Clinical Safety & Effectiveness Session # _6_

REDUCTION OF PATIENT TREATMENT TIME IN RADIATION THERAPY

CENTER FOR PATIENT SAFETY & HEALTH POLICY

UT HEALTH SCIENCE CENTER™ SAN ANTONIO

Educating for Quality Improvement & Patient Safety

The Team

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  - Department of Radiation Oncology

Project Milestones

• Team Created	Aug 2010
• AIM statement created	Aug 2010
• Team Meetings	Ongoing
• Background Data, Brainstorm Sessions, Workflow and Fishbone Analyses	Aug – Oct 2010
• Interventions Implemented	Oct 11, 2010
• Data Analysis	Aug 22-Nov 16, 2010
• CS&E Presentation	Jan 20 2011

Radiotherapy Delivery

- Radiotherapy requires accurate patient positioning throughout treatment
  - Image guided (CT): Aids in initial patient positioning
  - Patient may move after positioning
- Reduction in overall treatment time is beneficial
  - Reduced probability of patient motion
  - Better accuracy in targeting tumor and sparing normal tissues
  - Improved patient experience
  - Increased patient throughput

What We Are Trying to Accomplish?

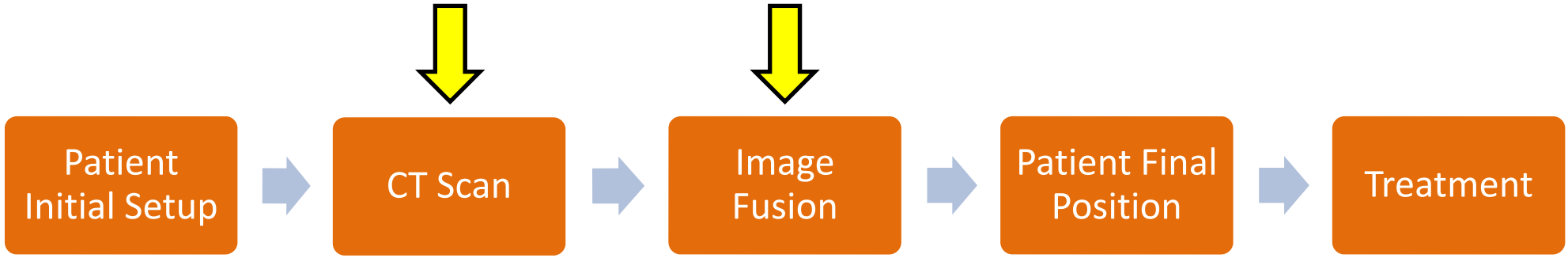
OUR AIM STATEMENT

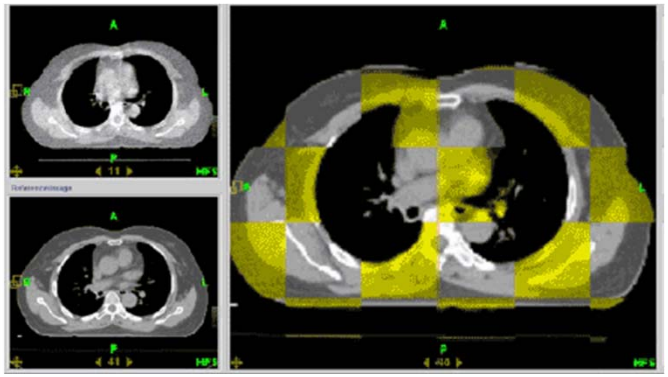
To decrease, by mid-December 2010, the single fraction treatment time* by 15.0% using the TomoTherapy Hi-ART unit located within the Department of Radiation Oncology at CTRC

*single treatment time – time required to setup, register and dismiss the patient

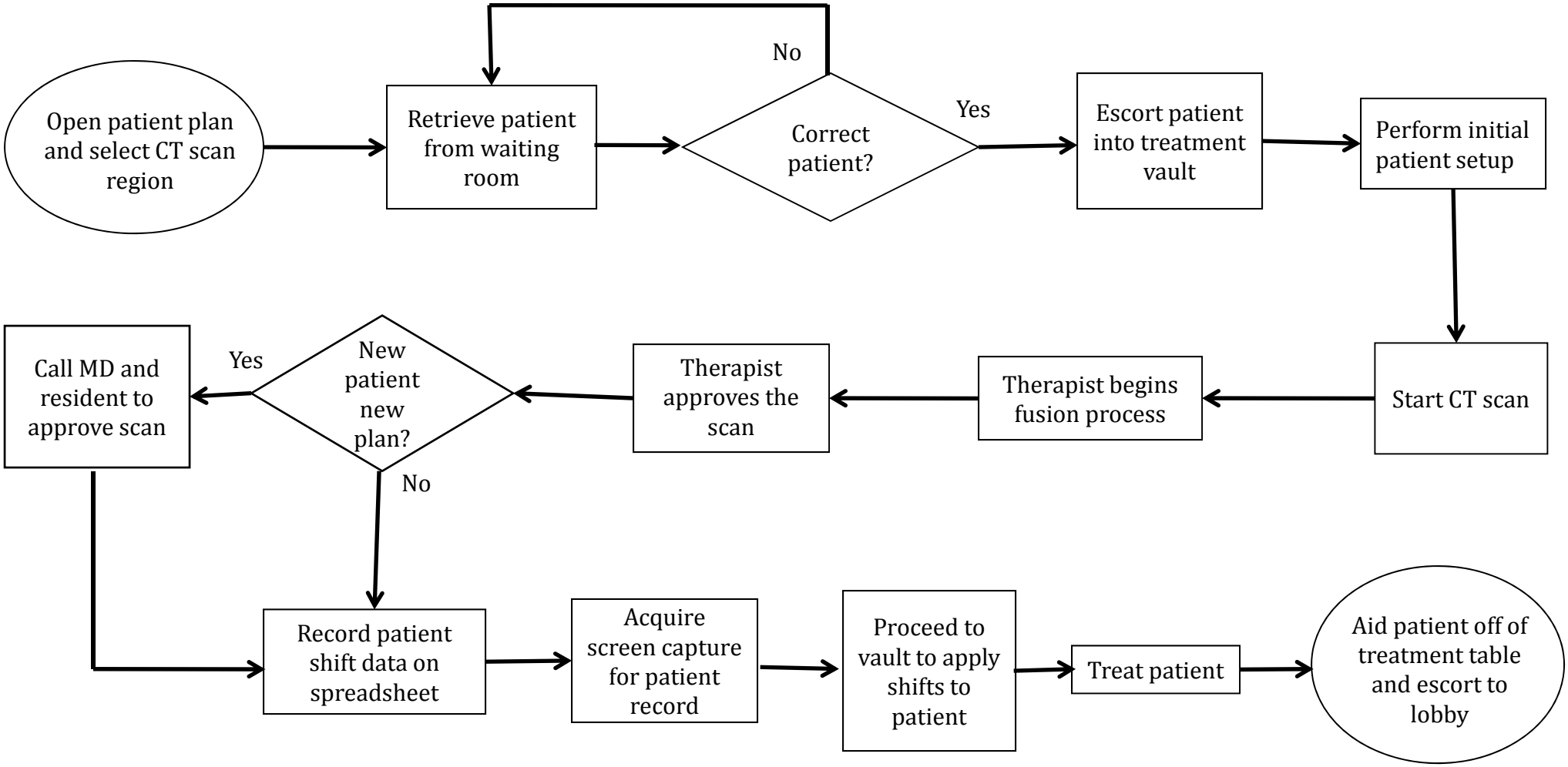
Major Key Process Components

- TomoTherapy Radiation Delivery Process





Flow Chart


Open patient plan and select CT scan region
Retrieve patient from waiting room
Correct patient?
No
Yes
Escort patient into treatment vault
Perform initial patient setup
Start CT scan
Therapist begins fusion process
Therapist approves the scan
New patient new plan?
Yes
No
Call MD and resident to approve scan
Record patient shift data on spreadsheet
Acquire screen capture for patient record
Proceed to vault to apply shifts to patient
Treat patient
Aid patient off of treatment table and escort to lobby

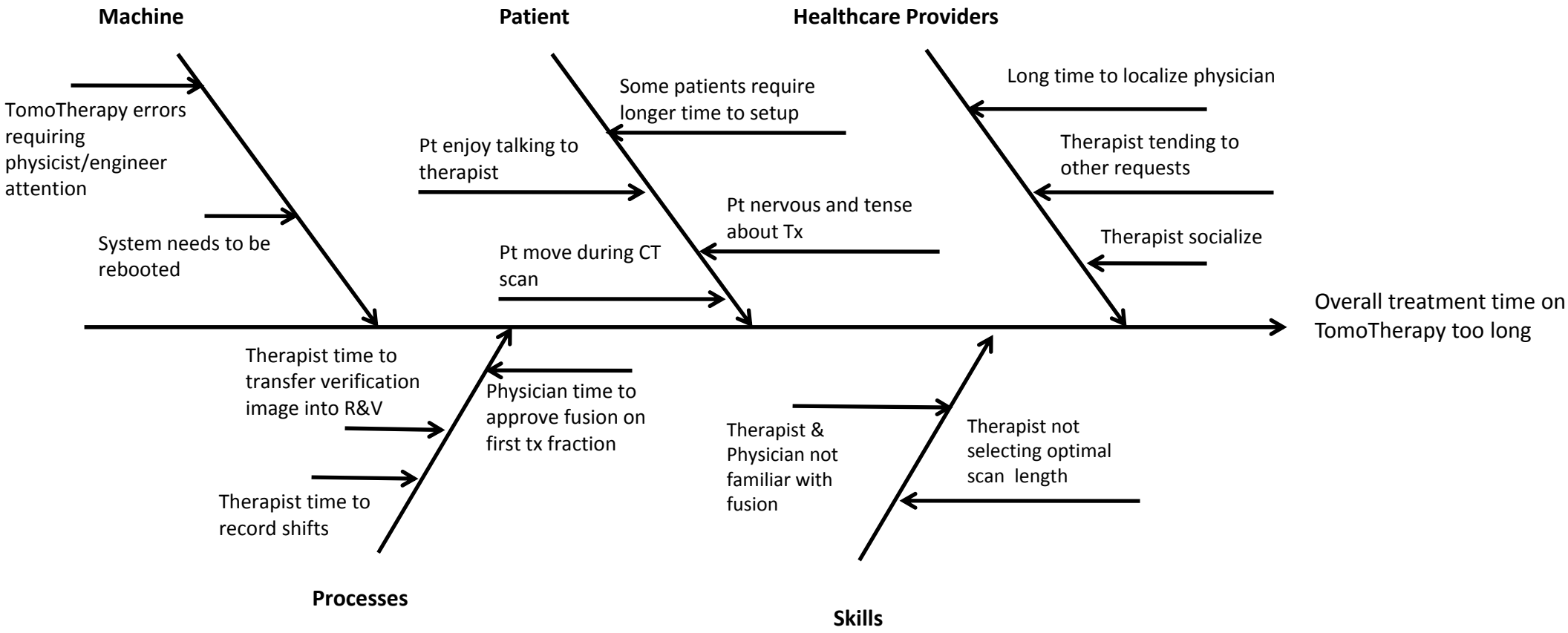
How Will We Know That a Change is an Improvement?

- To track improvement, overall treatment time for all patients will be logged
- Specific data recorded:
  - Time patient enters treatment vault
  - Time patient radiation delivery starts
  - Time patient exits treatment vault

What Component of the Process do We Target?

- Strategically evaluated main contributing factors:
  - TomoTherapy machine
  - Patients
  - Healthcare providers
  - Processes
  - Personnel Skills/Training

Cause-and-Effect Diagram of the Reasons Why Treatment Time is Prolonged on TomoTherapy



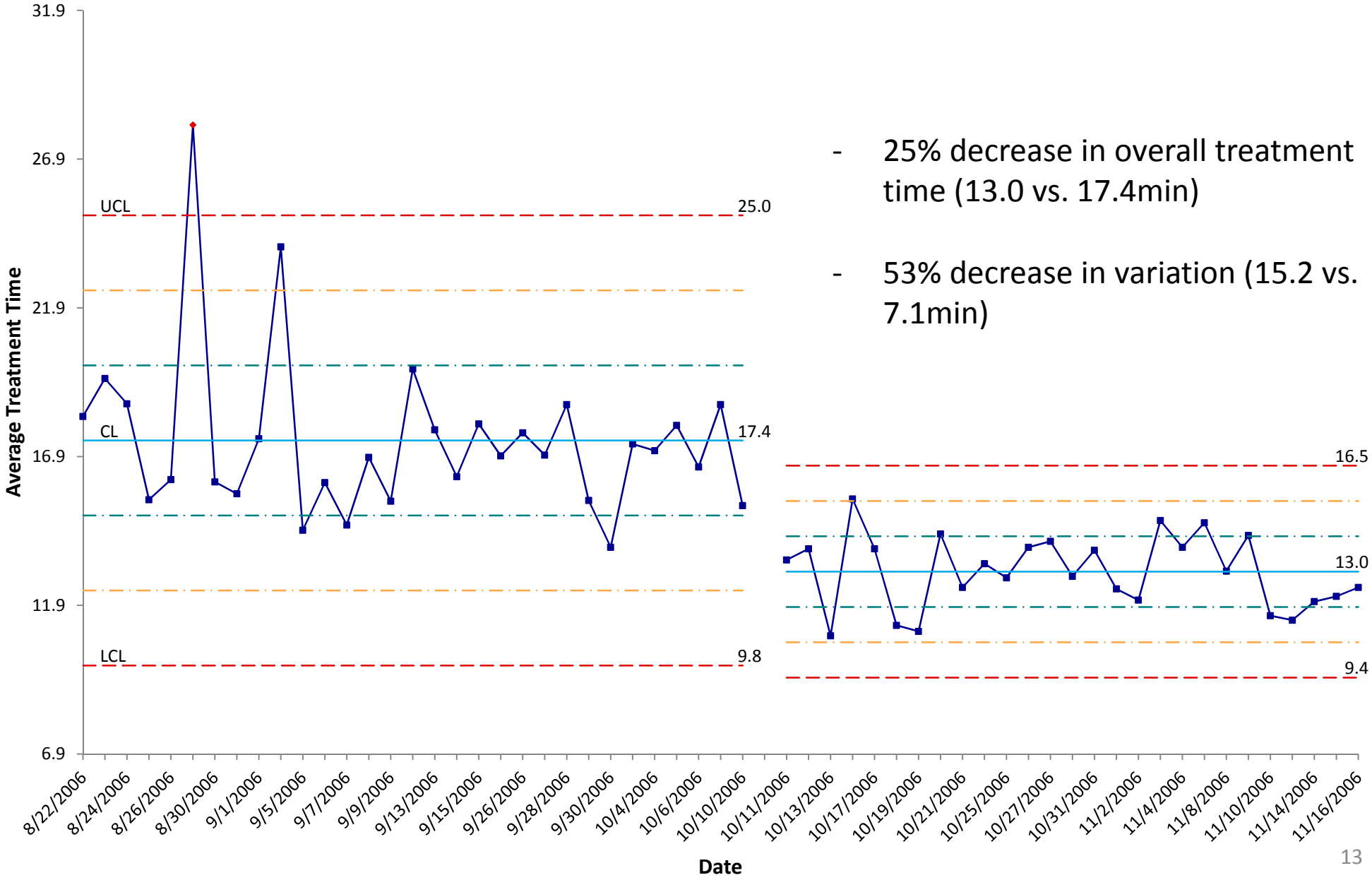
Intervention – Action Plan

- Focused on three specific components:
  - Healthcare providers
    - Time efficiency of treatment dependent healthcare provider
  - Processes
    - Current processes performed established practice and not optimized for efficiency
  - Personnel Skills/Training
    - Image fusion technique highly variable among physician and therapist
    - CT scan volume region also highly variable among therapist

Implementing the Change

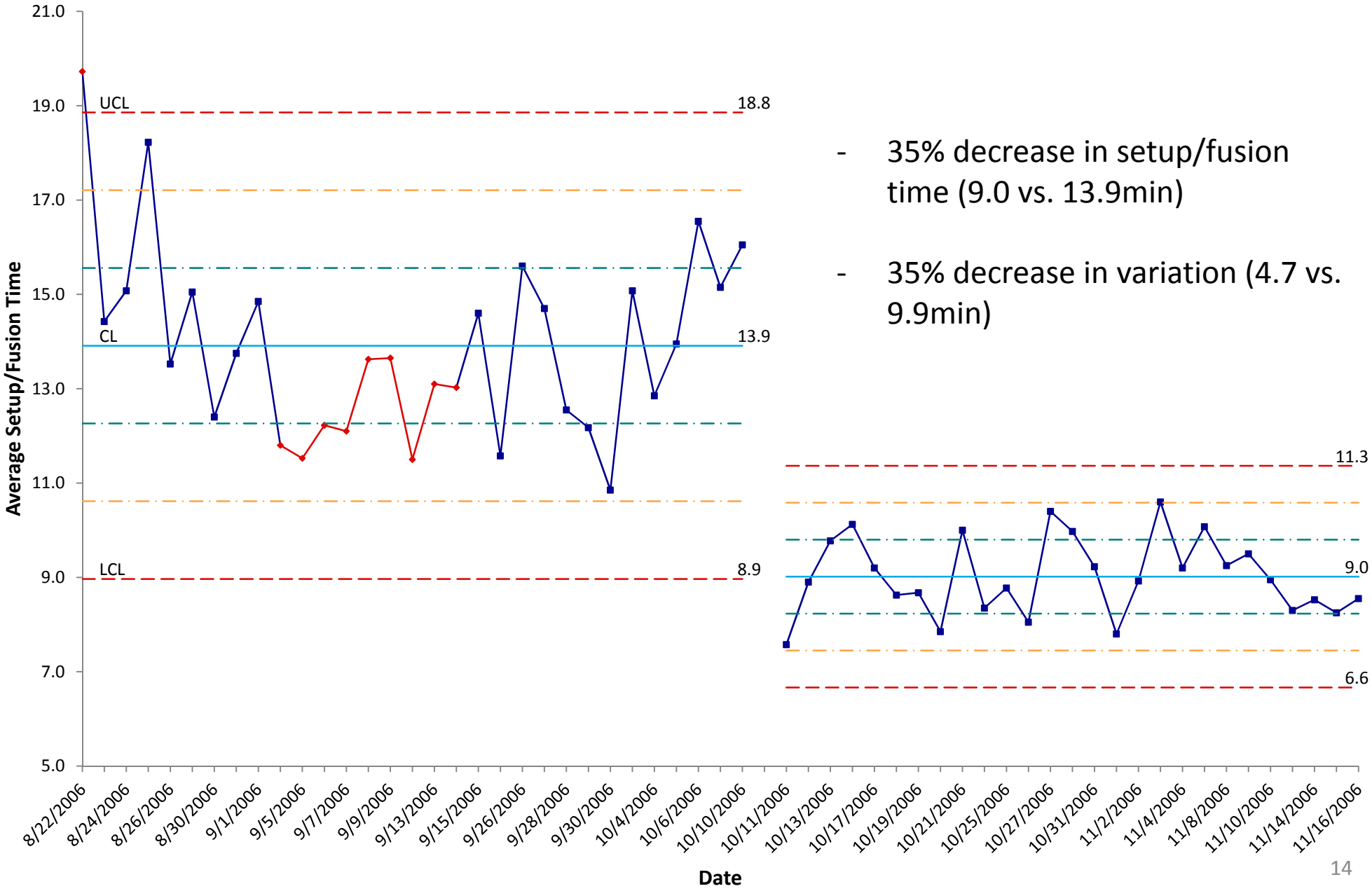
- Healthcare providers
  - "Tomo Time": Establish an understanding of the importance of time efficiency during setup thru delivery
- Processes
  - Pt. shifts recorded during radiation delivery
  - Fusion verification image transferred at END of day
  - Pre-notification of physician for fusion approval
- Personnel Skills/Training
  - Therapist training to optimize CT scan volume
  - Physician/therapist training to systematically fuse images

Mean Daily Patient Treatment Time Run Chart



- 25% decrease in overall treatment time (13.0 vs. 17.4min)
- 53% decrease in variation (15.2 vs. 7.1min)

Mean Daily Setup/Fusion Time Run Chart



- 35% decrease in setup/fusion time (9.0 vs. 13.9min)
- 35% decrease in variation (4.7 vs. 9.9min)

Expansion of Our Implementation

- Techniques utilized to decrease patient treatment time are universal
  - Apply similar strategy to other radiation delivery machines
    - Novalis Tx experience
- Address patient component
  - Providing patient education at start of treatment
  - Providing patient with multimedia illustrating treatment

Return on Investment (ROI)

- Tangible return
  - Increased patient throughput = increased department revenue
  - Typical IMRT treatment (5wks/$35K/Pt.)
  - Based on 8 hour work schedule
    - Treat 4 additional patients per day (~40 Pts/yr.)
    - Revenue increase: $1.4M
- Intangible return
  - Patient satisfaction
  - Potential improvements in treatment effectiveness
  - Potential reduction of radiation side effects

Conclusion/What's Next

- Our team was able to reduce overall patient treatment time by 25% largely due to:
  - Personal training
  - Processes optimization
- We found that continuous training and peer encouragement is essential for sustainability
- Overall patient satisfaction increased due to shorter treatment times
- Complete similar project for Novalis Tx treatment unit

Thank you!

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