Electronic Records with Alerts for CT Technologist QC across Multiple Locations

Kevin J Little, PhD, Amy Leighty, BS, Xia Jiang, PhD, Xiangyu Yang, PhD, David E Hintenlang, PhD
Department of Radiology, Ohio State University Wexner Medical Center, Columbus, OH 43210

Introduction

• Daily, weekly, and monthly technologists’ quality control (QC) tests have the potential to identify technical issues with a CT scanner before they affect clinical image quality or safety.
• Values outside their expected range are not always immediately recognized by the person performing the test.
• QC testing can be missed due to miscommunication or deviation from routines.
• If missed QC is not identified and reported according to site policy, this can lead to a citation by state regulators or accreditation agencies.
• Paper QC records are usually kept at the scanner, which can be inconvenient for a physicist or administrator to access in a multi-site system.
• While there is commercially available QC-related software and some groups have built fully automated in-house QC tools1,2, our goal was to use readily-available software at our institution to streamline the recording and review of QC data as acquired by technologists.

Methods

• Daily, weekly, and monthly QC forms for the diagnostic CT scanners in our system were implemented with Microsoft Excel and hosted using our institution’s existing Microsoft SharePoint website.
• The QC site could be remotely accessed by technologists, administrators, and physicists across our multiple sites.
• Versioning with timestamps was used to track changes.
• Conditional formatting was used to identify QC values that were outside their expected range.
• A Python script was utilized to trigger timely email alerts for missing QC to a qualified medical physicist (QMP) and the respective system’s lead technologist for follow-up.
• A dashboard was created using Excel-based indicators in SharePoint to give an overview of the QC status of the enterprise.
• QC Technologists’ feedback was used to refine the system and to implement improvements, such as including guidance for performing QC directly on the form.

Results

• Email alerts allow missed QC tests to be corrected the same day instead of being discovered after their due date by a technologist or by a physicist’s periodic QC review.
• QC tests that are out of range are easily identified, and appropriate action can be taken.
• QC review by the QMP can be done remotely and more frequently in less time.
• Preparation for regulatory inspections of QC logs has been simplified.
• In two cases in the first six months of use, failing QC values (MTF) gave an early indication of tube failure.

References: