Training and Education for Technologists

BACKGROUND

• Safe, efficient, and effective operation of modern CT equipment requires
  ■ High level of technical knowledge
  ■ High level of operational skills by RTs

• Acquiring and sustaining CT competencies in academic Department is challenging:
  ■ Subspecialty Imaging with demanding protocol
  ■ Newly CT technology and applications introduced early and frequently
  ■ Quality and Safety Requirements
  ■ Yet Operation has to be efficient
Training and Education for Technologists

BACKGROUND

CT Technologist

• Person who initiates the CT scan
  ■ Is the best safeguard against over-dosing

• Works with:
  ■ Patient
  ■ Attending MD’s
  ■ Fellows
  ■ Residents

30% of the volume occurs on 3rd shift and during the weekend hours.

Training and Education for Technologists

‘TRADITIONAL TRAINING MODEL’

• Graduates as a RTs
• Start in night/weekend shifts
  ■ Cross covering radiography and CT
• See one, do one, teach one method
  ■ No formal training
• Certification in CT desired, not mandatory until 2015
Training and Education for Technologists
‘TRADITIONAL TRAINING MODEL’

• In-services
  ■ Sporadic and low attendance

• Application training on new equipment
  ■ Only available for a few employees during day-time, hoping that new information would ‘trickle-down’ to other shifts

• Knowledge on radiation dose and safety
  ■ Minimal

Overall: Little attention given to technologist training and education, particularly night/weekend.

Training and Education for CT Technologists
MOTIVATION

• Initiated by CT technologists, we developed a new education and training program

• **GOAL:**
  Provide high-level training in latest CT technology, clinical applications, radiation dose and patient safety and communication
  ■ Including all sites (inpatient and outpatient facilities), and all shifts (day, night, weekend).
In this presentation we describe the structure of our new education system and present its effect on:

- Technologist knowledge
- Technologist job satisfaction
- Quality metrics on radiation dose
- Patient satisfaction ratings.

Key Elements

- Semi-annual full-day Workshops*
  - 25 USD application fee, refundable upon attendance

- Monthly CT in-services*
  - In person and online participation

- Coaching program
  - ‘Super-Tech’ per shift/site

- Training rotation for new staff & continuous staff education

ASRT approved*
Training and Education for Technologists

EVALUATION

• Technologist knowledge
  ■ Multiple choice questions before/after workshops and in-services

• Technologist satisfaction
  ■ Employee surveys, routinely applied by hospital administration

• Patient rating
  ■ Routinely gathered by hospital administration

• Radiation dose
  ■ Comparison of two index months pre/post program implementation

Stanford Computed Tomography Training Workshop

This is how it all began, in 2008 …

• ‘Grass-roots’ effort by CT technologists and radiologist

• No initial Hospital/administrative support

• No industry support (University rule)

• Volunteer speakers (MDs and RTs)

• Program combines basic principles with practical application and clinical examples

• Repeat workshop for night/weekend staff
Stanford Computed Tomography Training Workshop

• CT Workshops (two per year)
  ■ Full day; technical and clinical topics; pre/post evaluation
  ■ Presentations given by faculty, residents/fellows, technologists and nurses

Stanford Computed Tomography Training Workshop

• CT Workshops (two per year)
  ■ Full day; technical and clinical topics; pre/post evaluation
  ■ Presentations given by faculty, residents/fellows, technologists and nurses

■ Co-education with Radiology trainees:

  July Workshop
  ■ On a Saturday for all technologists
  ■ Incoming Fellows

  January Workshop
  ■ On a Thursday for weekend technologists
  ■ Pre on-call Residents (½ day)
## Budget

- **Workshop**
  - Academic Recording software: 179.- USD
  - Microphone: 69.- USD
  - ASRT accreditation: 325 USD
  - Testing software: 49.- USD
  - room rental: 0.-
  - student 20hrs recording/editing: 500.-
  - food: 800.-

- **total**: 1922.-

*2 FTE's dedicated to ½ Protocol/Education and ½ patient care.*

---

## Stanford Computed Tomography Training

### INSERVICES

- Once a month
- Regular schedule began in April 2012
- In-person and online participation via web conference
- ASRT accredited

### Topics

- Cardiac CT
- Cardiac anatomy & function
- Chest CT
- TAVR
- Lower Extremity CTA
- PE
- CT dose management
- Acute neuro CT
- Acute body CT,
- CT Urography,
- Xenon CT,
- T-bone CT
Stanford Computed Tomography Training

SHAREPOINT SITE

- Video archive of lectures and tutorials
- Document library
- Quality control tools
- Standard Work
- Quizzes & surveys

Stanford Computed Tomography

Knowledge Testing

- Online pre- and post-tests
- Electronic knowledge assessment
- Surveys
Training and Education for Technologists

RESULTS

• Workshops (total: 12, full day)
  - Last three workshops combined attendance: 141

• In-services:
  - Total 19 inservices held (in-room and online-participation)

• Radiation dose
  - 99.99% target dose rates, with over 10,000 acquisitions a month
  - Dose lower than ACR (e.g. CTDI for renal delay acquisitions decreased from 13.50mGy to 8.53mGy over the training period).

• Technologist satisfaction
  - Department wide employee surveys, routinely applied by hospital administration
  - 94% agree/strongly agree that job satisfaction has improved
  - 94% agree/strongly agree that quality of training has improved

• Patient satisfaction
  - Proportion of patients rating overall care in CT as “very good” gradually increased from 65.2% to 82.1%,
  - Proportion of patients “very likely to recommend” CT services increased from 71.4% to 85.5%.
Training and Education for CT Technologists

Conclusion

• An institution-wide program with resources dedicated for CT technologist training and education yields measurable benefits.

• It improves knowledge and job satisfaction among staff, creates an environment conducive to learning, reduces radiation dose, and – most importantly – contributes to positive patient experiences.

THANK YOU FOR YOUR INTEREST!

C. Zorich
D. Marsh
L. Molvin
J. Wang
J. Schott
D. Fleischmann