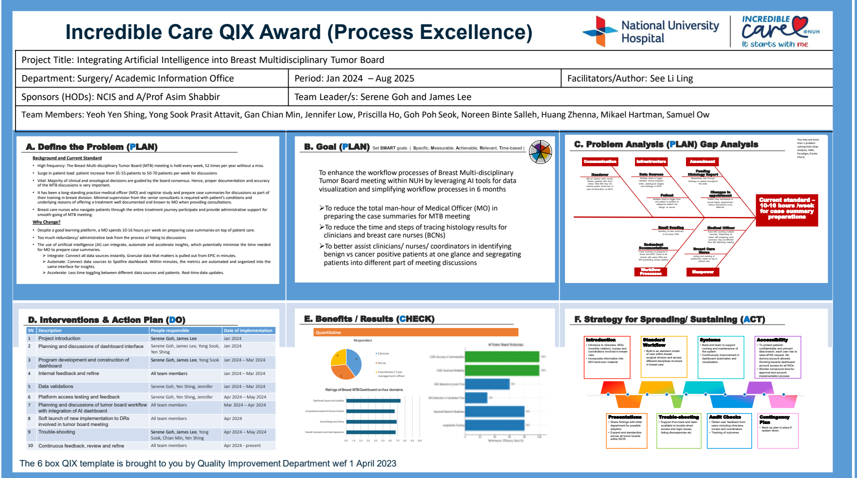
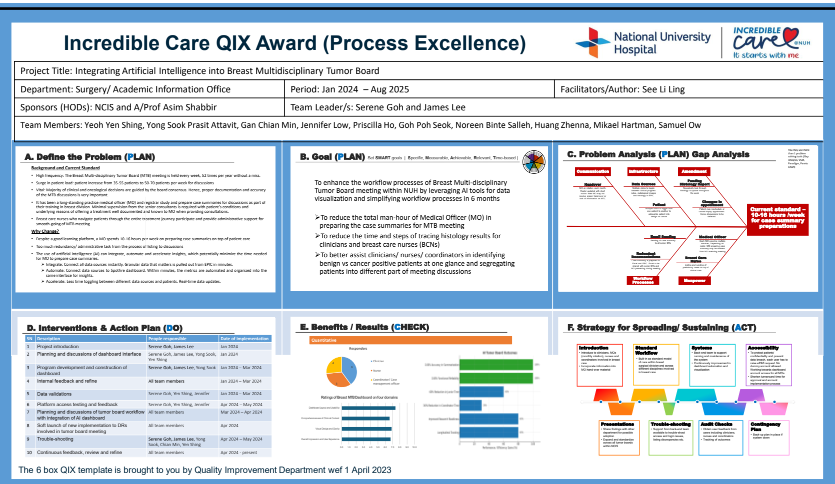
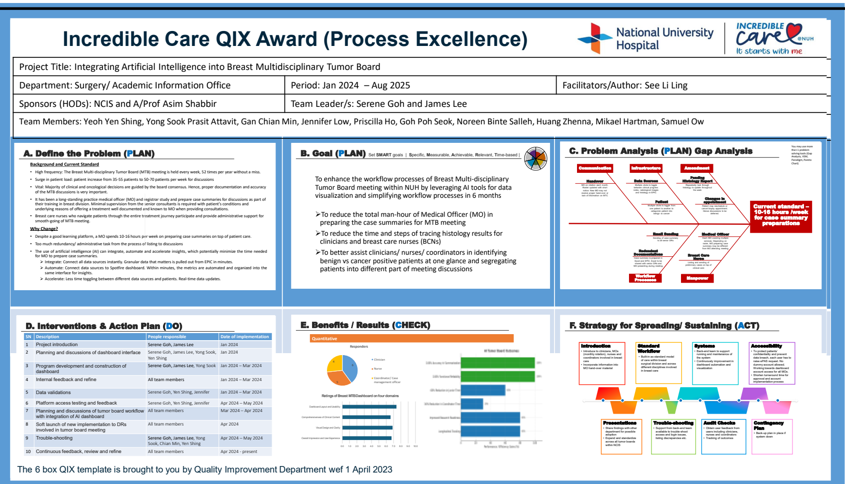
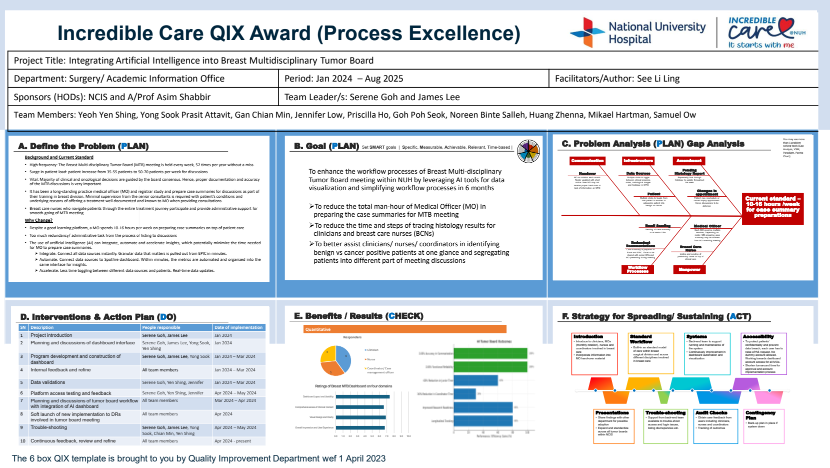
Incredible Care QIX Award (Process Excellence)

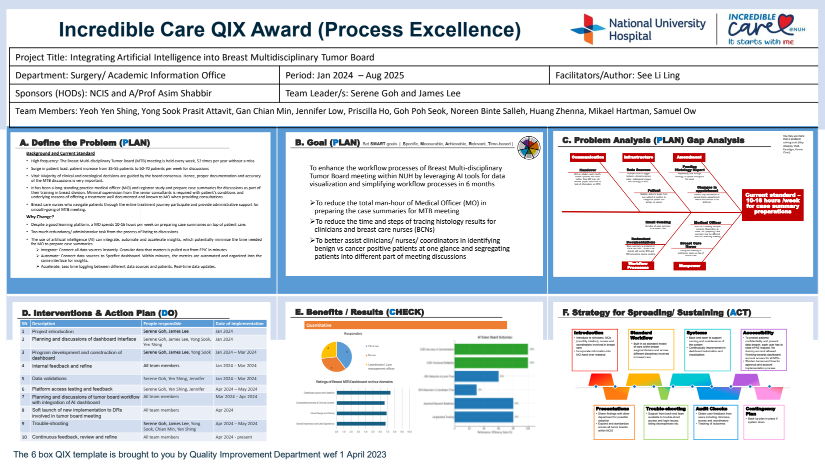
Project Title: Integrating Artificial Intelligence into Breast Multidisciplinary Tumor Board		
Department: Surgery/ Academic Information Office	Period: Jan 2024 – Aug 2025	Facilitators/Author: See Li Ling
Sponsors (HODs): NCIS and A/Prof Asim Shabbir	Team Leader/s: Serene Goh and James Lee	
Team Members: Yeoh Yen Shing, Yong Sook Prasit Attavit, Gan Chian Min, Jennifer Low, Priscilla Ho, Goh Poh Seok, Noreen Binte Salleh, Huang Zhenna, Mikael Hartman, Samuel Ow		

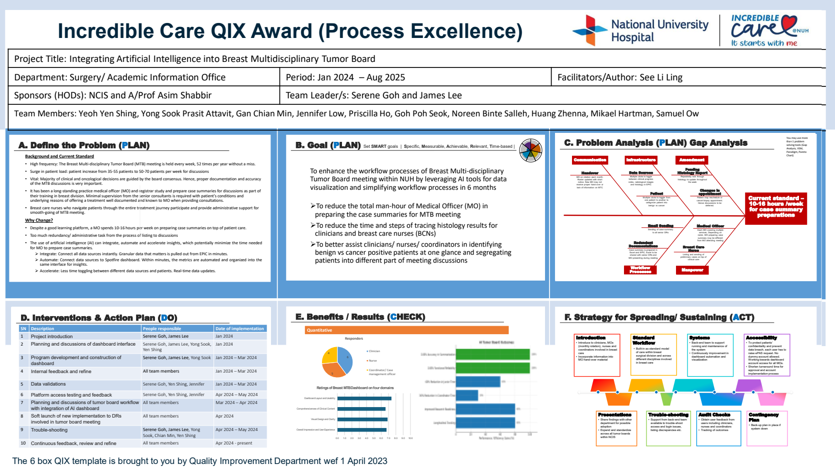












A. Define the Problem (PLAN)

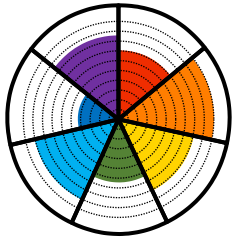
Background and Current Standard

- High frequency: The Breast Multi-disciplinary Tumor Board (MTB) meeting is held every week, 52 times per year without a miss.
- Surge in patient load: patient increase from 35-55 patients to 50-70 patients per week for discussions
- Vital: Majority of clinical and oncological decisions are guided by the board consensus. Hence, proper documentation and accuracy of the MTB discussions is very important.
- It has been a long-standing practice medical officer (MO) and registrar study and prepare case summaries for discussions as part of their training in breast division. Minimal supervision from the senior consultants is required with patient's conditions and underlying reasons of offering a treatment well documented and known to MO when providing consultations.
- Breast care nurses who navigate patients through the entire treatment journey participate and provide administrative support for smooth-going of MTB meeting.

Why Change?

- Despite a good learning platform, a MO spends 10-16 hours per week on preparing case summaries on top of patient care.
- Too much redundancy/ administrative task from the process of listing to discussions
- The use of artificial intelligence (AI) can integrate, automate and accelerate insights, which potentially minimize the time needed for MO to prepare case summaries.
  - Integrate: Connect all data sources instantly. Granular data that matters is pulled out from EPIC in minutes.
  - Automate: Connect data sources to Spotfire dashboard. Within minutes, the metrics are automated and organized into the same interface for insights.
  - Accelerate: Less time toggling between different data sources and patients. Real-time data updates.

B. Goal (PLAN) Set **SMART** goals | **S**pecific, **M**easurable, **A**chievable, **R**elevant, **T**ime-based |

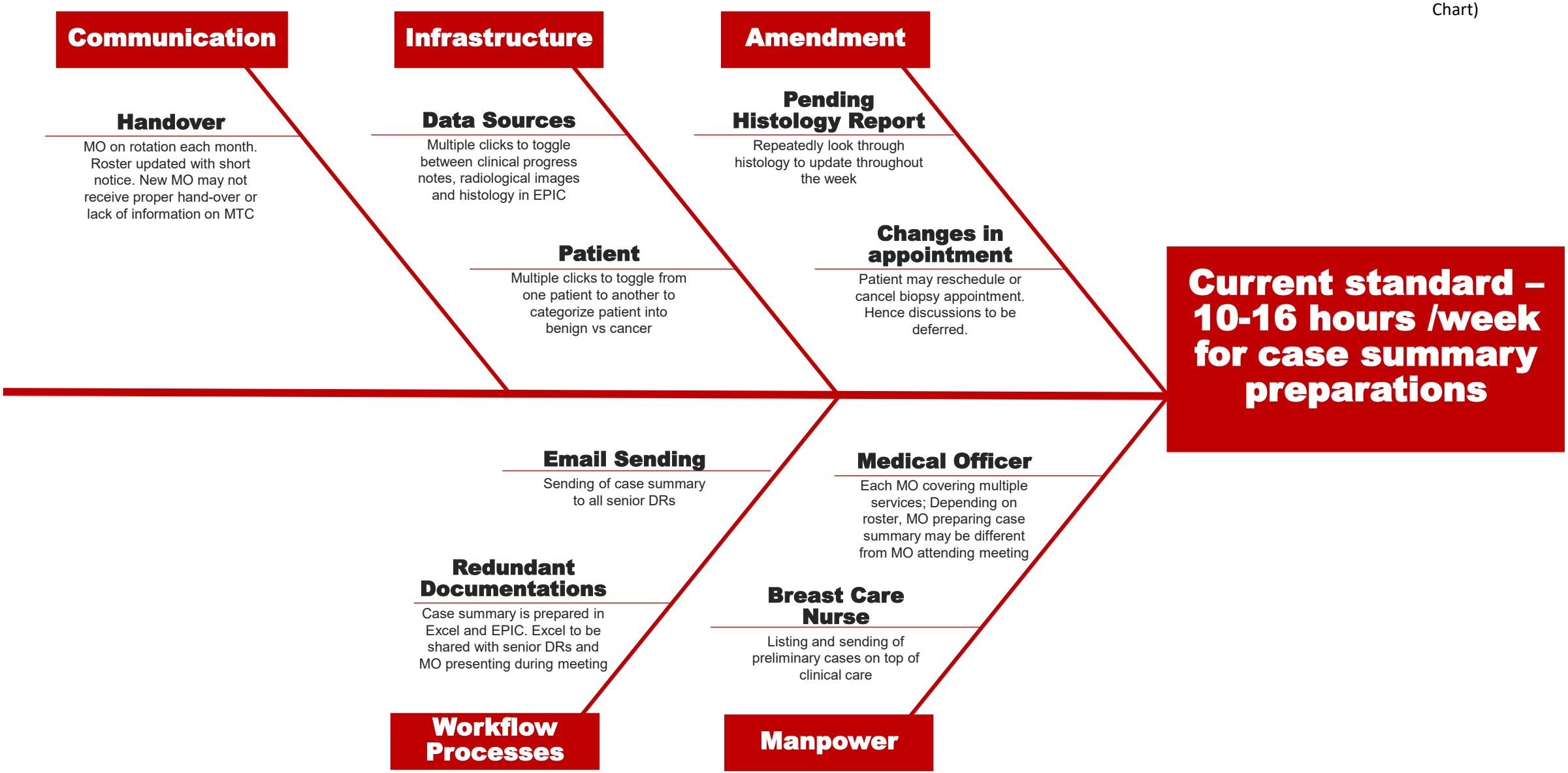


To enhance the workflow processes of Breast Multi-disciplinary Tumor Board meeting within NUH by leveraging AI tools for data visualization and simplifying workflow processes in 6 months

- To reduce the total man-hour of Medical Officer (MO) in preparing the case summaries for MTB meeting
- To reduce the time and steps of tracing histology results for clinicians and breast care nurses (BCNs)
- To better assist clinicians/ nurses/ coordinators in identifying benign vs cancer positive patients at one glance and segregating patients into different part of meeting discussions

C. Problem Analysis (PLAN) Gap Analysis

You may use more than 1 problem solving tools (Gap Analysis, VSM, Paradigm, Pareto Chart)

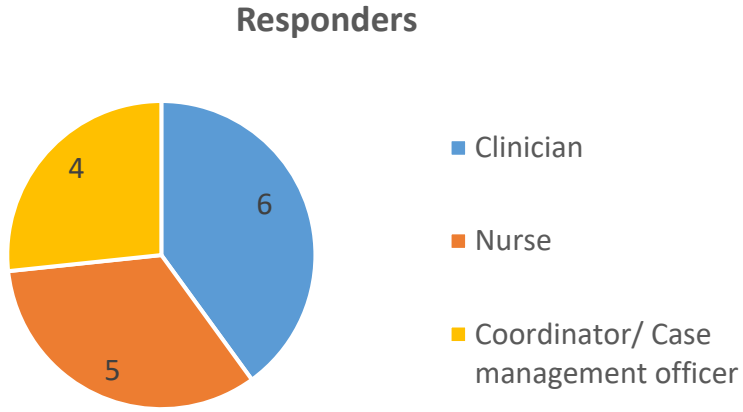


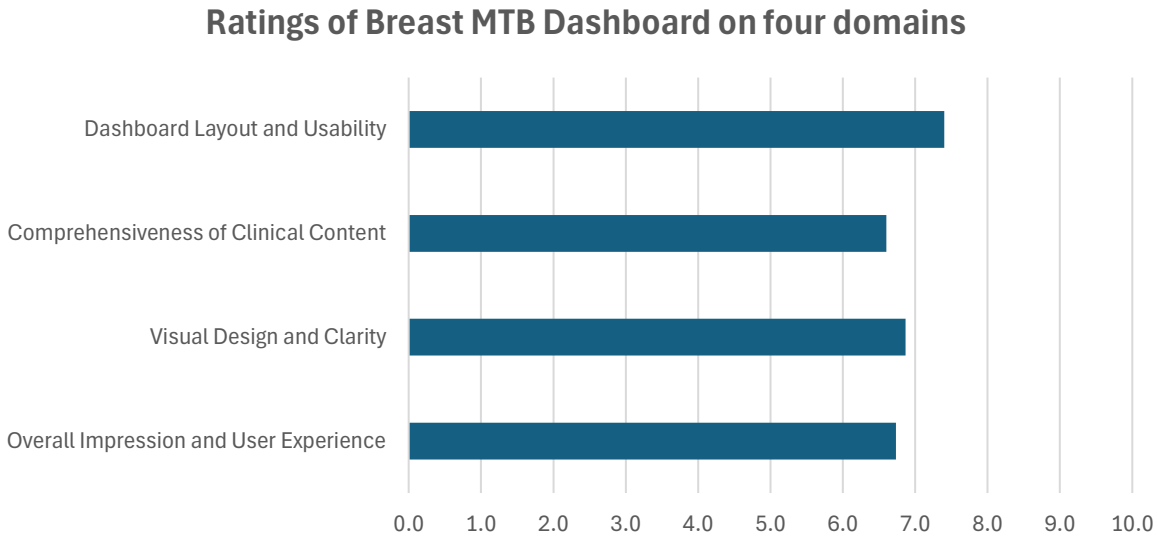
D. Interventions & Action Plan (DO)

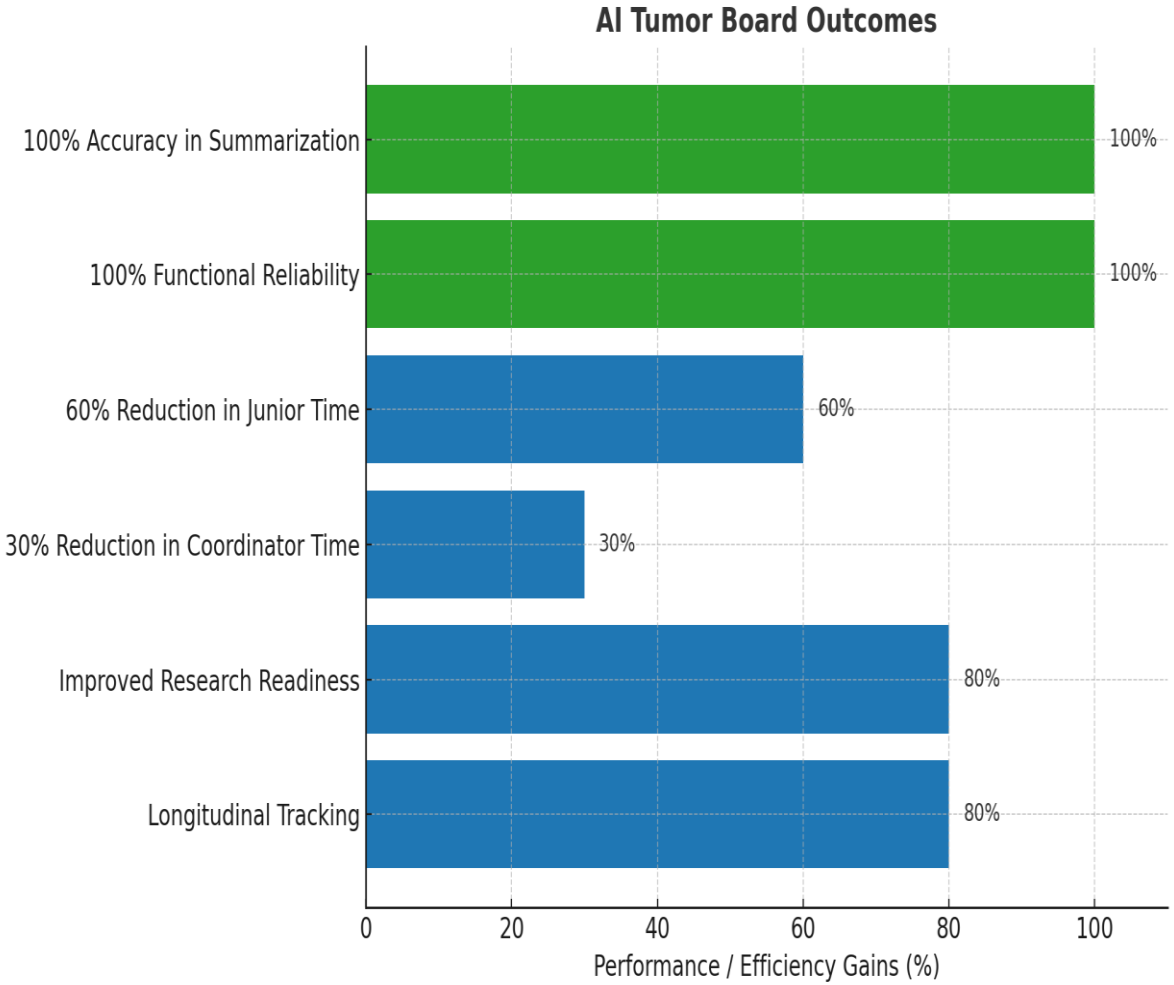
SN	Description	People responsible	Date of implementation
1	Project introduction	**Serene Goh, James Lee**	Jan 2024
2	Planning and discussions of dashboard interface	Serene Goh, James Lee, Yong Sook, Yen Shing	Jan 2024
3	Program development and construction of dashboard	**Serene Goh, James Lee**, Yong Sook	Jan 2024 – Mar 2024
4	Internal feedback and refine	**All team members**	Jan 2024 – Mar 2024
5	Data validations	Serene Goh, Yen Shing, Jennifer	Jan 2024 – Mar 2024
6	Platform access testing and feedback	Serene Goh, Yen Shing, Jennifer	Apr 2024 – May 2024
7	Planning and discussions of tumor board workflow with integration of AI dashboard	All team members	Mar 2024 – Apr 2024
8	Soft launch of new implementation to DRs involved in tumor board meeting	All team members	Apr 2024
9	Trouble-shooting	**Serene Goh, James Lee**, Yong Sook, Chian Min, Yen Shing	Apr 2024 – May 2024
10	Continuous feedback, review and refine	All team members	Apr 2024 - present

E. Benefits / Results (CHECK)

Quantitative







F. Strategy for Spreading/ Sustaining (ACT)

Introduction

- Introduce to clinicians, MOs (monthly rotation), nurses and coordinators involved in breast care
- Incorporate information into MO hand-over material

Standard Workflow

- Built-in as standard model of care within breast surgical division and across different disciplines involved in breast care

Systems

- Back-end team to support running and maintenance of the system
- Continuously improvement in dashboard automation and visualization

Accessibility

- To protect patients' confidentiality and prevent data breach, each user has to raise ePAS request. No dummy account allowed. Working towards dashboard account access for all MOs.
- Shorten turnaround time for approval and account implementation process

Presentations

- Share findings with other department for possible adoption
- Expand and standardize across all tumor boards within NCIS

Trouble-shooting

- Support from back-end team available to trouble-shoot access and login issues, listing discrepancies etc.

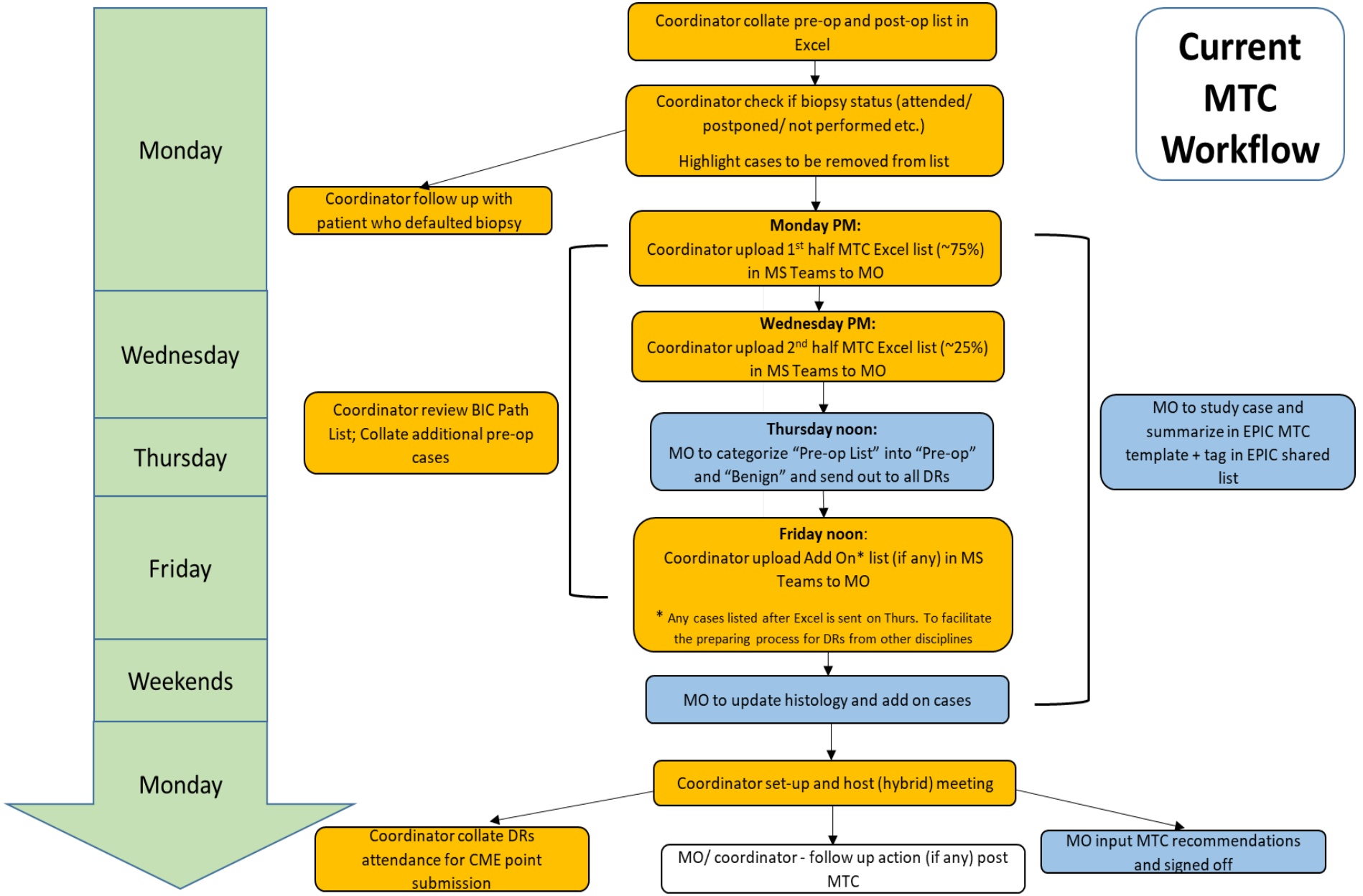
Audit Checks

- Obtain user feedback from users including clinicians, nurses and coordinators
- Tracking of outcomes

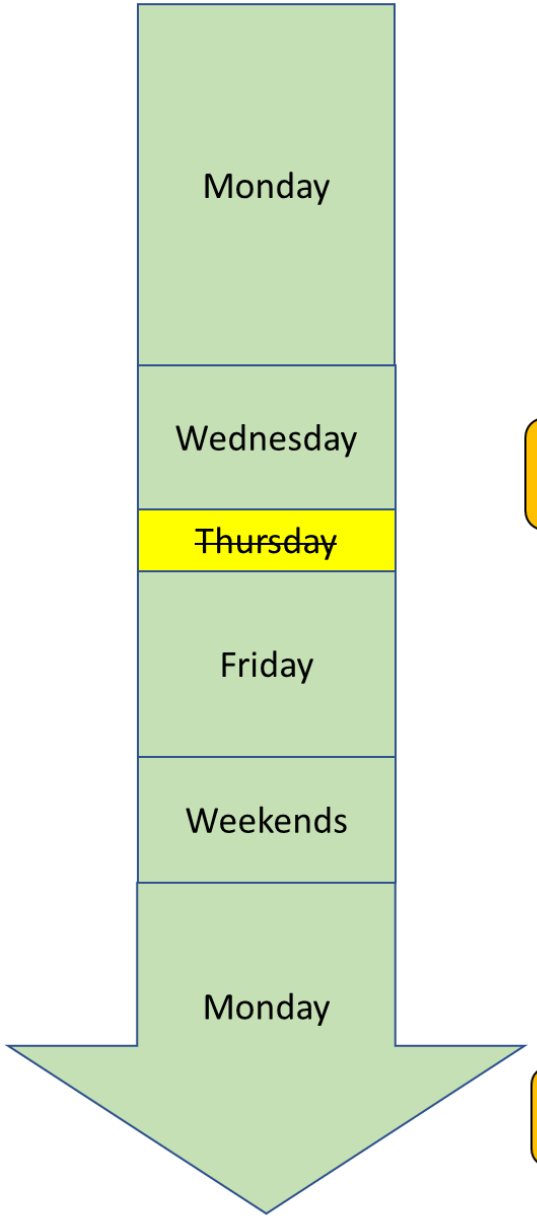
Contingency Plan

- Back-up plan in place if system down

Appendix


Monday
Wednesday
Thursday
Friday
Weekends
Monday
Current MTC Workflow
Coordinator collate pre-op and post-op list in Excel
Coordinator check if biopsy status (attended/ postponed/ not performed etc.)
Highlight cases to be removed from list
Coordinator follow up with patient who defaulted biopsy
Monday PM:
Coordinator upload 1st half MTC Excel list (~75%) in MS Teams to MO
Wednesday PM:
Coordinator upload 2nd half MTC Excel list (~25%) in MS Teams to MO
Coordinator review BIC Path List; Collate additional pre-op cases
Thursday noon:
MO to categorize "Pre-op List" into "Pre-op" and "Benign" and send out to all DRs
MO to study case and summarize in EPIC MTC template + tag in EPIC shared list
Friday noon:
Coordinator upload Add On* list (if any) in MS Teams to MO
* Any cases listed after Excel is sent on Thurs. To facilitate the preparing process for DRs from other disciplines
MO to update histology and add on cases
Coordinator set-up and host (hybrid) meeting
Coordinator collate DRs attendance for CME point submission
MO/ coordinator - follow up action (if any) post MTC
MO input MTC recommendations and signed off

Appendix



MTC Workflow with AI

Coordinator collate pre-op and post-op list in Excel

Coordinator check biopsy status (attended/ postponed/ not performed etc.)

Generate new and clean pre-op list to **feed AI**

Monday PM :
Coordinator upload 1st half MTC Excel list (~75%) in MS Teams to MO

Coordinator review BIC Path List; Collate additional pre-op cases

Wednesday PM:
Coordinator upload 2nd half MTC Excel list (~25%) in MS Teams to MO + **feed AI (pre-op)**

Friday noon:
Coordinator upload Add On* list (if any) in MS Teams to MO

**Any cases listed after Wed PM and not captured by AI*

Coordinator to tag patients, create encounter and pre-draft in EPIC

MO to study case and categorize "Pre-op List" into "Pre-op" and "Benign" in EPIC.

All DRs are tagged in this shared list. **No sending of email/ Excel**

MO to study cases and categorize "Pre-op List" into "Pre-op" and "Benign" in EPIC

Coordinator check and **re-feed AI**

Coordinator set-up and host (hybrid) meeting

Coordinator collate DRs attendance for CME point submission

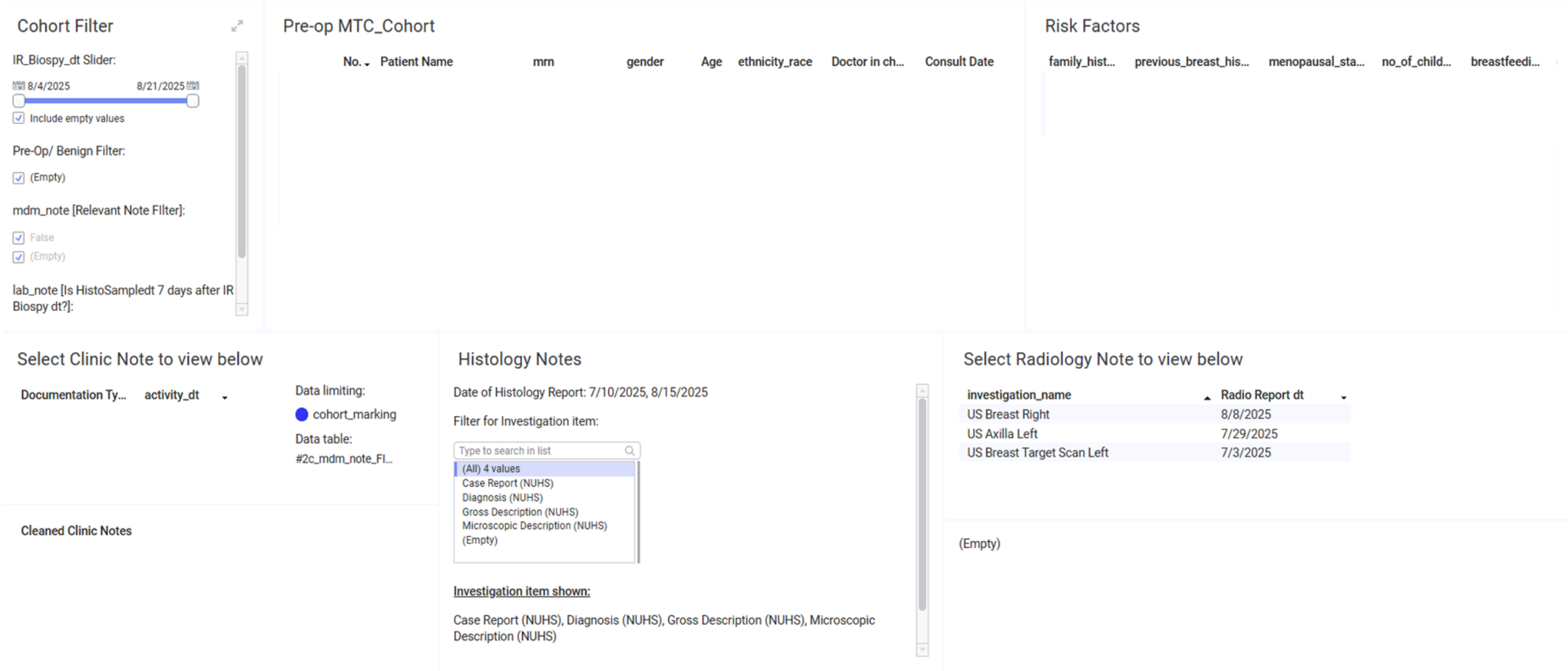
Coordinator follow up with patient who defaulted biopsy

MO/ coordinator - follow up action (if any) post MTC

MO input MTC recommendations, vet through and signed off

Appendix

Pre-Op Dashboard



Appendix

Post-Op Dashboard

(Empty) ((Empty))

Gender: (Empty) **Age:** (Empty)

Ethnicity: (Empty)

Intra-Op Finding

operation_date	surgery_findings

Post-op MTC Cohort

Patient Name	mrn	TOSP C...	Consultant In-Ch...	OP Start ...	Summary of Operation	DFS

Op Date Filter:

8/18/2025 8/22/2025

Histology Report

histology_s...	Histology_Report_Cleaned	Type	Grade	Size	ER_status	PR_s

Radiology Report

Radio Repor...	investigation_na...	Cleaned Radiology Report

Appendix

Accomplishments

Appendix

User Satisfactions and Feedbacks

Information is reflected systematically

Time reduced in case preparation especially with some of the info pre-drafted

Data is displayed clearly on the screen during meeting discussions

Accessibility to the dashboard is not seamless. Need to raise ePAS separately

Patients are easily segregated into benign vs malignant at one glance

Able to view clinical history, radiological reports and biopsy histology all in one interface; Less toggle between patients

The visual can be further improved to make it more understanding and attractive