

Final

ASCO Quality Training Program

Reducing Frequency of Radiation Therapy Treatment Planning Errors

AHNCI – Division of Radiation Oncology

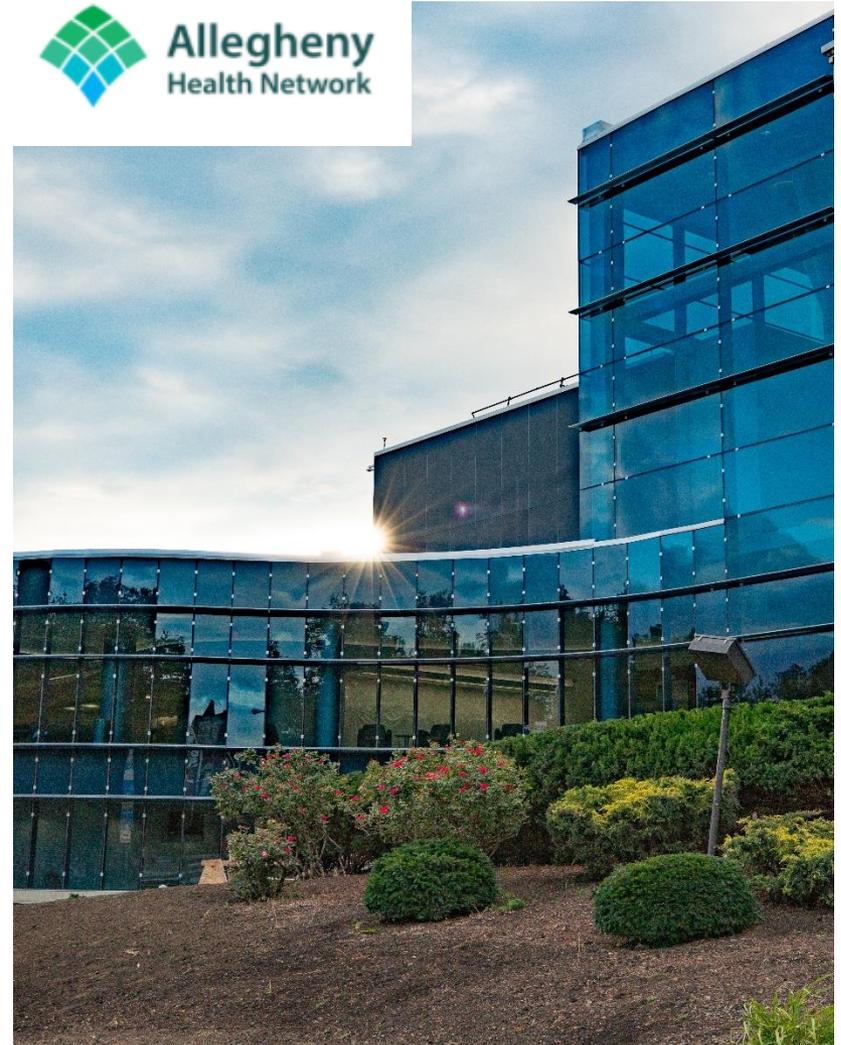
December 10, 2021

Institutional Overview

Allegheny Health Network Cancer Institute

Division of Radiation Oncology

- 13 facilities across Western PA and OH, main facility in Pittsburgh (Allegheny General Hospital)
- AHN, as a network, offers the full array of radiation oncology services including External Beam Radiation Therapy (including SBRT), Gamma Knife radiosurgery, and a variety of brachytherapy applications
- Actively accredited through the ASTRO Accreditation Program for Excellence (APEX)



Team members

Name	Role	Organization
Russell Fuhrer, MD	Team Lead; Physician	AHNCI – Radiation Oncology
Maria Clements	Team Member; Clinical Informatics Nurse	AHNCI
Brandon Weiss	Team Member/Facilitator; Manager, Radiation Therapist	AHNCI – Radiation Oncology
Andrew Soldner	Contributor; Medical Physicist	AHNCI – Radiation Oncology
Mark Word	Contributor; Medical Dosimetrist	AHNCI – Radiation Oncology
Lisa Ciafre	Executive Sponsor; Quality Director	AHNCI

Problem Statement

ANHCI provides [external beam] radiation treatment for approximately 400 patients per month. Each course of radiation treatment requires a patient-specific treatment planning process that will establish the type, dose and frequency of radiation treatment the patient will receive, as well as the custom radiation beam design that will deliver dose to the prescribed treatment area(s).

During the period of 1/1/2020 – 7/7/2021 it was found that there was a median of 4 errors per month.

These errors increase risk of downstream, systematic errors in radiation therapy treatment delivery.

Outcome Measure

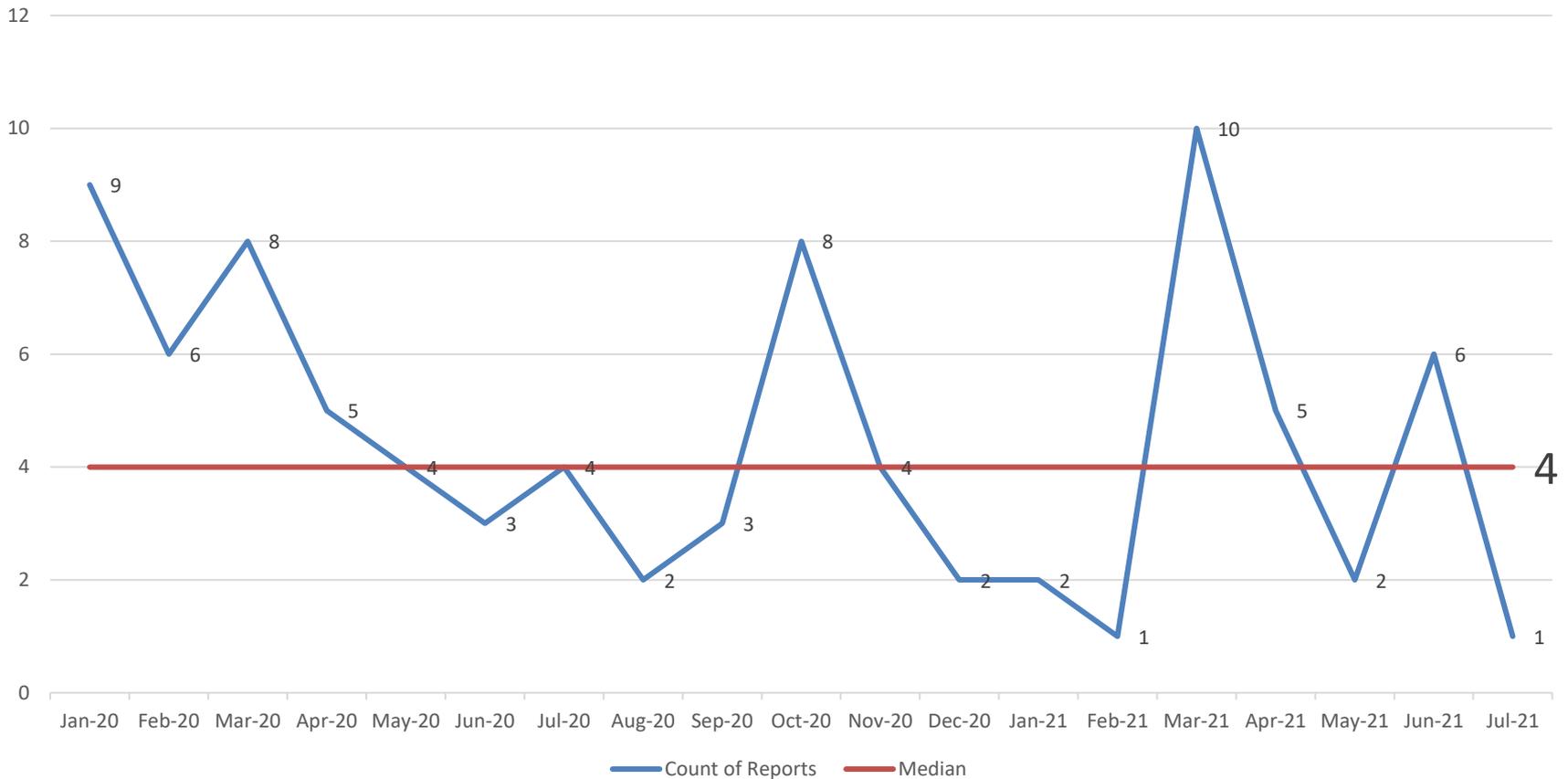
Baseline data summary

Item	Description
Measure:	Treatment Planning Safety events
Patient population: <i>(Exclusions, if any)</i>	Patients receiving radiation treatment at AHNCI – Division of Radiation Oncology (excluding brachytherapy) <i>(all locations except 1 contracted facility that is not reporting in the AHN incident reporting system).</i>
Calculation methodology: <i>(i.e. numerator & denominator)</i>	Numerator: # of “Treatment Planning” safety events (85) Denominator: Total # of Treatment plans completed (5059)
Data source:	AHN incident reporting system – RL6
Data collection frequency:	Per occurrence of event Date range: 1/1/20 – 7/7/2021
Data limitations: <i>(if applicable)</i>	Reliant on compliance with event reporting

Outcome Measure

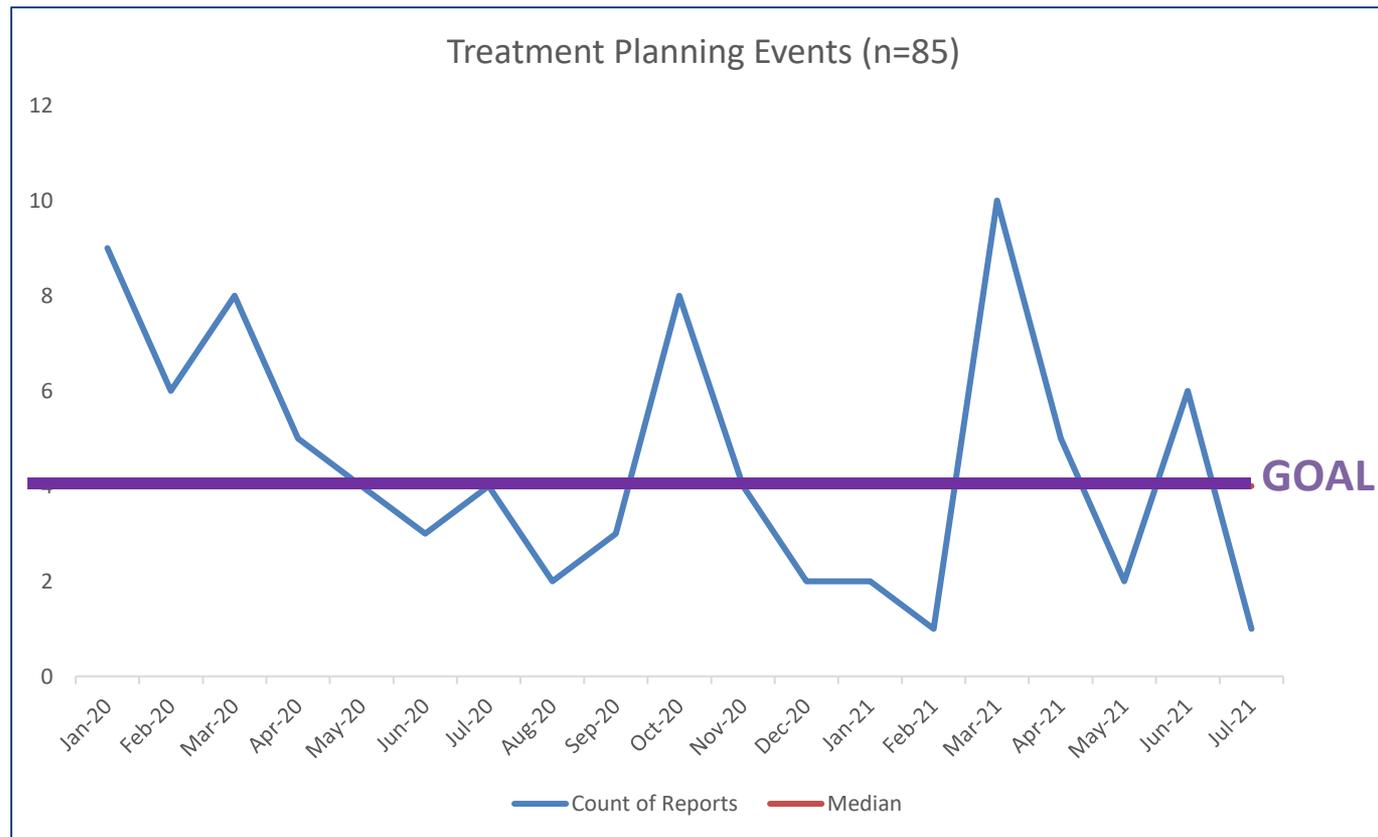
Baseline data

Treatment Planning Safety Events (n=85)



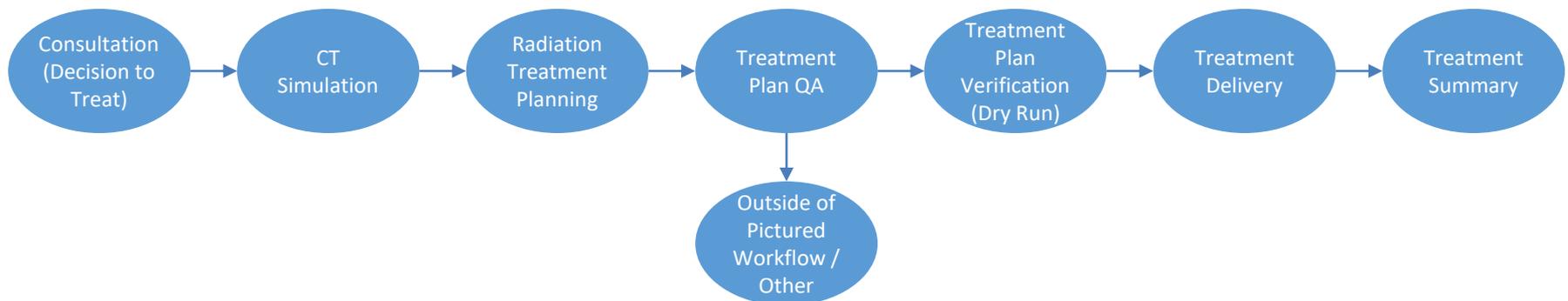
Aim Statement

Reduce the number of “Treatment Planning” reported safety events at ANHCI **to ≤ 4 per month**, by December 31, 2021.



Process map – Overview: Process of Care

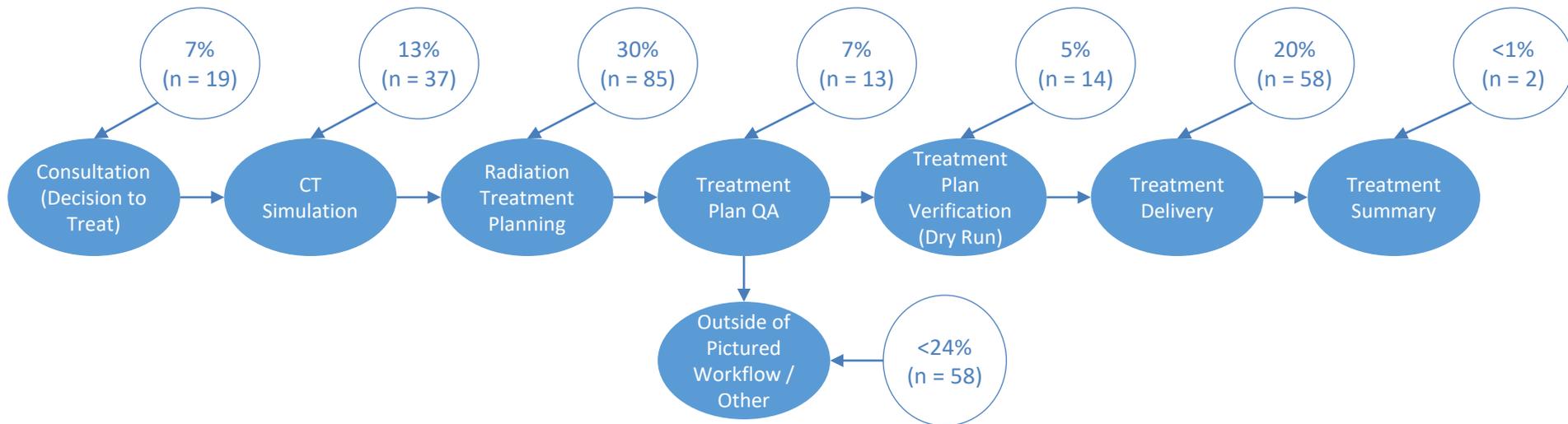
Radiation Therapy – Process of Care



Process map – Overview: Process of Care

Radiation Therapy – Process of Care

Total reported safety events in the date range of this project: 285

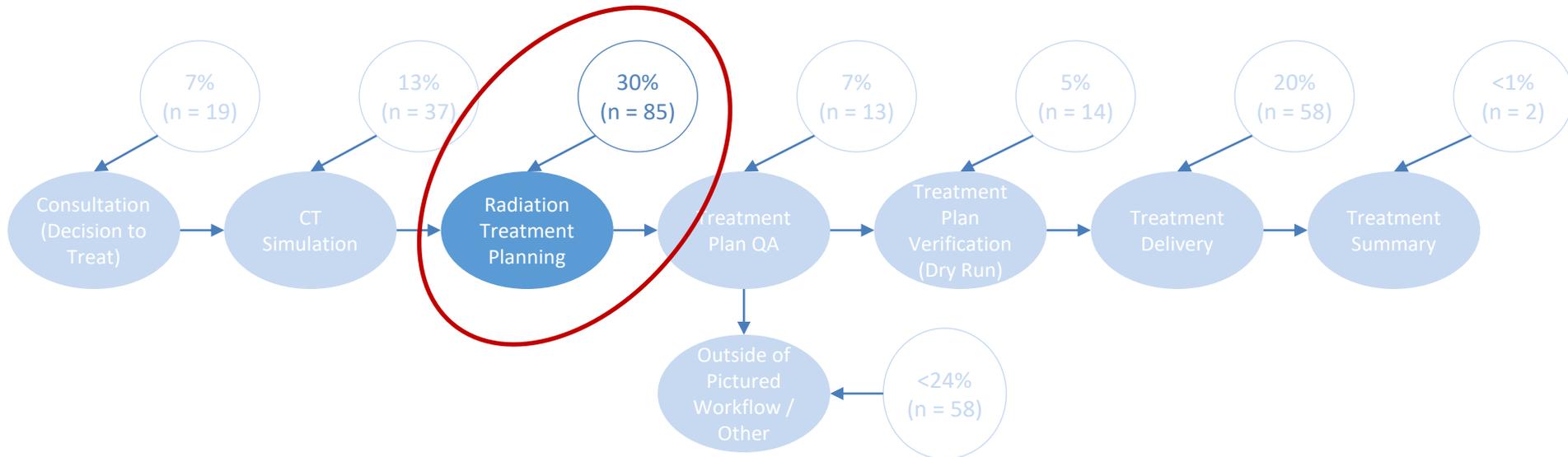


Process map – Overview: Process of Care

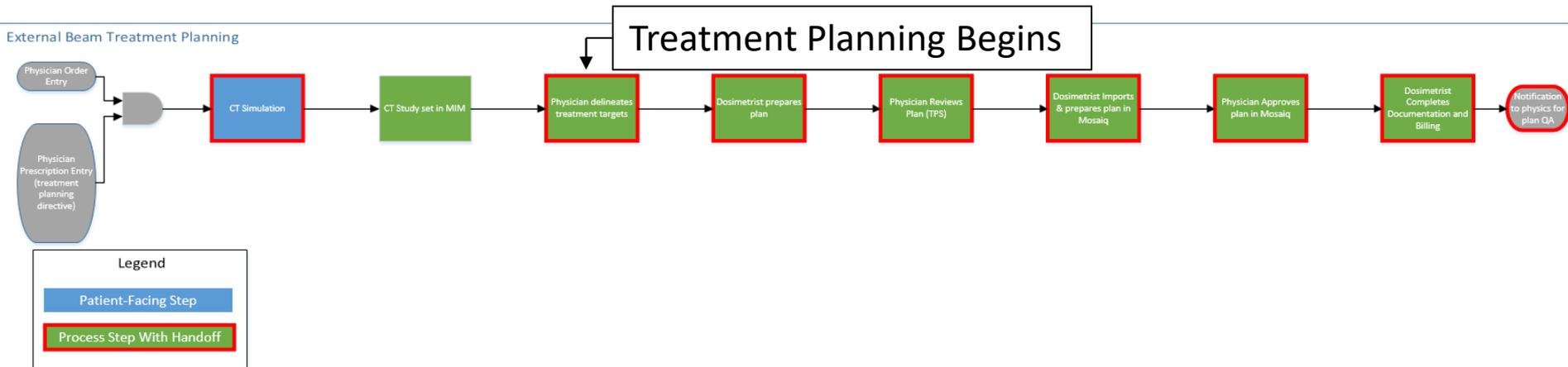
Radiation Therapy – Process of Care

Total reported safety events in the date range of this project: 285

30% of these events occurred during “treatment planning”. This step is the focus of the project



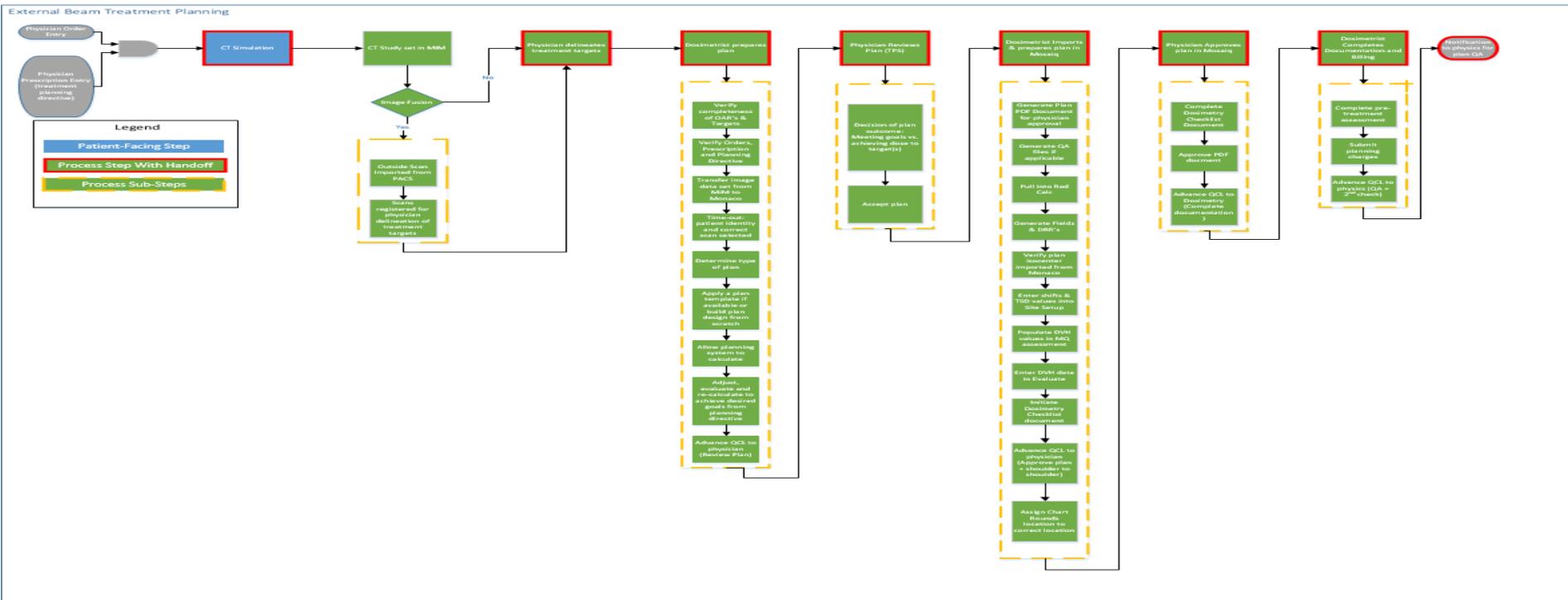
Process map (simplified) – Treatment Planning



Summary of Learning:

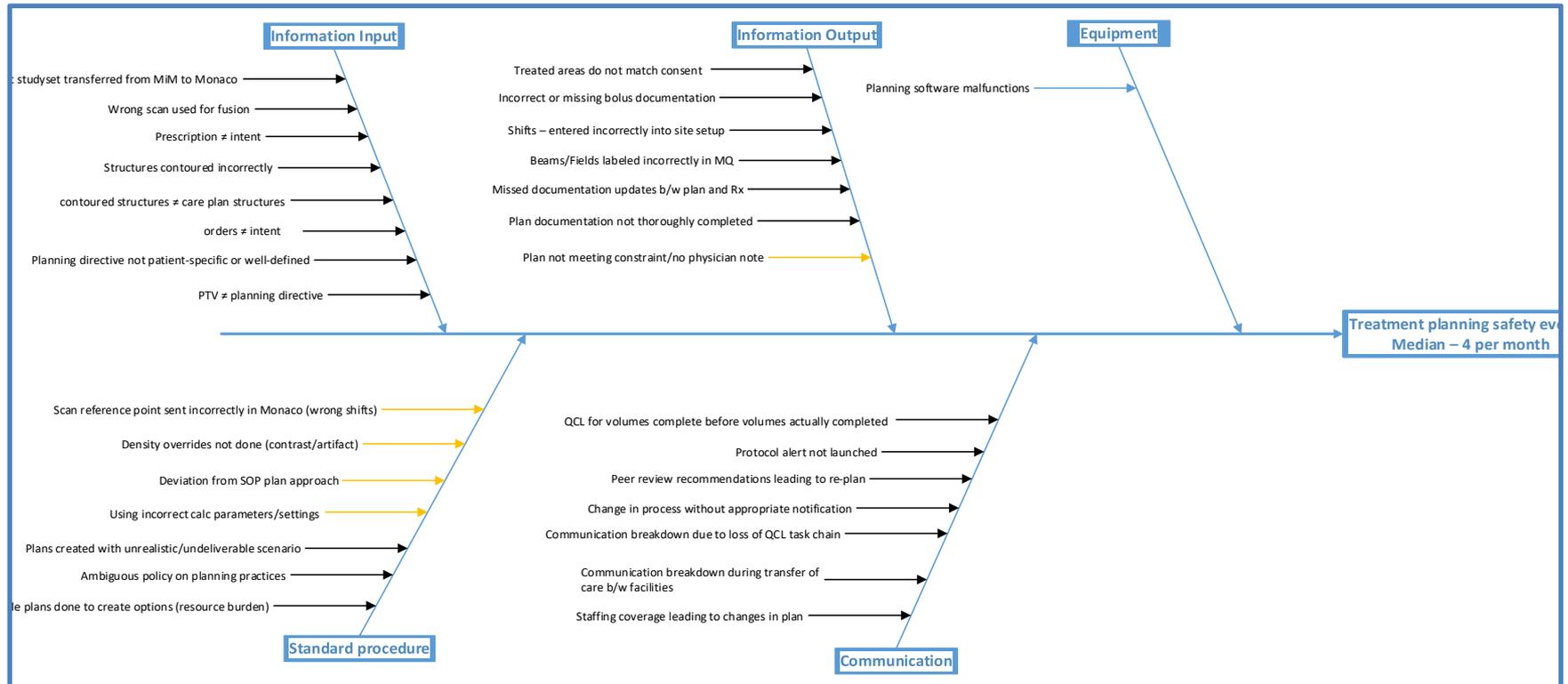
- 6 main steps in the process
- About 20% of the process involves a hand-off
- There are at least 2 individual staff members involved in every plan
- Staff working together on a treatment plan may not always be in the same physical location – many handoffs occur via task alert in electronic health record system

Process map (expanded) – Treatment Planning



- Complex and iterative process – many moving parts
- Not always reflected with a rigid yes/no decision, rather a balancing of goals vs. achievable reality (art vs. science)
- Critical elements of documentation must reconcile the entire process at the end to ensure congruency between prescription, planning directive and actual treatment plan

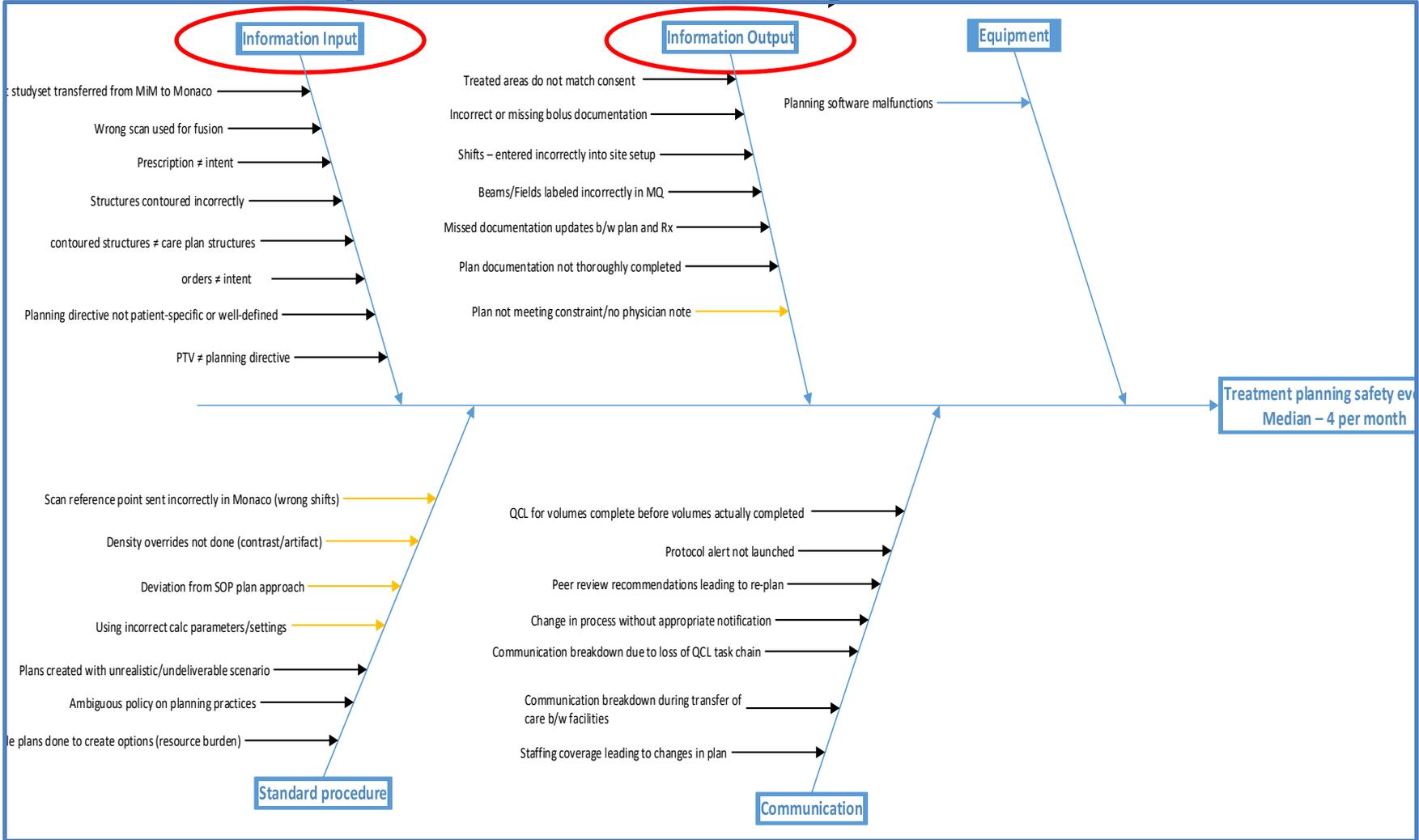
Cause and Effect diagram



- Black arrows = failure modes with existing metrics (reported in system)
- Gold arrows = failure modes provided during discussion
- Info input & output are both buckets of critical documentation

19% of tx planning errors

41% of tx planning errors

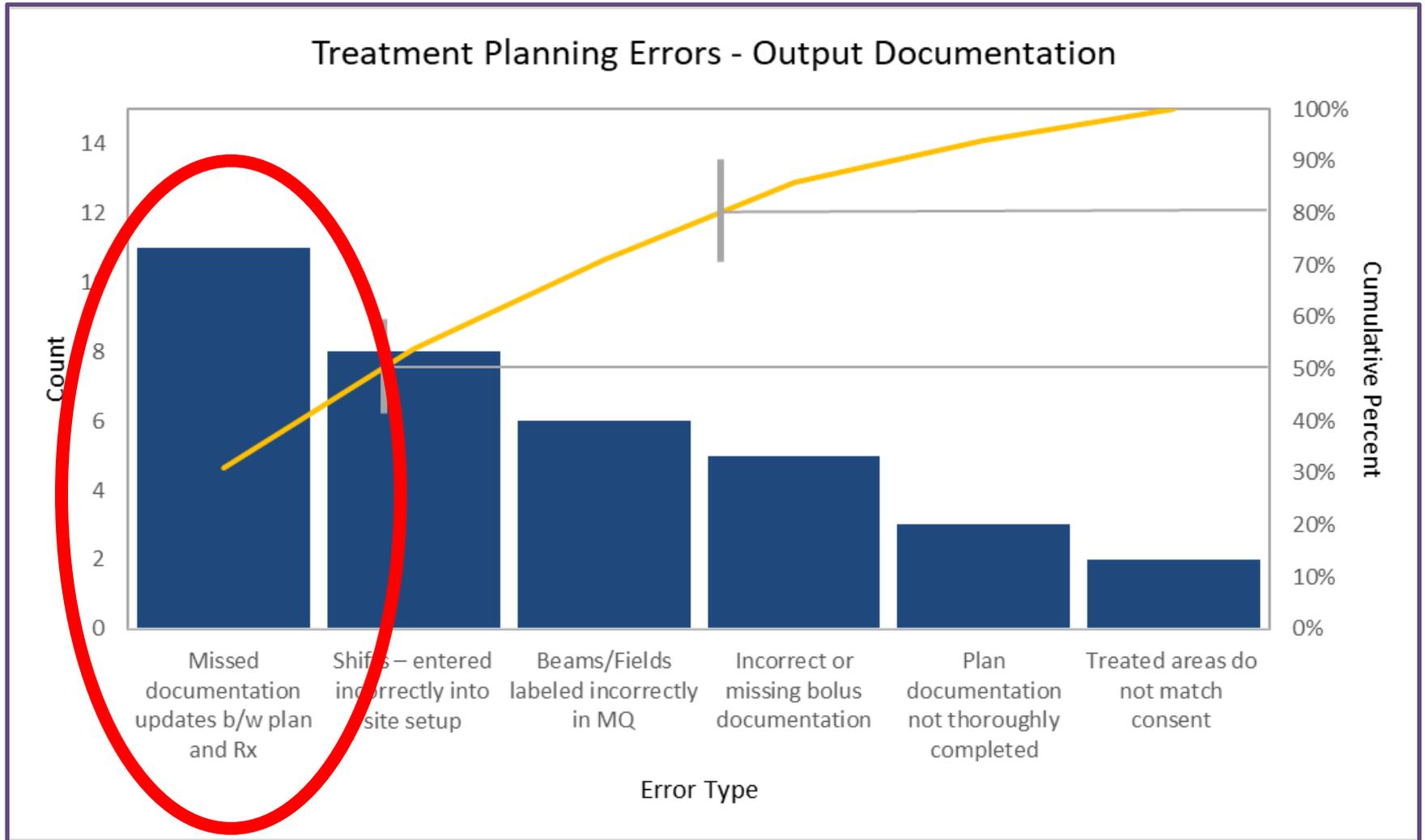


Process Measure

Diagnostic Data summary

Item	Description
Measure:	Treatment Planning Safety events involving output documentation
Patient population: <i>(Exclusions, if any)</i>	Patients receiving radiation treatment at AHNCI – Division of Radiation Oncology (excluding brachytherapy) <i>(all locations except 1 contracted facility that is not reporting in the AHN incident reporting system).</i>
Calculation methodology: <i>(i.e. numerator & denominator)</i>	Numerator: # of “Treatment Planning Output Documentation” safety events (35) Denominator: Total # of “Treatment Planning” safety events (85)
Data source:	AHN incident reporting system – RL6
Data collection frequency:	Per occurrence of event Date range: 1/1/20 – 7/7/2021
Data limitations: <i>(if applicable)</i>	Reliant on compliance with event reporting

Diagnostic Data



Priority / Pay-off Matrix

Countermeasures



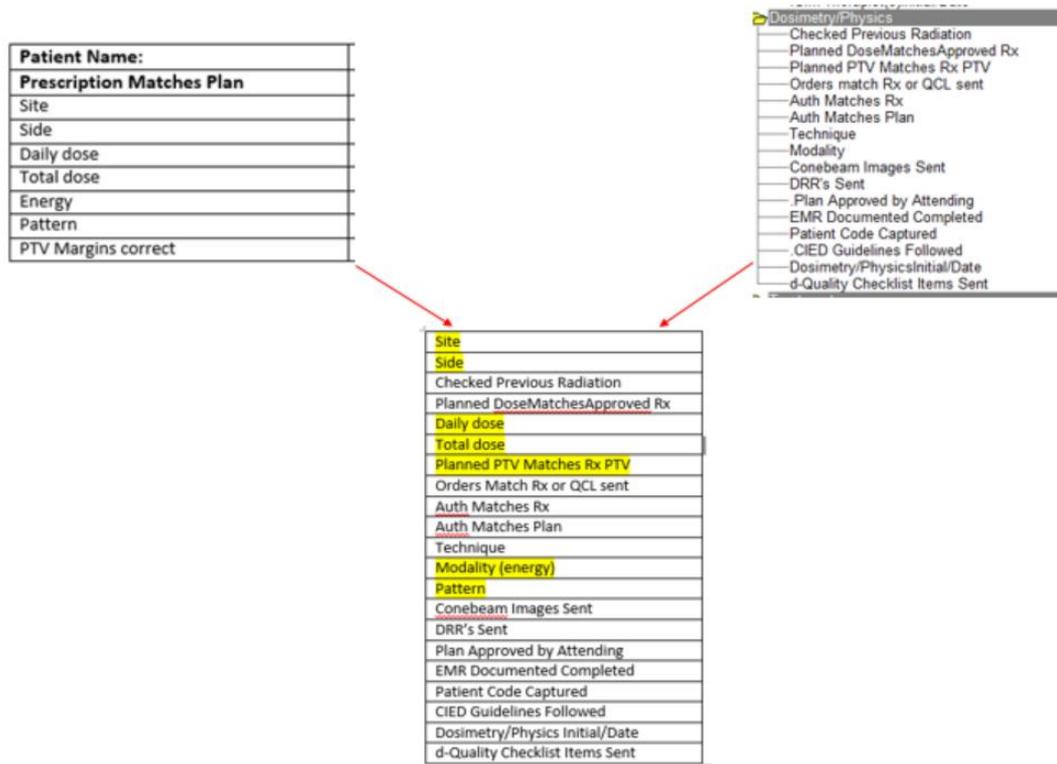
Test of Change

PDSA Plan

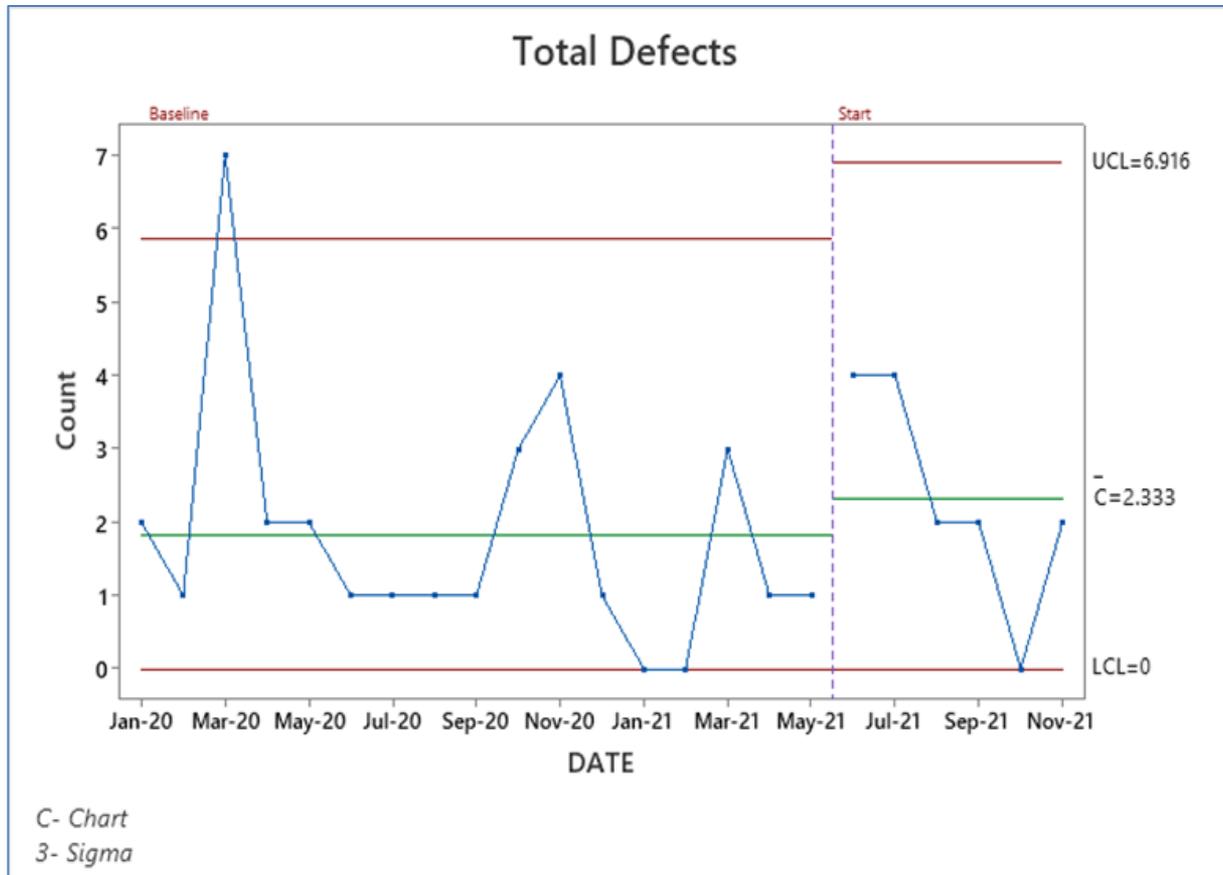
Date	PDSA Description	Lead	Status
10/12	Propose change to treatment planning manager	QTP Team	Done
11/4	Distribute change proposal presentation – recorded power point – to treatment planning	Brandon Weiss & Dr. Fuhrer	Done
11/23	Update change proposal presentation with modifications and distribute to wider audience for comment	Brandon Weiss	In progress
12/16	Present at committee for process change	QTP Team	Scheduled
12/16	Initiate system change process	Brandon Weiss	Not Started
12/16	Communicate & Educate all impacted team members (allow 1-2 week lead time)	QTP Team	Not Started
Jan 2022	Implementation	QTP Team	Not Started
Jan 2022	Collect change data	Brandon Weiss	Not Started

Education Material

Material developed for change proposal and training:
Recorded PowerPoint file.



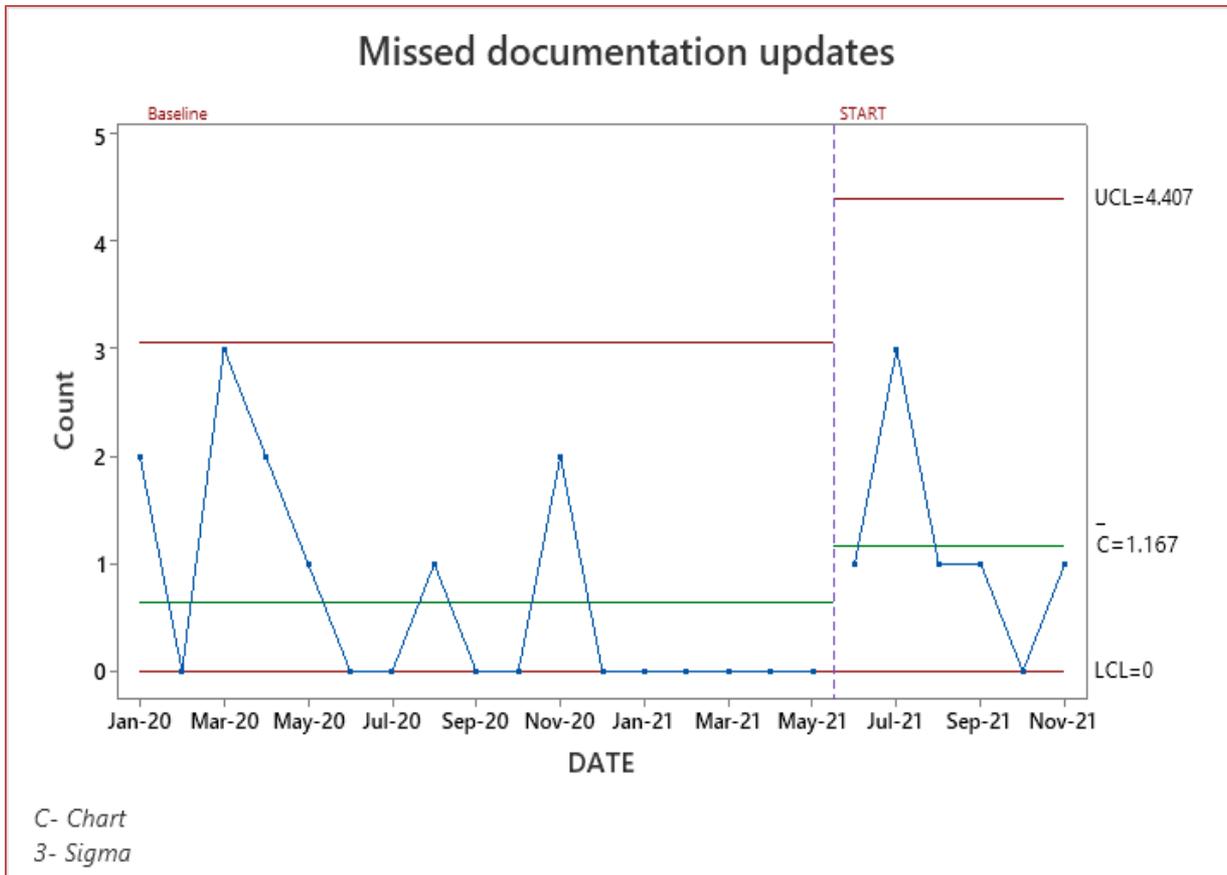
Outcome Data - Overall



Summary:

- Total defect data demonstrates a process NOT in statistical control
- “Start” represents the start of the QTP program
- Not enough data from the start of the program to current day

Outcome Data – Drill down



Summary:

- “Missed documentation updates” refers to the focus of the countermeasure
- 5 points of “0” data adjacent to the start of the program: potentially an effect of low engagement with reporting

Next Steps

Item	Owner
Prepare the final change proposal presentation and submit to committee	Brandon Weiss
Determine the style of measurement for collecting change data	QTP Team
Implement change, collect data and compare to baseline	QTP Team

Conclusion

1. The proposed countermeasure is one that resonates with staff
 - Something that people have been wanting to change (anecdotal evidence)
2. The proposed countermeasure is achievable in a relatively short time frame (priority matrix)
3. The baseline data brought forward validation of the effort to make the change (fishbone diagram + c-chart)
 - Prioritize the work relative to the list of all projects
4. The process map assisted in the realization of number of hand-offs in the process, which further confirms the value in developing effective reconciliation tools for documentation

Thank you