

New CT Scanner Installation Scanner at Site – Physicist Perspective

INTRODUCTION

CT scanners have undergone dramatic technological development in recent history. It is no longer practical to set up the new scanner without effective communication between the physicist, the site and the vendor. This is especially true if the scanner will be integrated into a population of already functioning scanners of different makes and models as communication of a site's scanning philosophy and practice to the vendor applications specialist is vital to ensure consistent practices across scanners. The installation process must involve all key players within the department, and this document is intended to provide guidance for the site physicist as a new scanner is being installed to ensure smooth integration of new scanning hardware into an existing department.

STEP 1 - COMMUNICATION WITH THE SITE

- Discuss with the site personnel responsibilities and activities during the installation and participate in the construction meetings. Be involved in the timeline to ensure physicist acceptance testing is scheduled as needed before clinical use. Explain the acceptance testing; scheduling, time needed, and criteria. Be prepared to communicate with the application specialist (AS) the procedure for managing protocols at the facility.
- Radiologist representatives from each section – neuro, body, MSK, peds etc. should be asked about specific topics or protocols of concern such as hanging protocols, technical features, use of iterative reconstruction techniques, etc... Any specific procedures of concern should be identified and scheduled during applications training.
- Discuss with site the vendor training for physicist to familiarize them with the features of the new scanner etc. See example list below.
- Discuss with the site the balance between the standardization of protocol parameters with other scanners at the facility while also taking advantage of any upgraded features which may be available on the new unit. To accomplish this, the key players should meet ahead of time to discuss common protocols: if parameters are expected to match the performance of existing units, discuss how the parameters will be proliferated from other units. If possible, get protocols ready to migrate to new scanner while the scanner is being installed.
- Consulting physicists should coordinate the visit such that they can provide input on protocol optimization for the new scanner. If it is not possible for the physicist and the AS to be present at the same time, the key players should meet in advance of AS training to better communicate protocol expectations.
- Ask the site which individual, usually a technologist supervisor/lead, will be present for the duration of the AS training. This will serve to minimize confusion and facilitate efficient operation.
- Follow up with the site after installation visit to confirm protocols are working as intended. A follow up site visit is recommended a 1-2 months after initial training.

STEP 2 - COMMUNICATION WITH VENDOR

- Prior to their arrival on site, there should be communication with the vendor. Obtain contact information for the vendor AS/physicist. Sites that have several scanners of one particular make and model should request that they have a dedicated AS for all sites within a system for a specific vendor. This is intended to promote a consistency in how the scanners are initialized.

Ask the AS to share the training agenda for the technologists.

- Discuss any protocol preferences or issues which the radiologists and staff have identified.
- Explain if protocols are to be 'built' or imported.
- Ensure there is communication with the system installer or other appropriate vendor representative what systems are in place for PACS, dose monitoring software, and any automated QC programs. If there are expectations concerning QA testing and Accreditation support, these must be delineated.
- Develop a list of desired training elements to become familiar with any new scanner features. The physicist may need to coordinate with the site well in advance (possibly during contract negotiations) to get access to vendor training. Training may be provided in advance via virtual access to a user interface, or it may take the form of online training modules. For example:
 - Interfacing with Auto QC tracking tools
 - Guidance on ACR phantom testing and CTDI measurement
 - Collimated beam width test tolerances
 - ATCM or automatic kV selection settings
 - Optimization of advanced post processing techniques
- Communicate with the AS how protocols and dose notification settings are revised on the scanner. Ensure that these features are password protected and that the site is clear which individuals are authorized to access these features.

Step 3 – Physicist/Technologist Interactions

- The physicist may discuss training/applications plans with the site technologist manager to confirm all relevant topics will be covered
- The physicist may develop with input from the technologist manager and vendor representatives a competency checklist for the new system to document training has been completed that meets any applicable regulatory or accrediting body requirements
- The physicist may provide additional resources from professional organizations (such as the AAPM hosted Dose Education or AEC education slides) to enrich the training resources provided by the vendor

STEP 4 – PREPARING FOR ACCEPTANCE TESTING

- Communicate with the vendor and site when and how acceptance testing will be performed. The physicist should obtain copies of user any manuals and technical specifications in advance to better understand the capabilities of the system and any special considerations for testing (such as for CTDI for nT>40 mm)
- The physicist should be available to perform acceptance testing when the system is ready for hand over and the install team is still available to ensure the scanner is performing according to specifications and that any deficiencies can be promptly corrected. Dose and image quality measurements should be repeated after protocol optimization is completed to confirm appropriateness.

STEP 5 – FOLLOW_UP

- Follow up on pending items and any concerns that may arise after the new scanner has been in use for some time. You can also talk to radiologist, technologist and administrators for any concerns with the new scanner.
- Ensure that RDSRs are being generated and transmitted to any Radiation Dose Index Monitoring software the site is using