Penn Medicine

RADIOLOGY ANNUAL QUALITY IMPROVEMENT PLAN SUMMARY

FY22
JULY 2021-
JUNE 2022

PREAMBLE

"How can we do better?" remains our quality mantra in Penn Radiology. In spite of the limitations of the pandemic, there have been many great quality and safety activities across the enterprise within our department over the past few years. As we do every year, we wish to share this past year's highlights with you, and hope you will be as excited about them as we are.

This summary provides an overview of Fiscal Year 2022 accomplishments and commitment to quality and patient safety. Our ongoing improvements, some of which are based on quality indicators determined by our various regulatory agencies, such as the American College of Radiology (ACR), Pennsylvania Department of Health (PaDOH), Centers for Medicare and Medicaid (CMS), Occupational Safety and Health Administration (OSHA), Nuclear Regulatory Commission (NRC), Food and Drug Administration (FDA) and The Joint Commission (TJC), assist with promoting an error-free safe environment for the patients we serve.

Radiology managers/faculty select specific Quality Assessment Performance Improvement (QAPI) initiatives and dashboard metric indicators in an effort to improve processes and mitigate error. The dashboard metrics are reviewed at the monthly Radiology Clinical Effectiveness Quality Improvement (CEQI) meeting.

All employees are encouraged to identify and report problems utilizing Penn Medicine's Incident Occurrence Reporting System - Safety Net. These events are reviewed daily by Radiology quality team and action plans are developed depending on the frequency and acuity of the reported concern. Promoting a blame-free culture along with the BLUEPRINT for Quality and Patient Safety creates transparency, empowerment and awareness leading to improvement opportunities to uphold our mission and vision of excellence.

Enjoy and savor the great work by our teams!

Yours in Quality,

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Shaquanna Simmons MS RT (R)(MR)

TABLE OF CONTENTS

2021 RADIOLOGY ANNUAL IMPROVEMENT PLAN SUMMARY

ENTERPRISE BLUEPRINT

OUTCOMES

SAFETY

EXPERIENCE
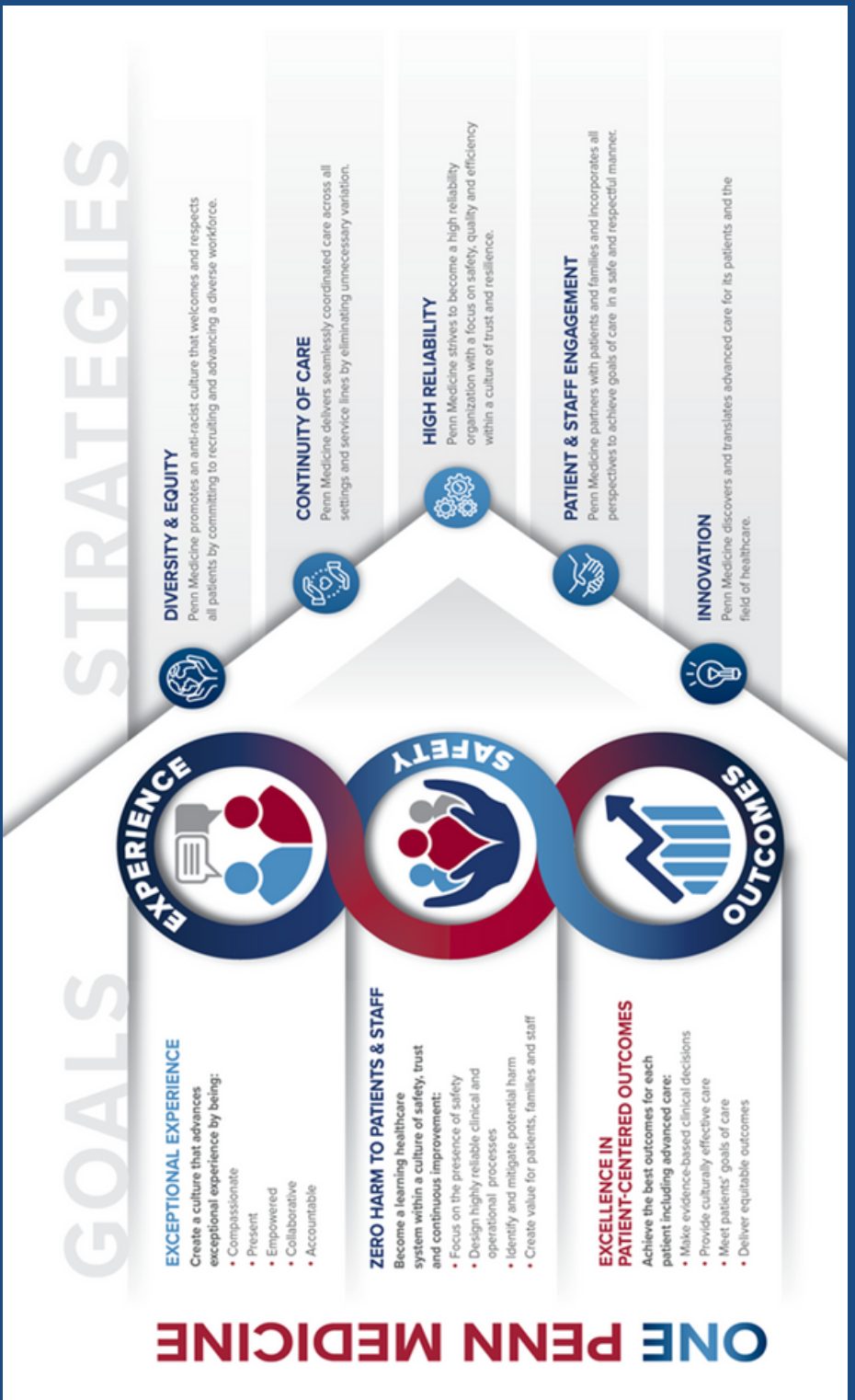
ONE PENN MEDICINE

The blueprint to provide the best care and experience for our patients and staff. We are committed to achieving equity by understanding and addressing differences in experience, safety and outcomes.

ENTERPRISE BLUEPRINT

STRATEGIES

DIVERSITY & EQUITY
Penn Medicine promotes an anti-racist culture that welcomes and respects all patients by committing to recruiting and advancing a diverse workforce.

CONTINUITY OF CARE
Penn Medicine delivers seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation.

HIGH RELIABILITY
Penn Medicine strives to become a high reliability organization with a focus on safety, quality and efficiency within a culture of trust and resilience.

PATIENT & STAFF ENGAGEMENT
Penn Medicine partners with patients and families and incorporates all perspectives to achieve goals of care in a safe and respectful manner.

INNOVATION
Penn Medicine discovers and translates advanced care for its patients and the field of healthcare.

GOALS

EXCEPTIONAL EXPERIENCE
Create a culture that advances exceptional experience by being:
- Compassionate
- Present
- Empowered
- Collaborative
- Accountable

ZERO HARM TO PATIENTS & STAFF
Become a learning healthcare system within a culture of safety, trust and continuous improvement:
- Focus on the presence of safety
- Design highly reliable clinical and operational processes
- Identify and mitigate potential harm
- Create value for patients, families and staff

EXCELLENCE IN PATIENT-CENTERED OUTCOMES
Achieve the best outcomes for each patient including advanced care:
- Make evidence-based clinical decisions
- Provide culturally effective care
- Meet patients' goals of care
- Deliver equitable outcomes

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ENTERPRISE BLUEPRINT

STRATEGIES	INITIATIVES	METRICS
DIVERSITY & EQUITY — The Department of Radiology promotes an anti-racist culture that welcomes and respects all patients by committing to recruiting and advancing a diverse workforce	Radiology results clinic Act 112 compliance communication Race based disparities in Breast Cancer screening and treatment	# of visits Proportion of scans c notification Time to biopsy by race
CONTINUITY OF CARE — The Department of Radiology delivers seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation	Patient e-consent Standardized Protocols Automated notification pathway for non-emergent findings	% compliance (report) # of new protocols # of new pathways
HIGH RELIABILITY — The Department of Radiology strives to become a high reliability organization with a focus on safety, quality and efficiency within a culture of trust and resilience	Matching subspecialty expertise to interpretation Patient e-consent Provider e-consults Peer learning	BI-RADS 3 % compliance (report) # of e-consults # of conferences
PATIENT & STAFF ENGAGEMENT — The Department of Radiology partners with patients and families and incorporates all perspectives to achieve goals of care in a safe and respectful manner.	Patient Self-scheduling through MPM Smoking cessation Act 112 compliance/communication	# of self-scheduled exams (report) # pts counseled (report) Proportion of scans c notification (Chuck Kahn)
INNOVATION — The Department of Radiology discovers and translates advanced care for its patients and the field of healthcare.	Radiology results clinic Provider e-consults Automated notification pathway for non-emergent findings	# of visits # of e-consults # of new pathways

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RADIOLOGY ENTERPRISE CLINICAL EFFECTIVENESS TEAM

FY22 Completed Enterprise Accomplishments

1. **e-Consents**

   E-consents are used across all 3 downtown hospitals (but not yet enterprise wide).

   Due to changes to the consent process required by enactment of Pennsylvania Act 61 of 2021, the department undertook a comprehensive review and modification of the process to reflect the new law.

   Every e-consent now includes an opportunity for the patient to request discussion with the provider performing the procedure; a response is mandatory. New attestation language states that the attending has spoken with the patient, offered to answer questions, and confirmed patient consent. Annual compliance includes:

   ·PPMC 92% compliance ~ 2000 consents
   ·HUP 86% compliance ~ 10,000 consents

   These aggregate numbers do not reflect the outstanding mid- to high 90s performance of some divisions; particularly given the effort given to bringing this initiative to life.

2. **Automated Notification of Non-emergent Actionable Findings**

   Actionable findings require non-routine communication. Facilitating delivery of these findings between busy radiologists and busy radiologists to busy referring providers has been challenging. These findings have been the source of many Penn Safety Net entries over the years and represent a malpractice risk.

   For several years, a team led by Juanita Kerber and Chuck Kahn with representation from Quality and IT groups has worked diligently to automate this process. Starting in July 2022 the first step in this process has come to fruition.

   Category 3 (Yellow) alerts for findings that need to be communicated "within days" can now be delivered directly to the ordering provider's Epic In-Basket in PennChart using the Nuance dictation system. Penn providers who use Epic's "Haiku" smartphone app will receive a notification when an alert appears in their In-Basket. Non-Penn providers can download the Nuance "Mobile Clinician" smartphone app which allows us to send them passcode-protected text messages.

RADIOLOGY ENTERPRISE CLINICAL EFFECTIVENESS TEAM

FY23 Ongoing Enterprise Initiatives

1. Penn Medicine results clinic

This collaboration between the Departments of Medicine, Surgery, ENT, Neurosurgery and Radiology helps providers manage imaging follow-up for patients with pulmonary nodules until non-imaging care is needed. This initiative was begun at HUP in FY21, was expanded to Radnor in FY22 and will continue to grow across the enterprise in FY23. *See page 12*

2. Matching subspecialty expertise with report interpretation

This effort aims to improve the value of imaging care by leveraging and matching subspecialty expertise across the Radiology enterprise with disease interpretation and consultation. Two project teams drawing from the Radiology Network Practice Optimization Teams began meeting during FY22 with plans to begin collecting and disseminating data in FY23. These teams are focused on 1) Decreasing variability in BI-RADS 3 rates for diagnostic women's imaging exams across UPHS and 2) Measuring variability in thyroid nodule biopsy recommendations at HUP, PPMC and DCR. *See page 14*

3. Enterprise wide dashboard reporting

The Enterprise clinical effectiveness dashboard team co-produced with ED stakeholders the prototype for the first dashboard measure, ED turn-around time, in March 2022. Currently the team is working on the first of two target measures to be implemented during FY23: Critical values. *See page 14*

4. e-Consults

This initiative provides asynchronous imaging consultation between radiologists and ordering providers using our health system's electronic health record. Following a successful FY21 pilot between Radiology and two HUP Internal Medicine and Family Medicine practices, the program was expanded in FY22 to include all HUP primary care practices. *See page 13*

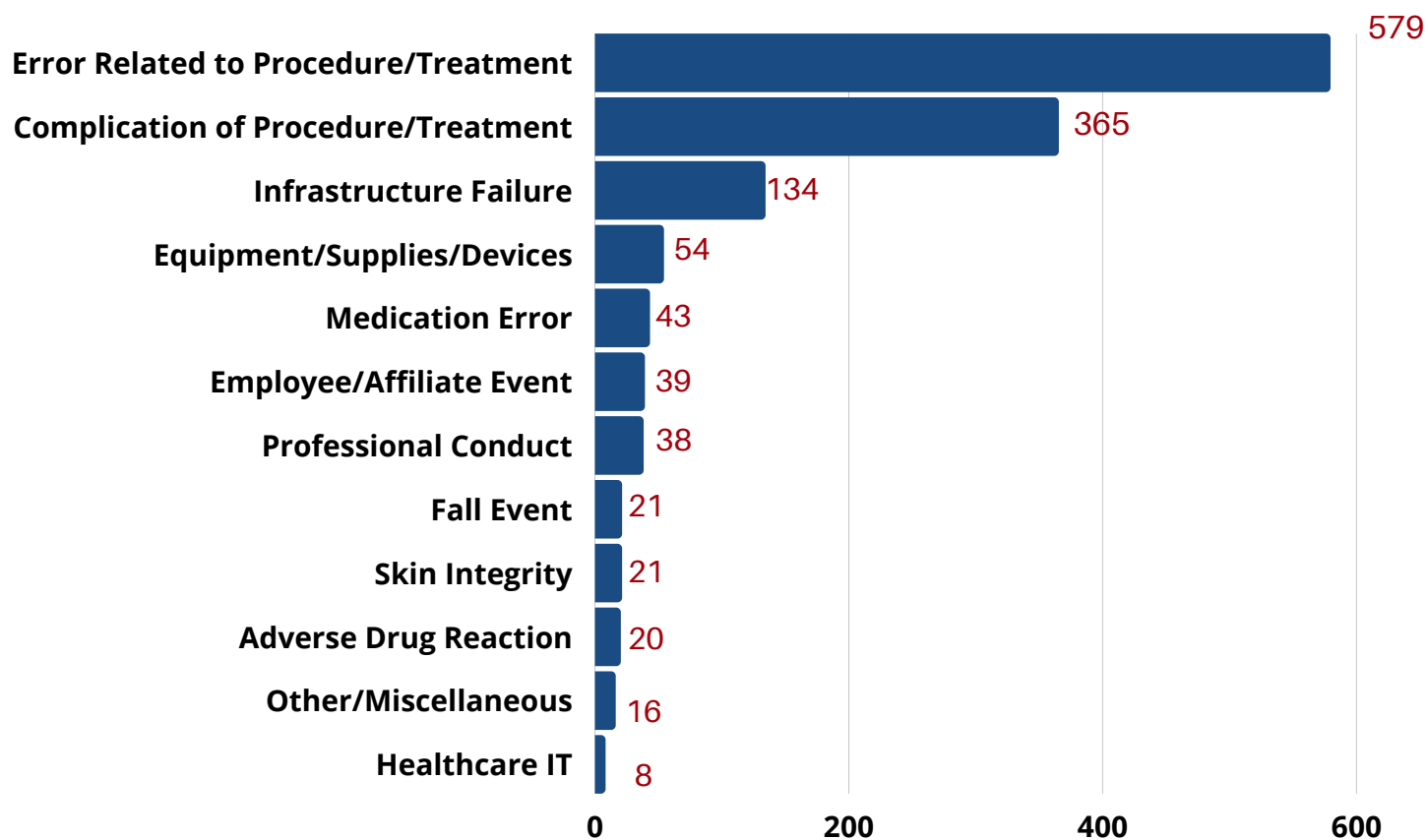# ENTERPRISE OPPORTUNITY IMPROVEMENT REPORTING

Penn Medicine Safety Net (PMSN)

All employees are encouraged to identify and report problems using PMSN, Penn Medicine's incident occurrence reporting system. These events are reviewed daily by the Radiology quality team and action plans are developed depending on the frequency and acuity of the reported concern.

QUIQRad

Working in tandem, QUIQRad, the Radiology Department-specific improvement reporting tool. This tool captures opportunities to 'do better' that are of lower severity than PMSN such as feedback to technologists on exam quality, patient delays due to scheduling and protocoling errors and Radiology IT.

PENN MEDICINE SAFETY NET ANNUAL ENTRIES

Category	Value
Error Related to Procedure/Treatment	579
Complication of Procedure/Treatment	365
Infrastructure Failure	134
Equipment/Supplies/Devices	54
Medication Error	43
Employee/Affiliate Event	39
Professional Conduct	38
Fall Event	21
Skin Integrity	21
Adverse Drug Reaction	20
Other/Miscellaneous	16
Healthcare IT	8

0   200   400   600

Total Radiology PMSN submissions:
FY22: 1338
FY21: 1220

QUIQ-RAD ANNUAL ENTRIES

Category	Value
Abdominal Imaging	210
US QA/ QI	165
Nuclear Medicine	74
Technologist	65
Hospital/facilities/infrastructure failure	32
Staff Availability	22
IT support	20
Reading room	12
Preparation/set up problem	12
Medical records/documentation	11
Scheduling/transport	10
Kudos for job well done	10
Musculoskeletal Imaging	6
Cardiothoracic Imaging	4
Nursing	4
Imager/Scanner failure	3
Professional Conduct - unprofessional behavior	3
Neuroradiology	2
Breast Imaging	1
Accidental injuries & unexpected clinical outcomes	0

3 of the 210 submissions in the Abdominal Imaging category were entered as Radiolog
arning Opportunity Cases

Total Radiology QUIQ-RAD submissions:
FY22: 666
FY21: 639

Severity Levels

Severity	Value
A - SERIOUS EVENT - Person Harmed	0
B - Potential for Harm	10
C - Condition requiring follow-up	80
D - Could've done better	524
S - Kudos for job well done	52
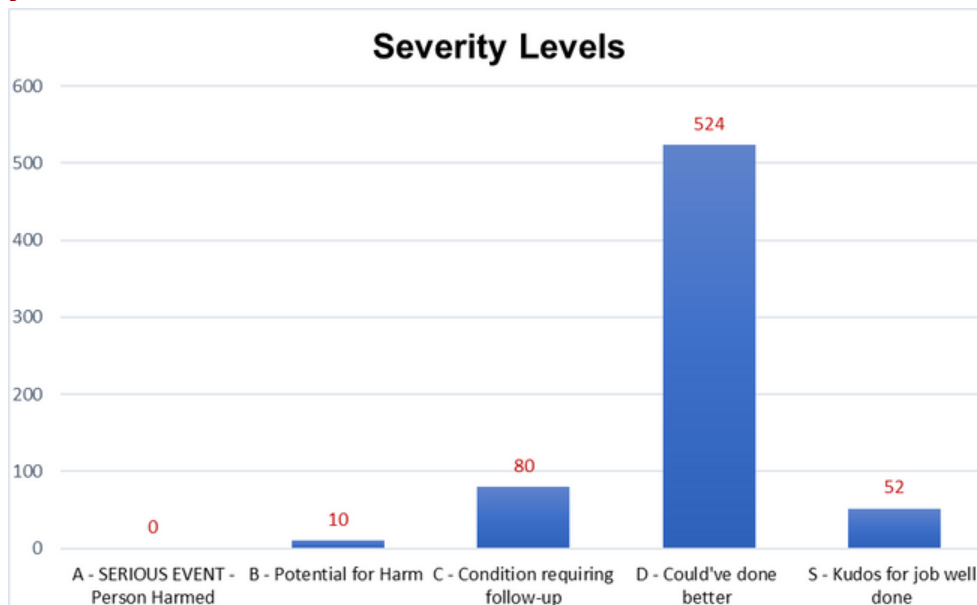
Of the 666 submissions in FY22:
All 10 of the 'potential for harm' submissions were submitted to PMSN

PENN MEDICINE RESULTS CLINIC
CENTER FOR PRACTICE TRANSFORMATION
TESSA COOK MD PHD, DARCO LALEVIC, CHARLES CHAMBERS

This collaboration between the Departments of Medicine, Surgery, ENT and Neurosurgery helps ordering providers manage imaging follow-up for patients with pulmonary nodules until non-imaging care is needed. In FY22 the service expanded to include Radnor.

GOALS/OBJECTIVES FY23 :

1. Expedite patient care and decrease adverse outcomes due to delayed lung cancer diagnoses.

2. Increase number of completed follow-ups and improve patient outcomes.

3. Improve compliance with national guidelines for managing incidental pulmonary nodules.

4. Improve access to high quality specialty pulmonary care.

Lung Nodules

(the scope is living patients who have had a LN macro requiring follow-up in a report ordered by a provider in DFMCH, Urology, Neurosurgery, or ENT since Jan 1,2020 or Radnor since July 1,2021 or DGIM since Dec 1,2021)

	Total	DFMCH	ENT	Neurosurgery	Urology	Radnor
All patients	287	109	56	73	45	4
Patients currently with unresolved follow-up	239	90	44	62	39	4
Patients currently with unresolved follow-up due	192	77	27	54	34	0
Patients followed	229	91	40	58	36	4
Patients with cancer Dx	6	1	3	2	0	0
Patients with managed care	21	0	3	11	7	0
Patients declining	9	1	0	2	6	0
Patients with messages sent to ordering provider	150	68	16	39	27	0
Patients with providers responding	119	63	15	18	23	0
(response rate)	79.33%	92.65%	93.75%	46.15%	85.19%	n/a
Patients enrolled	90	50	9	13	18	0
(enrollment rate)	75.63%	79.37%	60%	72.22%	78.26%	n/a
Patients with completed consult	93	48	11	14	16	4

e-Consults
ABDOMINAL IMAGING DIVISION
KALPANA SURESH MD

GOALS/OBJECTIVES:

1. **Provide consultations within 48 hours**
2. **Improve consultation workflow efficiency through electronic, asynchronous communication embedded within the EHR**
3. **Enhance Primary Care Provider access to radiology expertise regarding radiology orders (e.g. appropriate modality, timing) and report interpretation (e.g. next steps)**

FY22 METRICS:

1. **Expanded access from 2 downtown PCP practices to the entire Penn Primary Care service line including approximately 350 physicians and 150 APPs providers in 103 practices extending from downtown Philadelphia to Lancaster and Princeton**
2. **Expanded consult team from 1 abdominal radiologist to 6 radiologists with subspecialty expertise in MSK, nuclear medicine, women's imaging and CVI.**
3. **200 e-consults were placed, including approximately**
   - **71% from Internal Medicine and 21% from Family Medicine.**
   - **78% by physicians and 28% by APPs**
   - **16 placed by providers not located at a downtown practice**
4. **95% of consults took < 15 minutes of Radiologist time & occurred within 24 hours.**

NEXT STEPS

1. **Develop more robust automated IT workflows to triage cases to subspecialty radiologists and capture data on referring providers and consult category**
2. **Advertise the service more broadly to Primary Care Providers**
3. **Expand to Tandigm Health, a large network of suburban primary care practices**

369 E-Consults have been placed to date
200 during FY22
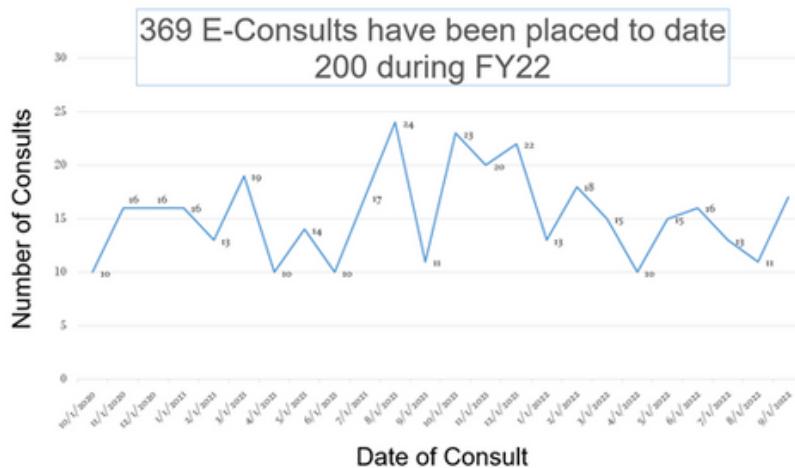
ENTERPRISE IMPROVEMENT DASHBOARD COMMITTEE

In March 2021 Radiology QI / QA and IT leads from all six UPHS hospitals and the Division of Community Radiology began co-development of an enterprise wide dashboard.

During FY22 this team co-produced along with ED stakeholders a prototype for the first dashboard measure: standardized measurement and reporting of Emergency Department / Observation Unit patient exam turnaround time defined as time from radiology exam order entry to preliminary report. This prototype measure is currently under review by UPHS leadership for dedicated IT buildout approval.

In FY23 the dashboard will be rolled out and the team will continue working on the first of two target measures to be implemented during FY23: compliance with the three most common critical values (i.e. malpositioned catheters, acute DVT, and PE). In alignment with with the Department goal of matching subspecialty expertise with imaging interpretation and the Breast Radiology Network Practice Optimization Team, the dashboard will also house metrics related to the use of BI-RADS 3 rates for diagnostic mammography, US and MRI by UPHS organization.

Through meeting bimonthly and working on these measures, the team has matured further as a learning community and begun to leverage best practices across the diversity of organizational and individual expertise represented by team members.

FY22

- ED report TAT

FY23

- Critical value compliance
- BI-RADS 3 rates

RADIOLOGY DASHBOARD PROTOTYPE

Penn Medicine Radiology

Use of BiRads Level 3 by ORG/Modality

YearRead	2022			2021		
ORGAssignment	%	N	Tot	%	N	Tot
⊟ CCH/DCR	6.08%	3694	60747	7.63%	3304	43315
MG	3.30%	1648	50007	4.02%	1445	35919
MR	8.71%	141	1618	10.05%	96	955
US	20.88%	1905	9122	27.37%	1763	6441
⊟ HUP/PAH/PPMC	5.97%	4205	70383	5.76%	2964	51500
MG	3.71%	2008	54091	3.71%	1477	39770
MR	8.92%	494	5540	9.61%	386	4017
US	15.84%	1703	10752	14.27%	1101	7713
⊟ MCP	9.44%	596	6316	10.81%	558	5160
MG	6.51%	322	4944	7.44%	310	4168
MR	28.57%	2	7	22.22%	2	9
US	19.93%	272	1365	25.03%	246	983
Total	6.18%	8495	137446	6.83%	6826	99975

IMPROVEMENT HIGHLIGHTS BY ENTITY

CHESTER COUNTY HOSPITAL

CCH BLUEPRINT

Chester County Hospital

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STRATEGIES	INITIATIVES	METRICS
DIVERSITY & EQUITY — The Department of Radiology promotes an anti-racist culture that welcomes and respects all patients by committing to recruiting and advancing a diverse workforce	Cultures of Belonging Initiative Healthy Women's Program	Employee Surveys Visits / Payments
CONTINUITY OF CARE — The Department of Radiology delivers seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation	MRI – In-Patient Prioritization IR – In-Patient Prioritization BD Nexiva™ Diffusics™ Closed IV Catheter System Radiology CDS MOR Meetings with Finance (Monthly Operating Report) NPOT Team Participation (Network Practice Optimization Team)	In-Patient Orders delay in performing In-Patient Orders delay in performing / Daily Review Infiltrates reported through Midas Orders CDS Documentation / Provider Compliance Monthly Operating Expenses Individual Group Progress on Initiatives
HIGH RELIABILITY — The Department of Radiology strives to become a high reliability organization with a focus on safety, quality and efficiency within a culture of trust and resilience	Stanley Temperature Monitoring System Downtime Documentation Review and Education – Radiology/Patient Access CCH Radiology / Patient Access / Revenue Integrity Change Control	Monthly Reporting Metrics / Automated Alerts Post Downtime Event review Individual Group Progress on Initiatives
PATIENT & STAFF ENGAGEMENT — The Department of Radiology partners with patients and families and incorporates all perspectives to achieve goals of care in a safe and respectful manner.	Radiology Invasive Procedural Time Out Review Breast Ultrasound – Add on exams Capacity Management and Staffing Plan	Time Out Documentation Order to Begin Overall Monthly Volume and Salary Expenses
INNOVATION — The Department of Radiology discovers and translates advanced care for its patients and the field of healthcare.	UPHS – Corporate Radiology Dashboard Initiative Siemens Engagement – Imaging Equipment Utilization	Individual Group Progress on Initiatives Begin to End Time (MAM and CT)

FY2022 Enterprise Improvement Highlights

Chester County Hospital Radiology Critical Values FY 2022												
Month / Year	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Active Hemorrhage	100%	100%	100%	100%	100%	100%	100%	100%	N/A	100%	100%	100%
Active Tuberculosis	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acute Intra-abdominal Hemorrhage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airway Obstruction	100%	100%	N/A	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Brain Death	N/A	N/A	100%	N/A	N/A	N/A	N/A	N/A	100%	N/A	100%	N/A
Brain Herniation	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	N/A
Cardiac Tamponade	100%	N/A	100%	100%	100%	N/A	100%	100%	100%	100%	100%	100%
Cord Compression	100%	100%	100%	100%	N/A	100%	100%	100%	100%	100%	100%	100%
Dissection	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
DVT	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Ectopic Pregnancy	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Epiglottitis	N/A	N/A	100%	100%	N/A	N/A	N/A	100%	N/A	N/A	N/A	N/A
Malposition	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Necrotizing Fasciitis	100%	N/A	N/A	N/A	N/A	N/A	100%	100%	N/A	N/A	N/A	N/A
Pneumomediastinum	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pneumoperitoneum	100%	100%	91.60%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pseudoaneurysm	100%	100%	100%	100%	100%	100%	100%	100%	100%	N/A	N/A	100%
Pulmonary Embolus	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Retained Sponge	100%	N/A	N/A	100%	N/A	100%	N/A	N/A	N/A	N/A	100%	100%
SBO	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Severe Cord Compression	100%	N/A	100%	100%	N/A	100%	N/A	N/A	N/A	N/A	100%	N/A
Tension Pneumothorax	100%	100%	100%	100%	100%	100%	100%	100%	100%	N/A	N/A	100%
Testicular/Ovarian Torsion	100%	100%	100%	100%	100%	N/A	100%	100%	100%	100%	100%	100%
Unstable Spine Fracture	N/A	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Volvulus	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	N/A
Overall Percentage	100%	100%	99.8%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Critical Values - Called to Ordering Providers	201	244	308	334	230	234	249	206	215	241	236	233
Total Critical Values - Not Called to Ordering Providers	0	0	1	0	0	0	0	0	0	0	0	0
Removed (identified in Montage DB as a critical result not called, after review, determined not to be a CV so removed from Montage DB)	372	366	307	334	290	402	396	418	436	379	365	362

CHESTER COUNTY HOSPITAL- PROCESS IMPROVEMENT INITIATIVE

Section: CCH	Chester County Hospital MRI
Project Title	Chester County Hospital In-Patient MRI Prioritization
Problem Statement	MRI Department is experiencing an increased volume of inpatient MRI. MRI department is tasked with the triage for a large number of inpatient studies when there is a high demand for MRI imaging with no current standardized process.
Blueprint ±	Continuity of Care – Deliver seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation
SMART goal*	MRI Technologist will reduce inpatient orders pending over >48 hours to <2.5% by December 2021
Quality Tools used project	• A3 • Run Chart
Metrics	• Average time to study • Studies delayed by greater than 48 hours • Huddles initated 100% of the time during high census • # patients converted to OP
Summary	This project is about prioritizing MRI studies and is important because we have an increase volume of studies based on increased patient volume with a single magnet at the hospital. The project group included representative from Radiology, Quality, Radiologists, Internal Medicine Clinicians and Finance. Project success will enable/achieve timely and appropriate inpatient imaging for patients while maintaining our level of service in turnaround time for studies. We will accomplish our goal of timely studies by reducing waste, standardizing processes for technologist's workflow, implementing processes for high volume days, and prioritizing patients. MRI Technologists and ordering clinicians will prioritize inpatient MRI orders to prevent delayed discharge through a daily huddle.
Results	 **Findings:** • A prioritization matrix resulted in guidance/support for technologist to help determine a streamlined process • Improved workflow efficiencies • Despite increased volume we were able to maintain high level of care. • Reduction in number of studies after multi-disciplinary huddle. • Potential revenue for inpatients converted to outpatients and a reduced length of stay **Lessons Learned:** • We need another magnet. This process will still be needed with another magnet when that is installed (in Fall 2022). • Expanding other revenue generating services will increase MRI volume for the second magnet and prioritization and standardization will continue to be important.
Sustainability	• Continued daily huddles when in-patient MRI orders area above a set threshold. • Continued Meeting to identify patient population that can be converted to Out-patient.

CHESTER COUNTY HOSPITAL- QAPI

Chester County Hospital / CT Department

Project Title:	*Infiltrates – New IV Closed Set - BD Nexiva™ Diffusics™ Closed IV Catheter System*
Problem Statement:	*Infiltrates during IV Contrast infussion leads to degraded study quality and can cause patient complications.*
Target State - SMART Goal:	*The radiology CT department will reduce the number of infiltrates by 90% during the CY 2022 second quarter reporting period.*
Project aligns with following UPHS quality blueprint Strategies:	*Continuity Of Care*
Sponsor/Champion	*Jason Colloton*
Data Collection Plan	*The data is collected form CCH Midas by the CCH Quality department and is provided to the Radiology Department*
Summary	*Infiltrates can happen for a variety of reasons. The Diffusics catheter tip features multiple teardrop-shaped diffusion holes to reduce injection forces enabling higher flow rates with a smaller gauge. The department will convert to 100% usage by March 2022.*

Implemented March 2022

Infiltrate/ Extravasation Events by Location	2020 Qtr1	Qtr2	Qtr3	Qtr4	Total 2020	2021 Qtr1	2021 Qtr2	2021 Qtr3	2021 Qtr4	Total 2021	2022 Qtr1	2022 Qtr2	2022 Qtr3	2022 Qtr4	Total 2022
CCH RAD FERN HILL CT Total	0	2	2	0	4	2	0	1	1	4					
CCH RAD MAIN CT Total	5	3	6	8	22	11	6	4	8	29					
CCH RAD OAKLANDS CT Total	1	1	1	2	5	0	0	0	0	0					
CCH RAD SOUTHERN CHESTER COUNTY CT Total	0	1	2	1	4	0	0	0	0	0					
Grand Total	6	7	11	11	35	13	6	5	9	33					

Year	Total CT Exams Completed with Contrast	Total Infiltrates	% of Infiltraed Doses
2020	13996	35	0.25%
2021	17195	33	0.19%
2022 (Qtr 1 and Qtr 2)			

Current IV / Extension Set Cost	$3.73
Diffusics Cost	$4.95

Outstanding: Data evaluation has not been performed post implementation / Additional training from vendor

Chester County Hospital / Mammo Department

Project Title:	*Radiology Time Out Review*
Problem Statement:	*Staff are unclear on who is responsible for documenting time in Penn Chart for invasive procedures*
Target State - SMART Goal:	*100% documentation of Patient Time Out by the Radiologist or Technologist for all invasive type procedures by August 2021.*
Project aligns with following UPHS quality blueprint Strategies:	*Patient Safety and Engagement*
Sponsor/Champion	*Kristen Alvanitakis*
Data Collection Plan	*The data is collected from Penn Chart monthly*

Time Out Documentation													
Radiologist	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
	1	0	0	0	0	0	0	0	0	0	0	0	0
	7	1	0	0	0	0	0	0	0	0	0	0	0
*NAMES REMOVED	2	6	0	0	0	0	0	0	0	0	0	0	0
	2	3	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0	0	0
	1	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total (Missed Documentation)	19	10	0	0	0	0	0	0	0	0	0	0	0
Total Exams	496	402	472	357	393	424	394	402	381	432	369	407	415
Documented Time Out	96.17%	97.51%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Updated as of 7/11/22

CHESTER COUNTY HOSPITAL-QAPI

Chester County Hospital / Radiology Department

Project Title:	Capacity Management and Staffing Plan
Problem Statement:	Out Patient volume has increased by 15% in part due to the closure of two hospitals in the CCH service area which has led to decreased scheduling exam availability
Target State - SMART Goal:	CCH Radiology leadership will provide a staffing plan to CCH Senior Leadership, maximizing weekly availability ,by modality, to meet growth by January 2022
Project aligns with following UPHS quality blueprint Strategies:	Patient & Staff Engagement
Sponsor/Champion	Colleen Scelsa / Jason Colloton / Kristen Alvanitakis/ Mike Ward
Data Collection Plan	Weekly availability rate collected from Penn Chart
Summary	CCH Radiology Leadership provided current staffing plan and modality availability to understand the staffing and budgetary needs. This was in an effort to maximize the schedulable slots on the imaging modalities. This provides a roadmap of Equipment, Staffing, and Facility needs as well as any changes to the CCH Out Patient department hours required to implement the plan by July 22

Example – CT Departments

Chester County Hospital / CT and Mammo Departments

Project Title:	Siemens Engagement – Imaging Equipment Utilization
Problem Statement:	Wide variance is observed in the entry of 'Begin exam and 'End exam' in Epic by technologists, limiting the ability of Department leadership to analyze accurate room utilization data
Target State - SMART Goal:	CT and Mammography technologists will reduce the number of inaccurate entries for 'Begin exam' and 'End exam' by 10% for CT and 6% for Mammography by April 10 2022
Project aligns with following UPHS quality blueprint Strategies:	Innovation
Sponsor/Champion	Kristen Alvanitakis / Jason Colloton
Data Collection Plan	The radiology data is collected by PennChart and provided to the Siemens TeamPlay application for data analysis

Modality	Baseline	Week 1 2/28-3/6	Week 2 3/7-3/13	Week 3 3/14-3/20	Week 4 3/21-3/27	Week 5 3/28-4/3	Week 6 4/4-4/10	Month 1 post measure 4/11-5/11
CT	21.2	19.6	14.6	21.9	20.2	18.4	18.8	18.5 (16.7 weekday only)
Mammo	8.5	3.2	3.3	2.9	1.7	2.2	2.7	3.3

CHESTER COUNTY HOSPITAL-QAPI

| Chester County Hospital / Ambulatory Care Center (ACC) - Interventional	
Project Title:	IR Physician Orders / After Visit Summary (AVS) Documentation
Problem Statement:	Ambulatory Care Center patients being preped and recovered for CCH IR were missing Pre-op Orders, Post-op Orders and AVS Information
Target State - SMART Goal:	Interventional radiologists will decrease missed documentation to less than 5% by August 2021
Project aligns with following UPHS quality blueprint Strategies:	Continuity Of Care
Sponsor/Champion	IR Nursing Staff / IR Radiologists / Ambulatory Care Center Nursing Staff
Data Collection Plan	The data is collected manually from individual Chart Review

IR Documentation Completion

► **Next Steps:**
  • Reengage team to see what progress has been made and see if there is any room for improvement

Chester County Hospital / CT Department	
Project Title:	IR Scheduling Communication Process
Problem Statement:	Radiology Interventional Radiology schedulers are moving to remote scheduling and all paper scheduling forms are to be converted to electronic format
Target State - SMART Goal:	Interventional Radiology schedulers will use electronic scheduling forms for 100% of out patients by July 2021
Project aligns with following UPHS quality blueprint Strategies:	Continuity Of Care / Innovation
Sponsor/Champion	Mike Ward / Reggie Fields
Data Collection Plan	100% of scheduled out patient procedures will be reviewed for the first 3 months

CHESTER COUNTY HOSPITAL

AWARDS

- *Julia Bartsch – Mammo Supervisor – Awarded CCH Leader of the Year.*
    - *The Leader of the Year Award is presented to the CCH team member who exemplifies the qualities we value at CCH including facilitating the delivery of the highest quality, compassionate care and services to our patients, fiscally responsible use of resources, and a collaborative and inclusive team approach.*

- *Certificate of Recognition*
    - *2022 I Am Patient Safety Award -Time-Outs*
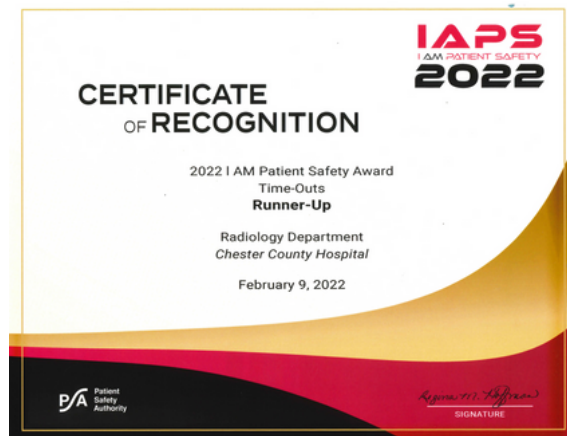
DIVISION OF COMMUNITY RADIOLOGY

DCR BLUEPRINT

Penn Medicine – Division of Community Radiology

ONE PENN MEDICINE

STRATEGIES	INITIATIVES	METRICS
DIVERSITY & EQUITY — The Department of Radiology promotes an anti-racist culture that welcomes and respects all patients by committing to recruiting and advancing a diverse workforce	Workplace Violence training	Staff to attend building specific training sessions as well as Knowledge Link tutorials
	We have a very diverse workforce in DCR and always follow the UPHS HR policy of hiring — All staff are encouraged to participate in many new Knowledge Link courses in addition to required educational courses — Staff are always encouraged to utilize EAP/Penn Cobalt if needed	
CONTINUITY OF CARE — The Department of Radiology delivers seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation	Ceiling mounted lift installed in Cherry Hill	Installed for safety to insure that staff could safely move patients from wheelchair/stretcher to the MRI table and/or stretcher for care in any modality
	IV training for General Rad Techs	Training additional staff members so that in case of an emergency, we are not limited to a MRI/CT tech if access is needed
HIGH RELIABILITY — The Department of Radiology strives to become a high reliability organization with a focus on safety, quality and efficiency within a culture of trust and resilience	SIMS Training for Emergency Management	Bi-annual training to insure we all know our roles, and that we work as a cohesive team during a medical emergency. Goal is to hold SIMS in each modality quarterly (new modality each quarter)
	N95 Fit Testing	Each office identified Super Users who were training and able to perform fit testing annually
PATIENT & STAFF ENGAGEMENT — The Department of Radiology partners with patients and families and incorporates all perspectives to achieve goals of care in a safe and respectful manner.	Modality Ambassadors — Healthy Lung Program — Falls Project — Smoking Cessation	
INNOVATION — The Department of Radiology discovers and translates advanced care for its patients and the field of healthcare.	Paperless 5 Minute drills — IV training — ALS/BLS Subject Matter Experts for training	

DIVISION OF COMMUNITY RADIOLOGY

DASHBOARD -RADNOR FY22

	FY21 Q3 Baseline	FY22 Goal	1 Qtr	2 Qtr	3 Qtr	4 Qtr	Source
CLINICAL QUALITY							
Press Ganey Radiology Outpatient Scores			Radiology	Radiology	Radiology	Radiology	PressGaney
1. Ease of Registration Process	96.6	96.6	96.5	97.0	96.8	96.5	PressGaney
2. Waiting time in registration	95.1	95.1	95.2	96.1	96.1	96.1	PressGaney
3. Helpfulness of person scheduling	96.6	96.6	96.3	96.9	96.7	96.3	PressGaney
4. Cleanliness of facility	97.5	97.5	97.5	97.7	97.6	97.6	PressGaney
5. Explanations given by staff	96.4	96.4	96.8	97.1	96.9	96.8	PressGaney
6. Our sensativity to your needs	95.9	95.9	96.3	96.4	96.7	96.6	PressGaney
7. Saw staff clean hands before caring	96.2	96.2	96.7	95.9	96.8	96.8	PressGaney
8. Likelihood of Recommending	97.6	97.6	97.6	97.6	98.3	97.9	PressGaney
9. Overall Radiology Outpatient Score	96.2	96.2	96.6	96.9	97.0	96.8	PressGaney
QUALITY INDICATORS							
1. Completed exam to final report DCR median		<6 hrs	3hr 9min	3hr 12min	2hr 32min	2hr 42min	PC
2. Screening Mammogram Imaging Recall Rate		<10%	8.60%	8.90%	8.00%	9.90%	PC

	FY22 Goal	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
3. CT contrast injection extravasation - number of events	0	1	2	0	1	1	1	0	0	0	0	2	1	Safety Net
4. CT contrast injection extravasation - Percentage	0.00%													Safety Net
5. MRI contrast injection extravasation - number of events	0	0	0	1	0	1	0	0	0	0	1	0	1	Safety Net
6. MRI contrast injection extravasation - Percentage	0.00%													Safety Net
7. Wrong provider selected (HIPAA Violation)	0	1	1	0	0	0	0	0	1	0	0	0	0	Safety Net
8. Wrong provider selected (Not HIPAA Violation)	0	1	2	1	1	1	3	3	0	0	1	1	1	Safety Net
9. Safety Net Entries		17	20	20	16	15	23	19	13	14	24	22	37	Safety Net
10. Falls		0	1	1	1	0	0	0	0	0	1	0	2	Safety Net
11. Montage Critical Result Tracking	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	Montage
ACCESS														
Unserved > 10 seconds	>10%	7%	6%	9%	18%	14%	6%	7%	3%	5%	6%	4%	1%	Radiology
PI MONITORS														
Reception: Check-In to Begin time Median	<13 min	11min	12min	12min	12min	12min	12min	11min	11min	11min	10min	11min	11min	PC

DASHBOARD -VALLEY FORGE FY22

	FY21 Q3 Baseline	FY22 Goal	1 Qtr	2 Qtr	3 Qtr	4 Qtr	Source
CLINICAL QUALITY							
Press Ganey Radiology Outpatient Scores			Radiology	Radiology	Radiology	Radiology	PressGaney
1. Ease of Registration Process	97.1	97.1	97.7	97.2	97.3	97.5	PressGaney
2. Waiting time in registration	96.1	96.1	95.6	95.3	95.3	95.8	PressGaney
3. Helpfulness of person scheduling	97.4	97.4	97.0	96.9	97.3	97.1	PressGaney
4. Cleanliness of facility	96.5	96.5	97.3	96.8	97.1	97.2	PressGaney
5. Explanations given by staff	97.1	97.1	97.1	96.9	96.7	96.3	PressGaney
6. Our sensativity to your needs	96.6	96.6	96.7	96.7	96.5	96.9	PressGaney
7. Saw staff clean hands before caring	96.2	96.2	96.5	96.6	96.5	97.1	PressGaney
8. Likelihood of Recommending	97.4	97.4	98.1	97.6	97.8	97.8	PressGaney
9. Overall Radiology Outpatient Score	96.7	96.7	97.2	96.7	96.8	96.9	PressGaney
QUALITY INDICATORS (Additional)							
1. Completed exam to final report DCR median		<6 hrs	3hr 54min	3hr 38min	2hr 58min	2hr 46min	Radiology
2. Screening Mammogram Imaging Recall Rate		<10%	6.70%	6.30%	7.10%	9.10%	PC

	FY22 Goal	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
3. CT contrast injection extravasation - number of events	0	0	0	0	0	0	0	0	0	0	1	0	1	Safety Net
4. CT contrast injection extravasation - Percentage	0.00%													Safety Net
5. MRI contrast injection extravasation - number of events	0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net
6. MRI contrast injection extravasation - Percentage	0.00%													Safety Net
7. Wrong provider selected (HIPAA Violation)	0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net
8. Wrong provider selected (Not HIPAA Violation)	0	0	0	0	0	0	1	0	0	0	1	3	1	Safety Net
9. Safety Net Entries		6	4	2	1	14	11	5	5	5	9	4	10	Safety Net
10. Falls		0	0	1	1	0	1	0	1	0	1	1	0	Safety Net
11. Montage Critical Result Tracking	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	Montage
ACCESS														
Unserved > 10 seconds	>10%	8%	9%	9%	18%	13%	6%	7%	4%	5%	6%	4%	1%	Radiology
PI MONITORS														
Reception: Check-In to Begin time Median	<10 min	5min	5min	6min	5min	5min	5min	4 min	4 min	5min	5min	5min	4 min	Radiology

DIVISION OF COMMUNITY RADIOLOGY

DASHBOARD -BUCKS FY22

	FY21 Q3 Baseline	FY22 Goal		1 Qtr		2 Qtr		3 Qtr		4 Qtr	Source
CLINICAL QUALITY											
Press Ganey Radiology Outpatient Scores				Radiology		Radiology		Radiology		Radiology	PressGaney
1. Ease of Registration Process	96.7	96.7		97.1		96.5		96.7		97.5	PressGaney
2. Waiting time in registration	96.1	96.1		96.3		95.8		95.6		96.5	PressGaney
3. Helpfulness of person scheduling	96.8	96.8		96.8		95.8		96.6		97.0	PressGaney
4. Cleanliness of facility	96.1	96.1		95.9		96.2		95.5		95.9	PressGaney
5. Explanations given by staff	96.0	96.0		95.7		95.0		95.3		95.6	PressGaney
6. Our sensitivity to your needs	96.4	96.4		95.5		95.1		95.4		96.0	PressGaney
7. Saw staff clean hands before caring	96.0	96.0		95.1		95.5		95.2		96.2	PressGaney
8. Likelihood of Recommending	97.2	97.2		96.9		96.9		97.2		97.6	PressGaney
9. Overall Radiology Outpatient Score	96.2	96.2		96.0		95.7		95.8		96.4	PressGaney
QUALITY INDICATORS (Additional)											
1. Completed exam to final report DCR median		<6 hrs		4hr 20min		4hr 38min		4hr 21min		4hr 18min	PC
2. Screening Mammogram Imaging Recall Rate		<10%		11.10%		9.00%		9.10%		9.70%	PC

	FY21 Q3 Baseline	FY22 Goal	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
3. CT contrast injection extravasation - number of events		0	2	1	1	0	1	2	0	0	0	1	2	1	Safety Net
4. CT contrast injection extravasation - Percentage		0.00%													Safety Net
5. MRI contrast injection extravasation - number of events		0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net
6. MRI contrast injection extravasation - Percentage		0.00%													Safety Net
7. Wrong provider selected (HIPAA Violation)		0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net
8. Wrong provider selected (Not HIPAA Violation)		0	2	1	1	0	2	1	2	0	3	1	5	0	Safety Net
9. Safety Net Entries			3	5	3	1	2	3	4	0	2	4	5	6	Safety Net
10. Falls			0	1	0	1	0	0	0	0	0	1	0	1	Safety Net
11. Montage Critical Result Tracking		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	Montage
ACCESS															
Unserved > 10 seconds		>10%	0%	0%	2%	2%	2%	2%	10%	0%	0%	8%	0%	0%	Radiology
PI MONITORS															
Reception: Check-In to Begin time Median		<10 min	6min	7min	8min	7min	8min	7min	7min	7min	6min	6min	6min	6min	PC

DASHBOARD - WOODBURY FY22

	FY21 Q3 Baseline	FY22 Goal		1 Qtr		2 Qtr		3 Qtr		4 Qtr	Source
CLINICAL QUALITY											
Press Ganey Radiology Outpatient Scores				Radiology		Radiology		Radiology		Radiology	PressGaney
1. Ease of Registration Process	97.3	97.3		97.3		98.2		96.9		96.5	PressGaney
2. Waiting time in registration	96.2	96.2		96.8		97.5		95.5		94.5	PressGaney
3. Helpfulness of person scheduling	97.1	97.1		96.9		97.5		96.7		96.9	PressGaney
4. Cleanliness of facility	97.6	97.6		97.8		98.4		97.7		97.9	PressGaney
5. Explanations given by staff	96.3	96.3		97.5		97.8		96.5		97.4	PressGaney
6. Our sensitivity to your needs	95.7	95.7		97.2		97.7		96.1		97.0	PressGaney
7. Saw staff clean hands before caring	96.7	96.7		97.5		97.0		97.1		96.9	PressGaney
8. Likelihood of Recommending	98.3	98.3		98.4		98.1		97.1		97.6	PressGaney
9. Overall Radiology Outpatient Score	96.4	96.4		97.5		97.7		96.5		96.7	PressGaney
QUALITY INDICATORS (Additional)											
1. Completed exam to final report DCR median		<6 hrs		2hr 15min		2hr 32min		1hr 55min		1hr 31min	PC
2. Screening Mammogram Imaging Recall Rate		<10%		6.80%		9.50%		10.80%		9.50%	PC

	FY21 Q3 Baseline	FY22 Goal	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
3. Wrong provider selected (HIPAA Violation)		0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net
4. Wrong provider selected (Not HIPAA Violation)		0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net
5. Safety Net Entries			1	0	0	0	0	0	1	0	0	0	1	0	Safety Net
6. Falls			0	0	0	0	0	0	0	0	0	0	0	0	Safety Net
7. Montage Critical Result Tracking		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	Montage
PI MONITORS															
Reception: Check-In to Begin time Median		<10 min	8min	6min	5min	7min	8min	8min	7min	10 min	11 min	14 min	8min	8min	Radiology

DIVISION OF COMMUNITY RADIOLOGY

DASHBOARD -CHERRY HILL FY22

	FY21 Q3 Baseline	FY22 Goal			1 Qtr			2 Qtr			3 Qtr			4 Qtr	Source
CLINICAL QUALITY															
Press Ganey Radiology Outpatient Scores					Radiology			Radiology			Radiology			Radiology	PressGaney
1. Ease of Registration Process	96.0	96.0			96.3			96.3			96.3			96.8	PressGaney
2. Waiting time in registration	95.3	95.3			95.2			95.7			94.9			96.2	PressGaney
3. Helpfulness of person scheduling	95.4	95.4			95.8			95.7			96.3			96.7	PressGaney
4. Cleanliness of facility	97.4	97.4			96.9			97.2			97.0			97.6	PressGaney
5. Explanations given by staff	96.0	96.0			95.4			96.2			96.3			96.8	PressGaney
6. Our sensativity to your needs	96.0	96.0			95.4			96.2			96.3			96.7	PressGaney
7. Saw staff clean hands before caring	96.1	96.1			95.4			95.9			96.2			96.5	PressGaney
8. Likelihood of Recommending	97.2	97.2			97.0			97.4			97.6			97.8	PressGaney
9. Overall Radiology Outpatient Score	96.3	96.3			95.8			96.3			96.3			96.8	PressGaney
QUALITY INDICATORS (Additional)															
1. Completed exam to final report DCR median		<6 hrs			4hr 7min			4hr 2min			3hr 23min			3hr 34min	PC
2. Screening Mammogram Imaging Recall Rate		<10%			8.80%			9.80%			9.90%			10.30%	PC

		Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
3. CT contrast injection extravasation - number of events	0	3	0	0	0	1	0	1	1	1	1	1	1	Safety Net
4. CT contrast injection extravasation - Percentage	0.00%													Safety Net
5. MRI contrast injection extravasation - number of events	0	0	0	0	0	1	0	0	0	0	1	1	0	Safety Net
6. MRI contrast injection extravasation - Percentage	0.00%													Safety Net
7. Wrong provider selected (HIPAA Violation)	0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net
8. Wrong provider selected (Not HIPAA Violation)	0	0	1	0	1	1	0	1	0	1	0	0	1	Safety Net
9. Safety Net Entries		6	5	1	2	8	0	3	4	4	8	3	7	Safety Net
10. Falls		0	1	0	0	1	0	0	0	0	0	0	0	Safety Net
11. Montage Critical Result Tracking	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	Montage
ACCESS															
Unserved > 10 seconds	>10%	6%	7%	8%	5%	4%	2%	4%	4%	9%	15%	15%	13%	Radiology
PI MONITORS															
Reception: Check-In to Begin time Median	<13min	14min	14min	14min	15min	14min	15min	13 min	14min	13 min	12min	12min	13 min	PC

DASHBOARD - DCR EXTRAVASATIONS FY22

Radnor

			Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
CT contrast injection extravasation - number of events		0	1	2	0	1	1	1	0	0	0	0	2	1	Safety Net
MRI contrast injection extravasation - number of events		0	0	0	1	0	1	0	0	0	0	1	0	1	Safety Net

Valley Forge

			Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
CT contrast injection extravasation - number of events		0	0	0	0	0	0	0	0	0	0	1	0	1	Safety Net
MRI contrast injection extravasation - number of events		0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net

Bucks

			Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
CT contrast injection extravasation - number of events		0	2	1	1	0	1	2	0	0	0	1	2	1	Safety Net
MRI contrast injection extravasation - number of events		0	0	0	0	0	0	0	0	0	0	0	0	0	Safety Net

Cherry Hill

			Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Source
3. CT contrast injection extravasation - number of events		0	3	0	0	0	1	0	1	1	1	1	1	1	Safety Net
5. MRI contrast injection extravasation - number of events		0	0	0	0	0	1	0	0	0	0	1	1	0	Safety Net

FY2022 Enterprise Improvement Highlights

Project Charter Title: Falls Prevention Taskforce

Problem/Opportunity Statement

CPUP has seen an increase in patient falls with injury reported in the ambulatory setting. These events often lead to physical harm, unplanned hospitalization and rehabilitation for our patients. Patient falls is one of our key ambulatory safety priorities defined by ECRI as well as a nurse sensitive outcome. Developing a Falls Prevention Program in ambulatory is imperative for patient safety.

Fall definition: An event involving a sudden, unintended, uncontrolled, downward displacement of a patient's body to the ground or other object. This definition includes an assisted fall - when patient begins to fall and is assisted to the ground by another person.

Business Impact

- FY21 v. FY22 falls data (see fall section on dashboards for each division)

Project Scope

- In scope: CPUP, PMMG
- Out of scope: All other UPHS

Project Milestones FY21

- Define and organize task force
- Develop task force subgroups
- Align best practices across divisions
- Develop ambulatory fall risk practice interventions
- Standardize fall prevention work flows

Success Metrics

Process Metrics:
- Reduction in falls, reduction in high harm score falls *E or higher* in Safety Net entries
- SMART Goal- 0 Falls by the end of June 2022.
- Success is measured in Safety Net entries: falls by harm score, falls by department
- REDCAP survey completed by staff member after falls occur for investigation purposes.
- Completed Pilot within Neurology, Radiation Oncology and Hem Onc that overall only 1 fall occurred in July 2021
- Expanding Pilot to include Radnor Radiology and Central Registration/Radnor Common Grounds.

Team
- Executive Sponsors: Barb Prior, Vivek Ahya, Ilona Lorincz
- Champion: Patti Macolino, Becki Fitzpatrick, Angela Miller
- Leaders: CPUP DONs - Kate Gray, Kristen McCabe, Nicole McClintock
- Facilitator: Katie Fox
- Team Members: Marilyn Lupus, Lisa Mills, Denise McDonald, Edna Volz, Kathleen Bailer, Betty Ann Boczar, Ethan Kannel, Florence Vanek, Molly Wolff, Tanya Weston, Annelies Pfeiffer Wood, Cori McLaughlin, Katie Hunter, Allison Benziger, Leticia Pendleton, Mary Harnish, Erik Vos, Susanne Wiborg, Elise Brownmiller, Monica Garton, Ashley Bucceli, Joanne Callahan, Deb Cerceo, Angela Shakarjian, Sonya Wood, Patty Paulley, Keah Buck
- Data Support: Katie Fox; Data Source: PMSN (count), Penn Diver (visit volume)

Radiology- Cat Scan Contrast Shortage

Problem/Opportunity Statement

CT contrast supply chain shortage of Omnipaque at CCH; DCR; HUP; PMC. New protocols needed to be created to match the lesser amount of contrast given to achieve a proper diagnosis.

Opportunity to adjust CCH-CT technologist scheduled locations to condense patient scheduled appointments to Radnor & Valley Forge CT units.

Target State: SMART Goal

- Adjust all CT protocols on the scanners with 20% less contrast by by 5/30/22 to minimize patient care delays at these specific sites.

Project Scope

- In scope: CCH; DCR; HUP; PMC Radiology Division
- Out of scope: All other UPHS

Analysis

Key Drivers

- Create new CT protocols that give 20% less contrast
- Consolidate the patient schedule from 3 to 2 sites for patients with contrast protocols

Interventions / Countermeasures

- Rad associates collaborated developing a new set of protocols that will proved a proper diagnosis with less contrast given.
- CCH outpatients CT scans were scheduled at Radnor and Valley Forge. The CCH technologists traveled to those sites to help with increased volume of patients receiving contrast.

Sustain Plan

Activity to sustain	Owner	Sustain method and frequency
Weekly meeting with all UPHS radiology administration to assess workflow status	Mary Jane Casey Colleen Scelsa	In EPIC -Blocked room schedules to CCH and schedule CT with contrast to other DCR sites. This initiative minimizes patient care delays.

CCH CASES

BUCKS Radiology- Workplace Active Violence/Active Shooter Training

Problem/Opportunity Statement

Not all Buck staff members are currently trained for an active shooter situation. All our staff are not prepared mentally and/or physically to deal with an active shooter situation that often occurs within a 10-15 minute duration.

Opportunities include: an emergency action plan (WAP) needs to be created and scheduled/conduct training exercises are needed to prepare staff to effectively respond and help minimize loss of life.

Target State: SMART Goal

- Train all Bucks staff with the Lower Makefield Township Police Department by June 30, 2022.

Project Scope

- In scope: DCR Bucks Radiology Division
- Out of scope: All other UPHS

Analysis

Key Drivers

- Emergency Action Plan (EAP) needs to involve several stakeholders
- Develop Training exercises

Interventions / Countermeasures

- Representative form human resource department, managers, local law enforcement responder were involved in evacuation policy, emergency escape procedures- escape route plans, emergency notification system configured.
- Developed mock active shooter training exercises with local law enforcement.

Sustain Plan

Activity to sustain	Owner	Sustain method and frequency
Annual mock sessions completed to include new hires	Sgt.Kurt Bradley/Bucks practice manager	Annually review: Awareness of possible dangers and environment. Know where 2 closets exists are located. Know how to secure door. Knowing when to attempt to take down an active shooter.

Tools and Training:

- Recognizing potential workplace violence
- tips and insight using the A.L.I.C.E training method:
  Alert.**L**ockdown.**I**nform.**C**ounter.**E**vacuate
- how to respond when an active shooter is in your vicinity
- how to respond when law enforcement arrives
- managing the consequences of an active shooter situation

DIVISION OF COMMUNITY RADIOLOGY- RADNOR QAPI

Radnor Radiology Cat Scan Department QAPI FY 2022

Project Title:	*Increase the Volume Percentage of CT Growth for Radnor Radiology*
Problem Statement:	• *Underutilizatoin of Pennchart Autoscheduling process for CT Coronary Artery exams.* • *Lack of patient appointment access for 2 neuro CT exams at Radnor Radiology facility.*
Project Goals/Objectives:	• *Optimize scheduling via Pennchart build that allows for efficiently autoscheduling CT Coronary Artery exams. Collaboration efforts with Dr. Boone and block scheduling.* • *Add 2 additional CT Head exams/services for DBS planning and HIFU planning that increases volume.* • *Surpass the 29% (YOY Comp) budgeted volume by the end of June 2022.*
Aligns with HUP Entity Goal:	• *Continuity of care • Patient and Staff engagement*
Sponsor/Champion	*Denise McDonald, Patient Quality/Safety, MaryJane Casey, Director of Radiolgoy*
Data Collection Plan/ Results	*CT Manager collects data monthly via Pennchart (EPIC).* *Results showed a 29% (YOY Comparison) to 36% Annual Growth(budget comparison)*

Radnor Radiology Nuclear Medicine Department QAPI FY 2022

Project Title:	*Increase the Volume Percentage of NM Growth for Radnor Radiology*
Problem Statement:	• *Underutilizatoin of Pennchart Autoscheduling due to inconsistent exam room templates.* • *Lack of patient appointment access for several NM exams at Radnor Radiology facility.*
Project Goals/Objectives:	• *Optimize autoscheduling via Pennchart revision of the radiology room templates based on exam codes.* • *Add 4 additional NM exams/services that includes: DaT scan, Lung Spect CT Scan, Cardiac Amyloid Spect CT, Melanoma Sentinel Node Study that increases volume.*
Aligns with HUP Entity Goal:	• *Continuity of care • Patient and Staff engagement*
Sponsor/Champion	*Denise McDonald, Patient Quality/Safety, MaryJane Casey, Director of Radiolgoy*
Data Collection Plan/ Results	*NM Manager collects data monthly via Pennchart (EPIC).* *Results showed a 34% (YOY Comparison) to 35% Annual Growth(budget comparison)*

Radnor Radiology MRI Department QAPI FY 2022

Project Title:	*Increase the Volume Percentage of MRI Growth for Radnor Radiology*
Problem Statement:	• *Underutilizatoin of Pennchart Autoscheduling due to inconsistent exam room templates.* • *Lack of patient appointment access for several MRI exams at Radnor Radiology facility.*
Project Goals/Objectives:	• *Optimize autoscheduling via Pennchart revisions of the radiology room templates based on exam codes.* • *Add 7 additional MRI exams/services that includes: HIFU Brain, DBS Brain, Lumbar plexus, Sacral Plexus, Liver Labs/Ferriscan, Elastography and Rectal exams.* • *Future initiatives to providing more services to patients with Pacemakers and other electronic conditional devices to move toward exceeding budget.* • *Surpass the 34% (YOY Comp) budgeted volume by the end of June 2022.*
Aligns with HUP Entity Goal:	• *Continuity of care • Patient and Staff engagement*
Sponsor/Champion	*Denise McDonald, Patient Quality/Safety, MaryJane Casey, Director of Radiolgoy*
Data Collection Plan/ Results	*MRI Manager collaborated with Siemens teamplay to collect data monthly. Although Siemens teamplay reports show our MRI room occupancy is 90-115% utilized our overall budget results showed our 34% (YOY comparison) to -9% annual growth (budget comparison). This is pending the inclusive pacer/conditional device volume.*

DIVISION OF COMMUNITY RADIOLOGY- RADNOR QAPI

Radnor Radiology Mammography Department QAPI FY 2022

Project Title:	*Increase the Volume Percentage of Mammo Growth for Radnor Radiology*
Problem Statement:	• *Underutilizatoin of evening/weekend schedule due to lack of external staffing interests.* •*Lack of protocol standarization causing patient care delays due to staff confusion/frustration throughout the day.* •*Lack of employee workflow standardization including employee structure and accountability.*
Project Goals/Objectives:	•*Cross training new general x-ray technologists in mammo that were recently hired. All existing staff and new hires will work 2 evenings p/week. Goal to operate 3 Mammo units until 8pm, 4nights p/week and 2 units on Saturdays by June 2022.* •*Radiologists established 18 standard protocols the the team refers to for guidance, >60 second decision tree.* •*Created a tag team approach in our patient throughput that engages postive efficient workflow if a radiologist is reviewing their cases minimizing technologists down time.* •*Surpass the 13% (YOY Comp) budgeted volume by the end of June 2022.*
Aligns with HUP Entity Goal:	• *Continuity of care • Patient and Staff engagement*
Sponsor/Champion	*Denise McDonald, Patient Quality/Safety, MaryJane Casey, Director of Radiolgoy*
Data Collection Plan/ Results	*Mammo Manager reviews Pennchart data and has team huddles to address weekly workflow concerns. Budget results showed our 13% (YOY comparison) to -6% annual growth (budget comparison). This is pending the filling of multiple vacancies- with the current volume we are assessing patient experinece via Press Ganey.*

Radnor Radiology PSA Department QAPI FY 2022

Project Title:	*PMR PSA Staff development in Radnor Radiology*
Problem Statement:	• *Central Check-in team are inappropriately arriving patients without the appropriate scripts, with the correct providers, completing cash collections and/or updating status of patient in patient progression in Pennchart-EPIC.*
Project Goals/Objectives:	•*Created a 2 hour training course and quick guides to support the PMR Central registration better. Tipsheets include the differences in the Radiology check in process versus the Provider based check in process to minimize confusion.* •*All PMR Central check in employees will complete course by June 31, 2022.* •*A Microsoft "Teams" instant messaging system has been set up for Central Registration managers to communicate immediate registration mishaps that supports real-time PSA education and feedback.*
Aligns with HUP Entity Goal:	• *Continuity of care • Patient and Staff engagement*
Sponsor/Champion	*Denise McDonald, Patient Quality/Safety, MaryJane Casey, Director of Radiolgoy*
Data Collection Plan/ Results	*Radiology Manager manually reviews Pennchart-Epic registration data process and monitors mishaps monthly. All the current PSAs completed the training class by the end of June 2022.*

Radnor Radiology Scheduling Department QAPI FY 2022

Project Title:	*Internal Medicine Scheduling Collaboration in Radnor Radiology*
Problem Statement:	• *Internal medicine department sends a high volume of patient to the Radnor registration desk to schedule future radiology appointments or same day addon radiology appointments. This delays the exisitng patients that are scheduled to be efficiently checked in for their current appointment.*
Project Goals/Objectives:	•*Radiology met with Intermedicine (IM) leaders to offer assistance in developing the IM team to schedule their patients radiology appointments. The IM team was provided access and quick rad scheduling guides for reference to Pennchart Radiology scheduling* •*All IM schedulers will complete training including quick guide references by June 31, 2022.* •*A Microsoft "Teams" instant messaging system has been set up for the IM team to communicate with the Rad Central Registration to address any further questions/concerns while scheduling their patients.*
Aligns with HUP Entity Goal:	• *Continuity of care • Patient and Staff engagement*
Sponsor/Champion	*Denise McDonald, Patient Quality/Safety, MaryJane Casey, Director of Radiolgoy*
Data Collection Plan/ Results	*Radiology Manager manually audits registration workflow with patient registration turnaround times. All the current IM schedulers completed the training by the end of June 2022.*

DIVISION OF COMMUNITY RADIOLOGY- VALLEY FORGE QAPI

Division of Community Radiology / Valley Forge Office

Project Title:	*Improve MRI Schedule Template*
Problem Statement:	*Needed to reduce wait time to get a Breast MRI from 28 days out.*
Target State - SMART Goal:	*Re-structured Breast MRI scheduling template to perform all breast MRI cases in a designated schedule block.*
Project aligns with following UPHS quality blueprint Strategies:	*Patient & Staff engagement / High Reliability / Continuity of Care*
Sponsor/Champion	*Melissa Fink, Administrator Practice Ops*
Data Collection Plan	*Melissa Fink, Administrator Practice Ops*

METRICS:
November, 2021 – First week of Nov prior to this change, first avail for a Breast MRI was 28 days out
June, 2022 – First week of June, 6 months post change, first avail for a Breast MRI was 12 days out
Max number of days out for first avail since making changes has been 16 days out

Division of Community Radiology / Valley Forge Office

Project Title:	*Increasing Mammo Volume*
Problem Statement:	*We have a need to adjust mammo schedule to try and reduce screening wait time from first available at 54 days.*
Target State - SMART Goal:	*Manager & Mammo team will evaluate schedules, exam durations, templates and staffing plans*
Project aligns with following UPHS quality blueprint Strategies:	*Continuity of Care / Patient & staff engagement*
Sponsor/Champion	*Melissa Fink, Administrator Practice Ops*
Data Collection Plan	*Melissa Fink, Administrator Practice Ops*

Measure FY22- Metric	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Total Screenings	304	329	299	314	416	471	392	432	391	296	306	341

Early October 2021 – First avail for Screening mammo is 54 days out

End of October 2021 – Durations of screening mammograms were changed from 30 min to 15 min and 54 additional patient slots per week (Mon-Sat) were opened up
No additional staff hired, just adjusted staffing schedules to facilitate the necessary coverage

*Per marketing team, drop in April volume is a known annual dip in volume during this time period for the VF office across all modalities

Even with the dip in April 2022, the total screenings is still up compared to April 2021 (226 screenings)

August 2022 – First avail for Screening mammo is SAME DAY!

Division of Community Radiology / Valley Forge Office

Project Title:	*N95 Fit testing for all DCR sites*
Problem Statement:	*Annual fit testing was not being performed in suburban sites*
Target State - SMART Goal:	*Dan Realbuto came out to each of our sites and trained two super-users to be able to perfrom annual fit testing*
Project aligns with following UPHS quality blueprint Strategies:	*Patient & Staff engagement / High Reliability*
Sponsor/Champion	*All site managers/Mary Jane Casey/Dan Realbuto/Denise McDonald*
Data Collection Plan	*Melissa Fink, Administrator Practice Ops*

DIVISION OF COMMUNITY RADIOLOGY

FY22-FY23 QI/QA ONGOING PROJECTS
PRESS GANEY:

1. *Ease of registration.*
2. Helpfulness of person scheduling.
3. *Wait time in registration.*
4. Cleanliness of facility.

DCR SITES ONGOING PROJECTS:

1. *Failed fax monitoring*
   - *Radiology failed faxes include DCR, CCH, HUP, PPMC, PAH*
   - *Work closely with Penn Spot & Right fax teams to ensure efficient turnaround on issues and tickets with updates to provider profiles*
   - *Average of 20 failed faxes per day*
2. *Critical Result Tracking via Montage*
   - *Worked monthly*
   - *Started recording on Quality Dashboard in FY22*
   - *Working on Enterprise team for Critical Result dashboard*
3. *Safety Net Entries*
   - *Each entry is reviewed and discussed with staff if needed*
   - *Monitored to ensure tickets are closed in a timely manner*
   - *Reported out to managers and Task Force monthly with breakdown of topics*
   - *Trends investigated (extravasations, falls, pt complaints, etc)*
   - *C-Status report- review daily report including read reports within 24hrs.*
   - *TJC Task force that includes liaisons responsible for auditing division tasks*

CHERRY HILL ONGOING PROJECTS:

1. *Ceiling Mounted Lift*
   - *one on one training for all staff on the ceiling mounted lift that was installed in MRI.*
   - *this was installed for safety to insure that staff could safely move patients from wheelchair/stretcher to the MRI table and or stretcher for care in any modality*
2. *SIMS Training*
   - *Bi-annual SIMS training for emergency management.*
   - *this training helps to insure that all staff know their roles and that*
   - *they work as a cohesive team during an emergency situation.*
   - *In the process of developing a plan to hold min-SIMS in each modality quarterly.*
3. *Venipuncture training*
   - *IV training for General Rad techs*
   - *with this training, we are not limited to an MRI/CT tech if access is needed*
4. *Oral Contrast*
   - *continued work with the water soluble oral contrast for CT*
5. *iStat*
   - *iStat training for all MRI techs*

DIVISON OF COMMUNITY RADIOLOGY

Root Cause Analysis (RCA):
An RCA is an in-depth review of a serious event that has resulted in harm and/or poses a serious threat to safety. Such events include sentinel events, never events and recurrent events that have previously resulted in multiple apparent cause analyses. The review is performed by a multidisciplinary team, led by a formally trained facilitator, and involves a designated methodology and templates. The review seeks to identify the underlying root cause(s) of the event and develop a formal measurable corrective action plan(s) as appropriate. When appropriate, a specific RCA may involve the review of more than one event. One RCA was completed in FY22.

GOOD CATCH AWARDS FY22

- *Jaclyn Rissling–MRI technologist- Excellent patient care skills with aborting an MRI scan due to metal artifact in the image preventing any harm to the patient. October 2021.*

- Jessica Mele, Michelle Huggett, Susan Stenkomph- MRI technologists- Incidental SDH finding seen/reported and the team patiently awaited for EMT to transfer patient to the ER. July 2021.

- Grace Garcia- CXR completed- Grace called provider based on patient history to clarify CT Chest exam would be best for PE. Provider order STAT CT Chest that the team was able to do same day. The CT Chest was positive for multiple emboli- patient was sent to the ER. August 2022.

- Brittany Bailey- CT Chest completed that Brittany called radiologist to review and confirmed patient had a positive PE diagnosis. Radiologist deferred patient to the ER (EMT escorted patient to the ER). August 2022.

LANCASTER GENERAL HOSPITAL

Lancaster General

STRATEGIES	INITIATIVES	METRICS
DIVERSITY & EQUITY — The Department of Radiology promotes an anti-racist culture that welcomes and respects all patients by committing to recruiting and advancing a diverse workforce	Provide education to staff about the importance of providing language assistance to all non-English speaking patients	% of compliance (chart audits)
CONTINUITY OF CARE — The Department of Radiology delivers seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation	• Meet CT Stroke Alert turnaround time (TAT) • Meet CT Act Alert TAT • Create an outpatient experience for hydration patients	TAT in minutes TAT in minutes # of patients
HIGH RELIABILITY — The Department of Radiology strives to become a high reliability organization with a focus on safety, quality and efficiency within a culture of trust and resilience	• Implementation of Trophon® use system-wide • Implementation of Savi Scout® breast localization procedure for Mammography • Duplicate order provider prompt in Epic • Improve overall report TAT for Neonatal ICU stat X-Ray exams	# of sites completed # of patients # of safety nets # of safety nets
PATIENT & STAFF ENGAGEMENT — The Department of Radiology partners with patients and families and incorporates all perspectives to achieve goals of care in a safe and respectful manner.	• Implementation of Clinical Ladder for Diagnostic Imaging (DI) Technologists • Focus Group review sessions with DI leadership, HR, and front line staff • Provide continuing education credits opportunities for Technologists • Utilization of Mammo scheduling cards at outpatient facilities	# of successful challenges # of improvements implemented # of Continue education sessions and # of attendees # of scheduled patients
INNOVATION — The Department of Radiology discovers and translates advanced care for its patients and the field of healthcare.	• Creation of modified small bowel follow through inpatient orders	Inpatients at hospital

ONE PENN MEDICINE

LANCASTER GENERAL HOSPITAL- PROCESS IMPROVEMENT INITIATIVE

Section: LGH	Modality CT
Project Title	Anti-Coagulation and Trauma Alert Protocol (ACT) TAT
Problem Statement	In 2020, the average compliance in meeting the 30-minute goal for the ACT Alert CT Head scan time from the time the CT Scan order is placed to the time the CT exam begins was only 72%.
Blueprint ±	Continuity of Care – Deliver seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation
SMART goal*	Diagnostic and Lab leadership collaborated to create workflows to improve overall communication between the Lab and CT regarding response times to orders on ACT alert patients, resulting in the improvement of overall compliance with the 30-minute TAT goal to 90% or greater.
Quality Tools used project Metrics	Multiple rapid experiments used to try various processes in order to determine the best process. Value Flow Map and graphs were utilized to evaluate results.

Act Alert Called overhead → CT & Labs ordered by ED → CT Immediately Transports to Radiology → Patient Scanned → Mobile Heartbeat Broadcast to Phlebotomist → CT returns patient to room → Phlebotomy meets patient in room

CT Average Order-to-Begin Minutes — **% Less Than 30 Minutes**

Month	CT Avg Order-to-Begin	% Less Than 30
Jul 2020	24	74%
Aug 2020	23	79%
Sep 2020	26	68%
Oct 2020	22	75%
Nov 2020	26	72%
Dec 2020	25	69%
Jan 2021	21	84%
Feb 2021	10	95%
Mar 2021	10	97%
Apr 2021	11	96%
May 2021	10	98%
Jun 2021	14	89%
Jul 2021	14	93%
Aug 2021	12	95%
Sep 2021	14	94%
Oct 2021	12	98%
Nov 2021	13	96%
Dec 2021	15	95%
Jan 2022	14	91%
Feb 2022	11	97%

Summary	Barriers in rapid experiment identified: Difficult to coordinate workflow between the requested Lab draws and requested CT head exam in real time. In addition, other departments were accessing the patient resulting in further delays in exam completion. Better process established: • CT responds immediately and performs CT head prior to Lab and other departments. • Mobile HeartBeat phone utilized as communication tool between CT and Lab • CT team sends (an)alert to (the) Lab via Mobile HeartBeat phone when (the)CT head exam is complete • CT returns patient to ED exam room. • Lab meets patient in the ED exam room.
Sponsor/ Champion	CT, Lab, and Trauma leadership
Sustainability	CT time from Order to average compliance improved and sustained. Goal has been reduced to 20 minutes.

LANCASTER GENERAL HOSPITAL-QAPI

Lancaster General / All Sections

Project Title:	*Language Assistance Documentation*
Problem Statement:	*For the months of November 2021 through March 2022 technologists documented the use of Language Services 38% of the time. This creates a risk of Joint Commission regulatory compliance failure which could result in actions up to suspending services.*
Target State - SMART Goal:	*In May 2022 the Diagnostic Imaging Quality Team recognized the need to examine the documentation of language services by using an A3 to develop a process that ensures language services is provided to all patients with EMR documentation that an interpreter is required.*
Project aligns with following UPHS quality blueprint Strategies:	*Diversity and Equity*
Sponsor/Champion	*Patty Rinehart, RT(R)(CT), Diagnostic Imaging Quality/Education Coordinator*
Data Collection Plan	• *Patty will perform random chart audits from each location.* • *Patty Rinehart, Nancy Nice, and Luke Charles will interview staff and document language assistance used during site tracers.*

Lancaster General CT

Project Title:	*Improve Access for Patients Undergoing CT Scans with Hydration at the LGH Suburban Outpatient Pavilion (SP).*
Problem Statement:	*Limited access for patients who need hydration undergoing a CT scan due to this only being performed at the main hospital.*
Target State - SMART Goal:	*CT leadership and the Infusion center will work together to provide an outpatient experience for patients requiring hydration when undergoing a CT scan by creating an outpatient order set and dedicated appointments at the SP by April 2022.*
Project aligns with following UPHS quality blueprint Strategies:	*Continuity of Care*
Sponsor/Champion	*Rob Leitch, MHA, BS, RT(R) (CT)*
Data Collection Plan	*Epic schedule*

LANCASTER GENERAL HOSPITAL- QAPI

Lancaster General / US

Project Title:	*Implementation of Trophon (high level disinfection) Use Across the LGH System.*
Problem Statement:	*Inconsistent Ultrasound probe disinfection process being utilized by various ultrasound areas during critical and semi-critical (based on Spaulding classification) procedures.*
Target State - SMART Goal:	*The Diagnostic Imaging Ultrasound Supervisor will develop a project plan to purchase, install, and educate all teams on the use of the Trophon system used as the disinfection process for ultrasound probes at all LGH locations performing ultrasound services by June 2022*
Project aligns with following UPHS quality blueprint Strategies:	*High reliability*
Sponsor/Champion	*KellyAnn Wissler, BS, RDMS, RVT* *US Supervisor*
Data Collection Plan	*KellyAnn has a project plan which includes implementation dates and educational sessions for all staff*

Trophon 2 Go-Live Dates		
February	IVU	2.28.22
March	LGH OR/ Anesthesia	3.27.22
April	ASF IV Team Breast Center Cardiology	4.3.22 4.17.22 4.17.22 4.24.22
May	TSG ED/Trauma	5.1.22 5.15.22
June	EP/Cath Lab IICU ICU Pain Management ABBCI TNU THG Sports Med	6.5.22 6.5.22 6.12.22 6.19.22 6.19.22 6.19.22 6.26.22 6.26.22

Lancaster General / Mammography

Project Title:	*Increase the use of Mammography scheduling cards to facilitate the scheduling of-6 month follow-up and screening Mammogram appointments.*
Problem Statement:	*No easy process for screening mammography patients who wanted to schedule their appointment a year in advance. Only had the option to use the online scheduling process or to call Centralized Scheduling.*
Target State - SMART Goal:	*In FY21 the Diagnostic Imaging Leadership implemented providing a mammogram scheduling post card to patients at the time of their exam for ease of scheduling their next annual screening mammogram.*
Project aligns with following UPHS quality blueprint Strategies:	*Patient and Staff engagement*
Sponsor/Champion	*Jessica L. Hamaker, BS., R.T.(R)(M)* *Multi-Modality Manager, Diagnostic X-Ray, Fluoroscopy, & Mammography*
Data Collection Plan	*Epic Schedule*

LANCASTER GENERAL HOSPITAL-QAPI

Lancaster General / Mammo

Project Title:	*Implementation of Savi Scout®*
Problem Statement:	*Delays in performing breast surgery at the hospital due to limited OR times for breast surgery and limited appointments and resources for necessary needle localization.*
Target State - SMART Goal:	*Breast Center leadership implemented the use of Savi Scout ® in November of 2021 to reduce surgical delays by eliminating the need for a needle localization thereby improving timely access to OR breast surgery.*
Project aligns with following UPHS quality blueprint Strategies:	*High reliability*
Sponsor/Champion	*Dr. Aaron Bleznak* *Dr. Nittan Tanna*
Data Collection Plan	*Epic schedule* *Order Savi Scout seed/marker and Savi detector to be used in the OR by the breast surgeon.* • *Training of Mammo staff, Radiologist, and OR staff on the use of Savi Scout* • *Elimination of patient scheduling conflicts.* • *Minimize length of stay on day of procedure.*

Lancaster General / X-Ray

Project Title:	*Neonatal ICU (NICU) Stat X-Ray Exams*
Problem Statement:	*In February there were two NICU exams with a delay of 12 hours due to the exams being assigned to an incorrect reading list.*
Target State - SMART Goal:	*Create a new neonate order and workflow (in collaboration with the Diagnostic Imaging Radiologist leadership) to ensure that exams ordered on NICU patients are easily identified on the PACS radiologist worklist to ensure interpretation is completed within 60 minutes of exam completion by June, 2022.*
Project aligns with following UPHS quality blueprint Strategies:	*High reliability*
Sponsor/Champion	*Jess Lewis, RT(R)* *Diagnostic X-Ray Supervisor*
Data Collection Plan	*Epic TAT for NICU exam and safety nets.* *Epic team created a modification so the NICU exams begin automatically.* • *Automatically starting the exams allows the technologist to do patient verification bedside without having to step away to perform this step at a computer. This minimizes risk of delays and missed identification.*

Name	Type	Px Code
XR NEONATE ABDOMEN AP	Imaging	RAD01144
XR NEONATE AP PORT W ABD	Imaging	RAD01079
XR NEONATE CHEST AP PORTABLE	Imaging	RAD01132

FY2022 Enterprise Improvement Highlights

Lancaster General / All Modalities

Project Title:	Duplicate Exam Prompt in EPIC for the Ordering Providers
Problem Statement:	Patients receiving unnecessary duplicate exams.
Target State - SMART Goal:	Diagnostic Imaging Leadership and Information Services will collaborate to create a duplicate exam prompt in Epic that will alert the ordering provider when the same or like exam has been performed within 24 hours so the ordering provider has the opportunity to review previous exams and determine if the duplicate exam is necessary by May, 2022.
Project aligns with following UPHS quality blueprint Strategies:	High reliability
Sponsor/Champion	Jess Lewis, RT(R) Diagnostic X-Ray Supervisor
Data Collection Plan	Safety Nets

Lancaster General / All Modalities

Project Title:	Focus Group Review-Second Session
Problem Statement:	There were no formal sessions for front line staff to give direct feedback to Diagnostic Imaging (DI) Director, Administrative Director Women's Health, HR Business Representatives.
Target State - SMART Goal:	Create structured, in-person focus group meetings with the Diagnostic Imaging leadership and HR Business Partner to allow frontline staff to share suggestions and concerns each fiscal year.
Project aligns with following UPHS quality blueprint Strategies:	Employee engagement.
Sponsor/Champion	Patty O'Driscoll, RT(R), BA, MBA Director, Diagnostic Imaging Bob Bleecher, Human Resources
Data Collection Plan	Ask all meeting attendees 2 questions: 1. What makes for a great day 2. What are the pebbles in your shoes? • Leader(s) listen to the feedback from the team, solutions are not offered at these meetings. • Attendee names are not recorded, only the comments and locations of each meeting. • The DI leadership team in conjunction with HR reviews the comments, sorts by category, and develops solutions. • Results from Session One (conducted during FY21) are compared to information obtained during Session Two (conducted in FY22). • Based on original concerns: multiple items are no longer on the list of "pebble in the shoes". The issues currently being identified are truly more patient care and operationally focused.

Lancaster General / All Modalities

Project Title:	*Implementation of an Ancillary Clinical Ladder Program.*
Problem Statement:	*No means of recognizing and rewarding staff who are participating in projects that are not included in their job description.*
Target State - SMART Goal:	*Financially reward staff who are participating in projects and performing tasks (above their job description) that are reviewed and approved by the Clinical Ladder Governance Committee as a means of staff retention by July 2021.*
Project aligns with following UPHS quality blueprint Strategies:	*Patient and Staff engagement*
Sponsor/Champion	*Patty O'Driscoll, Diagnostic Imaging Director* *Diagnostic Imaging Clinical Ladder Governance Committee* *Clinical Ladder Staff Advisory Committee*
Data Collection Plan	*Track the number of successful Clinical Ladder challenges*

November	December	January	February	March	April	May	June
5	1	5	1		5	5	2

	I: Employee-Client		
	Establishes effective therapeutic relationship with client that promotes the delivery of individualized care. Integrates teaching into the delivery of services based on the client responses and changing circumstances.		
2	Serve as an active member of a hospital committee. Must meet and be in attendance at least **4 times/year. 2 point per committee, maximum of 4 points.**	2-4	B
	II: Clinical Leadership		
	Serves as a model for professional behavior. Promotes clinical effectiveness, efficient resource use and quality of care in the practice setting. Facilitates the development of an effective team and the professional development of others.		
3	Project Leader for a new or ongoing DI special project, as approved by Director/ Manager. **Points determined by Manager based on scope/time spent on project.**	2-5	E
8	Preceptor/ Mentorship for new hires. Maintain required training. **1 point for each employee, maximum 3 points.**	1-3	G
9	Mentorship for new Clinical Ladder applicants. **1 point for each applicant maximum 3 points.**	1-3	A
	III: Clinical Scholarship		
	Participates in the evaluation of practice guidelines. Demonstrates a commitment of life long learning.		
5	Obtain an additional degree (Associates, Bachelors, Masters or Doctorate) , awarded from an accredited educational institution. **2 points for an Associates degree and 5 points for Bachelors, Masters or Doctorate degree (each degree can only be counted once; if not job required)**	2 or 5	C
20	Talent and Career Development - Attend a LG sponsored talent or career development program or class. Points determined by Manager based on scope/time spent on training. Example: Aspiring leader program. **1 point for every 4 hours attendance**	1-3	F
	IV: Department specific activities		
	Participates in modality specific activities to enhance the safety and daily performance of the department		
1	Performing specialty QC/QA for modality, with manager approval. **2 points maximum**	1-2	I
2	Actively participate as a technical competency Validator and maintain required training. **2 points.**	2	I

LANCASTER GENERAL HOSPITAL- QAPI

Lancaster General / CT

Project Title:	Stroke Alert Turnaround time (TAT)
Problem Statement:	Stroke alert TAT above the AHA standard of 25 minutes from patient arrival time to CT interpretation
Target State - SMART Goal:	CT and Lab leadership will collaborate to improve the overall "door-to-needle" TAT and reduce patient delays by changing the timing of lab draws to after CT head is complete to improve the goal of "results completed in less than or equal to 25 minutes or less" by May of 2022.
Project aligns with following UPHS quality blueprint Strategies:	Continuity of Care
Sponsor/Champion	Corinne Sherrer, CT Lead QC Technologist
Data Collection Plan	PeerVue and Epic

Stroke Alert: % compliance Door to Radiologist Review of non-contrast ≤ 25 minutes	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
	84	76	82	86	80	77	84	89	85	91

Lancaster General / X-Ray

Project Title:	Modified Small Bowel Follow Through Orders for Inpatients
Problem Statement:	No established order for the providers that were requesting a Gastrografin small bowel follow through exam
Target State - SMART Goal:	Diagnostic X-Ray and Radiologist Leadership will work together to create a new order panel in Epic with the help of Ann B. Barshinger Cancer Institute (ABBCI) and Trauma leadership to create a new protocol with pre-determined times and the contrast amount for obtaining post-contrast administration images to go live in June 2022.
Project aligns with following UPHS quality blueprint Strategies:	Innovation
Sponsor/Champion	Jess Lewis, RT(R) Diagnostic Imaging X-Ray Supervisor
Data Collection Plan	Epic

MODIFIED SBFT ABDOMEN ✓ Accept

Panel includes 8 and 24 hr post contrast admin Modified SBFT Abdomen orders. Please select additional timed orders accordingly. Do not order contrast - it will be supplied by Radiology.

☐ XR MODIFIED SBFT ABDOMEN (4 hrs post contrast admin)
   Routine, 4 Hours post contrast administration

☑ XR MODIFIED SBFT ABDOMEN   P
   Routine, ONE TIME, First occurrence today at 1454
   Reason for Exam: modified SBFT - 8 hrs post contrast admin
   Do Not Order Contrast (Radiology will provide), 8 hours post contrast administration, Sign

☐ XR MODIFIED SBFT ABDOMEN (12 hrs post contrast admin)
   Routine, 12 hours post contrast administration

☐ XR MODIFIED SBFT ABDOMEN (16 hrs post contrast admin)
   Routine, 16 hours post contrast administration

☑ XR MODIFIED SBFT ABDOMEN   P
   Routine, ONE TIME, First occurrence today at 1454
   Reason for Exam: modified SBFT (24 hrs post contrast admin)
   Do Not Order Contrast (Radiology will provide), 24 hours post contrast administration., Sign

LANCASTER GENERAL HOSPITAL- QAPI

Lancaster General / All Modalities	
Project Title:	Monthly Continuing Education (CE) Sessions for all Radiologic Technologists Offering Approved CE Credits
Problem Statement:	No CE credits currently offered at no charge for LGH Imaging technologists.
Target State - SMART Goal:	The Diagnostic Imaging Education Coordinator will develop one continuing education course each month that is worth 1 ASRT CE credit and offered to all LGH technologists free of charge beginning February, 2022
Project aligns with following UPHS quality blueprint Strategies:	Employee engagement.
Sponsor/Champion	Patricia G. Rinehart R T (R)(CT) Quality/Education Coordinator Diagnostic Imaging
Data Collection Plan	Number of in-services and number of staff attending

Feb	March	April	May	June
4-30 staff attended	4-28 staff attended	3-30 staff attended	4-33 staff attended	3-30 staff attended

Courses offered:
1. Regulatory Compliance specific to environmental rounds (Proud rounds/Tracers); Presenter: Denise Parke, Safety Officer for Safety and Environmental Care
2. Maxi Move Lift Device demonstration Presenter: Shelby Roberts, DXA Technologist
3. Manage Your Energy to Manage Your Time; Presenters: Janelle Glick: Wellness Dietitian and Health Coach and Olivia Duke: Community Health Program Coordinator
4. Stroke Alert Patient Assessment, Imaging, and Treatment;
    a. Presenters: H. Dean Hollenbacher: Advanced Visualization and 3D Specialist, Tracey Mousley: RN, Stroke Program Coordinator, and Dr. Danielle Cross: Stroke Medical Director
5. The Physics of Proton Therapy: A Primer; Presenter: Dr. Richard L. Maughan, PH.D: Professor

LANCASTER GENERAL HOSPITAL

GOOD CATCH AWARDS

Lancaster General Hospital												
Good Catch Awards - FY22	July	August	September	October	November	December	January	February	March	April	May	June
Technologist recognized laterality issues during the verification process prior to beginning the exam. Tech called the provider, reccieved a new order, and completed appropriate exam	6	2	1	2	1	1	3	7	4	5	6	4
The technologist identified positive results and expedited the patient receiving prompt care	2											1
The technologist noticed the patient had an allergy to IV Contrast but had not been premedicated for their scheduled Arthrogram	1											
The technologist realized the imaging order was incorrect and obtained a new order and performed the correct exam	3	6	2	1	1	2	2	10	4	5	3	8
The technologist noticed their patient had several imaging exams scheduled on different days the same week and rescheduled the patient so all the exams could be performed at one location	1	1										
The technologist discovered the patient had arrived for an X-ray with a duplicate order for an exam that had already been completed	1		2	2		2	2	1	2	1		1
The technologist noticed a previous patient had been registered in the X-ray unit under the incorrect patient information. She made sure all the patient information was corrected and confirmed the Images had the correct patient information			1				1					
The technologist identified the patient's personal identification was incorrect during the verification process. They ensured corrections were documented in the EMR						1	1		1	1	1	
The Technologist noticed the absence of the provider signature, diagnosis code or the diagnosis code did not match the order. They contacted the ordering provider to obtain a new corrected order.						1		1		3	1	2
The technologist noticed the patient's SNL injection was not rescheduled when her breast surgery was rescheduled. The Technologist contacted the surgical scheduler so the injection and							1					
The technologist identified an imaging order had been placed on a patient for a daily chest x-ray while intubated. The Technologist noticed the patient had been extubated but the order was never canceled. The provider was contacted and the order was canceled.									2			
The technologist recognized a pediatric patient had multiple X-rays ordered by their provider. She consulted the radiologist who then contacted the provider and suggested the appropriate imaging to reduce radiation exposure.									1			
The Technologist saw additional order in the EMR that was not scheduled and completed them for the patient after confirming the order with the provider.		1										1
The technologist realized during the verification process that an order had been placed on the incorrect patient. The provider was contacted and the order was canceled.								1	3			1
The technologist noted an inconsistancey in the patient's imaging report. The radiologist was contacted and an addenddum was										2		

PENNSYLVANIA HOSPITAL

PAH BLUEPRINT

Pennsylvania Hospital (PAH)

ONE PENN MEDICINE

STRATEGIES	INITIATIVES	METRICS
DIVERSITY & EQUITY — The Department of Radiology promotes an anti-racist culture that welcomes and respects all patients by committing to recruiting and advancing a diverse workforce	Mobile screening mammography in underserved areas — 1st Event – 3520 W Lehigh Ave; 2nd Event – 6001 Ceder Ave	# of patients screen; # of call-back exams requested; # of positive breast cancer patients
CONTINUITY OF CARE — The Department of Radiology delivers seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation	Sentinel Lymph Node Identification Failures in Head and Neck Melanoma Cases; Cross Training of MRI Technologist	# Total Injections; # of failures; Positive & Negative response rates pre & Post intervention
HIGH RELIABILITY — The Department of Radiology strives to become a high reliability organization with a focus on safety, quality and efficiency within a culture of trust and resilience	Radiology Ambulatory Falls Program implemented which includes screening questionnaire for all outpatient areas, documentation, identification and preventative measures	% compliance of screening questionnaire; % compliance with fall risk FYI flag; % compliance with fall risk wristband; # of patient falls
PATIENT & STAFF ENGAGEMENT — The Department of Radiology partners with patients and families and incorporates all perspectives to achieve goals of care in a safe and respectful manner.	Patient Engagement and Satisfaction Initiatives with strategies focused around area of improvement needed.	Mean %itle Ranking; % of positive & Negative Comments
INNOVATION — The Department of Radiology discovers and translates advanced care for its patients and the field of healthcare.	MRI Screening Errors – Implemented a direct notification process to providers when MRI screening error occur. Implemented remote Pacemaker interrogations with the vendors for MRI pacemaker exams	# of MRI Screening Error; # of MRI remote interrogations

PRESBYTERIAN MEDICAL CENTER

PRESBYTERIAN MEDICAL CENTER

Nnamdi D. Udeh, MD
Diagnostic Radiology, PGY-5

Optimization of Whole-Body CT Technique for Trauma at PPMC

Background
- Standard of care for polytrauma patients presenting to PPMC is organ-specific imaging to be decided upon by individual physicians
- Newer addition to trauma protocol is WBCT for expedited workup, considered a screening tool for patients with high impact mechanisms that "hastens trauma evaluations and diagnoses"
- REACT-2 trial: no mortality difference between the two techniques or reduced ED LOS; other studies: technique is sensitive for detection of injury, but best suited for patients with ISS > 15
- Interest in specific prospective analyses of WBCT and polytrauma-specific patient outcomes

Current State
- Current data showing 72% utilization of the WBCT protocol since implementation
- Of those receiving WBCT, 14% of studies have been acquired per protocol
  - "acquired per protocol" = both arms up during acquisition of CT chest and abdomen/pelvis + single axial acquisition of both chest and abdomen/pelvis ("one run")
  - Remainder of exams using organ-specific protocol or some combination of the two protocols
- Image quality showing highest correlation to arm position (r = -0.41) rather than protocol used (r = 0.24)

Problem statement: *Because the majority of patients receiving the WBCT protocol are scanned with their arms down, the images are lower quality, which may lead to lower diagnostic yield and the requirement for additional imaging.*
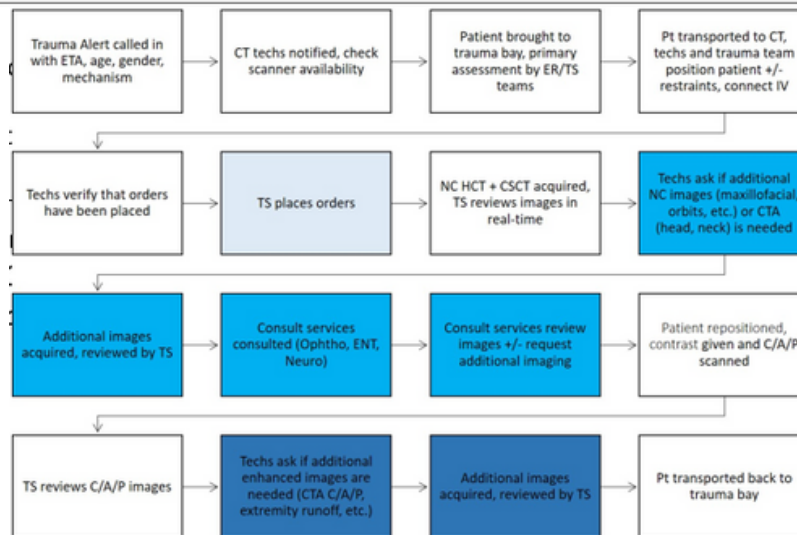
SMART Goal
Increase adherence to arm positioning standards for chest, abdomen and pelvis CTs in the WBCT protocol to 100% by XXXXX.

Analysis
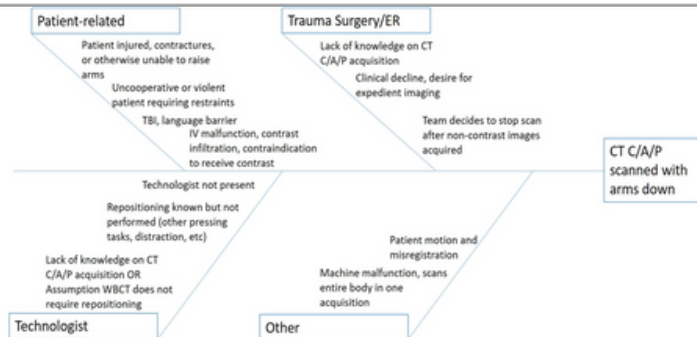
Countermeasures

Effectiveness →

- Send email to ordering teams on arm position
- **Post signs for appropriate patient position for WBCT**
- Technologist in-service on WBCT protocol
- Scan head and C-spine with patients arms up

- Elect a watchman in the CT control area to monitor WBCT execution
- Have radiologist come to scanner at image acquisition time

- **Re-scan scout after head and C-spine acquired and after IV checked and patient repositioned** (+/- have radiologist verify scout for appropriate positioning)
- Separate WBCT protocol into head and C-spine + chest and abdomen/pelvis

- Program into GE Rev/Rev HD an alarm to reposition patient after head and C-spine CT acquired if WBCT protocol selected

Effort ↓

Action Plan – in progress

Follow-up Plan – in progress

PRINCETON MEDICAL CENTER

PMC BLUEPRINT

Princeton Medical Center

ONE PENN MEDICINE

STRATEGIES · INITIATIVES

STRATEGIES	INITIATIVES
DIVERSITY & EQUITY	Breast Care Team reviewed the underserved as well as the community who have not had a screening mammogram. An outreach program was developed to educate and offer screening mammograms.
CONTINUITY OF CARE	CT, MRI & US added appointment slots on Saturday to decrease wait times Radiologists
HIGH RELIABILITY	Environment of Care Safety Rounds Joint Commission Readiness Team
PATIENT & STAFF ENGAGEMENT	Decreased Breast Ultrasound Biopsy wait times
INNOVATION	MRI Screening form completed when MRI order placed in Epic

PRINCETON MEDICAL CENTER- PROCESS IMPROVEMENT INITIATIVE

Princeton Medical	Radiology MRI FY22
Project Title	Decrease MRI Inpatient Turnaround Time; Exam Order to Completion
Problem Statement	Inpatient MRI exams are completed 24 - 36hrs from exam order to completion. Our internal goal is <24hrs. Due to delays, patients are not getting a diagnosis in a timely manner, which results in delay of care and an increase in LOS.
Blueprint ±	Continuity of Care / Innovation
SMART goal*	Decrease inpatient turnaround time order to completion <24hrs 80% by June 30, 2022
Quality Tools used project	Bar graph- Data from Epic will be collected monthly. Manager will meet with the MRI team to review data and discuss next steps to improve TAT.
Metrics	• Monitor Inpatient scheduled order date and exam completion date. • Historical data collected was used prior to start of project. • Collect Monthly data via EPIC. • Excluded Pacemakers, anesthesia and COVID19 patients.
Results	Due to staffing challenges, high volumes and our outpatient magnet going down we did not meet our target but will continue to enforce this workflow moving forward.
Sustainability	Phase 2- FY23 agenda: • Provide adequate staffing to extend through weekends and evening hours until 11pm to accommodate OP exams on both scanners. • Change appointment instructions for patients to arrive 30-minutes prior to their appointment. • Move Pacemaker studies from late Tuesday AM to Wednesday AM on the 1.5T scanner. • Replace outpatient magnet with wider bore and advanced technology.

Inpatient MRI Volume & Percent TAT ≤ 24 hours
FY22 July - June

	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
% ≤ 24 hours	65%	60%	50%	58%	62%	66%	63%	41%	63%	64%	34%	54%
Volume	155	176	183	145	146	130	139	133	141	141	213	157

Schedule blocked from 9:00am to 4:00pm for inpatient MRI studies
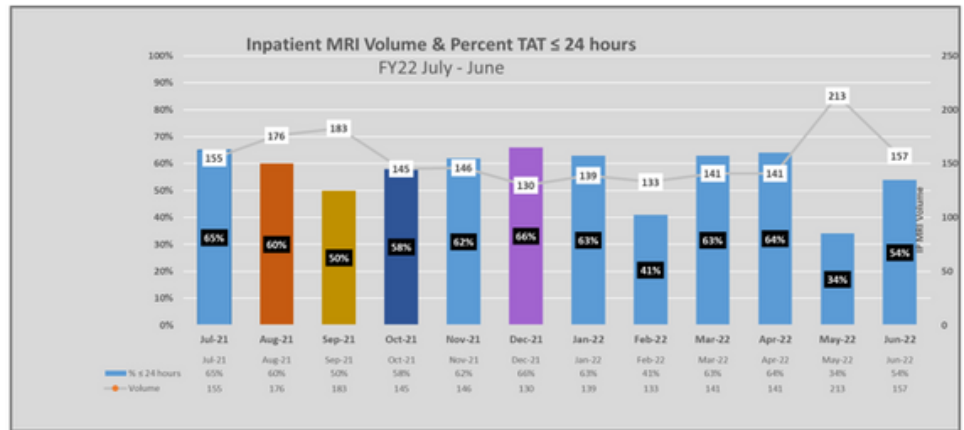
• Utilize "block scheduling" on the MRI 1.5T Scanner from 9:00am to 4:00pm for inpatient studies only

• Schedule outpatient MRI studies on the 1.5T by exception only before 9:00am or at / after 4:00pm

HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA

FY22

JULY 2021-
JUNE 2022

HUP BLUEPRINT

ONE PENN MEDICINE

STRATEGIES	INITIATIVES	METRICS
DIVERSITY & EQUITY The Department of Radiology promotes an anti-racist culture that welcomes and respects all patients by committing to recruiting and advancing a diverse workforce	Race based disparities in Breast Cancer screening and treatment	Time to biopsy by race
CONTINUITY OF CARE The Department of Radiology delivers seamlessly coordinated care across all settings and service lines by eliminating unnecessary variation	Improve Quality of CT Pulmonary Embolism studies Standardized IR patient workup	% low quality exams Time from start work-up to patient in room
HIGH RELIABILITY The Department of Radiology strives to become a high reliability organization with a focus on safety, quality and efficiency within a culture of trust and resilience	Same-day discharge TACE Automated notification of patients with spinal metastases FDG-PET scans for patients with glucose >200 Peer learning	# patients discharged same-day % reports with macro # of scans performed # of conferences
PATIENT & STAFF ENGAGEMENT The Department of Radiology partners with patients and families and incorporates all perspectives to achieve goals of care in a safe and respectful manner.	Optimizing biopsy scheduling for patients abnormal US / Mammogram Standardized IR patient workup Radiology Aide Patient Progression	# of patients scheduled same-day abnormal US / mammogram Time from start work-up to patient in room Time move patient to correct modality as logged in Patient Progressio
INNOVATION The Department of Radiology discovers and translates advanced care for its patients and the field of healthcare.	Automated notification of patients with spinal metastases	% reports with macro

Dashboard metrics include Improvement indicators and Critical values. Metrics are reviewed at the monthly HUP Radiology and Radiology Enterprise Clinical Effectiveness Team (CET) meetings.

University of Pennsylvania Health System
Department of Radiology - HUP
Quarterly Performance Report - FY22

	FY21 Average	FY22 Goal			1st Qtr			2nd Qtr			3rd Qtr			4th Qtr	FY22 Average	Source
					Radiology			Radiology			Radiology			Radiology		
CLINICAL QUALITY																
Addended ED Reports: **																
Total Major Change includes Inpt, Outpt and ED (%) (Residents/Fellows)	0.33/0.47	0.56/0.67			0.46/0.64			0.47/0.71			0.35/0.46			0.36/0.49	0.41/0.57	Capricorn
Major Change ED ONLY (%) (Residents/Fellows)	0.17/0.11	0.17/0.12			0.20/0.14			0.20/0.07			0.18/0.17			0.14/0.22	0.18/0.15	Capricorn
ED Notify Change(%) (Residents/Fellows)	2.14/1.84	1.36/1.34			2.24/1.98			2.31/1.57			1.77/1.72			1.92/2.09	2.06/1.84	Capricorn
Total Volume (Residents/Fellows)	25987/10644	17575/9532			30189/10427			29867/8491			23657/13637			25392/17240	27276/12448	Capricorn
ED Volume	14810/5763	9730/4969			16408/5490			16000/4122			12039/7413			13443/9637	14472/6665	Capricorn
	FY21 Average	FY22 Goal	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	FY22 Average	Source
REGULATORY																
ACT 60 compliance- PA code 127.32 effective 12/20	100%	100%	100	100	100	100	100	100	100	100	100	100	100	100	100	Pogozelski Audit in Penn Chart
CT contrast injection extravasation - # of events	10	10	14	7	13	9	11	8	3	4	9	8	7	8	8	CT Extrav Tracking- PMSN tab
MR- Thermal Injuries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MR Tracking- PMSN tab
MR - Ferromagnetic objects unintentionally entering scanner room	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.1%	MR Tracking- PMSN tab
MR - Ferromagnetic object injury	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MR Tracking- PMSN tab
Critical Values	99.60%	90.00%	99.73%	99.98%	99.83%	100.00%	100.00%	99.79%	99.95%	99.98%	100.00%	96.21%	99.95%	99.81%	100%	Montage
* Rad ED pt exam complete to final report time 90th percentile (Hours.Minutes)	8:19	12:00	12:08	11:27	12:11	12:00	11:58	12:42	11:21	11:00	11:12	11:11	11:53	11:07	11:57	Radiology- Business Objects report
Exam COMPLETE-FINAL (ED) hrs avg	4:01	12	4:20	4:07	4:38	4:22	4:16	4:24	3:54	3:39	3:53	3:49	4:17	3:56	4:12	Radiology- Business Objects report
Exam COMPLETE-FINAL Inpatient hrs avg	4:21	12	5:33	4:57	5:03	5:01	4:29	4:41	4:14	3:81	4:29	4:29	4:10	4:08	4:39	Radiology- Business Objects report
ACCESS																
Appointmant Availability: HUP outpatient- within 72 hours of request	81%	90%	63.0%	72.4%	70.6%	69.4%	60.6%	55.6%	54.0%	47.0%	37.0%	48.0%	56.0%	55.0%	57%	Gina Redfim
No show's (Perlman)	4.0%	9.0%	3.6%	3.9%	3.6%	3.9%	3.9%	4.1%	4.4%	3.6%	3.7%	3.6%	3.7%	3.5%	4%	Business Objects
Biopsy Scheduling Next Availability in days. **Previous FY data was based on next available appt from order to scheduled (5 operational days p/week)																Bonnie Brake
Breast Needle Locs		<= 5 days	9	13	6	10	10	12	13	10	11	12	11	12	11	Sue Penta
Breast Savi		<= 5 days	7	11	10	8	8	8	7	7	9	11	10	8	9	Sue Penta
Breast Stereo		<= 5 days	14	11	12	12	11	12	16	19	18	17	15	15	14	Sue Penta
Breast US Bx		<= 5 days	12	12	11	13	13	13	17	17	17	17	17	12	14	Sue Penta
CT Abdominal Imaging	# Metric started August 2021	<= 5 days	#	5	5	4	4	7	4	5	6	7	5	7	5	Bonnie Brake
CT Chest	# Metric started August 2021	<= 5 days	#	8	5	4	4	9	6	4	3	6	5	7	5	Bonnie Brake
CT MSK	# Metric started August 2021	<= 5 days	#	2	2	2	3	4	6	2	2	2	2	2	3	Bonnie Brake
CT Neuro	# Metric started August 2021	<= 5 days	#	12	14	15	10	12	11	10	17	29	9	4	13	Bonnie Brake
MR Breast Biopsy	**	<= 5 days	13	9	13	10	10	10	15	15	12	10	5	9	11	Andrea Pogozelski
US Abdominal Imaging	# Metric started August 2021	<= 5 days	#	5	4	3	7	10	8	8	7	8	5	7	7	Bonnie Brake
US MSK	# Metric started August 2021	<= 5 days	#	0	0	0	1	2	2	1	0	0	1	1	1	Bonnie Brake
US Thyroid Biopsies	# Metric started August 2021	<= 5 days	#	4	4	3	7	22	16	14	16	16	10	12	11	Bonnie Brake
MODALITY PI MONITORS Effective 2021																
Aides																
Radiology Aides Patient Progression- Median time for Aides escorting patients to the appropriate modality and updating patients location in Penn Chart- Unit of measure: minutes																Jim Demasi reports
CT	10	< =5 minutes	14	19	11	17	13	10	8	8	9	7	11	16	12	Jim Demasi reports
IR	10	< =5 minutes	11	12	12	15	12	11	10	10	11	8	13	18	12	Jim Demasi reports
Mammo	11	< =5 minutes	11	17	11	18	10	9	8	7	7	5	9	13	10	Jim Demasi reports

DASHBOARDS HUP
IMPROVEMENT INDICATORS

MR	14	<=5 minutes	15	18	13	18	13	10	9	9	10	8	13	17	13
Nuc Med	10	<=5 minutes	13	15	11	17	11	9	8	9	8.5	6	10	14	11
PET	15	<=5 minutes	19	22	15	21	15	12	9	9	8.5	8	12	14	14
US	12	<=5 minutes	13	17	12	17	11	9	8	8	11	7	12	16	12
XR	10	<=5 minutes	12	10	9	9	10	9	8	8	7	6	8	12	9
Diagnostic: Bone/Chest:															
Percentage of Pain Markers properly used or documented area of extremity noted	67%	85%	73%	80%	72%	72%	50%	55%	61%	67%	71%	76%	72%	81%	69%
CT:															
PCAM CT Median time from waiting room to exam begin. Unit of measure: minutes	New FY 22	<=23 minutes	22	22	25	19	28	26	22	23	23	22	24	20	23
GI/GU:															
HUP GI/GU Median time from waiting room to exam begin. Unit of measure: minutes	New FY 22	<= 13 minutes	16	18	13	18	13	14	15	16	14	11	10	10	14
IR Clinic:															
Percent of New Patient Visit Intake Forms Used	57%	>=70%	56%	49%	29%	11%	0%	4%	46%	83%	92%	80%	81%	80%	51%
IR															
Median IR Room Turnover Unit of measure: minutes	New FY 22	<= 35 minutes	34	34	37	37	37	30	37	34	37	36	34	34	35
Radiology Nursing:															
Omnicell Nursing Compliance- percent of unused medications returned	0.7%	0.0%	0.1%	0.0%	0.0%	1.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Mammo:															
Mammo Median time from waiting room to exam begin. Unit of measure: minutes	New FY 22	<= 19 minutes	16	13	14	18	19	19	17	17	17	14	15	14	16
MR:															
PCAM MR Room 7 Median time for Cardiac imaging from table time to discharge. Unit of measure : minutes	New FY 22	<= 78 minutes	81	82	86	81	78	83	87	82	81	80	81	77	82
Nuc Med:															
NucMed median time from waiting room to exam. Unit of measure: minutes	New FY 22	<= 20 minutes	26	32	43	38	36	43	35	47	28	26	34	29	35
First Case Start Time- Nuc/Card Ribidium cases	New FY 22	>= 55%	73.0%	66.7%	52.2%	62.8%	60.5%	62.2%	65.8%	58.0%	67.3%	60.0%	63.0%	60.3%	63%
PET															
PET Median time from PET uptake room to exam. Unit of measure : minutes	New FY 22	<= 65 minutes	51	45	55	52	51	57	51	50	56	48	54	42	51
Reception:															
Median time from reception patient sign in at podium to check-in. Unit of measure: minutes	New FY 22	Varies by modality minutes													
CT	New FY 22	<= 5 minutes	6	10	5	5	6	5	6	6	7	6	7	8	6
IR	New FY 22	<= 10 minutes	12	15	11	11	13	11	14	10	12	11	13	13	12
Mammo	New FY 22	<= 5 minutes	10	12	7	7	9	6	8	6	8	7	8	9	8
MR	New FY 22	<= 5 minutes	7	10	5	6	7	6	6	6	8	6	8	9	7
Nuc Med	New FY 22	<= 5 minutes	6	6	4	5	5	4	5	4	6	4	5	6	5
PET	New FY 22	<= 5 minutes	8	8	4	4	5	5	5	5	5	5	5	8	6
US	New FY 22	<= 5 minutes	10	11	6	7	9	6	8	7	9	7	9	9	8
XR	New FY 22	<= 5 minutes	3	3	2	2	2	2	1	2	3	1	2	2	2
3D lab:															
3D labs percentage of monthly exams that the technologist are correctly completing exams in realtime via Pennchart	New FY 22	95%	84.0%	85.5%	96.0%	95.0%	96.0%	94.0%	97.0%	97.0%	97.0%	99.0%	99.0%	99.0%	95%
Ultrasound:															
US Median time from waiting room to exam begin. Unit of measure: minutes	New FY 22	<= 12 minutes	16	13	16	14	18	16	13	17	17	21	23	23	17

DASHBOARDS HUP
CRITICAL VALUES 2021

Radiology
Critical Values

YEAR = 2021	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Active Hemorrhage	90%	100%	100%	100%	100%	95%	100%	100%	100%	100%	100%	100%
Acute Cerebral Hemorrhage	NA	NA	NA	NA	100%	100%	100%	100%	100%	100%	100%	100%
Active Tuberculosis	NA	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	NA
Acute Intra-abdominal Hemorrhage	100%	100%	100%	100%	90%	100%	100%	100%	100%	100%	100%	100%
Airway Obstruction	NA	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Brain Death	NA	NA	NA	100%	100%	NA	NA	NA	NA	NA	100%	100%
Brain Herniation	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Cardiac Tamponade	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Cord Compression	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Dissection	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
DVT	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Ectopic Pregnancy	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%
Epiglottitis	NA	NA	NA	NA	NA	NA	NA	NA	100%	NA	NA	NA
Malposition	99%	100%	100%	99%	99.5%	100%	100%	99.6%	99%	100%	100%	97%
Necrotizing Fasciitis	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pneumomediastinum	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pneumoperitoneum	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pseudoaneurysm	100%	100%	100%	100%	100%	100%	94%	100%	100%	100%	100%	100%
Pulmonary Embolus	99%	100%	100%	100%	100%	100%	100%	100%	97%	100%	100%	98%
Retained Sponge	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Ruptured/Leaking Aortic Aneurysm	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%	NA
SBO	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Tension Pneumothorax	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Testicular/Ovarian Torsion	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unstable Spine Fracture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Volvulus	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Severe Cord Compression	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	99.32%	100.00%	100.00%	99.96%	99.60%	99.80%	99.73%	99.98%	99.83%	100.00%	100.00%	99.79%
Total Critical Values - **Called to Ordering Providers**	382	383	428	361	504	457	514	482	492	543	507	519
Total Critical Values - **Not Called to Ordering Providers**	4	0	0	3	2	1	2	1	3	0	0	3
Removed (identified in Montage DB as a critical result not called, after review, determined not to be a CV so removed from Montage DB)	420	403	526	510	531	510	554	552	507	505	472	624

Radiology
Critical Values

YEAR = 2022	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Active Hemorrhage	100%	100%	100%	100%	100%	100%						
Active Tuberculosis	100%	NA	NA	NA	NA	100%						
Acute Cerebral Hemorrhage	100%	100%	100%	100%	100%	100%						
Acute Intra-abdominal Hemorrhage	100%	100%	100%	100%	100%	100%						
Airway Obstruction	100%	100%	100%	100%	100%	100%						
Brain Death	NA	NA	NA	100%	NA	NA						
Brain Herniation	100%	100%	100%	100%	100%	100%						
Cardiac Tamponade	100%	100%	100%	100%	100%	100%						
Cord Compression	100%	100%	100%	100%	100%	100%						
Dissection	100%	100%	100%	10%	99%	95%						
DVT	100%	100%	100%	100%	100%	100%						
Ectopic Pregnancy	100%	NA	100%	100%	100%	100%						
Epiglottitis	NA	NA	NA	NA	100%	NA						
Malposition	99%	99.6%	100%	100%	100.0%	100%						
Necrotizing Fasciitis	100%	100%	100%	100%	100%	100%						
Pneumomediastinum	100%	100%	100%	95%	100%	100%						
Pneumoperitoneum	100%	100%	100%	100%	100%	100%						
Pseudoaneurysm	100%	100%	100%	100%	100%	100%						
Pulmonary Embolus	100%	100%	100%	100%	100%	100%						
Retained Sponge	100%	100%	100%	100%	100%	100%						
Ruptured/Leaking Aortic Aneurysm	100%	100%	100%	100%	NA	100%						
SBO	100%	100%	100%	100%	100%	100%						
Severe Cord Compression	100%	100%	100%	100%	100%	100%						
Tension Pneumothorax	100%	100%	100%	100%	100%	100%						
Testicular/Ovarian Torsion	100%	100%	100%	100%	100%	100%						
Unstable Spine Fracture	100%	100%	100%	100%	100%	100%						
Volvulus	100%	100%	100%	100%	100%	100%						
	99.95%	99.98%	100.00%	96.21%	99.95%	99.81%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Critical Values - **Called to Ordering Providers**	487	489	531	453	420	472	0	0	0	0	0	0
Total Critical Values - **Not Called to Ordering Providers**	1	1	0	1	1	1	0	0	0	0	0	0
Removed (identified in Montage DB as a critical result not called, after review, determined not to be a CV so removed from Montage DB)	530	525	617	574	506	641	0	0	0	0	0	0

DASHBOARDS HUP CEDAR

CRITICAL VALUES 2022

HUP Cedar Radiology
Critical Values

YEAR = 2022	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Active Hemorrhage	100%	100%	100%	NA	NA	100%	NA					
Active Tuberculosis	NA	NA	NA	NA	NA	NA	NA					
Acute Cerebral Hemorrhage	100%	100%	100%	100%	100%	100%	100%					
Acute Intra-abdominal Hemorrhage	100%	100%	100%	NA	NA	100%	100%					
Airway Obstruction	NA	NA	NA	100%	NA	100%	100%					
Brain Death	NA	NA	NA	NA	NA	NA	NA					
Brain Herniation	100%	NA	NA	NA	100%	NA	100%					
Cardiac Tamponade	NA	NA	NA	NA	100%	NA	NA					
Cord Compression	100%	NA	100%	100%	100%	100%	100%					
Dissection	100%	NA	100%	NA	100%	NA	100%					
DVT	100%	100%	100%	100%	100%	100%	100%					
Ectopic Pregnancy	NA	NA	100%	NA	NA	100%	100%					
Epiglottitis	NA	NA	NA	NA	NA	NA	NA					
Malposition	100%	100%	100%	100%	100.0%	100%	100%					
Necrotizing Fasciitis	NA	NA	100%	NA	NA	100%	100%					
Pneumomediastinum	100%	100%	NA	100%	100%	NA	NA					
Pneumoperitoneum	100%	100%	100%	100%	100%	100%	100%					
Pseudoaneurysm	100%	100%	100%	100%	NA	NA	NA					
Pulmonary Embolus	100%	100%	100%	100%	100%	100%	100%					
Retained Sponge	NA	NA	NA	NA	NA	100%	NA					
Ruptured/Leaking Aortic Aneurysm	NA	NA	NA	NA	NA	NA	NA					
SBO	100%	100%	100%	100%	100%	100%	100%					
Severe Cord Compression	NA	100%	100%	NA	NA	NA	100%					
Tension Pneumothorax	NA	NA	NA	NA	NA	NA	NA					
Testicular/Ovarian Torsion	100%	100%	NA	100%	100%	NA	NA					
Unstable Spine Fracture	NA	NA	NA	NA	NA	NA	100%					
Volvulus	100%	100%	NA	NA	100%	NA	NA					
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Critical Values - **Called to Ordering Providers**	54	58	33	42	35	36	32	0	0	0	0	0
Total Critical Values - **Not Called to Ordering Providers**	0	0	0	0	0	0	0	0	0	0	0	0
Removed (identified in Montage DB as a critical result not called, after review, determined not to be a CV so removed from Montage DB)	45	27	40	34	31	25	48	0	0	0	0	0

SECTION QUALITY ASSESSMENT PERFORMANCE IMPROVEMENT (QAPI) INITIATIVES

Radiology staff engage in QAPI initiatives to improve processes within Divisions that mitigate error and advance the safety of patients and staff.

Radiology Aides Patient Progression QAPI FY 2022

Project Title:	*Radiology Aides Patient Progression*											
Problem Statement:	*Rad Aides are delayed getting patients to the appropriate modalities and updating the patient location in Pennchart (EPIC) within the Patient Progression status board.*											
Project Goals/Objectives:	*Move patients to modalities in 5 minutes by July 31, 2022.* *Ensure patients are roomed to the correct location*											
Penn Medicine Team Goal:	*Employee engagement*											
Sponsor/Champion	*Andrea Pogozelski, Assitant Director of Patient QA Radiology* *David Waters, Assitant Director of Radiology*											
Data Collection Plan	*Mark Matthews Radiology PCAM manager, collects Pennchart (EPIC) data monthly*											
Measure FY22	**Jul-21**	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**	**Jan-22**	**Feb-22**	**Mar-22**	**Apr-22**	**May-22**	**Jun-22**
Minutes Performed												
CT	14	19	11	17	13	10	8	8	9	7	11	16
IR	11	12	12	15	12	11	10	10	11	8	13	18
MAMMO	11	17	11	18	10	9	8	7	7	5	9	13
MR	15	18	13	18	13	10	9	9	10	8	13	17
NM	13	15	11	17	11	9	8	9	9	6	10	14
PET	19	22	15	21	15	12	9	9	9	8	12	14
US	13	17	12	17	11	9	8	8	11	7	12	16
XR	12	10	9	9	10	9	8	8	7	6	8	12
Target Performance	5	5	5	5	5	5	5	5	5	5	5	5

Radiology Aides Patient Progression
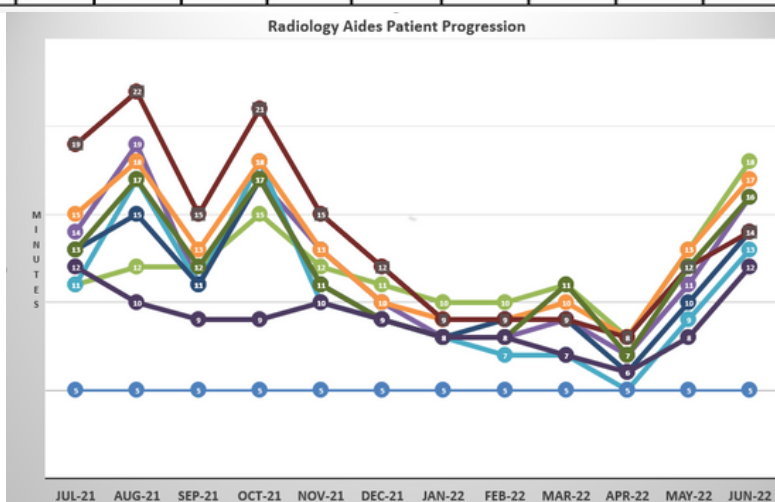
QAPI

Bone Chest Radiology Department QAPI FY 2022

Project Title:	*Point of Pain Markers*
Problem Statement:	*Proper use of radiographic markers indicating point of pain to better assist Radiologist when dictating exams are not consistently being used. This can cause delays in first report due to radiologist searching on the xray image for the area of interest.*
Project Goals/Objectives:	*Tracking this will ensure technologists are using proper tools at least 85% of the time.* *Better educate technologists when markers are not used.*
Penn Medicine Team Goal:	*Value to provide high quality, efficient care and the best outcomes for all patients.*
Sponsor/Champion	*Andrea Pogozelski, Assitant Director of Patient QA Radiology* *David Waters, Assitant Director of Radiology*
Data Collection Plan	*Joseph Lamb Radiology Manager- Manually review SECTRA imaging*

Point of Pain Markers chart (Percentage vs Jul-21 through Jun-22).
Legend:
— Measure FY22 Percentage of Exams with Point of Pain Identifiers
— Measure FY22 Target Performance
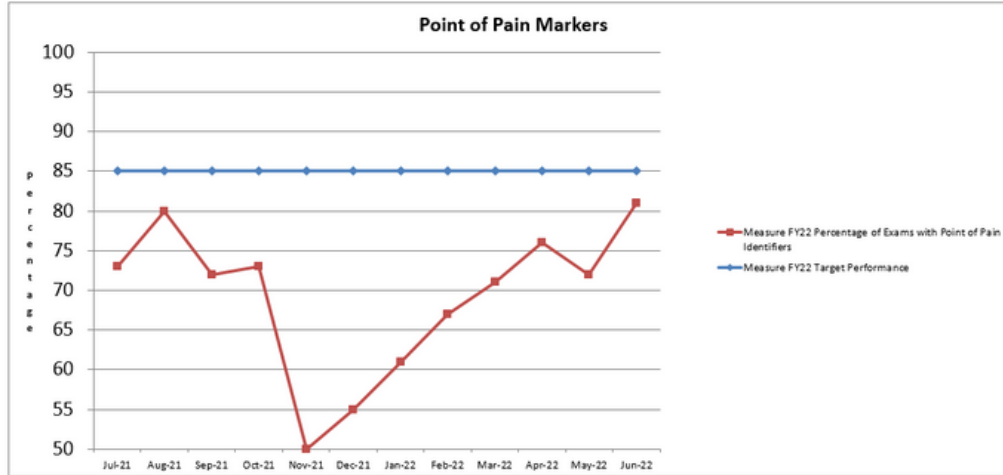
Department of Mammography QAPI FY 2022

Project Title:	Mammography Wait Times
Problem Statement:	Time in waiting room needs to be reduced to improve patient satisfaction.
Project Goals/Objectives:	To provide Breast Imaging services to all patients in a timely fashion while reducing waiting room times prior to imaging as reported on Patient progression- Pennchart reports. Goal is within 10 minutes by July 31, 2022.
Penn Medicine Team Goal:	Patient Care Processes
Sponsor/Champion	Andrea Pogozelski Assitant Director Radiology QA, David Waters Assitant Director Radiology
Data Collection Plan	Department Manager will collect data from monthly Pennchart patient progression reports, review and share with staff .

Minutes in Waiting Room Before Imaging

	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Metric #1	16.0	13.0	14.0	18.0	19.0	19.0	17.0	17.0	17.0	14.0	15.0	15.0
Target Performance	10	10	10	10	10	10	10	10	10	10	10	10
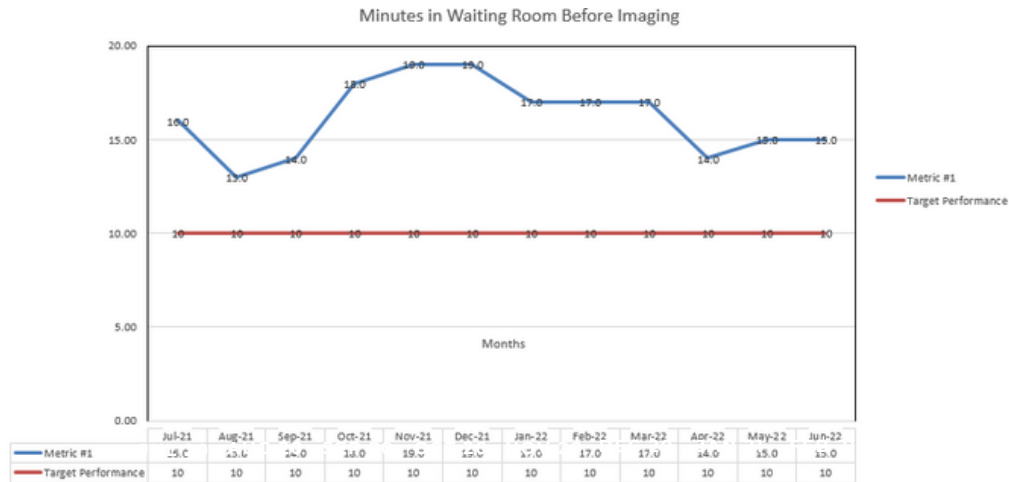
CT Radiology Department QAPI FY 2022

Project Title:	*Reducing ED IV extravasations*
Problem Statement:	*The CT radiology sections has seen an incline in IV extravastions over the past 6 months*
Project Goals/Objectives:	*Radiology goal is to lower the amount of CT IV extravasations by 50% with ultimate goal of zero. The CT department has noticed a higher amount of IV extravasation.*
Penn Medicine Team Goal:	*To decease the amount of IV extravasations in the CT department by utilizing the ultrasound IV with longer catheter when applicable.*
Sponsor/Champion	*Andrea Pogozelski (Assitant Director Radiology QA) and David Waters (Assistant Director)*
Data Collection Plan	*Andrew Koch is the CT manager that reviews monthly metrics via safety net and educates the team when applicable. Issues not able to be resolved will be reported to Sponsor/Champion.*

CT Radiology Extravasations FY22
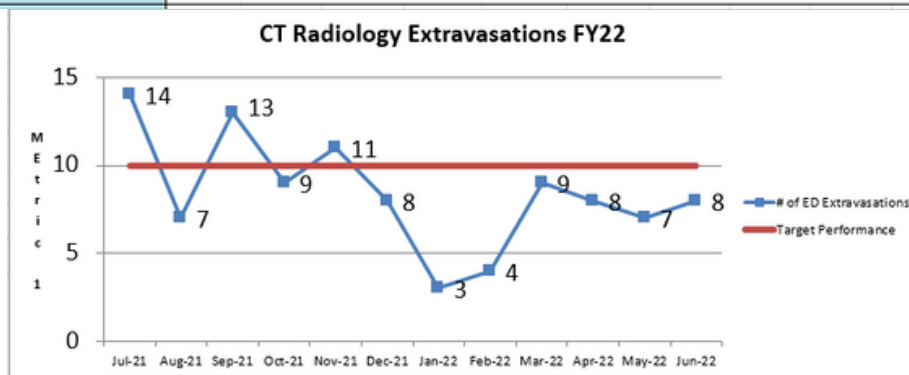
CT PAVILION ED TAT QAPI FY 2022

Project Title:	*Radiology CT ED Turnaround Time (TAT) Metrics Improvement*
Problem Statement:	*Improve Inpateint CT TAT monthly metrics for exam to be completed within 1.0hr TAT.*
Project Goals/Objectives:	*Data will be collected weekly and will be put into a spreadsheet to compare month to month averages. Goal is to complete CT/ED exams consistently within 1 hour by October 31, 2022.*
Penn Medicine Team Goal:	*This project most closely aligns with Penn Medicine's minimizing ED length of stay (LOS).*
Sponsor/Champion	*Andrea Pogozelski (Assitant Director) and David Waters (Assistant Director) the leaders responsible for the project and its overall outcomes. Their role is to provide direction, remove barriers, and ensures the action plans and goals are being achieved.*
Data Collection Plan	*Andy Koch (Supervisior) started in April 2022 and is collecting Pennchart metrics monthly. Issues not able to be resolved will be reported to Sponsor/Champion.*

Radiology CT ED QAPI FY 22
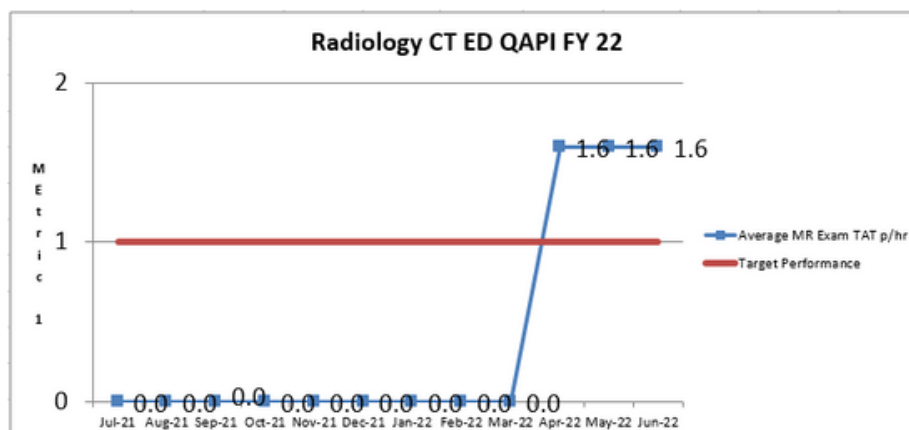
QAPI

Interventional Radiology Procedure Room Turnover QAPI FY 2022

Project Title:	*Interventional Radiology Procdure Room Turn Around Times*
Problem Statement:	*Interventional radiology patients are delayed longer than allotted appointment time. We need to reduce TAT to improve patient satisfaction.*
Project Goals/Objectives:	*To provide IR Procedure services to all patients in a timely fashion while reducing TAT for IR procedures.*
Penn Medicine Team Goal:	*Patient Care Processes*
Sponsor/Champion	*Andrea Pogozelski Assitant Director Radiology QA, David Waters Assitant Director Radiology*
Data Collection Plan	*Danette Lewis IR Manager will manually collect data monthly from Pennchart, review and share with staff*

Minutes in Waiting Room Before Imaging

	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Metric #1	34.0	34.0	37.0	37.0	37.0	30.0	37.0	33.0	37.0	36.0	34.0	34.0
Target Performance	35	35	35	35	35	35	35	35	35	35	35	35
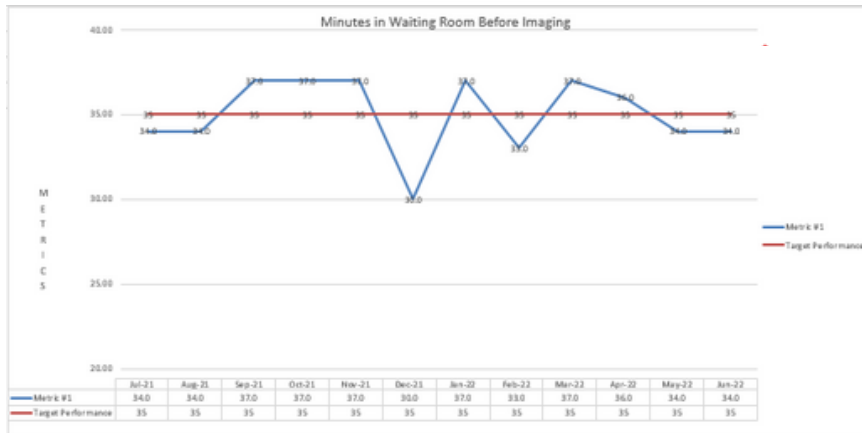
Interventional Radiology Clinic QAPI FY 2022

Project Title:	*Interventional Radiology New Patient Consult Intake Form Utilization*
Problem Statement:	*Currently, less than 50% of the IR Clinic New Patient visits have all records and care team information completed 2 weeks out from their scheduled appointment. The APPs with the IR clinic have created a NPV intake form in Epic that will guide the AA throught obtaining the required records.*
Project Goals/Objectives:	*IR goal is to in crease the NPV intake form process to at least 80% by June 30, 2022.*
Penn Medicine Team Goal:	*Patient Care Process, Continuitiy of care*
Sponsor/Champion	*Andrea Pogozelski Assitant Director Radiology QA, David Waters Assitant Director Radiology*
Data Collection Plan	*Amanda Davis, RN-IR clinic. Manually audit and review Epic charts monthly for compliance and share with team monthly.*

MEASURE FY22	JUL 21	AUG 21	SEP 21	OCT 21	NOV 21	DEC 21	JAN 22	FEB 22	MAR 22	APR 22	MAY 22	JUN 22
% INTAKE FORMS USED	56	49	29	11	0	4	46	83	92	80	81	80
TARGET PERFORMANCE	80	80	80	80	80	80	80	80	80	80	80	80

QAPI

MAGNETIC RESONANCE IMAGING

MRI PCAM Cardiac Exam Room TAT QAPI FY 2022

| Project Title:	MRI PCAM Cardiac Exam Room TAT QAPI FY 2022
Problem Statement:	Currently the PCAM MRI cardiac appointments are exceeding the given scheduled time slots within Pennchart..
Project Goals/Objectives:	Tracking the minutes from the start of a cardiac MRI appointment to discharge. The cardiac appoinntment involves 2 exams p/1 appointment. The goal TAT is within 78 minutes.
Penn Medicine Team Goal:	Value-Provide high quality, efficient care and the best outcomes for all patients.
Sponsor/Champion	Andrea Pogozelski, Assitant Director of Patient QA Radiology David Waters, Assitant Director of Radiology
Data Collection Plan	Joseph Smith Radiology Manager- Pennchart/patient progression reports by James Demasi
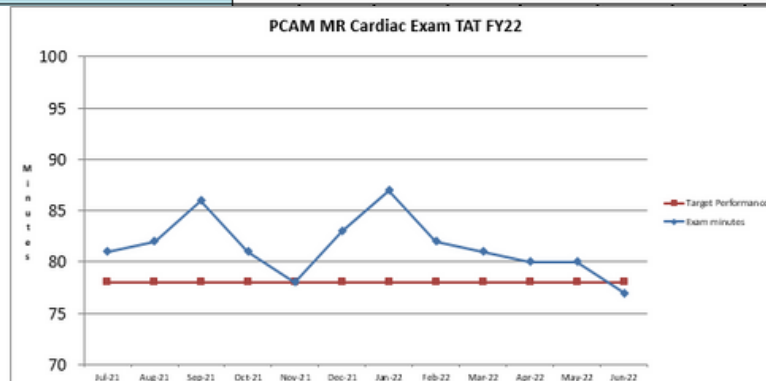
MRI PCAM Scheduling Shunt Mishaps - QAPI FY 2022

Project Title:	MRI PCAM Scheduling Mishaps - Patients with Programmable Shunts
Problem Statement:	Currently the PCAM MRI patients with programmable snunts are being scheduled for their MRI in Pennchart without a followup neurosurgery shunt check appointment post MRI. This causes patient care delay attributing to the overall MRI appoitnment delays the day of the appointment.
Project Goals/Objectives:	Tracking monthly the number of patient scheduling mishaps. Goal is no more than 1 per month.
Penn Medicine Team Goal:	Value-Provide high quality, efficient care and the best outcomes for all patients.
Sponsor/Champion	Andrea Pogozelski, Assitant Director of Patient QA Radiology David Waters, Assitant Director of Radiology
Data Collection Plan	Joseph Smith Radiology Manager- Manually auditing Safety net reports.
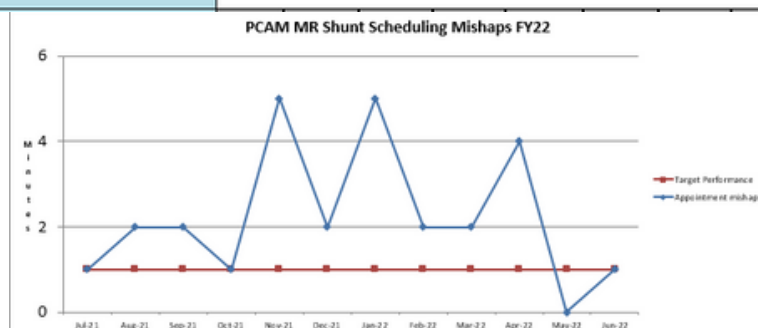
QAPI

PET Department QAPI FY 2022

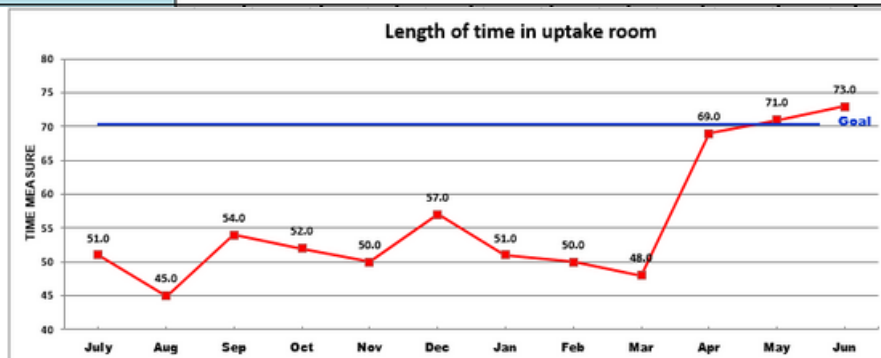|	
Project Title:	*Likelihood of Recommending PET*
Problem Statement:	*Low scores on Press Ganey regarding likelihood of patients recommending Penn Medicine to others.*
Project Goals/Objectives:	*To improve the likelihood our patients will recommend Penn Medicine to others at least 90% of the time.*
Penn Medicine Team Goal:	*Engagement*
Sponsor/Champion	*Ann Costello and Dan Pryma, MD*
Data Collection Plan	*Monthly Press Ganey reports will be utilized to gather data and drive improvement.*

Likelihood of Recommending

% patients likely to recommend
Target Performance

Jul-21 96, Aug-21 97, Sep-21 98, Oct-21 96, Nov-21 98, Dec-21 97, Jan-22 98, Feb-22 98, Mar-22 98, Apr-22 95, May-22 99, Jun-22 95
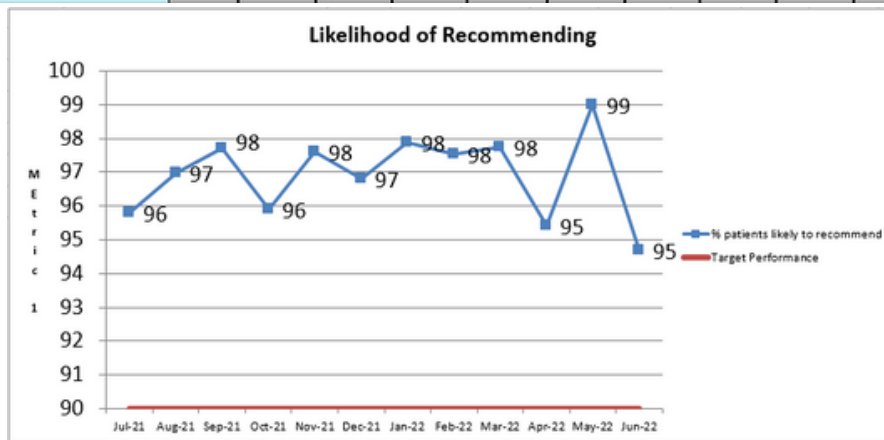
PET Department QAPI FY 2022

Project Title:	*Time Spent in PET inject/uptake room*
Problem Statement:	*PET patients have had an increase in inject/uptake room time for overall turnaround time.*
Project Goals/Objectives:	*To reduce PET inject/uptake room time to less than 66.9 minutes by June 31, 2022. Staff will expedite patient care to imporve room utilization and decrease length of patient study with updated radioglogist protocols.*
Penn Medicine Team Goal:	*Value-Provide high quality, efficient care and the best outcomes for all patients.*
Sponsor/Champion	*Ann Costello and Dan Pryma, MD*
Data Collection Plan	*Ellie Mantel, Manager collects data monthly via Patient progression dashboard data in EPIC.*

Length of time in uptake room

TIME MEASURE — Goal

July 51.0, Aug 45.0, Sep 54.0, Oct 52.0, Nov 50.0, Dec 57.0, Jan 51.0, Feb 50.0, Mar 48.0, Apr 69.0, May 71.0, Jun 73.0

QAPI

PET Department QAPI FY 2022

Project Title:	*First start PET rubidium stress tests*
Problem Statement:	*Rubidium PET stress tests on patients in the ED, ED/OBS and inpatient units were not being performed in the early morning.*
Project Goals/Objectives:	*Goal is to perform rubidium PET stress testing on 60% of ED, ED/OBS and admitted patients before 10am. This can potentially help improve discharge times of patients in these settings.*
Penn Medicine Team Goal:	*Continuity*
Sponsor/Champion	*Daniel Pryma, MD and Ann Costello*
Data Collection Plan	*Monthly reports are generated for review and tracking*

Rubidium PET Stress Testing Start Times

Jul-21: 73, Aug-21: 67, Sep-21: 52, Oct-21: 63, Nov-21: 61, Dec-21: 62, Jan-22: 66, Feb-22: 58, Mar-22: 67, Apr-22: 60, May-22: 63, Jun-22: 60 (Target Performance 60)

PET Department QAPI FY 2022

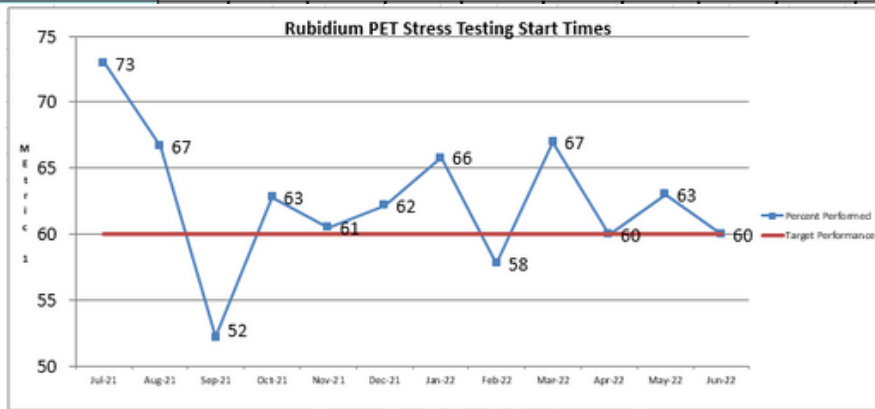|	
Project Title:	*Improve hand hygiene to 100% compliance in PET*
Problem Statement:	*Patient's do not observe staff performing hand hygiene when necessary while in PET department*
Project Goals/Objectives:	*Goal is to have100% compliance with patient's seeing staff perform hand hygiene*
Penn Medicine Team Goal:	*Value*
Sponsor/Champion	*Ann Costello and Dan Pryma, MD*
Data Collection Plan	*Monthly Press Ganey reports will be utilized to gather data and drive improvement*

Hand Hygiene in PET

Jul-21: 84, Aug-21: 96, Sep-21: 97, Oct-21: 95, Nov-21: 96, Dec-21: 96, Jan-22: 98, Feb-22: 96, Mar-22: 98, Apr-22: 94, May-22: 98, Jun-22: 96 (Target Performance 100)
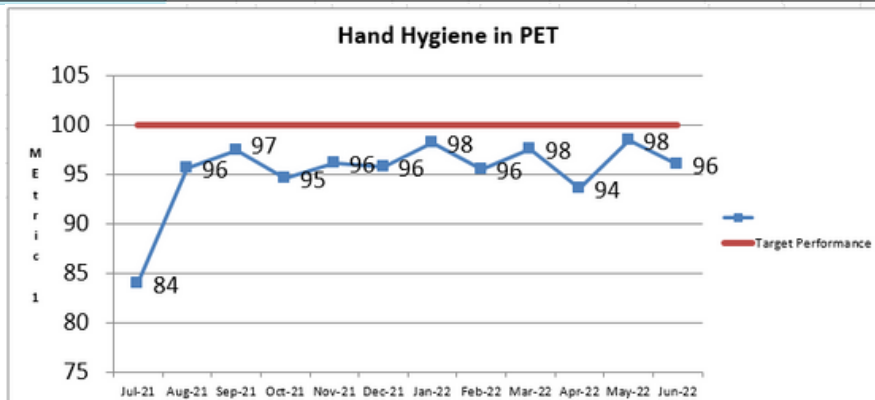
QAPI

PET Department QAPI FY 2022

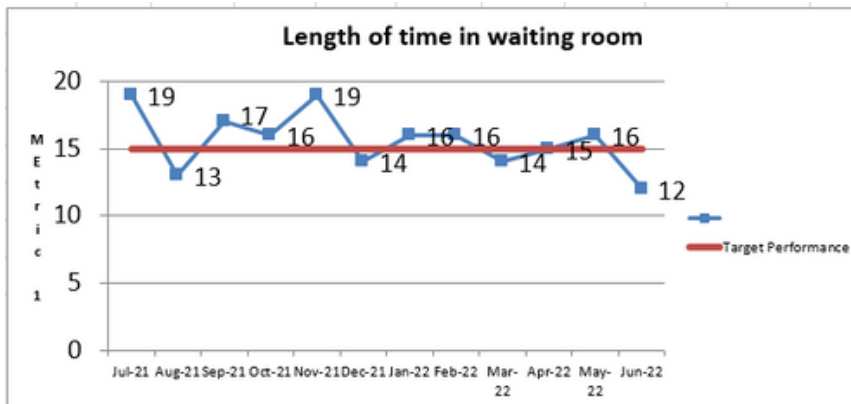|	
Project Title:	*Improved perception of staff's concern for patient comfort while in PET*
Problem Statement:	*Patient perception of care they received regarding their comfort while in PET*
Project Goals/Objectives:	*Goal is to have100% patient satisfaction with the care they receive regarding their comfort while in PET*
Penn Medicine Team Goal:	*Value*
Sponsor/Champion	*Ann Costello and Dan Pryma, MD*
Data Collection Plan	*Monthly Press Ganey reports will be utilized to gather data and drive improvement (mean values)*

Concern for Comfort in PET

Data points: 90, 96, 98, 96, 99, 96, 99, 97, 98, 97, 98, 96 (Jul-21 through Jun-22); Target Performance = 100
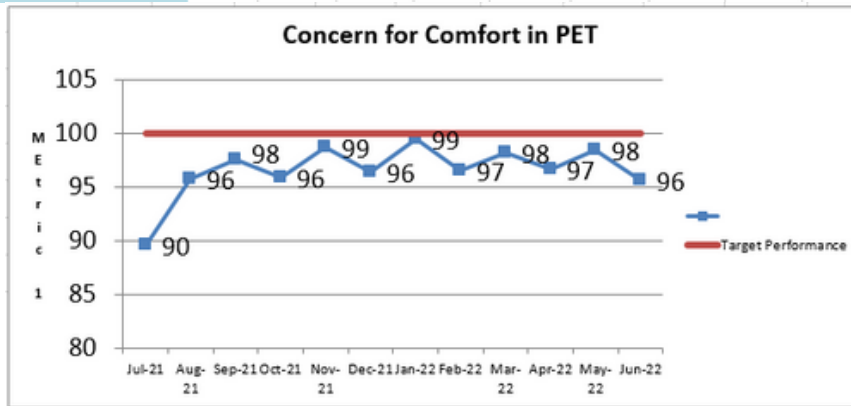
Nuclear Medicine Department QAPI FY 2022

Project Title:	*Reduction fo Time Spent in NM Waiting Room*
Problem Statement:	*Increased patient waiting room time to the exam room.*
Project Goals/Objectives:	*Goal is to achieve wait time of <15 minutes in the NM waiting room by June 30, 2022. Staff will provide patient care in an expedited manner in an effort to imporve room utilization and length of patient exam.*
Penn Medicine Team Goal:	*Value*
Sponsor/Champion	*Ann Costello and Dan Pryma, MD*
Data Collection Plan	*Monthly EPIC Patient progression reports will be utilized to gather data and drive improvement (mean values)*

Length of time in waiting room

Data points: 19, 13, 17, 16, 19, 14, 16, 16, 14, 15, 16, 12 (Jul-21 through Jun-22); Target Performance = 15

QAPI

Nuclear Medicine Department QAPI FY 2022

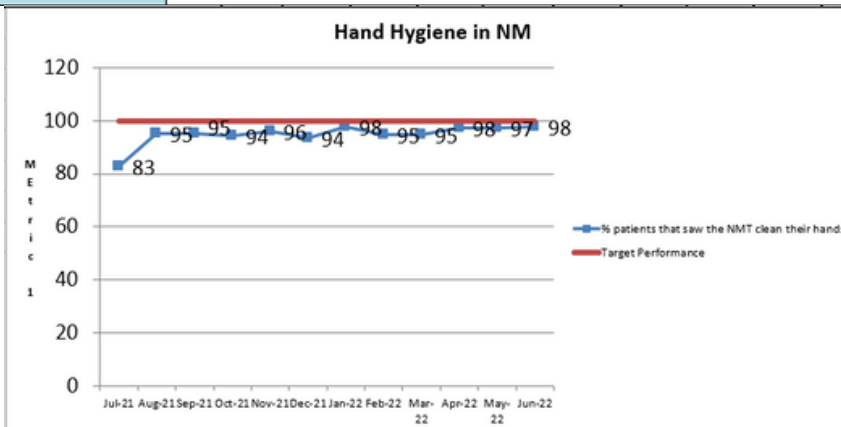|	
Project Title:	*Improved perception of staff's concern for patient comfort while in NM*
Problem Statement:	*Patient perception of care they received regarding their comfort while in NM*
Project Goals/Objectives:	*Goal is to have100% patient satisfaction with the care they receive regarding their comfort while in NM*
Penn Medicine Team Goal:	*Value*
Sponsor/Champion	*Ann Costello and Dan Pryma, MD*
Data Collection Plan	*Monthly Press Ganey reports will be utilized to gather data and drive improvement (mean values)*

Concern for Comfort in NM
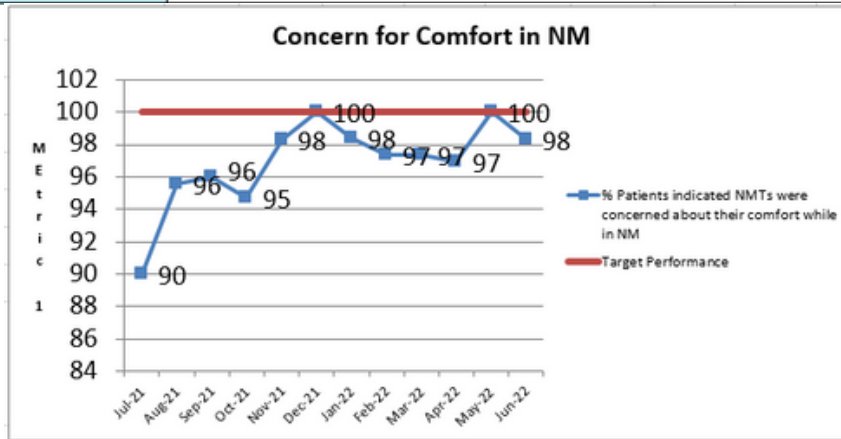
Nuclear Medicine Department QAPI FY 2022

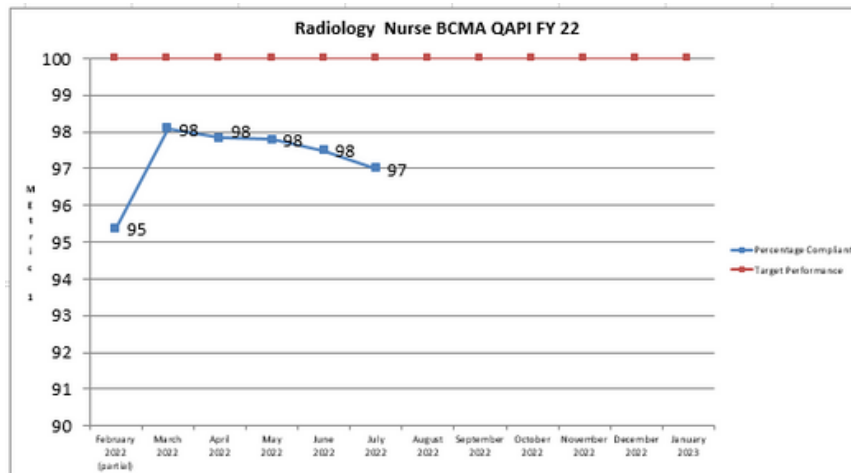|	
Project Title:	*Improve hand hygiene to 100% compliance in NM*
Problem Statement:	*Patient's do not observe staff performing hand hygiene when necessary while in NM department*
Project Goals/Objectives:	*Goal is to have100% compliance with patient's seeing staff perform hand hygiene*
Penn Medicine Team Goal:	*Value*
Sponsor/Champion	*Ann Costello and Dan Pryma, MD*
Data Collection Plan	*Monthly Press Ganey reports will be utilized to gather data and drive improvement (top box values)*

Hand Hygiene in NM

QAPI

Project Title:	**Radiology Nursing BCMA Compliance**
Problem Statement:	Radiology Nursing does not utilize barcode medication administration scanning (BCMA) when administering medications.
Project Goals/Objectives:	Whenever a medication is given to a patient in the radiology modalities, a radiology nurse will scan the patient's wrist band, and vial of medication (which is ordered in PennChart) before medication administration. The goal is 95% compliance.
Penn Medicine Team Goal:	This project aligns with medication compliance and safety.
Sponsor/Champion	Director of Radiology - Ann Costello Radiology Nurse Manager - Justin Walters Radiology Nursing Professional Development Specialist - Jestina Wolff
Data Collection Plan	Daily reports with raw data are sent to nurse manager and analyzed. Daily data is compiled and placed into the QAPI file. Daily, weekly, and monthly trends are shared with the team.

Radiology Nurse BCMA QAPI FY 22

RADIOLOGY PCAM RECEPTION

Radiology Reception QAPI FY 2022

Project Title:	*Radiology Reception PSA Metrics Improvement*
Problem Statement:	The PSAs are not optimizing their registration process in PCAM radiology.
Project Goals/Objectives:	Improve PSA monthly patient registration metrics to an average of 8 patients/hour on a daily basis - target by June 30, 2022. Data will be collected weekly and will be put into a spreadsheet to compare month to month averages. Monitoring these metrics on a monthly basis will help create aeffective patient flow.
Penn Medicine Team Goal:	This project most closely aligns with Penn Medicine's Radiology Revenue Cycle Operations team. Value-based to provide high quality, efficent care.
Sponsor/Champion	Ann Costello (Director) and David Waters (Assistant Director) the leaders responsible for the project and its overall outcomes. Their role is to provide direction, remove barriers, and ensures the action plans and goals are being achieved.
Data Collection Plan	Antoniette Johnson (Supervisior) and Blessy Alexander (Team Lead) will collect PSA metrics monthly. Issues not able to be resolved will be reported to Sponsor/Champion.

Radiology Reception PSA Metrics Improvement
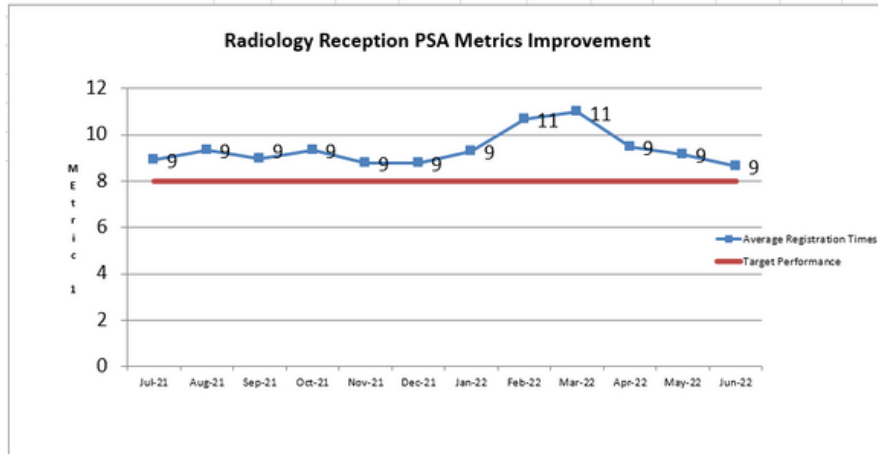
QAPI

ULTRASOUND

Radiology Ultrasound Department QAPI FY 2022

Project Title:	Waiting room communication project
Problem Statement:	Our patients are complaining of not being informed about delays
Project Goals/Objectives:	Our goal is to improve communication with our patients in the waiting area's. Press Ganey scores will be monitored through June 30, 2022 with a target of 95% of the time the patient answered "yes", they were informed of delays in the US area. Since the goal has not been met due staff shortages we will continue to monitor through FY23.
Aligns with HUP Entity Goal:	Quality based care; Continuity of seamless patient care.
Sponsor/Champion	Andrea Pogozelski Assistant Director Patient Quality/Safey, Dave Waters Assistant of Radiology
Data Collection Plan	Manager will collect the Press Ganey data and review at each staff meeting and shared governance meeting

Patients informed of delays in waiting area
Press Ganey Data
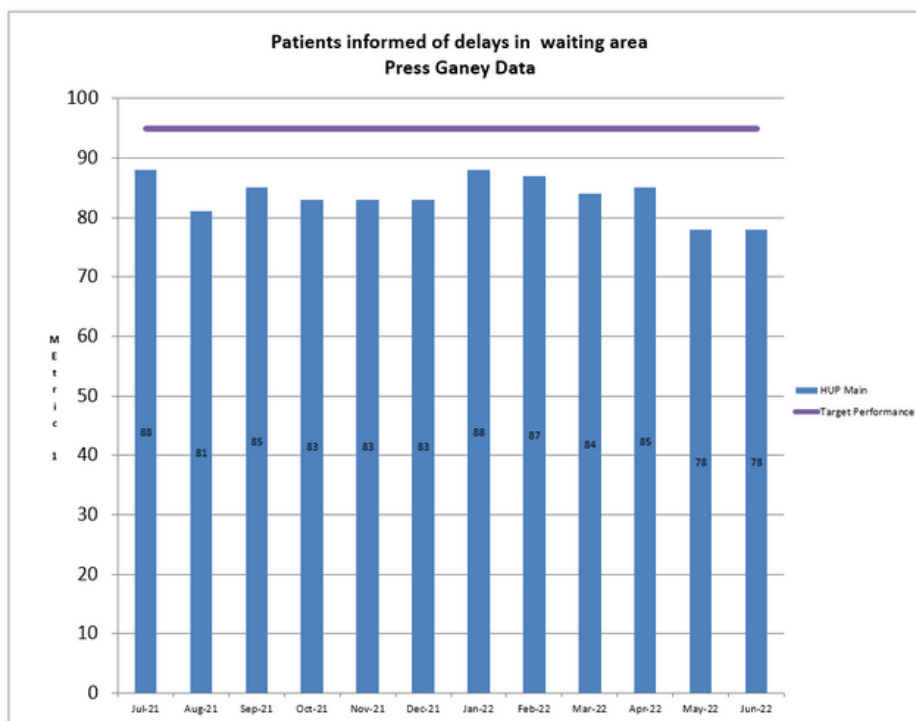
QAPI

HUP CEDAR Radiology QAPI FY 2022

Project Title:	HUP CEDAR Radiology EXAMS TAT Metrics Improvement
Problem Statement:	*Improve Inpateint Radiology exams order to complete TAT monthly metrics. Target goal is 60 minutes.*
Project Goals/Objectives:	*Monitoring these metrics on a monthly basis will help create greater patient satisifaciton and minimize length of stay due to shorter TAT. Target is to complete these inpatient radiology exams within 60 minutes by June 30, 2022. Since target for all areas were not met we will continue through FY23.*
Aligns with HUP Entity Goal:	*Continuity- This project most closely aligns with Penn Medicine's minimizing ED length of stay (LOS).*
Sponsor/Champion	*Colleen Nale HUP Cedar Radiology Director and Ann Costello HUP Corporate Radiology Director are the leaders responsible for the project and its overall outcomes. Their role is to provide direction, remove barriers, and ensures the action plans and goals are being achieved.*
Data Collection Plan	*Colleen Nale (Director) will collect Pennchart Metrics monthly. Issues not able to be resolved will be reported to Sponsor/Champion.*

Measure FY22	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
CT	96	100	104	100	99	104	99	97	92	89	82	87
MRI	122	99	95	106	105	112	137	116	120	101	111	92
US	50	52	39	46	50	50	54	57	57	41	44	44
Target Performance	60	60	60	60	60	60	60	60	60	60	60	60

HUP CEDAR EXAM ORDER TO COMPLETE TAT

QAPI
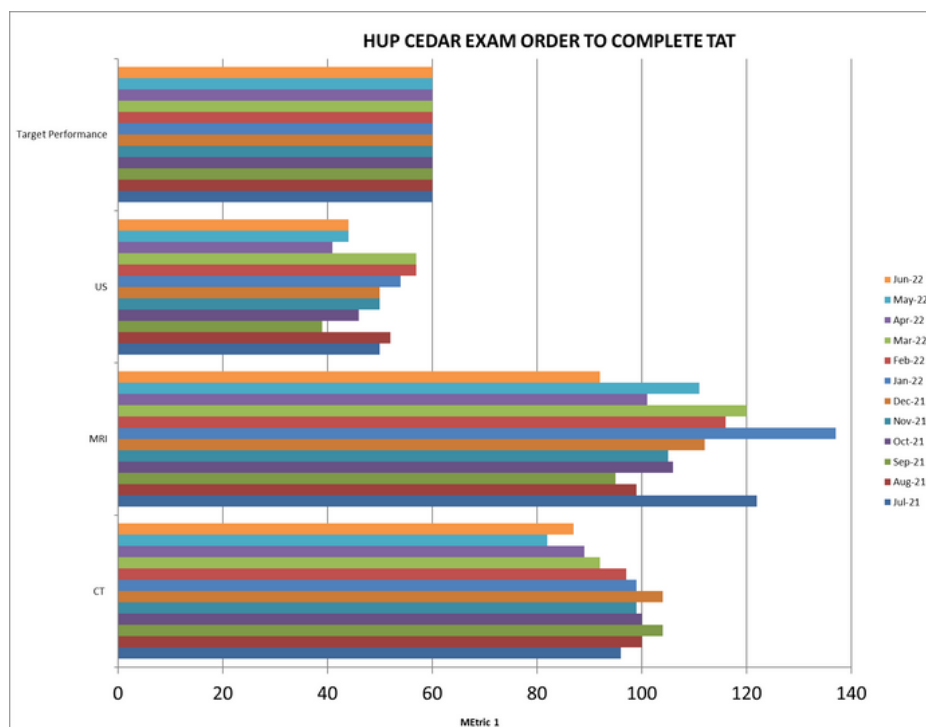
HUP SIX SIGMA YELLOW BELT FY22 PROJECTS

Six Sigma is defined as a set of techniques and tools for process improvement. Initially developed in the telecommunications field, this approach has been widely used in multiple industries including health care.

Six Sigma projects follow a defined methodology and targets in order to reduce error and minimize variability. Each year several staff members of the HUP Department of Radiology conduct high impact projects as part of their Yellow and Green Belt training.

University of Pennsylvania Health System

HUP Mammography Biopsy Scheduling Optimization

Sponsor(s): Susan Penta, Antoinette Carey   Last Updated: 8/31/22
Leader: Dave Waters, Assistant Director Radiology
Other Team Members: Andrea Pogozelski, Blessie Alexandria, Steve Hyland

Problem Statement

There is an overabundance of mammography administrative duties at HUP in the Radiology Mammography nursing role.
The Mammography nurse has been scheduling and coordinating future biopsy patients in between their daily patient care nursing tasks in the Mammo Radiology area.
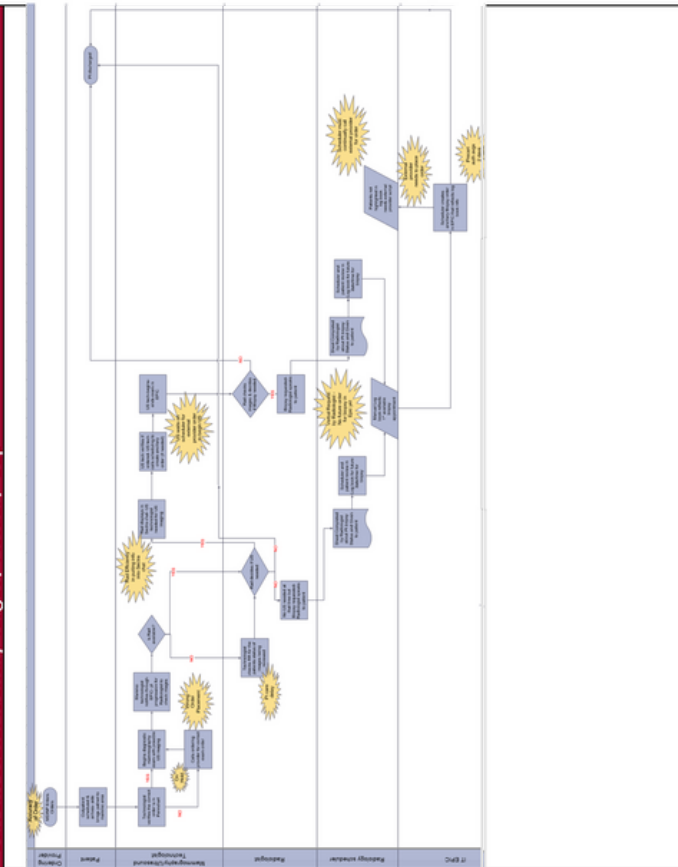Delays to appointment availability is up to 3 weeks.

Background

The radiology nurse contacts our patients that have abnormal Mammo/Ultrasound findings. These patients need to be scheduled for a future biopsy procedure as soon as possible.
This process can cause delays in early intervention and loss of revenue if we do not capture these patients and schedule them at HUP in a timely manner. Best practice is prior to discharge from the unit.

Target State: SMART Goal

Increasing the percentage of patients that are scheduled by the PSA on the same day of their abnormal Mammo/US to a future biopsy appointment prior to discharge from 46% to 80% by 9/30/22.
Decrease the first appointment availability from the average 14 days to 5 days by 12/30/22.
With optimizing the scheduling process this will contribute to a 30% increase of daily biopsy volume by 12/30/22.

Current State: Identify Target / Actual / Gap

Key Drivers

- Specific Mammography scheduler (PSA) needed
- Radiologist needs to communicate with the PSA
- Trained PSA is only scheduled 830am–4pm.
- Pennchart IT build needed- recognize internal/external providers- when scripts are needed

Interventions / Countermeasures

(2) PSA schedulers educated and trained 5/2/22-2/27/22 by the Mammography scheduler on biopsy scheduling resources/workflow.

Prior to patient being discharged. The radiologist sends a script with patient to the front desk with the type of procedure needed to be scheduled in the future.

Extending PSA coverage from 830a-4p through 5pm- goal date 9/30/22- pending staffing needs.

Mammography auto scheduling snapboard created with color-coded internal/external differentiation to visually see if script is needed- goal date 8/31/22.

Results

Designated PSA training started 5/2/22. Within the 1st month (5/22) we scheduled 55% of abnormal Mammo/US patients for future biopsies at HUP.

July 2022 we have reached 82% same day scheduling for future biopsies.
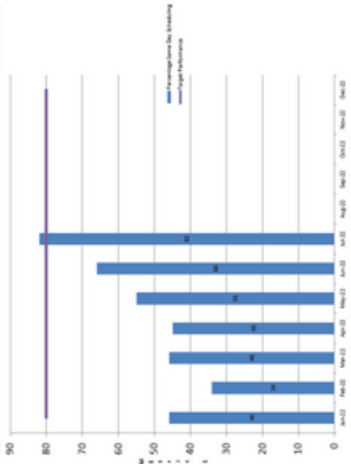
Sustain Plan

Project has been assumed by (2) PSA schedulers, breast radiologist team and the Mammo/US technologists.
PSA schedulers will train and support future PSAs as needed.
Data will be collected from EPIC monthly for PCAM Mammography Department to assess sustainability.
Discuss progress monthly at staff meeting.

University of Pennsylvania Health System

Interventional Pre-Procedure Standardization of the Patient Work Up Process

Sponsor(s): Justin Walters, Rad nurse manager **Last Updated:** 6/13/202
Leader(s): Ann Costello, Director Radiology
Other Team Members: Radiology nurse coordinator/holding area nurse/procedure room nurse

Problem Statement
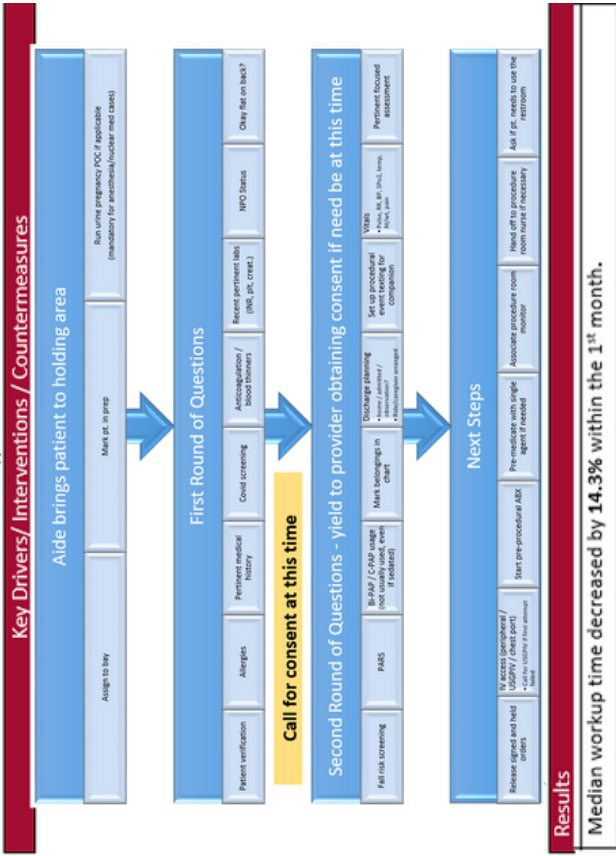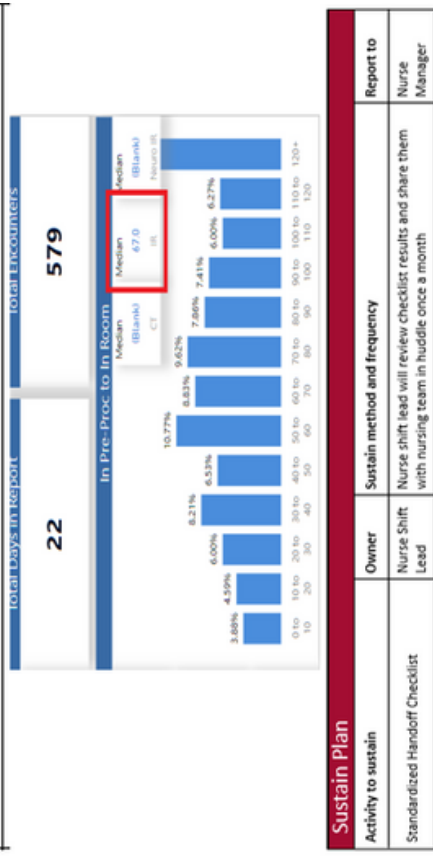Excessively high times are occurring in Radiology in interventional radiology (IR) during the pre-procedure workup prior to an IR procedure at HUP. This is causing patient care delays within the appointment and patient dissatisfaction.

Background
The average time form the start of pre-procedure workup (for an IR procedure patient done by a nurse in radiology) to be taken in to the procedure room is 77 minutes, in July 2021. Anticipated goal is reducing the pre-procedure median workup time by the radiology nursing by 10% by August 2021.

Target State: SMART Goal
Service excellence,
Growth/capacity,
Nursing strategic imperatives including patient family experience

Current State: Identify Target / Actual / Gap

Total Days in Report: 22   Total Encounters: 556

In Pre-Proc to In Room — Median 77.0 (Blank) CT / Neuro IR

3.69% 3.06% 4.44% 7.65% 8.64% 10.06% 6.48% 7.11% 7.24% 7.26% 6.64% 5.51%
(0 to 10, 10 to 20, 20 to 30, 30 to 40, 40 to 50, 50 to 60, 60 to 70, 70 to 80, 80 to 90, 90 to 100, 100 to 110, 110 to 120, 120+)

Analysis

Work up process not consistent:
- Which order should questions be asked in?
- Improper use of timestamps
- When is best time to call for consent?
- When to do vital signs?
- When to insert IV / start pre-procedure antibiotics?

Stakeholder Role	What is their importance?	Why would they be for/against the change?	What do you need to do to gain buy-in?
Radiology Nurse Clinical Coordinator	Very important – The coordinator functions as a charge nurse, highly involved in daily flow of the radiology procedural areas.	Could be for this change because it will increase efficiency in a busy procedural schedule, making it more likely to get done on time.	Discuss one on one with coordinator – make them realize the positive impact this change could have on procedural area efficiency by showing them detailed data.
			Show new process map
Radiology Nurse assigned to the Holding Area	Very important – The nurse assigned to the holding area is the one that pre-op's patients prior to their procedure.	Could be against this change due to feeling rushed.	Discuss in staff meetings
			Shoulder to shoulder
			Show detailed data
			Show new process map
Radiology Nurse assigned to a Procedure Room	Mildly important – The nurse in the procedure room does not pre-op patients. They take over patient care in the procedure room.	Could be for this change because it will increase efficiency in a busy procedural schedule, making it more likely to get done on time.	Discuss in staff meetings
			Shoulder to shoulder
			Show high-level data
			Show new process map

Key Drivers/ Interventions / Countermeasures

Aide brings patient to holding area
- Assign to bay
- Mark pt. in prep
- Run urine pregnancy POC if applicable (mandatory for anesthesia/nuclear med cases)

First Round of Questions
- Patient verification
- Allergies
- Pertinent medical history
- Anticoagulation / blood thinners
- Recent pertinent labs (INR, plt, creat.)
- NPO Status
- Okay flat on back?
- Fall risk screening
- PARS
- Covid screening

Call for consent at this time

Second Round of Questions – yield to provider obtaining consent if need be at this time
- Release signed and held orders
- IV access (peripheral/ USGPIV / chest port) • Call for USGPIV if first attempt failed
- Start pre-procedural ABX
- Bi-PAP / CPAP usage (not usually used, event if sedated)
- Mark belongings in chart
- Discharge planning • home / admitted / observation? • Aide/companion arranged
- Pre-medicate with single agent if needed
- Vitals • Pulse, BP, sp02, temp, RR/wt, pain
- Associate procedure room monitor
- Set up procedural event testing for completion
- Hand off to procedure room nurse if necessary
- Ask if pt. needs to use the restroom
- Pertinent focused assessment

Next Steps

Results

Median workup time decreased by 14.3% within the 1st month.

Total Days in Report: 22   Total Encounters: 579

In Pre-Proc to In Room — Median 67.0 (Blank) IR / Neuro IR CT

4.59% 3.86% 6.00% 8.21% 8.53% 10.77% 9.62% 7.86% 7.41% 6.00% 6.27%
(0 to 10, 10 to 20, 20 to 30, 30 to 40, 40 to 50, 50 to 60, 60 to 70, 70 to 80, 80 to 90, 90 to 100, 100 to 110, 110 to 120, 120+)

Sustain Plan

Activity to sustain	Owner	Sustain method and frequency	Report to
Standardized Handoff Checklist	Nurse Shift Lead	Nurse shift lead will review checklist results and share them with nursing team in huddle once a month	Nurse Manager

SAFETY EVENT ANALYSES

Quality and Patient Safety:

Increasingly medical decisions rely on Radiology testing with the expectation that the results are performed correctly the first time and every time. Despite our best efforts, however, mistakes can and do occur. Through event reporting systems, such as Penn Medicine Safety Net (PMSN), we can explore errors in order to develop prevention strategies and mitigate error. These systems and processes are part of the "just culture" or "no blame culture" of Penn Medicine that promotes transparency in order to improve patient and staff quality and safety. In alignment with this culture, the Department of Radiology employs several Six Sigma quality investigative tools and processes which focus on systems and processes rather than individual performance:

Root Cause Analysis (RCA):
An RCA is an in-depth review of a serious event that has resulted in harm and/or poses a serious threat to safety. Such events include sentinel events, never events and recurrent events that have previously resulted in multiple apparent cause analyses. The review is performed by a multidisciplinary team, led by a formally trained facilitator, and involves a designated methodology and templates. The review seeks to identify the underlying root cause(s) of the event and develop a formal measurable corrective action plan(s) as appropriate. When appropriate, a specific RCA may involve the review of more than one event. **Three RCAs were completed in FY22.**

Apparent Cause Analysis (ACA):
An ACA is a limited unit or department level focused review of selected near-miss events that have minor or no harm or recurrent events that have previously been evaluated in Local Reviews. An ACA is usually performed by 1-2 individuals, does not require formal training, follows a standard template and will result in measurable corrective action(s) designed to prevent recurrence. **There were no ACAs completed in FY22.**

SAFETY EVENT ANALYSES

Just Do It or Local Review:
A local review is performed on all events by the appropriate unit or department manager at the time of the event to determine if any intervention is immediately needed in order to continue care and/or address an unsafe condition. All events will be looked at in aggregate to help identify current risks, along with safety trends, aid in the identification of future risks, and assist in the development and dissemination of information regarding safety and quality improvement. Information developed and disseminated by Just Do Its includes recommendations, protocols or information regarding best practices. **Two Just Do It were complete in FY22.**

Safety Event Analysis (SEA)
Throughout the year Resident facilitators conducted 20 minute inter-professional meetings to discuss recently reported PMSN events. The goal is to analyze a safety net and discuss a framework for effective event analysis and for evaluating the strength of various interventions. FY22 resident facilitators were Coulter Cranston MD and Julia D'Souza MD. **Three SEAs were completed in FY22.**

Each year up to four Penn Radiology residents are selected for the Penn Medicine Healthcare Leadership Resident Quality (HLQ) Track. This inter-departmental course exposes residents from HUP, PPMC and PAH to a variety of formal quality tools as they engage in a two year long project.

1. **Residents: Gregory Parker MD, Nathaniel Linna MD (Mentor: Hanna M Zafar MD MHS)**

   Title: Implementation Of A Smart CDS Tool For Improved Lumbar Spine MRI Ordering

   Summary: Reduce 'No score' CDS orders for MRI L spine for lower back pain for low back pain ordered by spine specialists. *See page 81*

2. **Residents: Cathal O'Leary MD (Mentor: Friedrich D. Knollman MD PhD)**

   Title: Dual Energy CT Lung Perfusion

   Summary: Optimize image quality and protocol standardization for Pulmonary Embolism exams using dual energy CT. *See page 92*

3. **Residents: Nnamdi Udeh, MD (Mentor: Friedrich D. Knollman MD PhD)**

   Title: Optimization of Whole Body CT Technique for Trauma Patients at PPMC

   Summary: Define best practices for whole body CT scans of trauma patients presenting to Presbyterian Medical Center. *See page 49*

Penn Medicine — Implementation Of A Smart CDS Tool For Improved Lumbar Spine MRI Ordering

Problem Statement

- Imaging Clinical Decision Support (CDS) is intended to reduce inappropriate imaging orders by providing real-time evidence based guidelines to ordering providers at the time of order entry.
- Imaging CDS cannot be applied to nearly 2/3rds of Penn Medicine imaging orders due to the use of free text order indications; free text indications do not map appropriate use criteria and thus pose a lost teaching opportunity to ordering providers.
- MRI L spine maps to one of the eight priority clinical areas targeted by CMS for the scheduled imaging CDS mandate.
- Our CDS mechanism developed an AI smart tool embedded within the EHR that automatically suggested existing structured indications based on free text entered by providers.

Background

This project promotes two UPHS blueprint goals:

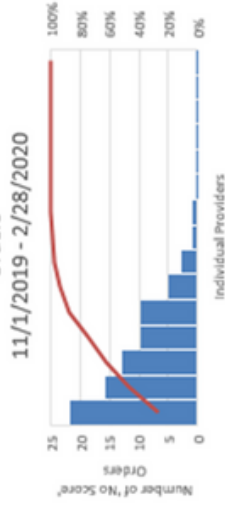- Continuity of care
- High Reliability

Target State: SMART Goal

Reduce 'No score' imaging CDS order for MRI Lumbar Spine (MRI-LS) for low back pain ordered by spine specialists by 50% using an AI smart tool by October 3, 2021.

Analysis



Pareto Chart – MR Lumbar Spine 'No Score' Orders
11/1/2019 - 2/28/2020

Post Intervention

Order Score	All Spine Specialist Orders						
	Pre-intervention		Post- intervention				chi-square statistic
	count	%	count	%	p-value		
Usually Appropriate	167	55.3%	405	76.0%	0.00001		38.2
May be Appropriate	47	15.6%	71	13.3%	0.37		0.8
Usually Not Appropriate	7	2.3%	4	0.7%	0.056		3.6
No Score	81	26.8%	53	9.9%	0.00001		40.8
Total	302		533				

Physician Order Scores
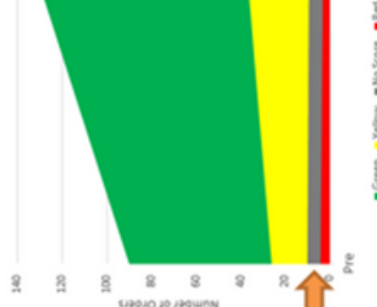
APP Order Scores
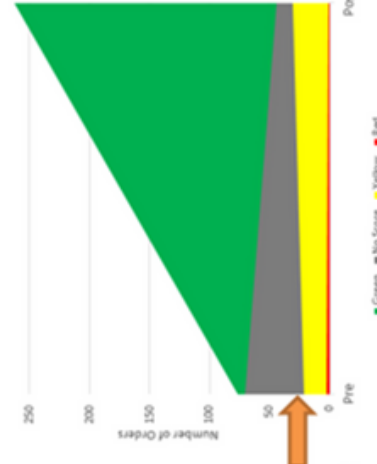
Sustain Plan

TBD

BIOPSY QA

QA is an integral part of the biopsy process. Diagnostic yield and complications are tabulated on a quarterly basis by biopsy coordinator Bonnie Brake MS RDMS RVT and shared at relevant divisional meetings. IR biopsy QA has now been automated using Montage and is reported on a quarterly basis and reviewed at IR division meetings. For both the biopsy service and IR, yield and complications in FY21 were better than published national standards, where such standards exist. A sample report for quarter 3 is provided below

Radiologist Summary FY22 Quarter 3

Annoymized Radiologist	Total Biopsies	Complication- Major (N)	Complication- Minor (N)	Complication Rates-Major (%)	Complication Rates-Minor (%)	Diagnostic Results (N)	Non-diagnostic results (N)	Diagnostic Success Rate (%)
1	5	0	0	0	0	5	0	100.00%
2	31	0	1	0.00%	3.23%	30	1	96.77%
3	8	0	0	0.00%	0.00%	8	0	100.00%
4	6	0	0	0.00%	0.00%	6	0	100.00%
5	4	0	0	0.00%	0.00%	4	0	100.00%
6	8	0	0	0.00%	0.00%	7	1	87.50%
7	7	0	0	0.00%	0.00%	6	1	85.71%
8	22	0	2	0.00%	9.09%	22	0	100.00%
9	77	0	0	0.00%	0.00%	76	1	98.70%
10	4	0	0	0.00%	0.00%	4	0	100.00%
11	16	0	0	0.00%	0.00%	16	0	100.00%
12	17	0	0	0.00%	0.00%	17	0	100.00%
13	17	0	0	0.00%	0.00%	17	0	100.00%
14	10	0	0	0.00%	0.00%	9	1	90.00%
15	38	0	1	0.00%	2.63%	38	0	100.00%
16	5	0	2	0.00%	40.00%	3	2	60.00%
17	12	0	0	0.00%	0.00%	12	0	100.00%
18	1	0	0	0.00%	0.00%	1	0	100.00%
19	33	0	1	0.00%	3.03%	32	2	96.97%
20	12	0	0	0.00%	0.00%	12	0	100.00%
21	16	0	0	0.00%	0.00%	16	0	100.00%
22	23	0	0	0.00%	0.00%	22	1	95.65%
23	26	0	0	0.00%	0.00%	26	0	100.00%
24	48	0	0	0.00%	0.00%	45	3	93.75%
25	41	0	0	0.00%	0.00%	41	0	100.00%
Grand Total	497	0	7	0.00%	1.41%	484	13	97.38%

HUP CLINICAL EFFECTIVENESS TEAM (CET)
## *DIVISION SUMMARIES*

FY2022
Division Initiatives

Each division CET representative presents an annual review of that division's QA/QI activities at bimonthly HUP CET meetings. These presentations are also shown in respective divisional meetings and are available to anyone who wishes to review them. Summaries of these presentations follow, showing the rich and diverse quality activities completed in FY21 and underway in FY22.

Radiology Peer Learning: Opportunity Cases to Improve Patient Care

Sponsor: Mark Rosen, MD
Leader: Joanie Garratt, MD
Team Members: Hanna Zafar, MD, MHS; Kalpana Suresh, MD

Last Updated: July 2022
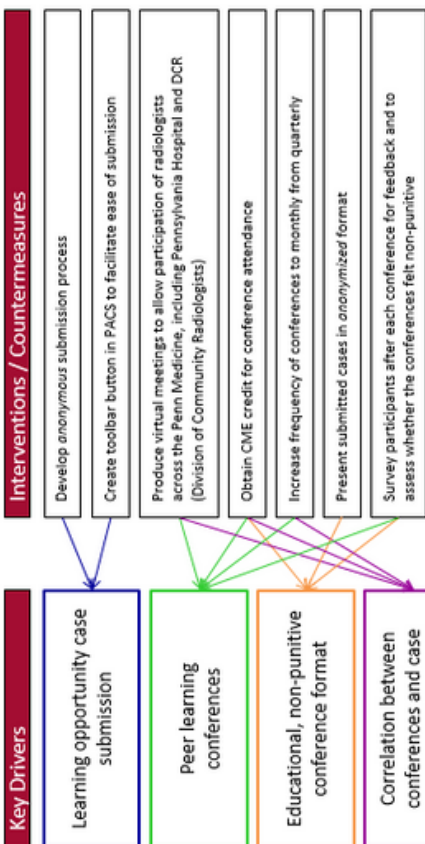
Problem Statement

- Score-based peer review is based on peer reported errors.
- Perception that the peer review process is biased and punitive contributes to distrust, underreporting and limited participation.
- Most category 3 discrepancies are only shared with the reporting radiologist rather than across a larger groups of radiologists reading similar studies.

Background

- The era of value-based healthcare requires radiology practices to facilitate continuous improvement and ensure that performance standards are maintained.
- In peer learning misses, mimics and great calls are submitted by radiologists. However, the focus shifts away from quantifying individual error rates to group learning through anonymized case conferences.
- Non-punitive discussion of peer learning cases in a safe and collaborative environment enhances radiologist education, builds team cohesion, and increases patient safety.

Target State: SMART Goal

- By June 2022, peer learning case submission by Abdominal Imaging Division radiologists at the University of Pennsylvania will increase by 10 percent from June 2021.

Key Drivers

- Learning opportunity case submission
- Peer learning conferences
- Educational, non-punitive conference format
- Correlation between conferences and case submission

Interventions / Countermeasures

- Develop anonymous submission process
- Create toolbar button in PACS to facilitate ease of submission
- Produce virtual meetings to allow participation of radiologists across the Penn Medicine, including Pennsylvania Hospital and DCR (Division of Community Radiologists)
- Obtain CME credit for conference attendance
- Increase frequency of conferences to monthly from quarterly
- Present submitted cases in anonymized format
- Survey participants after each conference for feedback and to assess whether the conferences felt non-punitive

Analysis: Case Submissions

Results

Submission Window	Total Number of Cases Submitted	Average Case Submission Per Month
July 2018 – June 2019	180	15
July 2019 – June 2020	120	10
July 2020 – June 2021	96	8
July 2021 – June 2022	203	17
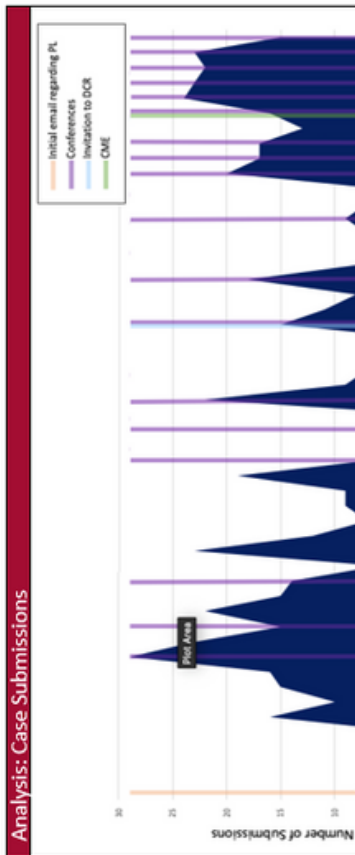
Sustain Plan

Activity to sustain	Owner	Sustain method and frequency
Collect cases and prepare for presentation at peer learning conferences by Abdominal Imaging fellows	Joanie Garratt, MD	Export cases and prepare for presentation monthly
Submit paperwork for attendees to obtain CME credit for participating in peer learning conferences	Joanie Garratt, MD	Submit CME paperwork monthly

Penn Medicine

Addressing Race-Based Disparities in Time to Breast Cancer Diagnosis and Treatment

Sponsor(s): Breast Imaging/Breast Surgery   Last Updated: X/XX/20XX
Leader(s): Christine Edmonds MD   Coach:
Other Team Members: Carmen Guerra, MD; Leisha Elmore, MD; Oluwadamilola Fayanju, MD; Brian Englander, MD; Sara Ginzberg MD

Problem Statement

- Black women in the United States diagnosed with breast cancer have longer time intervals from diagnosis (via image-guided percutaneous needle biopsy) to treatment initiation compared to White women.
- Black women present with more advanced breast cancers and face markedly higher disease specific mortality.

Background

This project promotes two UPHS blueprint goals:
- Diversity and Equity
- High Reliability

Target State: SMART Goal

Penn breast cancer multi-disciplinary team will decrease the median time-to-biopsy among our Black West Philadelphia population from 21 days (current) to 10 days by August 2023. In addition, we will eliminate race-based disparities in time-to-biopsy by August 2023.

Current State: Identify Target / Actual / Gap

Time-to-Biopsy: *By Race/Ethnicity*

Overall

	Median days (95% CI)	% follow-up within 1 year
White	12 (11-12)	81.2%
Black	21 (20-21)	79.9%
Hispanic	14 (13-16)	78.2%
Asian/PI	14 (13-15)	80.9%

BI-RADS 4

	Median days (95% CI)	% follow-up within 1 year
White	13 (12-13)	80.0%
Black	22 (21-23)	78.5%
Hispanic	15 (13-17)	77.6%
Asian/PI	16 (14-18)	79.5%

BI-RADS 5

	Median days (95% CI)	% follow-up within 1 year
White	7 (6-7)	90.1%
Black	13 (11-14)	88.3%
Hispanic	8 (5-16)	85.2%
Asian/PI	7 (6-9)	90.2%

Analysis

Biopsy Delays (fishbone diagram with branches: Lack of Insurance, Childcare Responsibilities, Lack of Transportation, Language/Illiteracy, Clinic Delays, Out-of-Network PCP, Challenges Navigating Health System, Employment Responsibilities)

Key Drivers

- Incorrect information provided by primary care providers
- Time away from work / childcare
- Fear of results
- Fear of pain/discomfort

Interventions / Countermeasures

- Partnership with community-based health centers to educate clinicians on specific screening and high-risk assessment needs of Black women

- Implement clinical coordinator and patient navigator team to efficiently chaperone targeted patients community through the screening, diagnostic, and biopsy process. This team will also arrange for funding of uninsured patients' imaging and biopsies through the state PBHI/Healthy Women program

- Implement same-day biopsy program at HUP/PCAM for targeted patients with BI-RADS 5 (highly suspicious for breast cancer) assessments

Sustain Plan

TBD

Section	HUP/PCAM Breast Imaging Division
Project Title	Updated Chaperone Policy for Breast Ultrasound
Problem Statement	Under the longstanding chaperone policy for breast ultrasound, male trainees (residents and fellows) were required to have a female chaperone (tech aide) present for all breast ultrasounds conducted on female patients. In addition to reflecting outdated gender-based practices and biases, the policy also resulted in substantial delays (10-30 minutes) for ultrasound exams conducted by male physicians, as tech aides needed to be called from outside the division to chaperone.
Blueprint ±	Diversity and Equity; High Reliability; Staff Engagement
SMART goal*	Update the chaperone policy to both expedite patient care and alleviate gender-based practice. Measure delays to ultrasound start time. Assess trainee comfort and satisfaction with new policy via survey. Monitor for patient satisfaction and concerns
Quality Tools	Surveys; A3 tool Visual room audits of current chaperone workflow
Metrics	Dr. Christine Edmonds was responsible for collecting data over a several-month period on ultrasound delays when utilizing chaperones. She conducted surveys via social media as well as email to understand chaperone practices at other sites around the country, and well as among other departments at the Hospital of the University of Pennsylvania (including breast oncology and surgery).
Results	The breast imaging division created a new chaperone policy. Under the new policy, chaperones are not required for breast ultrasounds, regardless of patient and physician gender. However, chaperones are available upon patient and/or physician request, as is posted in multiple locations around the division.
Sustainability	The chaperone policy was standardized across the Cancer Center (breast radiology, surgery, oncology, and radiation oncology). Assessments of each area reviewed when applicable or requested.

Section	HUP/PCAM Breast Imaging Division
Project Title	Utilization of Sonographers (technologists) to Improve Breast Imaging Workflow and Decrease Patient waits for Diagnostic Imaging in Breast Ultrasound
Problem Statement	Long wait times for diagnostic breast ultrasound are creating significant delays in diagnostic care, and long total appointment times for diagnostic breast imaging patients. Attending availability to perform the ultrasounds is driving these delays.
Blueprint ±	High Reliability; Patient and Staff Engagement
SMART goal*	Implement a pilot program utilizing sonographers to image a subset of the patients who need diagnostic breast ultrasounds. Under the pilot, three sonographers will rotate through breast imaging, with one sonographer on service per day. Wait times for ultrasounds, as well as total appointment lengths, will be measured pre-pilot, and again during the pilot. Number of ultrasound performed by technologists during pilot will also be collected.
Quality Tools	Epic/DAR monthly data collected; A3 tool
Metrics	Data on ultrasound delays and appointment length will be collected prior to pilot initiation, and then monthly following implementation. Data will be collected by Dave Waters from EPIC/DAR, and shared with the workflow team at a weekly project update meeting (led by Dr. Zuckerman, as well as Penn workflow consultant Mitra Sarkar, Mitch Schnall, Christine Edmonds, and Sue Penta).
Results	Breast radiologist updated schedule for more daily availability during 12-1pm. Ultrasound department continues to collaborate with Mammo to have a sonographer available daily to do ultrasounds within the mammo dept. Preliminary data has shown an average decrease of 1st available appointment date -17 days to 10 days within 6months of the initiative.
Sustainability	Monthly meetings review and assess data-including mammo technologist/US technologist/mammo manager/director of radiology/radiologist. Those meeting notes are reviewed at Mammo/US monthly staff meetings.

BREAST IMAGING -PROCESS IMPROVEMENT INITIATIVES

Section	HUP/PCAM Breast Imaging Division
Project Title	**Breast Abscess Drainage Policy**
Problem Statement	The breast imaging division previously referred nearly all breast abscesses to the breast surgery clinic, to see a breast surgeon, for drainage (including abscesses that would benefit from image-guided needle drainage and do not necessitate surgical drainage).
	This results in delayed management and treatment of abscesses, as the surgery clinic is not always able to accommodate patients for same-day drainage, and is not equipped to send specimens for micro path.
Blueprint ±	High Reliability, Continuity of Care, Patient and Staff Engagement
SMART goal*	Implement and trial a policy of performing all clinically indicated and feasible abscess aspirations in the breast imaging clinic, on the same day as diagnosis, for those that undergo diagnostic imaging by 3:30 pm.
	For those imaged after 3:30 pm, schedule aspiration for the following morning.
Quality Tools used project	Epic/DAR monthly data collected A3 tool
Metrics	For the trial, measure the number of abscess drainages scheduled per week in breast imaging clinic.
	For the first four weeks following implementation of the new policy, Christine Edmonds was responsible for collecting the number of add-on abscess aspirations performed per week, from the EPIC Status Board, and sharing this data with the team at the division meeting.
Results	Pending
Sustainability	For the first four weeks following implementation of the new policy, Christine Edmonds was responsible for collecting the number of add-on abscess aspirations performed per week, from the EPIC Status Board, and sharing this data with the team at the division meeting.

Project Title	**Core Biopsy Policy for Axillary Lymph Node Biopsies**
Problem Statement	The majority of attending radiologists in breast imaging at HUP/PCAM preferentially and routinely perform fine needle aspiration (FNA) for axillary node diagnosis, rather than core biopsy.
	However, FNA has been well documented to have lower sensitivity (70-75%) for axillary node metastasis compared to core needle biopsy (88-100%). This impacts treatment planning. Following two consecutive false negative axillary node FNAs, the division of breast surgery renewed their requests that breast imagers stop performing axillary node FNAs, and instead perform core biopsies.
Blueprint ±	High Reliability
SMART goal*	Minimize the percentage of false negative node biopsies through the implementation of a policy where ultrasound guided core biopsy, followed by clip placement, is the standard of care for node diagnosis at HUP/PCAM.
Quality Tools used project	Epic/DAR monthly data collected A3 tool
Metrics	If the attending to perform the node biopsy deems the biopsy technically challenging/unsafe, they are to review the imaging with Christine Edmonds.
	If Christine agrees that core biopsy is not feasible, then the procedural attending reaches out to the breast surgeon to offer FNA versus localization marker placement for excisional biopsy.
Results	Data obtained from Pennchart MQSA pathology database. Collect and compare numbers and percentages of ultrasound guided node FNAs performed pre- versus post-implementation. Compare rates of non-diagnostic node biopsies.
Sustainability	Analysis will be shared with the breast imaging division at faculty meeting, and with Chief of Breast Surgery Dr. Lola Fayanju.

BREAST IMAGING -PROCESS IMPROVEMENT INTIATIVES

Section	HUP/PCAM Breast Imaging Division
Project Title	**Pilot Intervention to Decrease Delays in Time-to-MRI-guided-Biopsy**
Problem Statement	Long delays (3-5 weeks) are noted to occur between breast MRI and MRI-guided core biopsy. Because many of these delays occur in patients with known diagnoses of breast cancer who undergo MRI for staging and are found to have additional lesions in need of biopsy, these delays can result in treatment delays, with possible impacts on prognosis. One major component of the delay is the two-step process that occurs in patients recommended for biopsy based on MRI: patients are first recommended to undergo ultrasound in an attempt to identify a correlate for biopsy. Then, if a correlate is not identified, patients are scheduled for an MRI guided biopsy, while if a definitive correlate is identified, they are scheduled for ultrasound biopsy on a subsequent day.
Blueprint ±	High Reliability
SMART goal*	We are piloting the following policy: if the abnormality on MRI is a focus, non-mass enhancement, or a sub-centimeter mass, the radiologist should recommend directly proceeding with **MRI-guided biopsy** (as ultrasound is unlikely to identify a correlate in these cases). However, if the abnormality identified on MRI is a mass measuring 1 cm or larger, the radiologist should recommend a **directed ultrasound,** and facilitate scheduling of an ultrasound-guided core biopsy to be scheduled the same day as the diagnostic ultrasound.
Quality Tools	Epic monthly data collected; A3 tool
Metrics	Compare time-to-MRI biopsy pre-policy and during the pilot of the policy.
Results	Data obtained from Pennchart MQSA pathology database. Pending results.
Sustainability	Analysis will be shared with the breast imaging division at faculty meeting and technologist staff meeting.

Section	HUP/PCAM Breast Imaging Division
Project Title	**Racial and Ethnic Disparities in Diagnostic Follow-up Following BIRADS 0 Mammogram**
Problem Statement	Timely follow-up after abnormal mammograms can improve outcomes, and delayed follow-up may contribute to health disparities following cancer diagnoses. Numerous prior studies have demonstrated racial and ethnic disparities in breast cancer mortality, and delayed diagnosis is a leading contributor.
Blueprint ±	High Reliability; Diversity and Equity
SMART goal*	To investigate racial and ethnic disparities in rates and timeliness of (1) diagnostic follow-up after a BIRADS 0 screening mammogram and (2) biopsy following subsequent BIRADS 4 or 5 diagnostic mammogram.
Quality Tools	EPIC MQSA database collection; A3 tool
Metrics	Databases (hospital-wide UPHS maintained, Cancer Center database, as well as EPIC MQSA database) were utilized to identify all women who underwent mammograms between 2010 and 2018, as well as dates of subsequent diagnostic breast imaging and biopsies.
Results	The preliminary analysis was presented at ASCO 2022.
Sustainability	Review data monthly at the faculty meetings.

CARDIOTHORACIC IMAGING - PROCESS IMPROVEMENT INITIATIVES

Section	HUP Chest/CVI Imaging Division
Project Title	**Dual energy CT - lung perfusion**
Problem Statement	Low quality CTPE studies (6-10%) across UPHS lead to diagnostic uncertainty and frustration for radiologists and providers. There is a decrease of quality optimization causing non-diagnostic assessment of past central pulmonary arteries, apparent filling defect that causes repeat CTPE or LE duplex. This can cause patient care delays, early treatment and additional contrast doses to the patients.
Blueprint ±	High Reliability, Continuity of Care
SMART goal*	Improve contrast: noise ratio=reduce low quality studies by August 2022- 1. Use Dual energy CT (DECT) scanner when COVID+/suspected. 2. Standardize breathing instructions, technologist coach patient
Quality Tools used project	Fishbone for root cause; Bar graph; A3 tool **Patient factors** — **Imaging Artifacts** Lung disease, Uncooperative / Sick / Trach, ↑BMI — Contrast bolus, SVC Streak, Hardware → Low Quality CTPE Poor IV Access, Arm positioning, Lack of coaching, Wrong protocol **Protocol Factors**
Metrics	1. Assess low quality %, reader rating, reasons for low quality, reviewer rating 2. Breathing motion, TIC (patient takes too deep breath), COVID+
Results	**DECT, Reasons for Low Quality on Review** Bar graph with categories: Timing, SVC Streak, Motion, Mottle, Other (Count, Percentage) 1. Low Quality Studies: DECT 24% (26/110) vs 8% (40/489) SECT* 2. Start Date: July 22nd *(table below)*
Sustainability	Targeted improvement of breathing protocol High pitch protocol Use visual breathing prompts with lights Longer contrast injection time Patient coaching video

	Jun 23 - Jul 6	Jul 7 - Jul 22	Jul 22 - Aug 6	Aug 7 - Aug 22
Combined Total	91	110	124	118
High	58%	57%	54%	47%
Moderate	34%	35%	42%	42%
Low	9%	7%	4%	8%
Low quality studies	7	8	4	10
Breathing Motion	4	3	1	4
TIC	1	0	3	4

CARDIOTHORACIC IMAGING-
PROCESS IMPROVEMENT INTIATIVES

Section	HUP CHEST/CVI Imaging Division
Project Title	Handling of Larger Pandemic Volumes
Problem Statement	Larger COVID volumes surges- Chest division needs to focus on manpower distribution.
Blueprint ±	High Reliability; Continuity of Care
SMART goal*	New shifts added (more people needed)- increase staffing needs from 17 to 26 radiologist by 5/2020.
Quality Tools/Metrics	Qgenda schedule- review of areas needed; EPIC Data review- graphs below; A3 tool Chest CT Volume CXR Volumes
Results	 All day- Preliminary- pre-COVID 73 +/-21 min- COVID: 55 +/-21min, p<10, Result <18min (25%) Final- pre-COVID 167 +/-31min- COVID: 139 +/-23min, p<10, Result <28min (18%) Daytime only- Preliminary- pre-COVID 84 +/-25 min- COVID: 55 +/-22min, p<10, Result <29min (35%) Final- pre-COVID 136 +/-31min- COVID: 100 +/-20min, p<10, Result <36min (26%)
Sustainability	Monthly meetings review and assess data-including Chest/CV radiologist.

INTERVENTIONAL RADIOLOGY-
PROCESS IMPROVEMENT INITIATIVES

Section	Description
Project Title	**Prospective Pilot: Increasing utilization of alternative IR options for patients undergoing large volume paracentesis (LVP) through proactive IR outreach**
Problem Statement	Patients undergoing repeated LVP at PCAM may not be appropriately referred to more durable IR options; would more proactive IR engagement lead to change in management?
Blueprint ±	High reliability. Patient and staff engagement. Excellence in Patient-Centered Outcomes
SMART goal*	Increase the % of LVP patients enrolled in the pilot referred for durable IR interventions as a result of proactive IR attending outreach by March of 2022.
Quality Tools used project	N/A
Metrics	% of LVP patients for whom management was changed as a result of proactive IR engagement.
Summary	- Prospectively followed all LVP patients presenting to PCAM IR between 7/1/2021 and 9/3/2021 - Patients undergoing repeated LVP assessed by two residents & three attendings as to suitability for alternative IR interventions such as transjugular intrahepatic portosystemic shunt (TIPS), denver shunt (DS) or tunneled peritoneal drain (TPD) placement. - Each patient followed for approximately two months through 12/2022 to assess whether IR referral made spontaneously - If no referral made, an IR attending would reach out to referring MD and/or patient to determine if IR clinic referral appropriate.
Results	38 paracentesis patients identified with >2+ LVP in 30-day period 7/1/2021 to 9/3/2021. As of March, 2022 the following outcomes were obtained. 17 (45%) -- not suitable for IR intervention (poor candidate or ascites improved) 14 (37%) – IR referral made spontaneously 5 (13%) potential candidates for proactive intervention 3 – Referring attending contacted but no referral generated. 2 (5%) - Referring attending contacted generating clinic referral and subsequent TIPS stent placement. __Conclusion:__ Paracentesis patients at PCAM appear to be triaged appropriately to more durable IR interventions; more proactive IR engagement resulted in change of management in only 5% of patients.
Sustainability	Based on results we will not attempt to sustain this project at PCAM.

Section	Description
Project Title	**Pre-Intervention CT improves performance of catheter-based therapy in patients with blunt or penetrating abdominal trauma**
Problem Statement	Trauma patients without imaging prior to catheter based intervention (CBI) may undergo non-therapeutic intervention. There is a paucity of literature examining the informative role that CTA may play prior to catheter-based intervention (CBI) in patients with abdominopelvic trauma. We hypothesized that prioritization of CT prior to CBI may reduce the incidence of negative catheter-based arteriography and improve the likelihood of therapeutic intervention
Blueprint ±	High reliability. Innovation. Excellence in Patient-Centered Outcomes
SMART goal*	N/A- Retrospective review
Quality Tools used project	N/A
Metrics	Length of hospital stay, complications, repeat interventions, transfusion requirements, mortality (15 and 30 day)
Summary	Retrospective review of CBI performed for abdominopelvic trauma from 1/1/2010 to 8/31/2020 utilizing Montage and HI-IQ databases collecting data on: • Traumatic etiology/presentation • Imaging type (CT vs. CTA) and findings prior to catheter-based intervention • Procedure data: Ex-lap before IR, bleeding in OR, IR procedure performed, procedure length, radiation dose, contrast, vascular territories of arteriography/embolization
Results	• Cross sectional imaging prior to CBI was associated with a reduction in negative CBI (37.9% vs. 55.2%, p = .03). • Prior CTA/CT was associated with a significant reduction in the volume of contrast administered at the time of CBI compared to patients with no prior imaging (80 ± 41 mL vs. 114 ± 52 mL, p < .001). • No significant differences in mortality or renal function were observed based on the type of intervention performed or by pre-procedural imaging. Conclusion: CT prior to CBI may improve efficiency and limit unnecessary interventions in trauma patients regardless of mechanism.
Sustainability	N/A – Retrospective review. However, pre-procedure CTA is accepted by both the Trauma and IR sections as a priority prior to CBI in the setting of trauma.

INTERVENTIONAL RADIOLOGY- PROCESS IMPROVEMENT INITIATIVES

Section	Description
Project Title	**Increasing same-day discharge of patients undergoing hepatic chemoembolization using standardized discharge criteria**
Problem Statement	At HUP, transarterial chemoembolization (TACE) for treatment of liver cancer has historically been followed by overnight observation to provide hydration, antiemetics and analgesia. Our hypotheses were that a) same-day discharge of selected TACE patients could be performed safely and b) standardized discharge and follow-up criteria would lead to increased rates of same-day discharges and reduced hospital costs.
Blueprint ±	High reliability. Excellence in patient-centered outcomes
SMART goal*	Increase the % of HUP TACE patients discharged same-day by the end of the pilot compared with historical baseline data with minimal impact on readmissions.
Quality Tools used project	N/A
Metrics	1. Percentage of TACE patients being discharged same-day. 2. % of patients with ER visits / readmissions within one week and one month of discharge.
Summary	Six-month prospective pilot: April 2021 – Sept 2021 • Standardized criteria: same-day discharge criteria developed by consensus by physicians and nursing staff • Pre-emptive monitoring: Post discharge all patients assessed by clinic nurse call 5 - 7 days post procedure to pre-empt worsening clinical issues • Data gathering: ER visit / readmissions at 7 days and 30 days post TACE gathered by clinic staff and explicitly documented in EPIC notes • Results compared to pre-pilot baseline retrospective data gathered from Jan 2020 – June 2020.
Results	Pilot period included 98 TACE patients • Same-day discharge rate doubled to 59% (58) during pilot compared with 29% during baseline period. • Readmission rates between the same-day discharge and overnight admission groups did not increase @ 1 week post-TACE (1.7% vs 7.5%) or @ 30-day post -TACE (3.5% vs 2.5%) • Hospital cost analysis suggested savings of $891 for each patient discharged the same day. ~$25,839 total in savings over the period of the pilot.
Sustainability	Protocol for same-day discharge continues as standard procedure at HUP.

| Section	Description
Project Title	**Increasing statin utilization among patients with peripheral arterial disease (PAD)**
Problem Statement	Myocardial infarction is the leading cause of mortality in patients with PAD. According to AHA/ACC guidelines, all PAD patients who can tolerate statin should be on statin therapy; despite this a high percentage of high-risk PAD patients seen by in the PPMC IR clinic are not on statins.
Blueprint ±	High reliability. Continuity in care. Excellence in Patient-Centered Outcomes
SMART goal*	Increase percentage of PPMC IR clinic PAD patients receiving an appropriately dosed statin to 75% within one year.
Quality Tools used project	N/A
Metrics	% of PAD patients on an appropriately dosed statin at the time of initial consultation with PPMC IR and at 1st subsequent IR clinic follow-up.
Summary	On January 1, 2021, PPMC IR began physician assistant led patient education initiatives and provider to provider notification initiatives to increase the number of high-risk PAD patients on statin therapy.
Results	• Prior to January 1st, 2021: 40.8% of patients were on an appropriately dosed statin therapy at first IR consult which increased to 53.7% at follow-up. • After January 1st, 2021: 62.5% of patients were on an appropriately dosed statin therapy at first IR consult which increased to 67.5% at follow-up. **Conclusion:** After implementation of patient education and provider notification among new PAD patients a 14.0% increase in appropriately dosed statin therapy was observed. A patient and provider education program can result in increased use of appropriately dosed statin therapy in high-risk PAD patients.
Sustainability	Project is continuing and is maintained primarily by two PPMC IR PAs.

Section	Neuroradiology
Project Title	Spine Oncology Imaging Score Macro and Imaging Referral Pipeline
Problem Statement	- Spinal osseous metastases have significant morbidity and mortality - Variability in radiology reporting for patients presenting with spinal metastases leading to confusion as to the clinical significance from the referring provider - Issues with delayed or misdirected consultations - Delay in patient care
Blueprint ±	- Continuity of case - Innovation
SMART goal*	Multidisciplinary physician group will create and implement an evidence-based scoring and automated communication system for spine neoplastic disease to be used in all spinal metastasis MRI exams by Dec 2021
Quality Tools used project	- Fishbone - A3
Metrics	- Compliance of macro usage in the division by review of all eligible spine exams/reports via Montage on a regular basis by lead neuroradiologists - Notification of the finding to the multidisciplinary team within 1 hour (automated email generated with notifications confirmed during regular spine oncology conferences) - Reduced time to consultation and subsequent treatment with macro implementation (initial qualitative assessment per discussion at multidisciplinary conferences, with quantitative analysis pending)
Summary	- Multidisciplinary group of radiologists, radiation oncologists, and spine neurosurgeons regularly convened to discuss imaging and potential management of spine oncology cases - Co-developed spine MRI oncology imaging score (SOIS), incorporating important information easily attainable to the radiologist. The SOIS macro was designed to be inserted by radiologists into reports of relevant exams - Developed a notification system, with help of Dr. Kahn/Rad IT, that automatically triggers a notification (within 1 hour) of the results to the appropriate clinical subspecialists - Implementation and tracking plan discussed at division meetings with buy-in from neuroradiologists - Lead neuroradiologist (Dr. Hassankhani) promoted uniform utilization of the SOIS macro in the division by reviewing eligible MRI spinal exams by Dec 2021
Results	>95% compliance of macro usage in the division - After initial issue with automated communication, there was 100% notification of the findings to the multidisciplinary team within 1 hour - Additional data for impact on time to consultation and treatment are pending - See graphs/tables below for additional results to date
Sustainability	Ongoing multidisciplinary conferences being held with radiologists, radiation oncologists, and spine neurosurgeons where cases are reviewed for consistency in reporting/macro usage and appropriate communication through the automated system, in addition to treatment planning

| Site of Greatest Spinal Compression	
Description	**Grade**
Osseous disease only	0
Epidural involvement without thecal sac deformity	1a
Thecal sac deformity without cord contact	1b
Thecal sac deformity with cord contact	1c
Cord compression with preservation of some CSF	2
Cord compression with complete effacement of CSF	3
Intramedullary/cord or drop metastasis	4
Intradural and extradural	5

NEURORADIOLOGY -
PROCESS IMPROVEMENT INITIATIVES

Site of Maximum Spine Oncology Imaging Score	
Description	**Points**
Location	
Rigid spine (S2-S5)	0
Semi-rigid spine (T3-T10)	1
Mobile spine (C3-C6, L2-L4)	2
Junctional spine (Occiput-C2, C7-T2, T11-L1, L5-S1)	3
Alignment	
Normal	0
Deformity (kyphosis/scoliosis)	2
Subluxation	4
Collapse	
None	0
Mild (No collapse with > 50% vertebral body involvement)	1
Moderate (<50% height loss)	2
Severe (>50% height loss)	3
Posterior Elements	
None	0
Unilateral	1
Bilateral	3
Total SOIS Score Range:	**0-13**
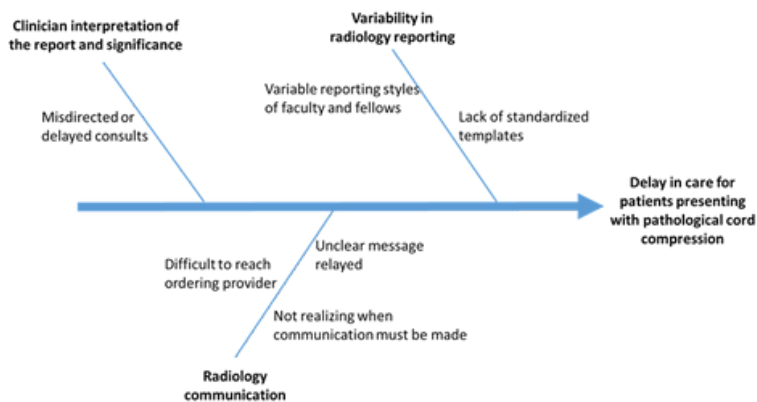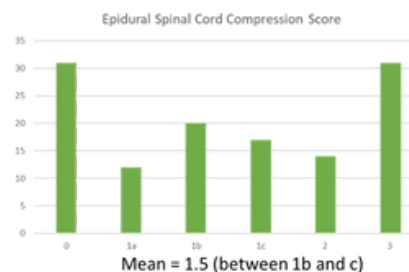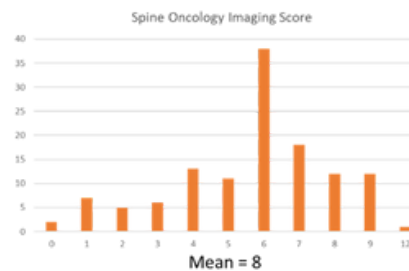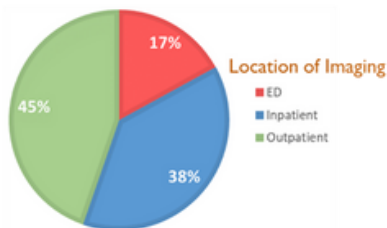
Optimizing patient preparation for FDG PET/CT scans

Sponsor(s): Michael Farwell, MD
Leader(s): Sophia O'Brien, MD; Katherine Hartmann, MD, PhD
Other Team Members: David Tischfield, MD, PhD; Christopher Hensley, MD, PhD; Austin Pantel, MD

Last Updated: 7/14/2022

Problem Statement

- Patients are asked to reschedule their FDG PET/CT scan if their blood glucose is >200 mg/dL on the day of the study, which causes a delay in the acquisition of a medically necessary scan, results in patient dissatisfaction, and wastes resources if that time slot and FDG dose go unused.

Background

- Patients with blood sugar levels as high as 300 mg/dL (and higher) have occasionally had FDG PET/CT scans, and anecdotally these scans have been diagnostic.
- We hypothesize that patients do not need to reschedule their scans if they have high blood sugar.

SMART Goal

- Trainees and faculty will determine if we can avoid rescheduling patients with blood glucose levels >200 mg/dL by analyzing differences in mean liver SUV, mean blood pool SUV, and tumor Max SUV between individual and paired FDG PET/CT scans in patients with blood glucose levels >200 mg/dL versus < 200 mg/dL by June 2023.

Methods

- 49,169 FDG PET/CT exams between September 2016 and September 2021 were identified using Montage Search Engine and were retrospectively reviewed.
- Blood glucose, mean liver SUV, mean blood pool SUV, and tumor Max SUV were extracted from radiology reports.
- Correlations between the measured variables were assessed.
- Paired analyses were performed in patients who had FDG PET/CT scans performed when their blood glucose was >200 and <200 mg/dL on different scan dates.

Results

- Mean liver and mean blood pool SUV were on average larger for those exams with blood glucose greater than 200mg/dL (see figures to the right).
- 69 studies were identified in which patients had a suboptimal scan due to a hyperinsulinemic state from a recent meal.
- The average blood glucose in these patients was 105. No patients had a blood glucose of 200 or above.
- Tumor Max SUV and paired FDG PET/CT scans are still being analyzed.

Figure 1. Coronal view maximum intensity projection (MIP) in a 41 year-old man with squamous cell carcinoma of the tongue post surgical resection. FDG PET/CT obtained for post-treatment surveillance. Blood Glucose prior to injection was 99 mg/dL. Despite normal blood glucose, diffuse FDG activity of the muscle activity is seen in keeping with hyperinsulinemic state from recent meal, rendering this scan non-diagnostic.

Results (continued)
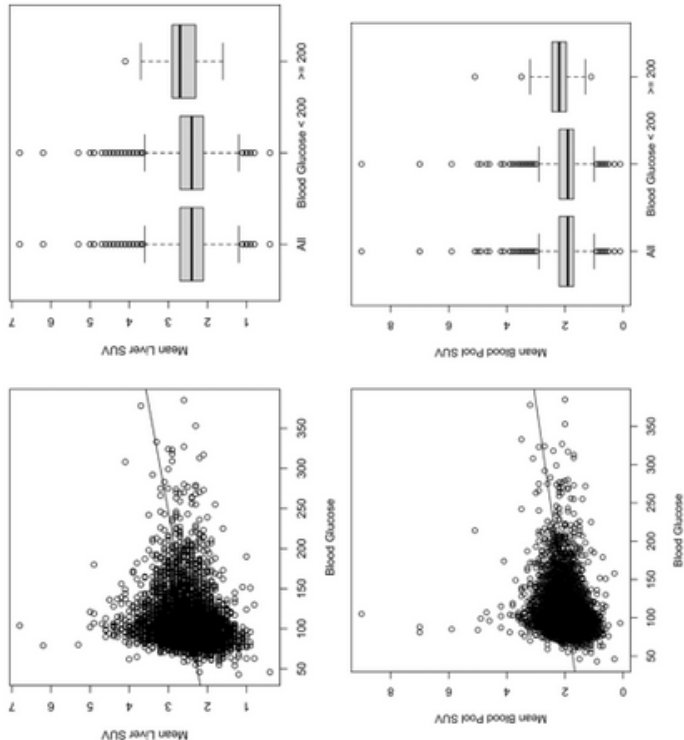
Conclusions and Impact

- Large changes in blood glucose produce small changes in mean liver and mean blood pool SUV, which is interesting but should not impact scan quality.
- Blood glucose cannot be used to identify patients who will have a suboptimal scan from a recent meal.
- Tumor Max SUV and paired FDG PET/CT scans are still being analyzed.
- This project has the potential to modify patient preparation guidelines for FDG PET/CT scans, which will have a significant impact on how FDG PET/CT studies are done throughout the United States, and internationally, and will make it easier for more patients to undergo their scheduled FDG PET/CT scans without fear of having their scan canceled due to high blood glucose.
- Blueprint for Quality and Patient Safety strategies: high reliability and innovation.

NUCLEAR MEDICINE IMAGING & THERAPY

Additional QA/QI Projects:

- *Using FDG PET/CT for infection instead of an In-111 WBC scan. Based on coverage changes by CMS, we are now recommending FDG PET/CT for fever of unknown origin (FUO) and other questions of infection for both inpatients and outpatients, as its sensitivity and anatomic localization are both superior to an In-111 WBC scan, and FDG PET/CT can be performed in 1 day rather than 2 days.*

- *ECG-gated coronary artery calcium scoring for stress tests. ECG-gated coronary artery calcium scoring has been incorporated into myocardial perfusion SPECT/CT studies. Training for image processing and interpretation are ongoing.*

- *Cardiac stress tests at PAH. To facilitate greater collaboration, cardiac stress tests at PAH are now supervised and read by both cardiology and nuclear medicine, with each department taking responsibility for covering different days of the week.*

- *NPOT. The NM Network Practice Operations Team has finished renaming various NM and PET studies across the network to make them more clear and easier for referring clinicians to order. They have also standardized NM reading templates across all sites.*

- *Quantification of lung perfusion with SPECT imaging. Lung perfusion is currently quantified with planar imaging of the chest (following administration of Tc-99m MAA), which is not able to provide accurate data on individual lobes since there is overlap between the lobes on anterior and posterior planar images. Thus, we created a new workflow using MIM that allows us to segment SPECT images into individual lobes of the lung, and provide perfusion data for each lobe.*

HUP GOOD CATCH AWARDS FY22

- *Sarah Denny*- IR nurse- We celebrate your dedication to the safety of our patients. We commend your vigilance and prompt call to pharmacy to ensure the Omnicell had the appropriate medication labeled and stocked.

- *Dr. Rupal Parikh*- Radiologist- Thank you for completing additional calls to the referring to clarify and remove the correct tunneled catheter during an IR procedure.

- *Jeremy Kaut*-Diagnostic Technologist- Excellent patient care skills- Jeremy responded quickly to placing a patient immediately in a wheelchair avoiding a patient fall situation. He facilitated rapid response call to escort patient to the ED to be assessed.

- *Dr. Shahodat Voreis*- Radiologist- On a CXR recognized inadequate outside hospital line placement. Right subclavian central line terminating in the area of the proximal SVC/aortic knob. Recommend follow-up chest x-ray in a neutral position.

ACKNOWLEDGEMENTS

We want to thank and recognize the staff across our Department who strive to keep the quality and safety of patients and staff at the forefront of our actions every day! We know that many individuals contributed to the work highlighted in this summary and want to acknowledge everyone's contributions even if your name was omitted from these pages.