Continuous Fluoroscopy Rate During Videofluoroscopic Swallowing Studies Contributes to Accurate Dysphagia Diagnosis and Appropriate Treatment

A resource for radiologists and other interprofessional team members

Guidance From the American College of Radiology

The American College of Radiology's ACR–SPR Practice Parameter for the Performance of the Modified Barium Swallow,[1] which represents a policy statement and consensus, states the following:

"The literature supports a fluoroscopic acquisition rate of 30 pulses per second or continuous fluoroscopy whenever possible to provide optimal visualization of rapid movements associated with swallowing and aspiration detection. However, fluoroscopic acquisition rates should be determined by the supervising radiologist with attention to optimally minimizing the patient's radiation exposure and maximizing adequate swallowing evaluation." (Section IV–D–2, fourth sentence)

Guidance From ASHA

ASHA's Videofluoroscopic Swallow Study Practice Portal[2] is a comprehensive resource that addresses aspects of clinical practice—like roles and responsibilities, assessment, and treatment. ASHA uses the term *videofluoroscopic swallowing study (VFSS)* to describe the radiographic instrumental swallowing evaluation, also known as a modified barium swallow study (MBSS).

On the topic of frame rate and other visualization settings, the practice portal states the following:

"Either a continuous fluoroscopy rate or a fluoroscopic pulse rate (FPR) of 30 pulses per second is preferred for VFSS. FPR may decrease radiation exposure from that of continuous rate. However, decreasing FPR below 30 can limit accurate visualization of the anatomy and physiology of swallowing. Lower FPR means fewer available images for assessment. Low FPR may influence clinician recommendations and judgment of swallowing impairment and findings during the assessment."

"Recording software can impact the quality of a VFSS image. For example, if recording software captures at a rate of 15 frames per second (FPS) and the VFSS is set to 30 FPR, there is a net loss of 15 FPS (i.e., FPR minus FPS)."

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Optimizing frame rate and visualization settings impacts the SLP's assessment and the patient's outcome.

Decisions about swallowing function must be made quickly—often in just one tenth of a second. Lower pulse rates can result in incorrect diagnoses, like missing laryngeal penetration or aspiration.[3, 5]

Lowering the patient's pulse rates:

- reduces the accuracy of physiological observations
- reduces the likelihood that swallowing problems will be detected
- influences treatment recommendations—misdiagnosing these issues can harm a patient's health and quality of life.[3]

VFSS is a low-radiation exposure procedure—it exposes patients to an average of 0.27 millisieverts (mSv) of radiation. This is less radiation than a person emits in 1 year. It's about the same as living on Earth for 32 days.[4] VFSS has a lower radiation dose than a mammogram, which is 0.4 mSv. It's also about one eighth the dose of a head computed tomography (CT) scan at 2 mSv.[4]

Lowering the number of pulses per second requires increasing the power (milliamperage) to maintain image quality. So, instead of cutting radiation exposure by 50% when reducing the number of pulses from 30 pulses per second to 15 pulses per second, the actual reduction is only about 25%–28%. This small rise in radiation is worth it. It boosts diagnostic accuracy and helps make better treatment choices.[6]

LOW RISK

The risk of cancer from VFSS radiation is very low. It ranges from 0.0032% for a 20-year-old woman to 0.00049% for a 60-year-old man.[4]

Opportunities for Collaboration

- Consider implementing a consistent VFSS process or procedure that clarifies interprofessional providers' roles and responsibilities to optimize fluoroscopy time.
- Use standardized scoring tools—like the Modified Barium Swallow Impairment Profile (MBSImP)[7]—to maintain consistency and decrease exposure.
- Continue to prioritize exposure "as low as reasonably achievable" (ALARA) to promote radiation safety for patients and providers.

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