2024 VIZIENT CONNECTIONS SUMMIT
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Dana-Farber Cancer Institute

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# Building a Learning Health System: Nursing Quality

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# Learning Objectives

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- Discuss select principles used to assess organizational areas where a learning health system can be built.
- Describe the key elements required to successfully build a learning health system.

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# Dana-Farber Cancer Institute

We are an acute care hospital/dedicated cancer center providing world class inpatient and outpatient care to patients. Our care settings include:

**Ambulatory**

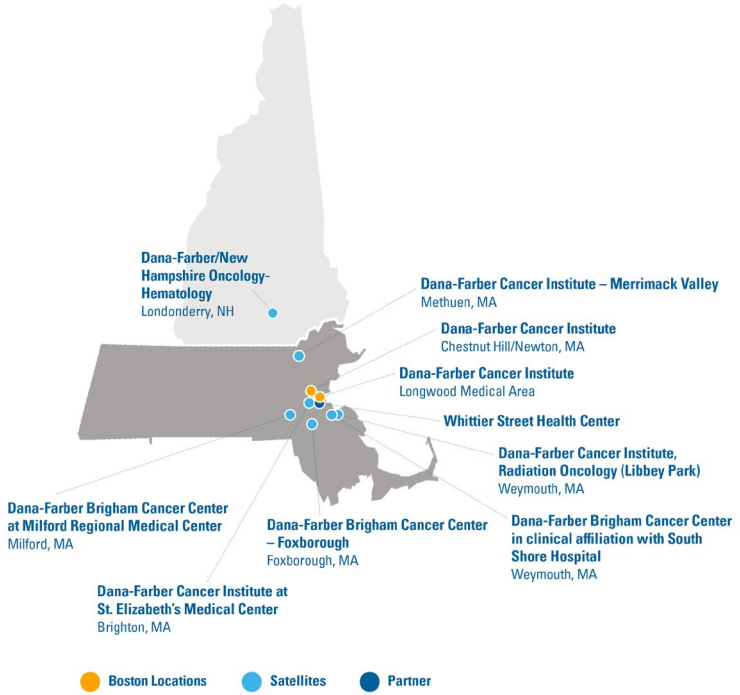
- Adult care
  - Longwood: exam, infusion, imaging, radiation, lab
  - Chestnut Hill: exam, infusion, imaging, lab
  - 6 satellite locations (provider-based hospital outpatient)
- Pediatric care at Longwood: exam and infusion

**Inpatient**

- 30 licensed adult beds (co-located with Brigham & Women's Hospital)

**Designations, Accreditations, and Achievements**

- NCI-Designated Comprehensive Cancer Center
- 5-time Magnet Designated Hospital
- Commission on Cancer Accredited Program
- USNWR #4 Adult and #2 Pediatric Cancer Hospital




| FY2023 Statistics | |
|---|---|
| Adult & Pediatric Infusion Visits | 217,279 |
| Adult & Pediatric Outpatient MD Visits | 384,094 |
| New Patients | 31,627 |
| Adult Inpatient Discharges | 1,300 |
| Total employees | 7,191 |

NCI – National Cancer Institute
USNWR – US News and World Report

# Burning Platform: Practice Compliance

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Regulatory Standard → Create a policy → Does practice comply to policy?

- Pain Assess/Reassess
- Blood Administration
- Initial Assessment
- Patient Identification
- Chemo Safe Handling/PPE

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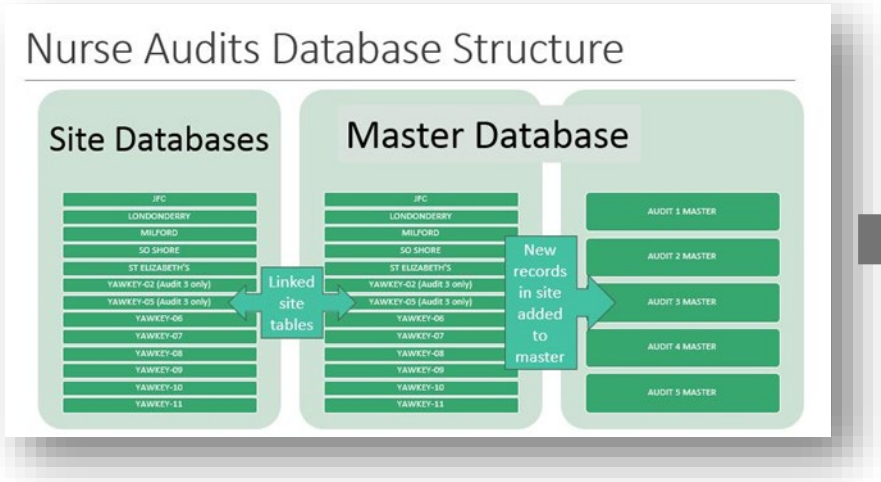
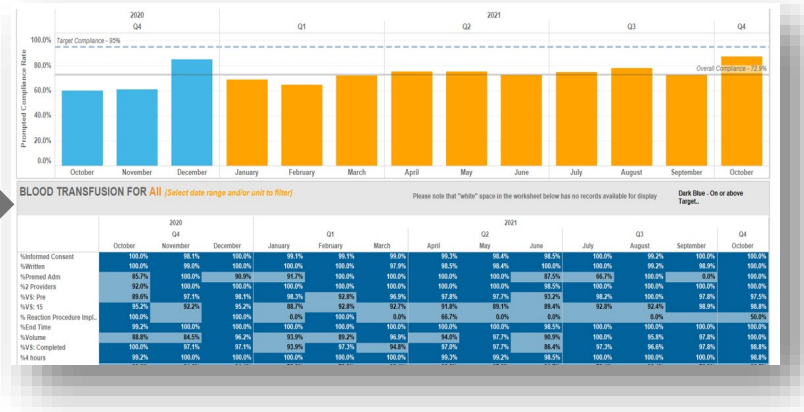
PPE – personal protective equipment

# Nursing Practice Audit Workflow - Prior State




Some questions did not reflect current policy

Data entry forms non-standardized

Many data points entered not exported to dashboard

# Nursing Quality Goals for Project

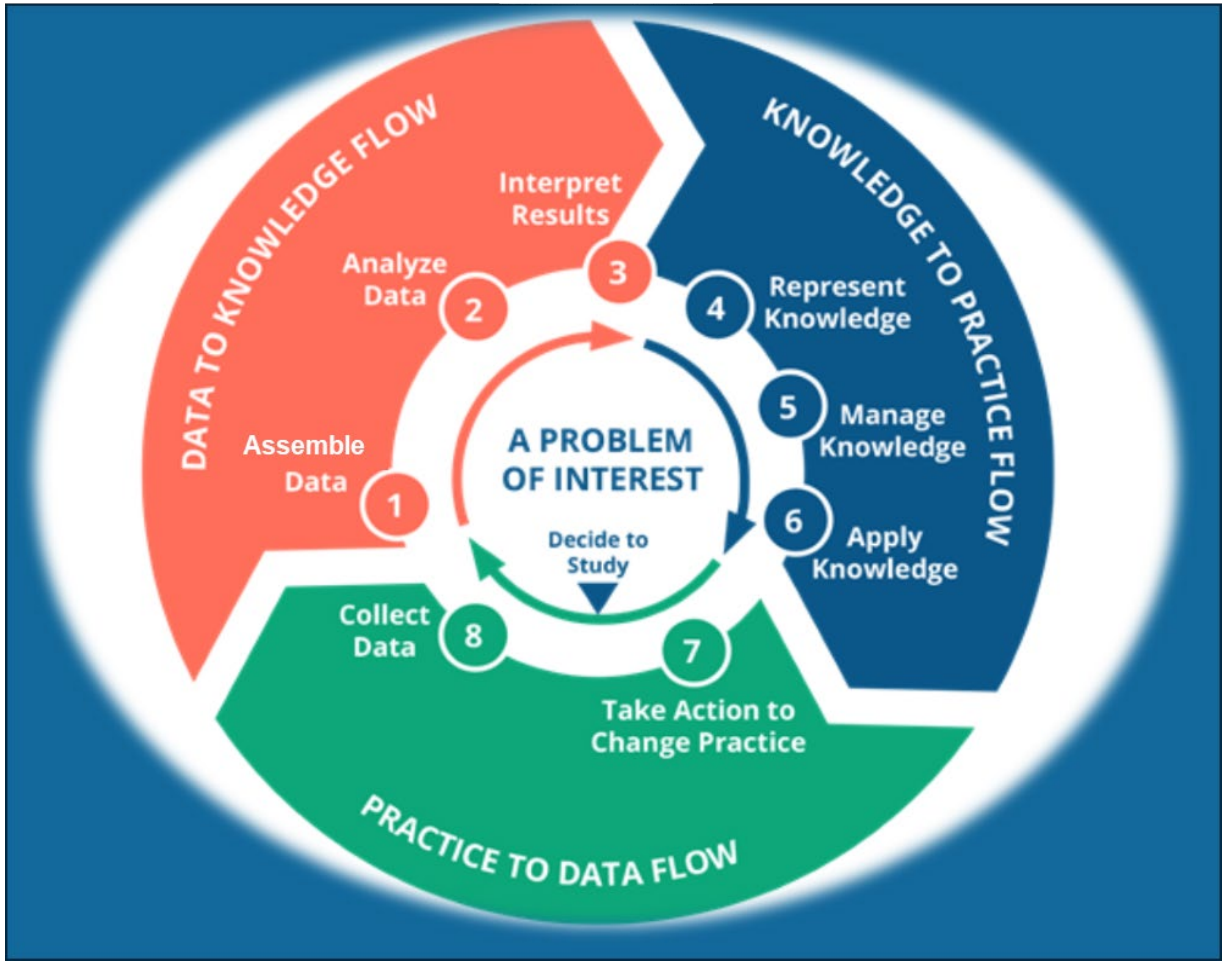
Sunset historical database

Leverage systems and documentation

Analyze full compliance

Optimize scope of nursing practice

# Methodology: Building a Learning Health System




- Cyclical model illustrating a continuous improvement framework
- Flynn et al. model published is the best alignment to the principles used in this project
- As part of growth, this model can also evolve to include additional layers, such as:
  - Operational research
  - Advanced analytics (i.e., predictive models)
  - Generative AI

Sources: https://learninghealthcareproject.org/technical-building-blocks/
Flynn AJ, Friedman CP, Boisvert P, Landis-Lewis Z, Lagoze C. The Knowledge Object Reference Ontology (KORO): A formalism to support management and sharing of computable biomedical knowledge for learning health systems. *Learn Health Sys*. 2018; 2:e10054. https://doi.org/10.1002/lrh2.10054

# Strategy: The Big Picture for Change

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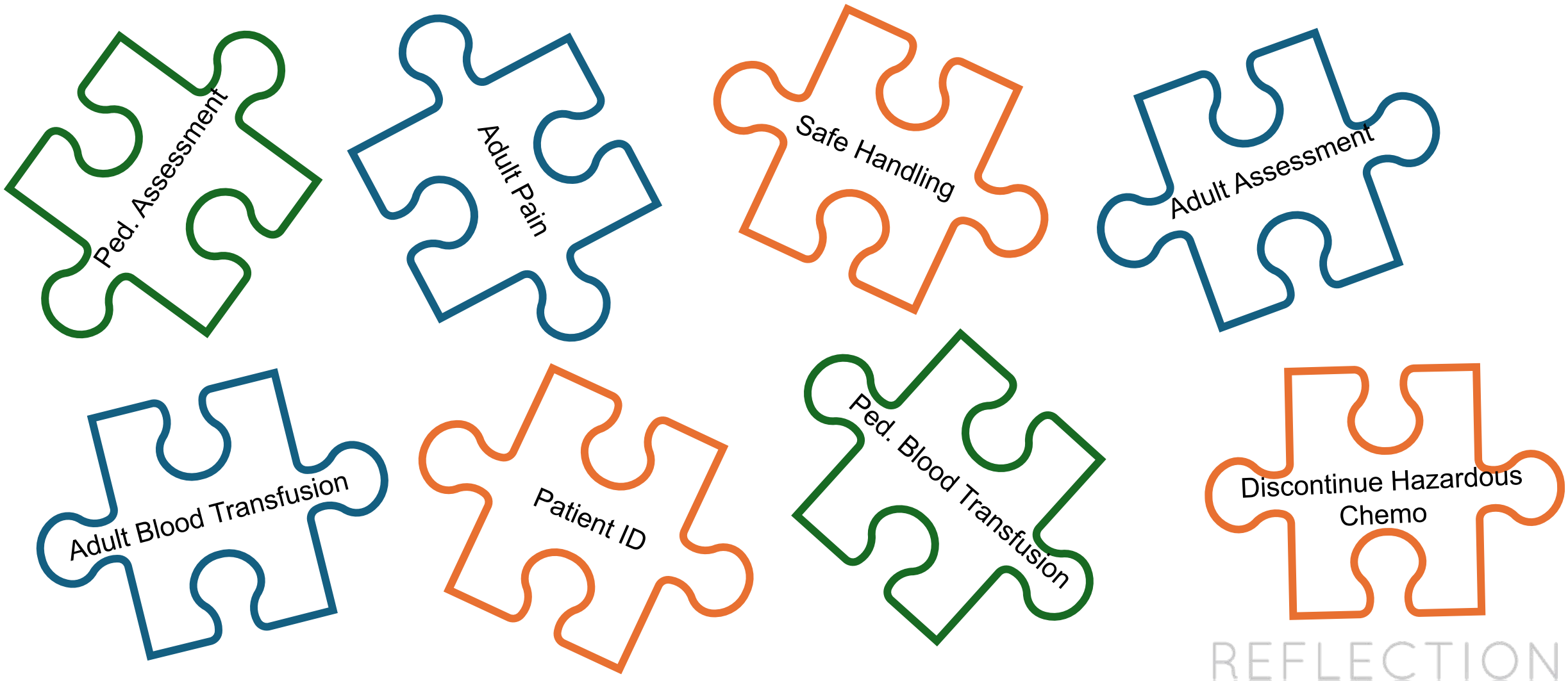

# Vision: Nursing Compliance Dashboard

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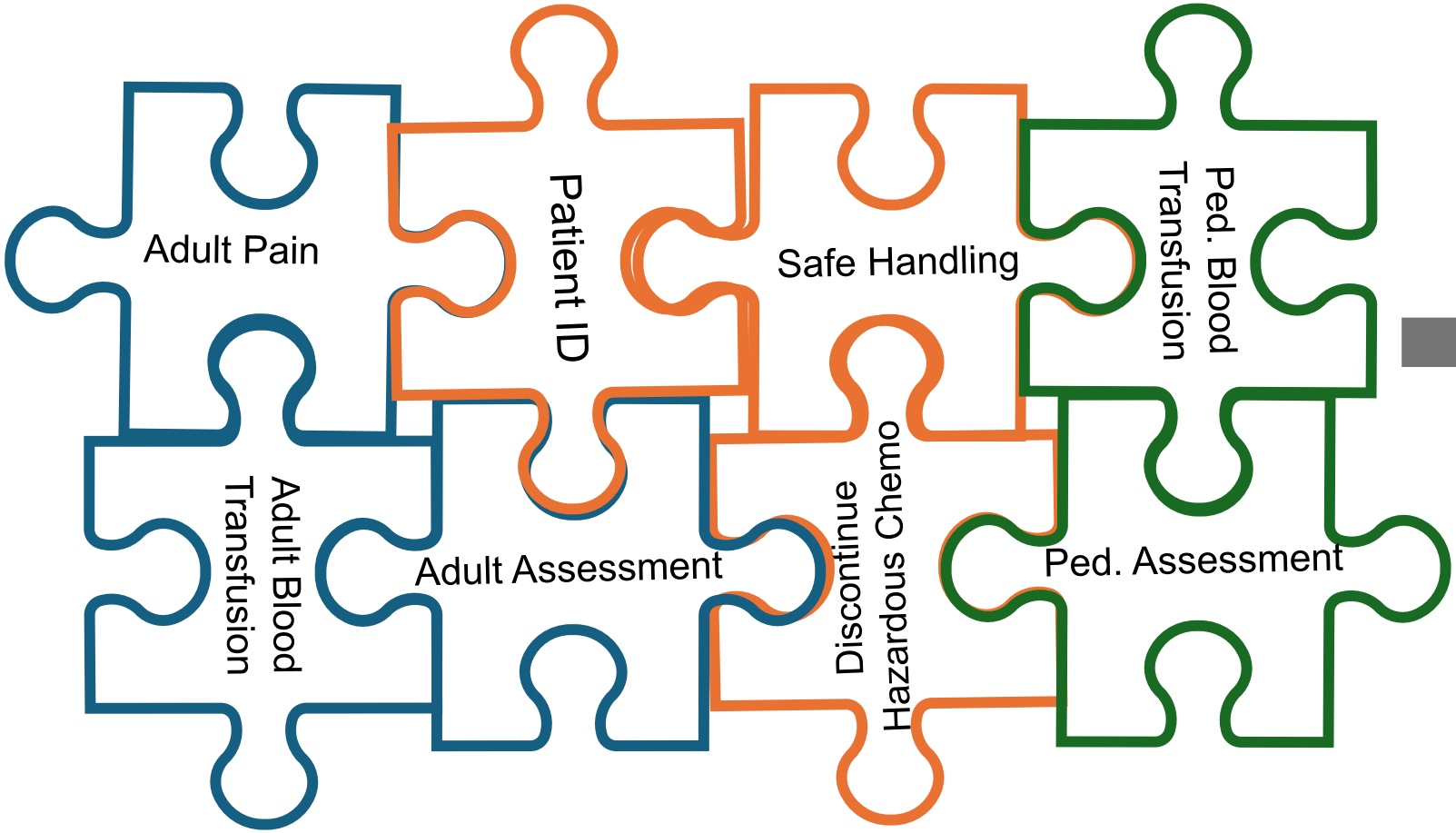


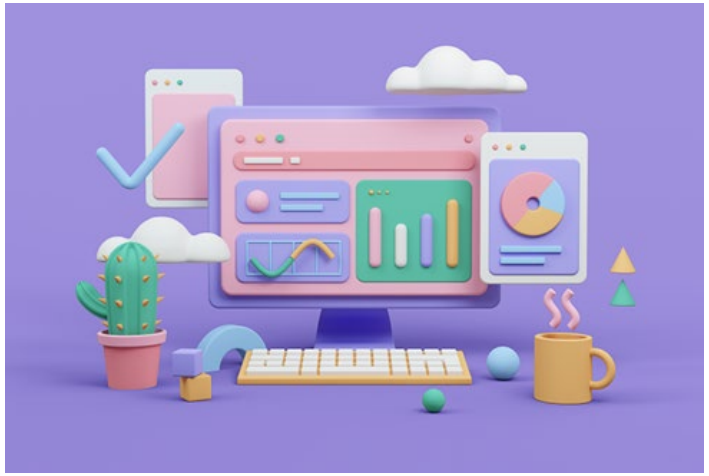

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# Nursing Compliance: A Learning Health System Roadmap

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2021 | 2022 | 2023 | 2024

## Observational Audits

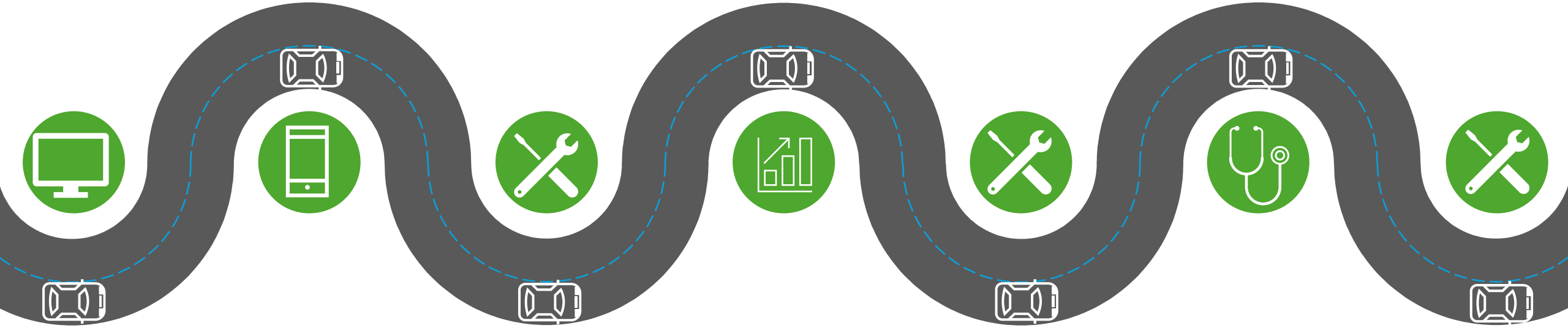
- Database development
- Tablet implementation

## Observational Audits

- Data integration
- Dashboard

## Pediatrics Electronic Health Record (EHR)

- Data Ingestion
- Dashboard



## EHR dashboards

- Compliance Audits
- Dashboard

## Maintenance and Enhancements

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# Workstream 1: Electronic Health Record

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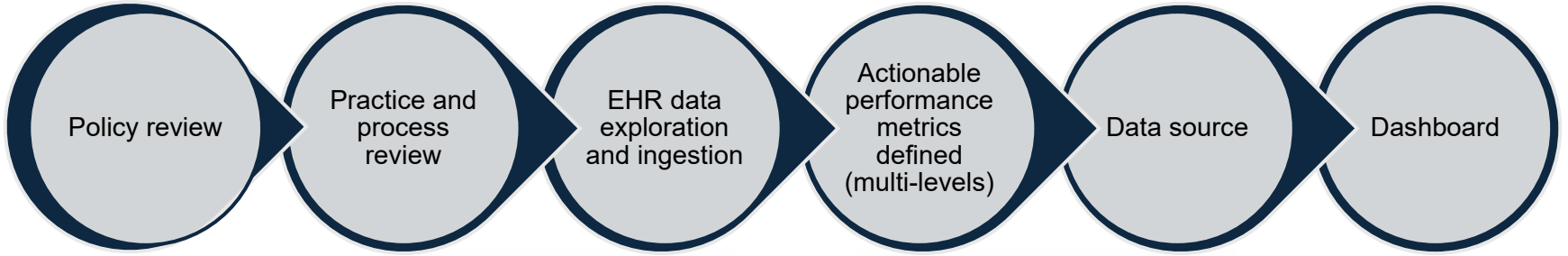


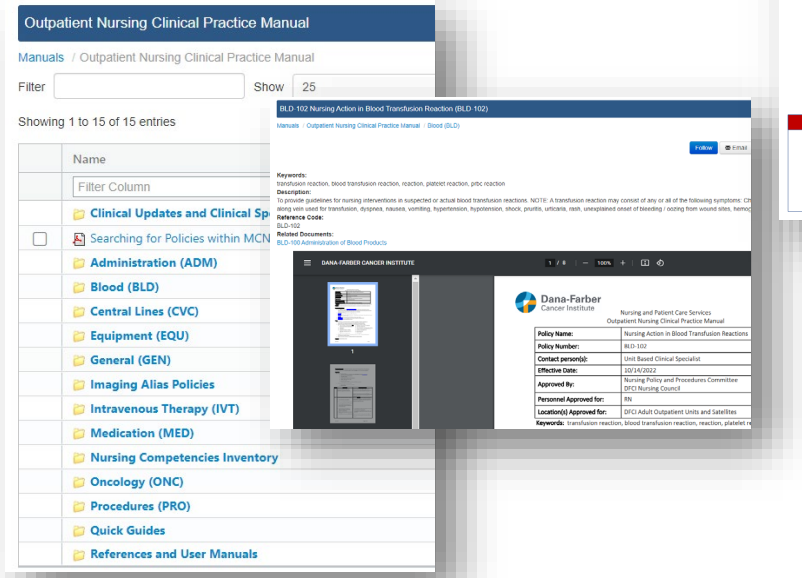


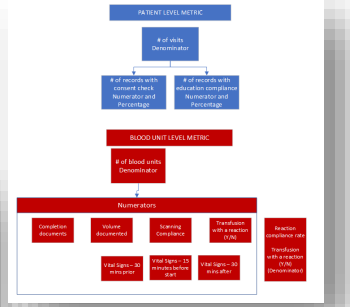


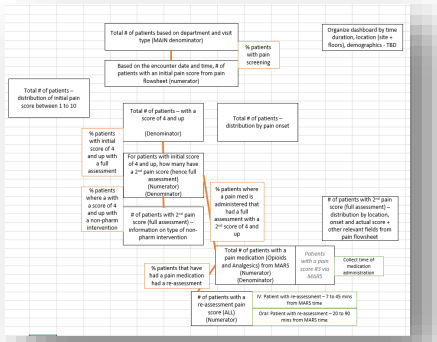


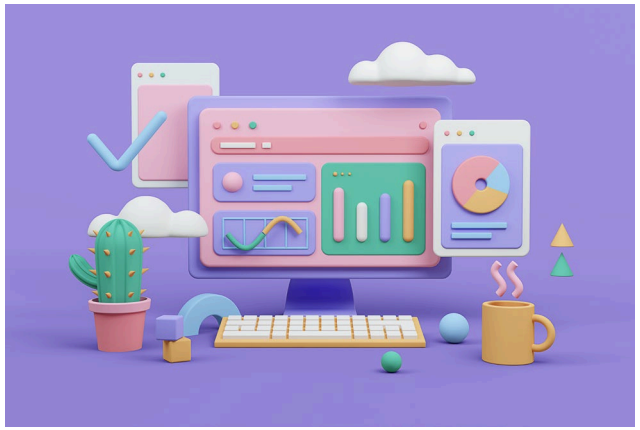

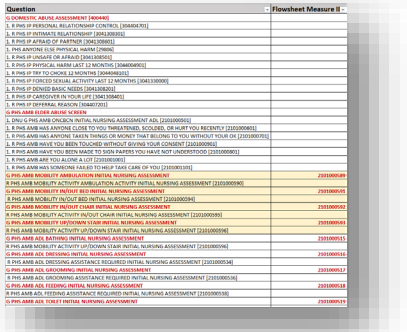


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# Workstream 2: Observational Audits

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Nurse Units

Yawkey 2

Brighton

Chestnut Hill

Foxborough

Londonderry

Merrimack Valley

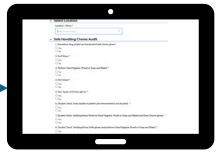
Milford

Jimmy Fund Clinic

South Shore

Yawkey 5-11

Database Forms:
Safe Handling PPE, Discontinuing Hazardous Chemo, Patient ID



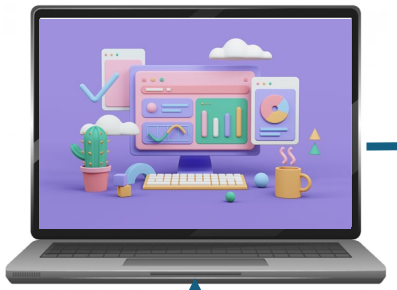
Automated Data Validation & Error Checking:
Unit Names,
Dates, Unchecked Boxes

Automated Alerts to nurse directors to ensure required # of audits are completed every month

Database Application:
Audit Table

Database API

DFCI Enterprise Data Management



Regular objective feedback to nursing leadership to enhance policy and/or compliance

EHR

Discreet Data:
Blood Transfusion
Pain Assessment
Initial Nurse Assessment

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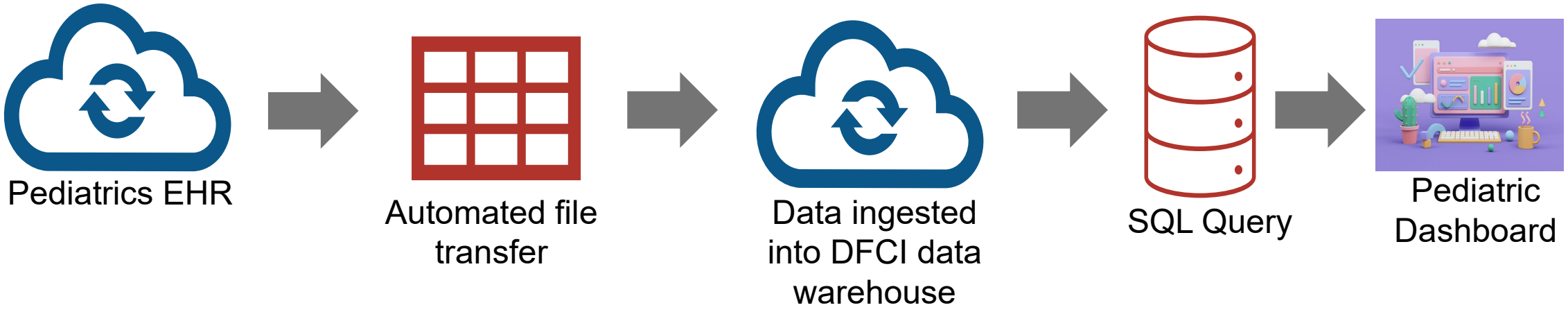
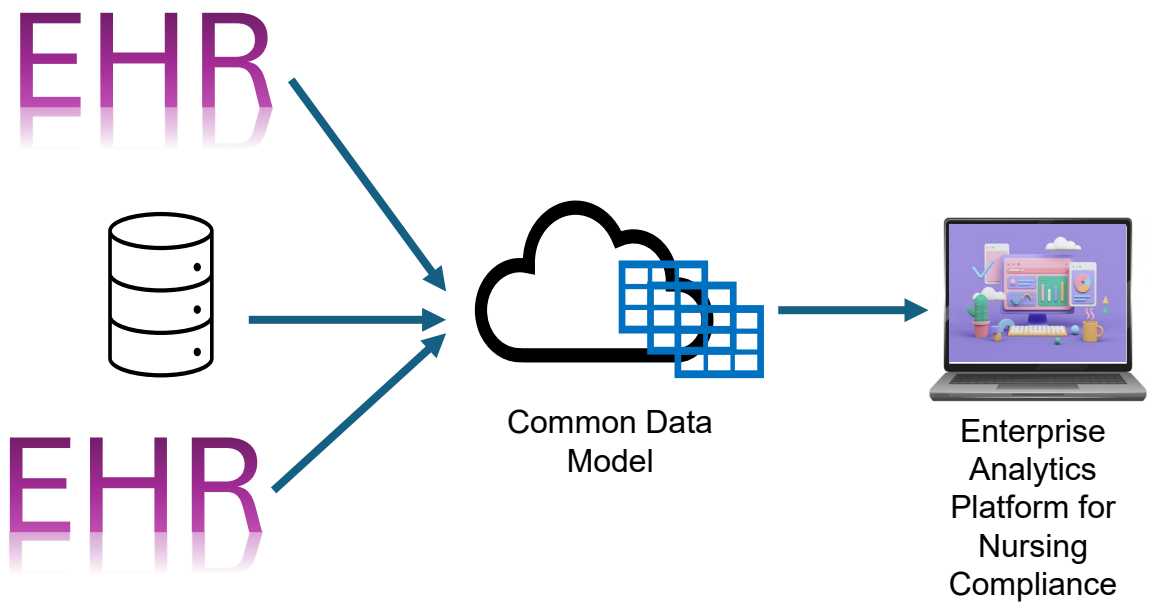
API – Application Programming Interface; DFCI - Dana-Farber Cancer Institute

# Workstream 3: Pediatrics Data Integration




DFCI - Dana-Farber Cancer Institute; SQL – Structured Query Language

# Overall Infrastructure




- Consider best practice for product management
- Significantly larger patient sample size and real-time data
- Tool provides actionable metrics at both aggregated and patient level, which is used to identify and conduct quality improvement initiatives
- Our project is uniquely innovative as it is the first in measuring every aspect of nursing quality in such detail.
- Our learning health system is cyclical in nature, where the metrics are presented in detail and are easy to use in pinpointing areas for improvement. These same measures are used to assess if the initiative has resulted in an improvement and to measure that improvement.
- Proactive vs. reactive
- Foundational work for future innovation

# A Learning Health System in Action*

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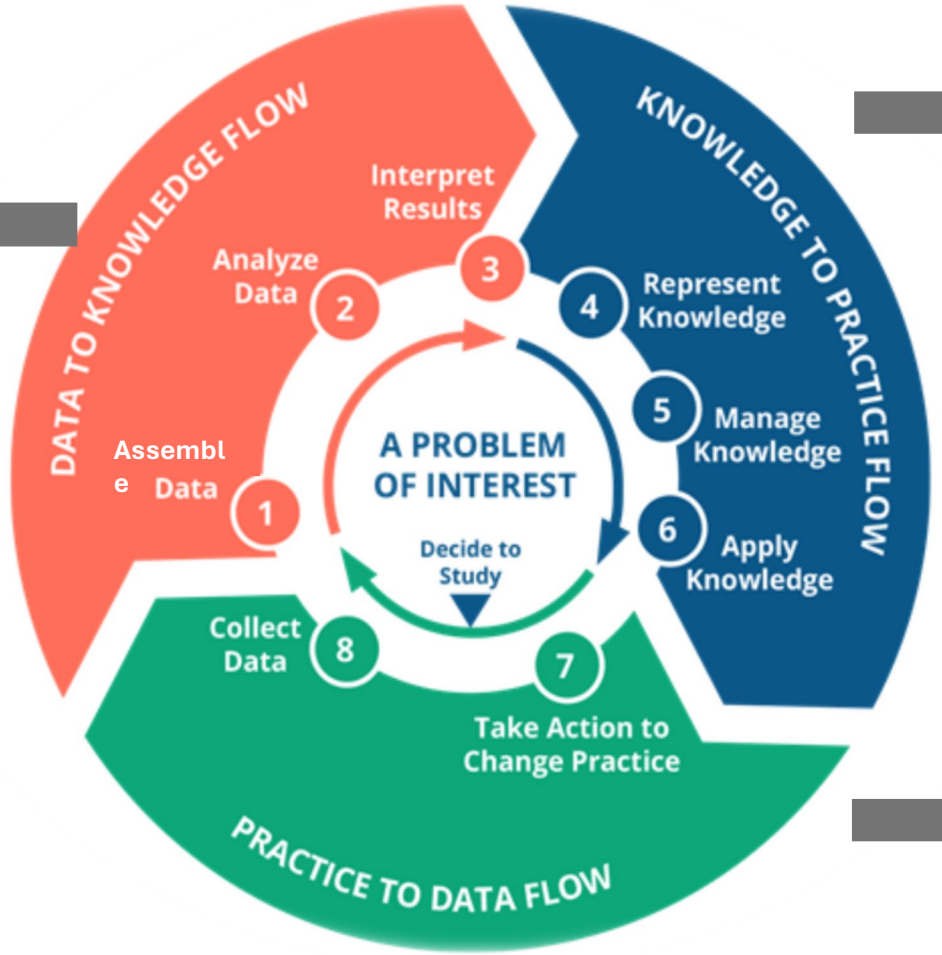
1. Integrate data from systems
2. Understand workflows and develop metrics
3. Develop dashboards and provide key performance indicators at aggregate level and patient and nurse level (actionable)




4. Present dashboard results monthly at various staff and leadership meetings, workgroups, and unit level
5. Use data to inform areas for improvement
6. Plan quality improvement and education initiatives

7. Implement quality improvement and education initiatives
8. Monitor metrics on dashboard post practice change and assess impact / improvement

REFLECTION

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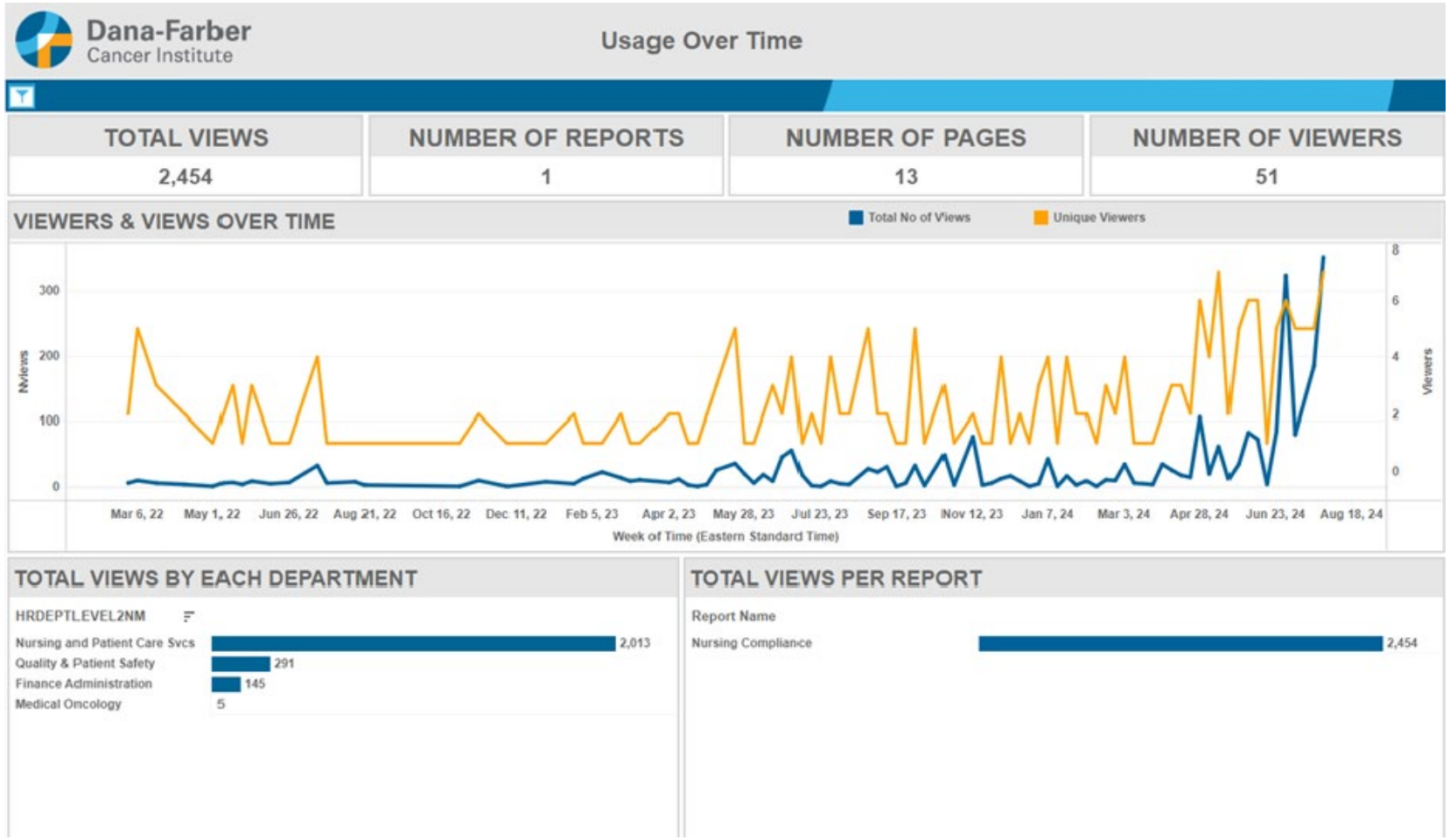
A. J. Flynn, C. P. Friedman, P. Boisvert, Z. Landis-Lewis, and C. Lagoze, "The Knowledge Object Reference Ontology (KORO): A formalism to support management and sharing of computable biomedical knowledge for learning health systems," Wiley Online Library, 2018. [Online]. Available: https://pubmed.ncbi.nlm.nih.gov/31245583/

# Staff Engagement (Weekly)



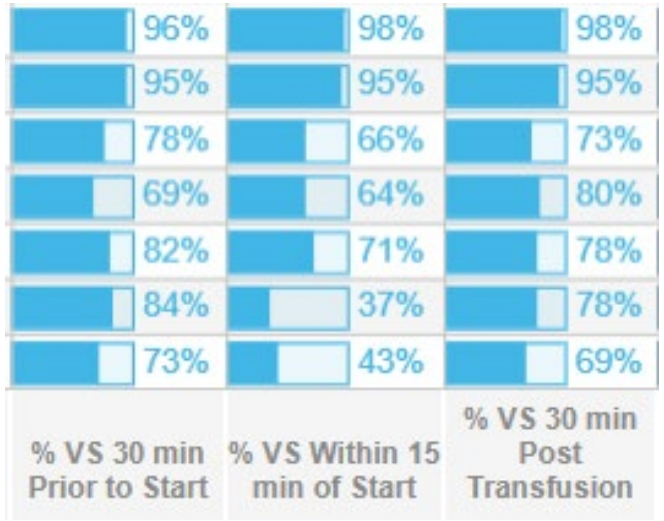
# Clinical Outcomes – Blood Transfusion Vital Signs

Dashboard go live July 2021

## July '21 to June '22

### Institution

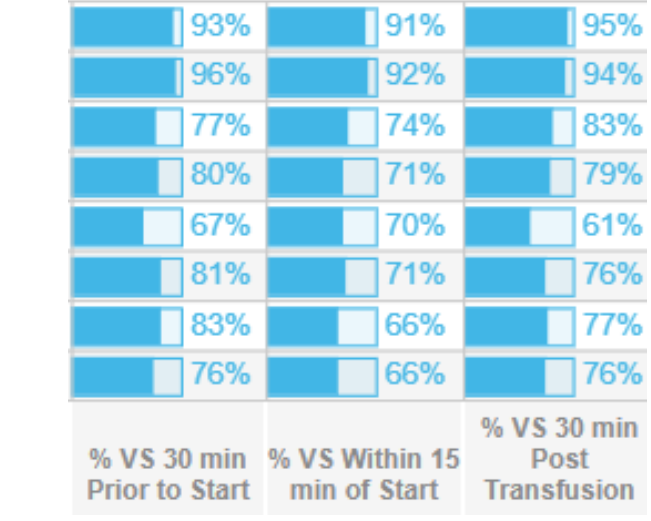
### Locations




## July '22 to June '23

### Institution

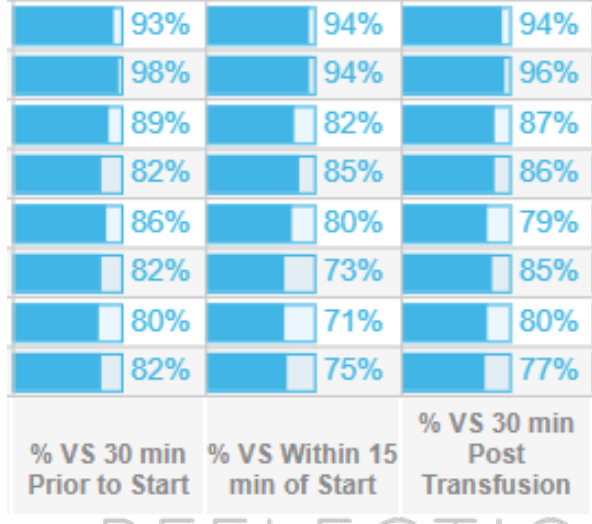
### Locations




## July '23 to June '24

### Institution

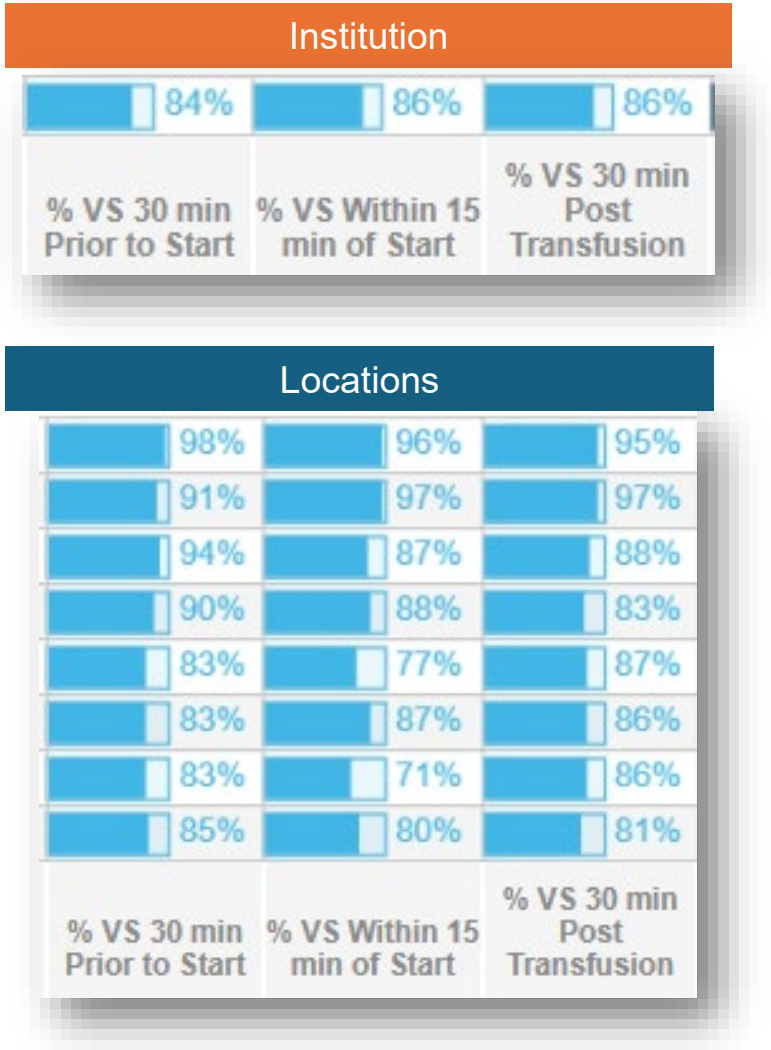
### Locations




VS – vital signs

# Clinical Outcomes – Blood Transfusion Vital Signs

Latest quarter (April to June 2024)




- Incremental quality improvement over the years with a real-time learning health system suite of tools
- Policy, process, education accountability with the Blood Transfusion working group that conducted quality improvement projects with nursing leadership and frontline
- Significant improvement in clinical outcomes for vital signs documentation in alignment with policy

# Learning Health System Impact on Practice, Quality and Patient Care

- Strengthened our data driven culture
- Savings in time and dollars
- Improved data availability, integrity, and reliability
- Value-added quality improvement initiatives
- Infrastructure for advanced analytics and Generative AI
- Efficient quality reporting – regulatory and accreditation (i.e., TJC, ANCC Magnet)

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TJC – The Joint Commission
ANCC – American Nurses Credentialing Center

# Quality Assurance and Performance Improvement

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Learning Health System Benefits:

- Alignment with data automation across our QAPI program
- Focus on high-risk areas
- Proactive risk identification
- Measurement capability for quality improvement

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QAPI – Quality Assurance and Performance Improvement; DFCI - Dana-Farber Cancer Institute

# Continuous Regulatory Readiness

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## High-Risk Areas:

- Procedures
- Suicide Prevention
- High-Level Disinfection
- Blood Transfusion
- Pain Assessment
- Initial Nursing Assessment
- Restraint Utilization

**Pre-survey**

- Measure compliance
- Engage leadership & staff
- Implement improvements

**Survey**

- Identify patients for tracers
- Demonstrate proactive approach
- Triage surveyor concerns with data

**Post-survey**

- Implement action plans
- Ensure sustained compliance
- Cultivate strong culture of safety

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# Lessons Learned

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- Take time to understand the practice and process flow and have well defined business requirements
- Plan for enhancements in your project plan
- Constantly learning
- Have a well-planned quality assurance plan to match data to practice
- Have right stakeholders at the table
- Various levels
- Front line clinician observation

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# Key Takeaways

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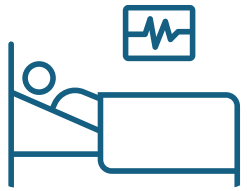
High risk, high volume

Continuous need to monitor

Data discretely available

## Future Areas for Consideration



Restraints

Vein Assessment

Procedure Documentation

Suicide Risk Assessment

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# Questions?

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