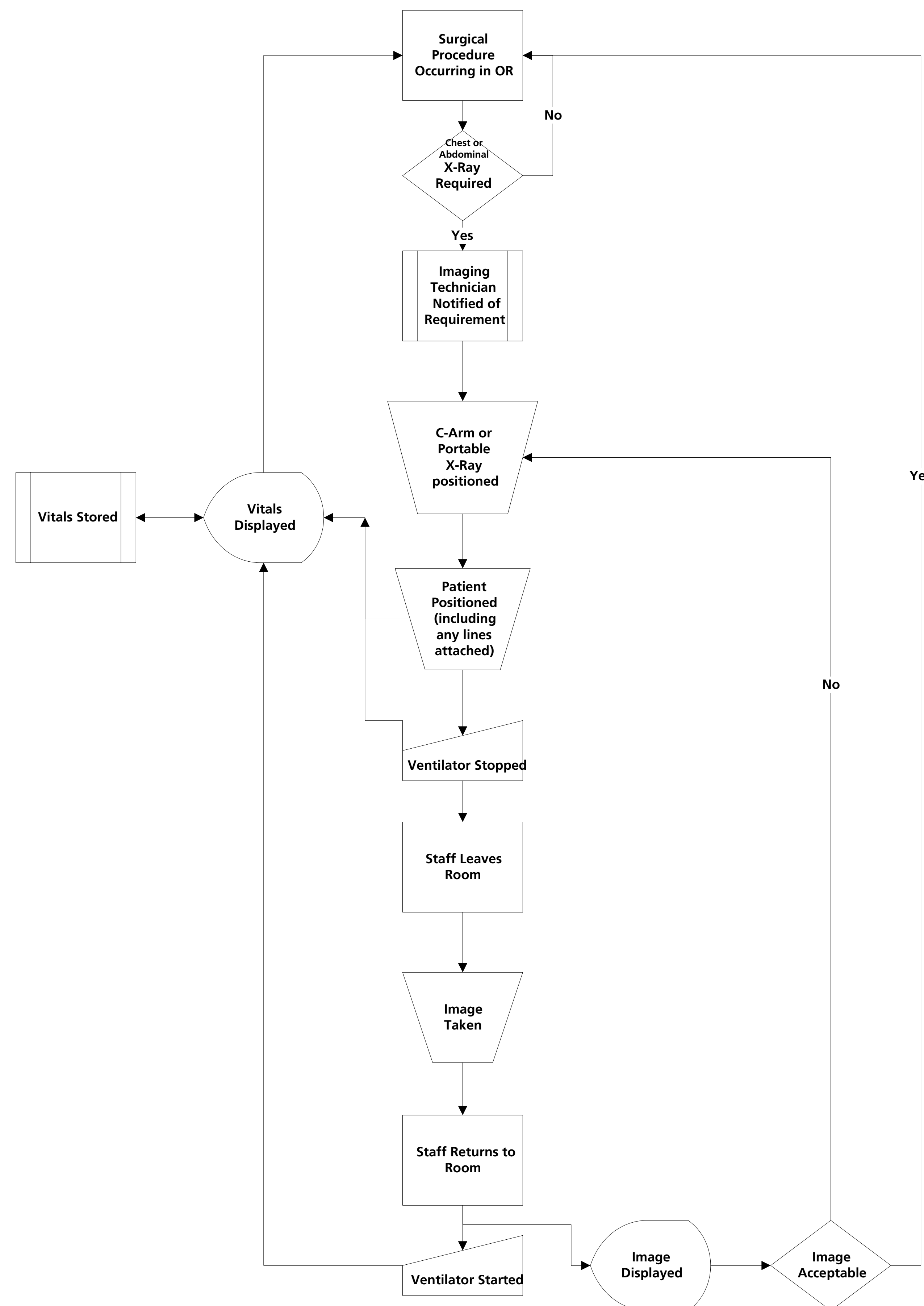
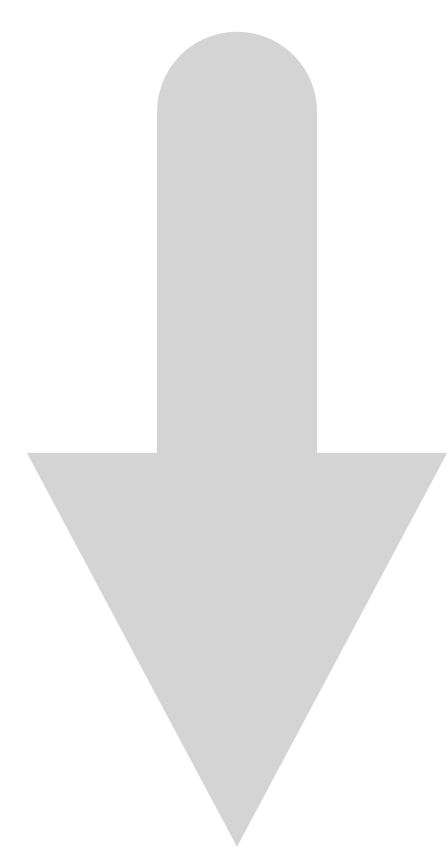


Clinical Workflow and Use Cases

CLINICAL WORKFLOW FOR EXAMPLE 1



CLINICAL USE CASES

Textual use case

Lung expansion during ventilation moves the diaphragm and gall bladder, and may blur the x-ray image. Therefore, current clinical practice is to stop the (anesthesia) ventilator to take a portable x-ray image during intra-operative cholangiography.

As with conventional photography, longer exposure time (usually required with larger patients) and higher respiratory rates may exacerbate the image degradation if ventilation is not stopped. Currently, the various components of the procedure are prepared (x-ray machine, catheter in bile duct, etc.) and then the ventilator is turned off, the staff leaves room, the x-ray technician shoots the x-ray, we come back in, and turn ventilator back on. Since the ventilator is manually switched off (or changed from mechanical to manual ventilation mode), the ventilation system does not identify the absence of ventilation as an error, and no specific alarm is activated if the ventilator is not turned back on. (Other physiologic monitors will eventually alarm.) Patient injury and death have occurred when the ventilator was not turned back on. Currently, if a clinician forgets to manually turn ventilator back on, or it is turned off for an excessive amount of time, it could cause physiological instability, hypoxemia, and death. It would be ideal to synchronize (gate) the triggering of the x-ray exposure with cycle of the ventilator. The system may assess x-ray exposure requirements and ventilatory parameters, and inform the clinician that synchronization is or is not possible. Then, the system will advise the clinician when to inject contrast agent. Finally, the system may briefly pause ventilation (to prolong expiration of 1 breath by 3-5 s) if ventilator supports this feature. Another benefit of synchronization would be the ability to synchronize an x-ray with inspiration, to improve the quality of chest x-rays.

Graphical use case

