



Clinical Safety & Effectiveness Cohort # 17

A Quantitative Model to Forecast Clinical Activity in Radiation Oncology



CENTER FOR PATIENT SAFETY & HEALTH POLICY

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The Team

- Cancer Therapy and Research Center

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- William Nordwick, RT(T)
- Jonathan Eppes, CPT
- Lissa Persson
- Lowell Glassburn, MHA
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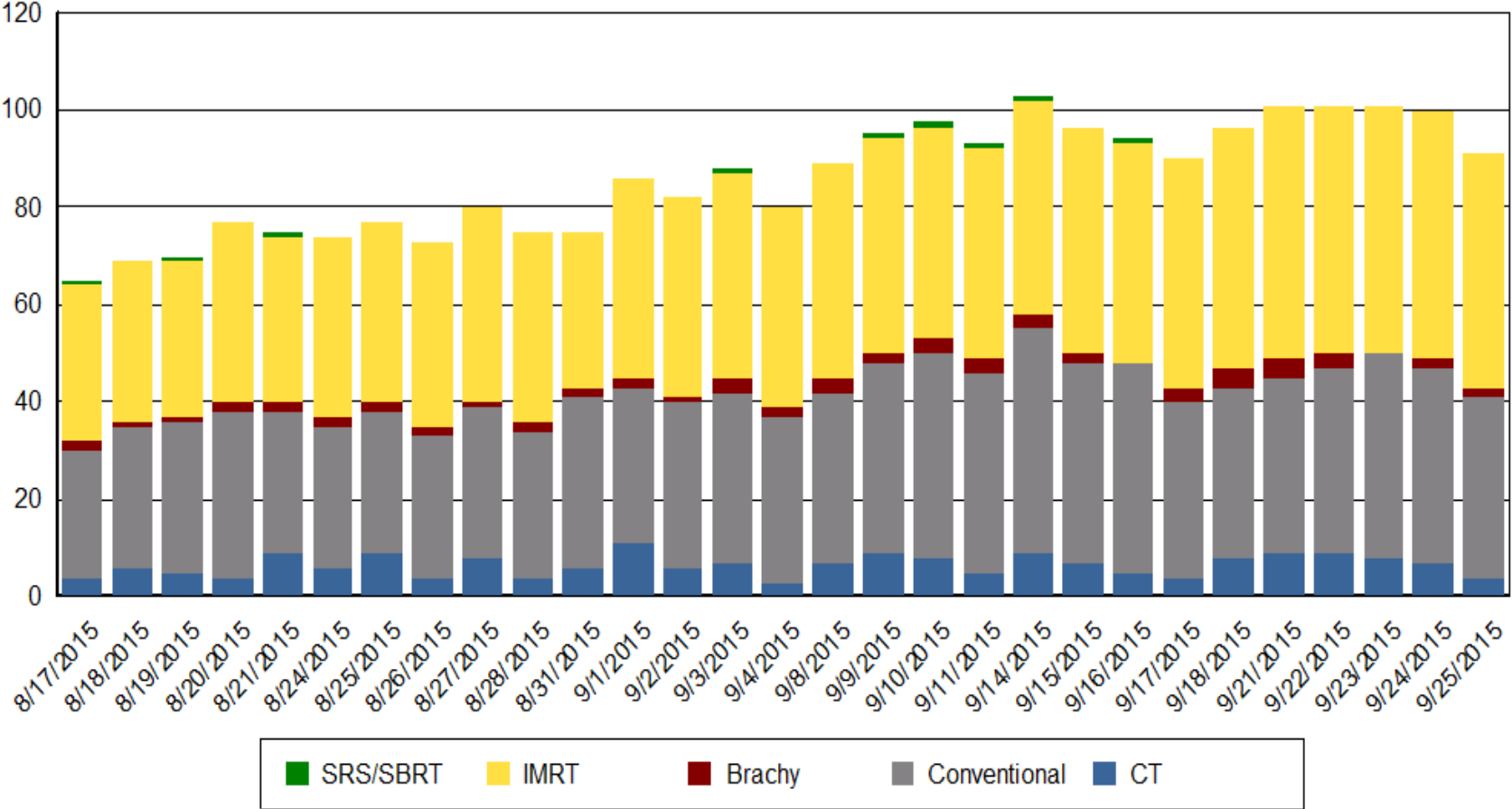
- Sponsor Department:

- Chul Ha, M.D., Chairman Department of Radiation Oncology

Project Milestones

- Team Created August 28, 2015
- AIM statement created September 2, 2015
- Weekly Team Meetings September 2, 2015
- Background Data, Brainstorm Sessions, Workflow and Fishbone Analyses Sep 2015 – Dec 2015
- Interventions Implemented Nov 2015 – Jan 2016
- Data Analysis Oct 2015 – Jan 2016
- CS&E Presentation January 15, 2016

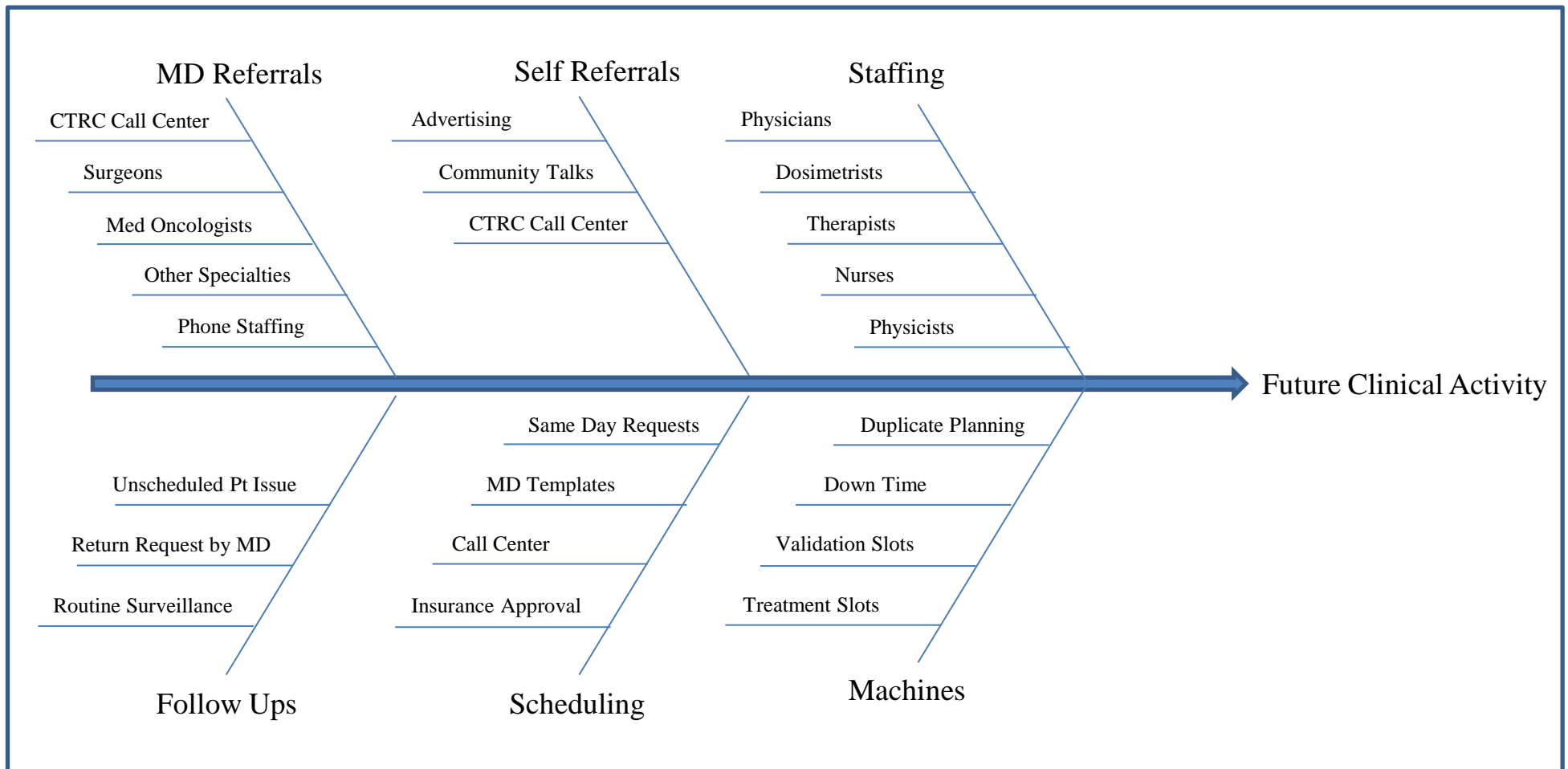
Background – Current Dashboard



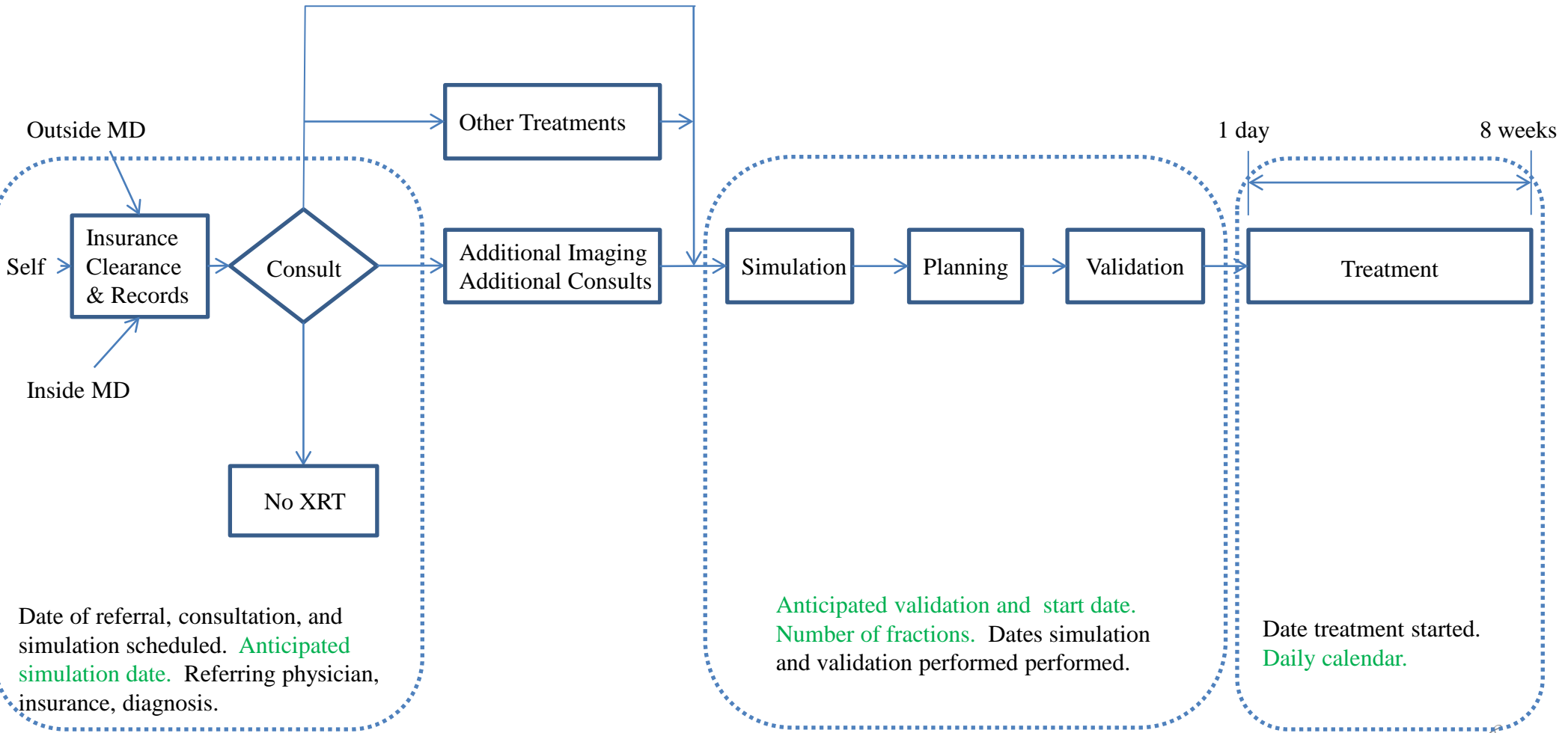
Background

- Patient Delays
 - Obtaining Consult Appointments
 - Scheduling Validation Times
 - Ultimately in Starting Treatment
- Compressed Treatment Planning Time
- Staff Stress
- Overtime Costs
- Managing Projects (e.g., Research Time)

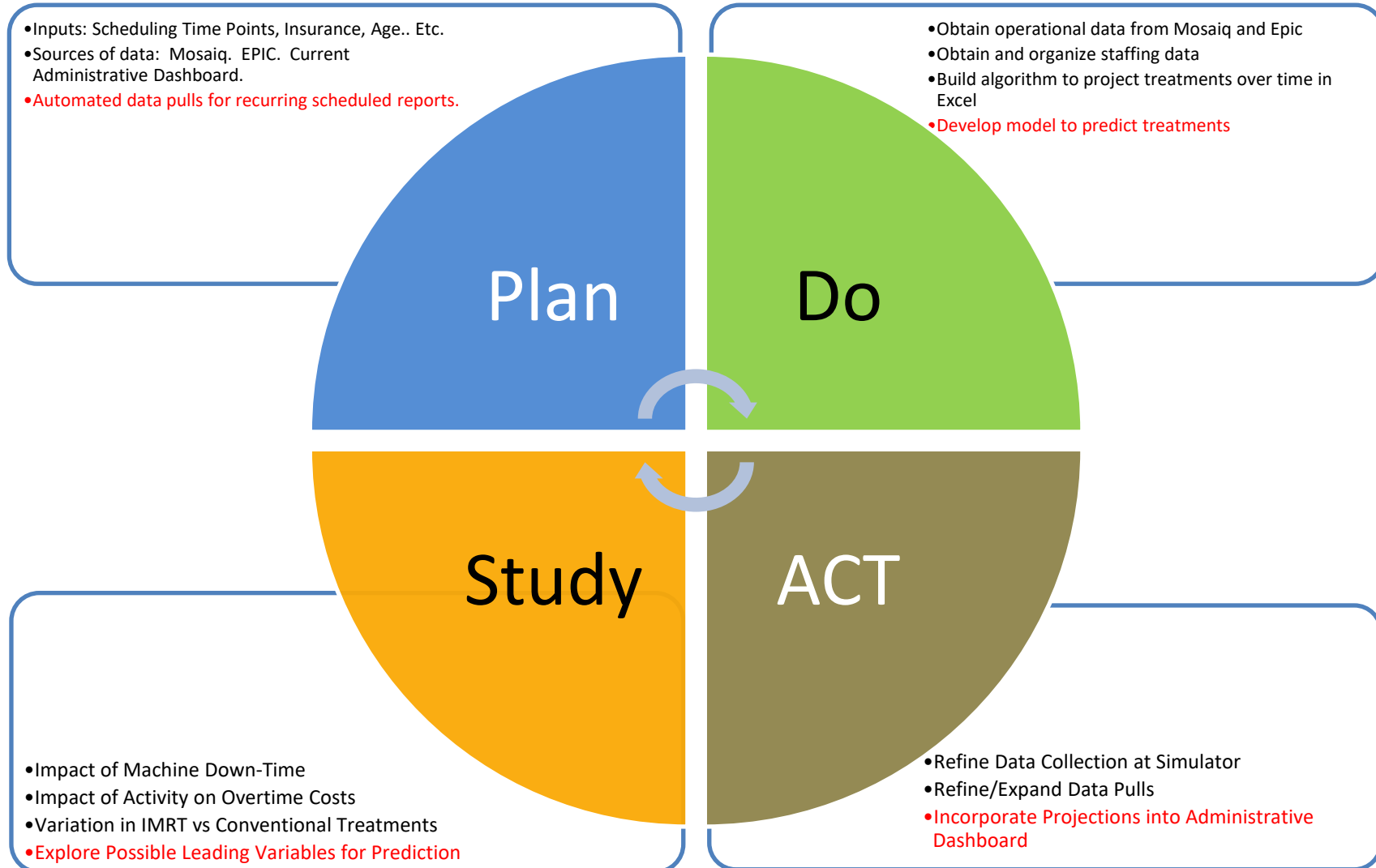
Fishbone Diagram



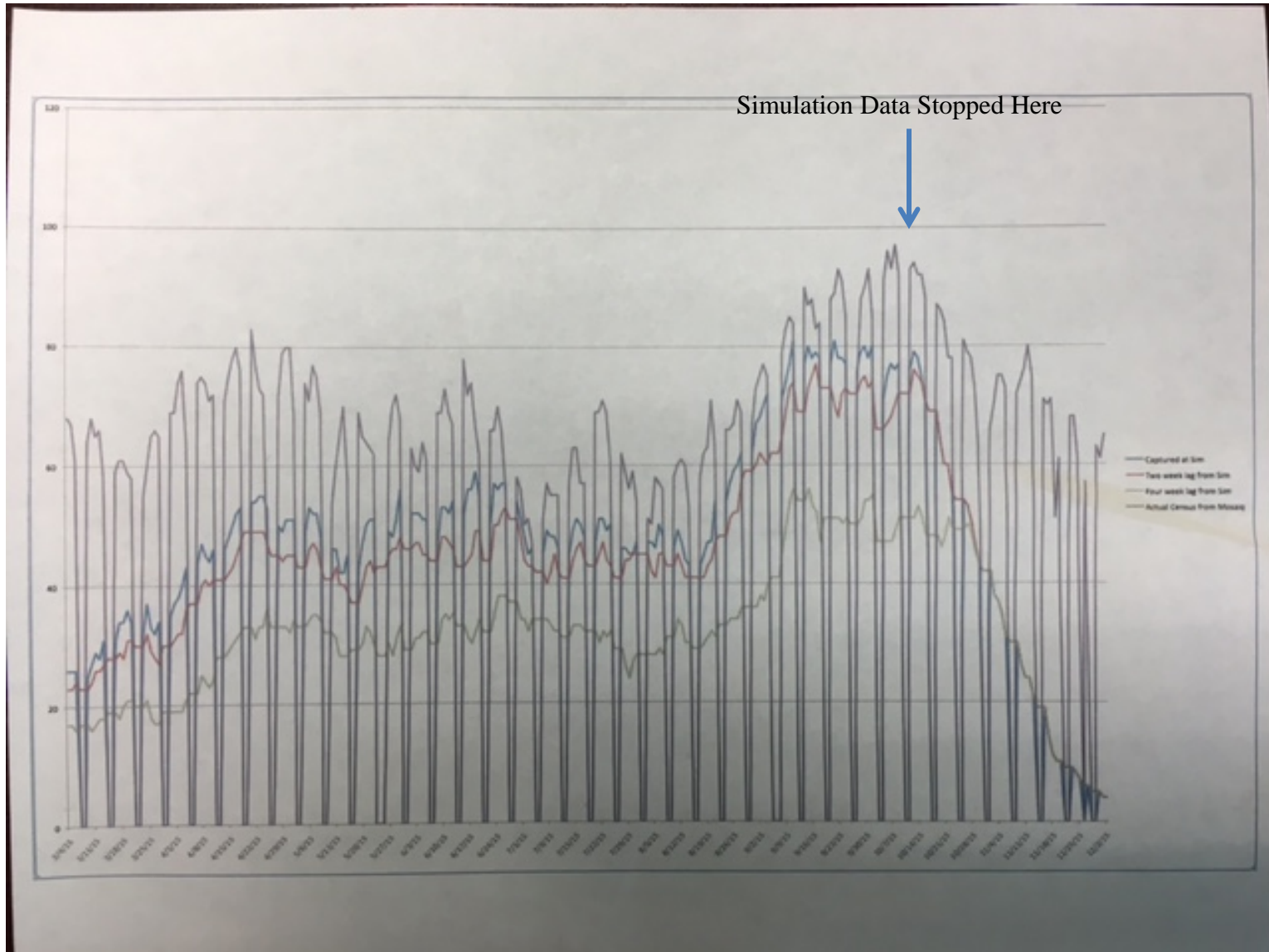
Patient Flowchart



PROJECT CYCLE



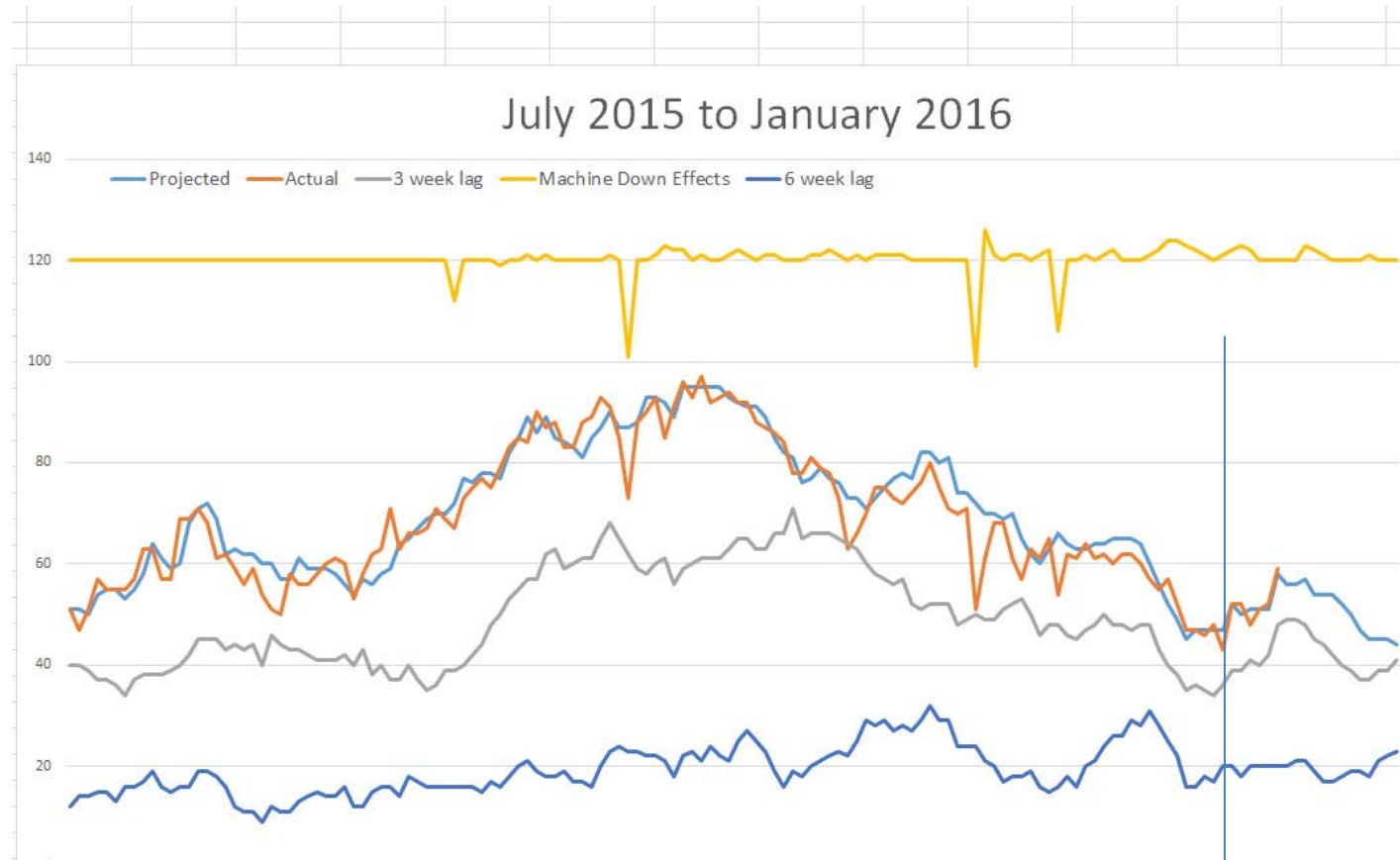
First Look at Data – the way we saw it



Plan / Do / Check

- Account for Discrepancy Between Actual and Projected Numbers
 - Refining Data Pull From Mosaic
 - Arbitrary Use of Consult Date Truncated Data
 - Found Inconsistent Reporting Method at Simulation
 - Data Verification by Physician (**Time Consuming Step**)
 - Iterative Improvement in Algorithm for Data Pulls
 - Handling of bid Treatments
 - Combination External Beam and Brachytherapy
 - Limited Analysis to External Beam Treatments
- Exploration of Possible Sources of Variations
 - Machine Down Time – Random Cancellations and Transfers
 - Patient’s Missing Treatment Days. Approximately 7% “slippage.”
- Predictive Modeling
 - Now Have Clean Data Set as Input
 - Explore Leading Indicators and Patient Subsets

Projection from Available Data



Simulation Data Ends Here

RETURN ON INVESTMENT

- Priceless Intangibles
 - Reducing Pace of Treatment Planning for Patient Safety
 - Reducing Staff Stress
- Reducing RTT and Nursing Overtime Costs
 - Possibility of Timing Elective Treatment Starts
 - Mycosis Fungoides, Definitive Prostate, DCIS Breast
 - Reduction in Double Planning for Multiple Machines
 - Tomotherapy Experience. Deep-Inspiration Breath Hold
- Scheduling Out-of-Clinic Educational Experiences
 - Residents Participating in Surgical Cases or Dosimetry Rotations
 - Staff Away Research Activities

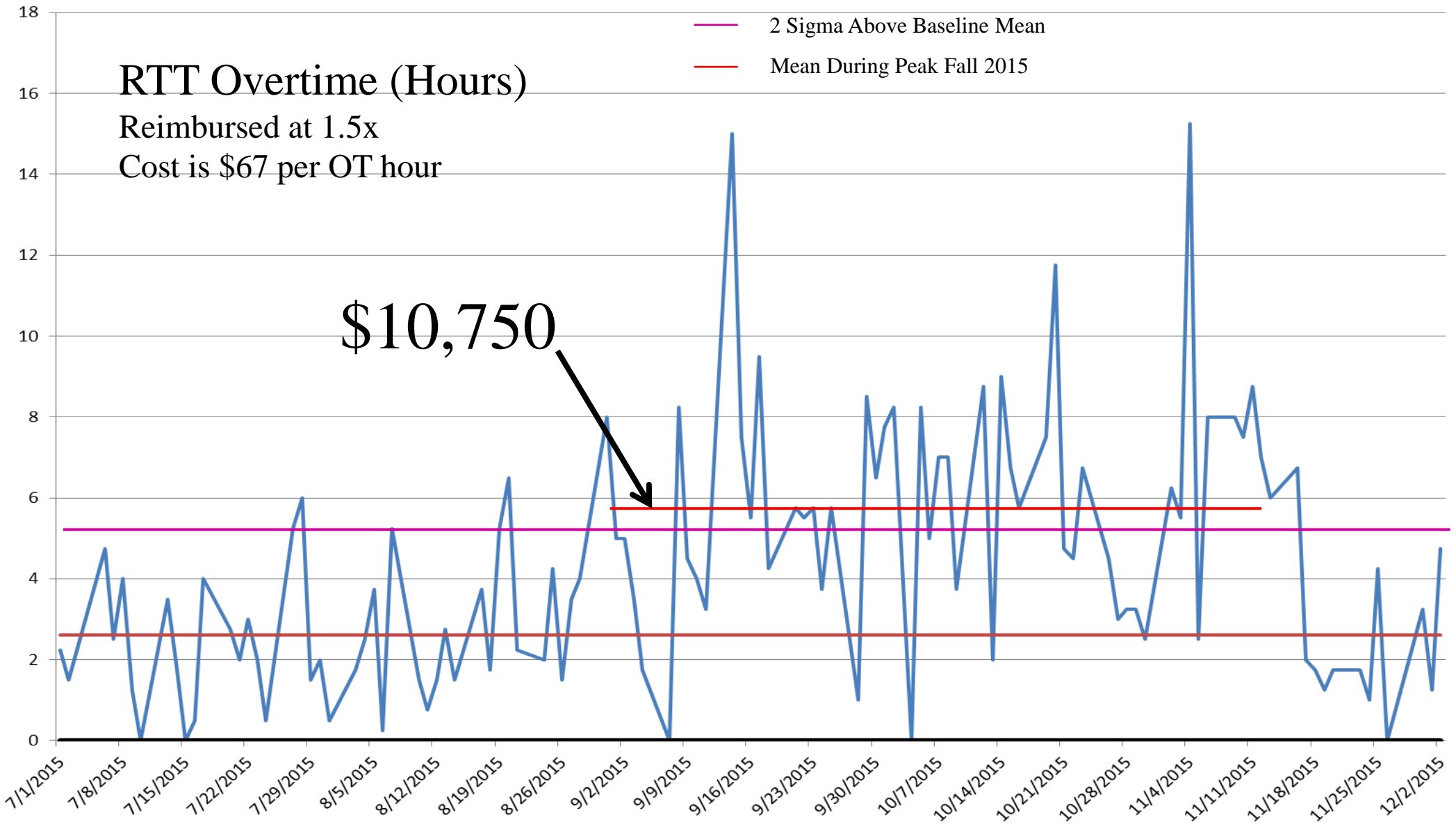
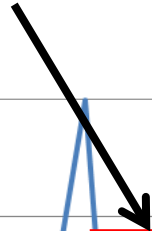
RTT Overtime (Hours)

Reimbursed at 1.5x

Cost is \$67 per OT hour

- Mean "Normal" Baseline
- 2 Sigma Above Baseline Mean
- Mean During Peak Fall 2015

\$10,750



Conclusion / What's Next

- It is Now Possible to Anticipate Near-Term Changes in Clinical Volume
 - Based on Currently Available Data
 - There is Room to Improve this Process
 - Inclusion of Treatment Calendar Information
- Begin Routine Characterization of Patient Encounters
 - “Old Patient New Problem”
 - “Continuation of Consult”
- Begin Routine Automated Data Pulls for Dashboard Application
- Validate a Predictive Model on Multiple Time Periods
- Re-Design Dashboard As a Pro-Active Tool

Team Picture



Thank you!

