Clinical Workflow and Use Cases

CLINICAL WORKFLOW FOR EXAMPLE 1

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 ventilator, wait for 1 breath, and then shoot 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. If the ventilator is turned off for an excessive amount of time, it could cause physiological instability, hypoxia, and death. It would be ideal to synchronize (get the triggering of the x-ray exposure with cycles of the ventilator). The system may assess x-ray exposure requirements and ventilation parameters, and alert 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 ventilation supports this feature. Another benefit of synchronization would be the ability to synchronize an x-ray with pause ventilation (to prolong expiration of 1 breath by 3-5 s) if ventilator supports this feature.

Graphical use case

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 ventilator, wait for 1 breath, and then shoot 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. If the ventilator is turned off for an excessive amount of time, it could cause physiological instability, hypoxia, and death. It would be ideal to synchronize (get the triggering of the x-ray exposure with cycles of the ventilator). The system may assess x-ray exposure requirements and ventilation parameters, and alert 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 ventilation supports this feature. Another benefit of synchronization would be the ability to synchronize an x-ray with pause ventilation (to prolong expiration of 1 breath by 3-5 s) if ventilator supports this feature.