

# A Story of Quality Improvement in the Emergency Department: Reducing Low Value Diagnostic Imaging

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[www.medicqi.org](http://www.medicqi.org)

Michigan Radiological Society  
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 DEPARTMENT OF EMERGENCY MEDICINE

# Disclosures

- Michigan Emergency Department Improvement Collaborative (MEDIC)
  - [www.medicqi.org](http://www.medicqi.org) (Kocher, PI)
  - Blue Cross Blue Shield of Michigan and Blue Care Network
- Grant funding
  - AHRQ: R01 HS027811
  - NHLBI/NIH: R01 HL163438
  - Department of Defense: W81XWH2211024
  - Michigan Department of Health and Human Services
  - SAMHSA

# Learning objectives

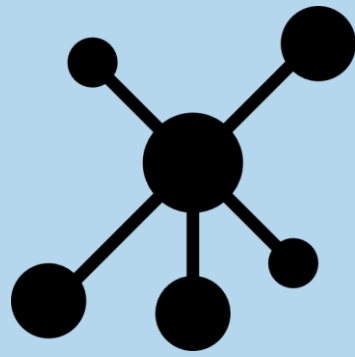
1. Describe *clinical scenarios* in the emergency department where there is high quality evidence to guide diagnostic imaging testing practices
2. Discuss common *barriers and facilitators* to reducing low value diagnostic imaging testing in the emergency department
3. Identify *quality improvement strategies* to reduce low value diagnostic testing in the emergency department

# Shape of the Talk



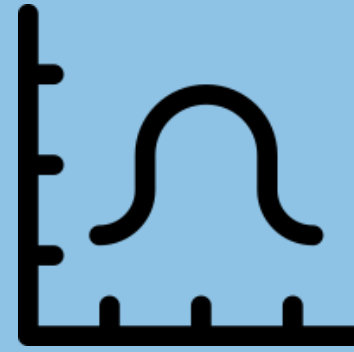
Orientation to ED

Part I



MEDIC overview

Part II



QI in ED imaging

Part III



Role for Radiology

Part IV

# Orientation to the Emergency Department



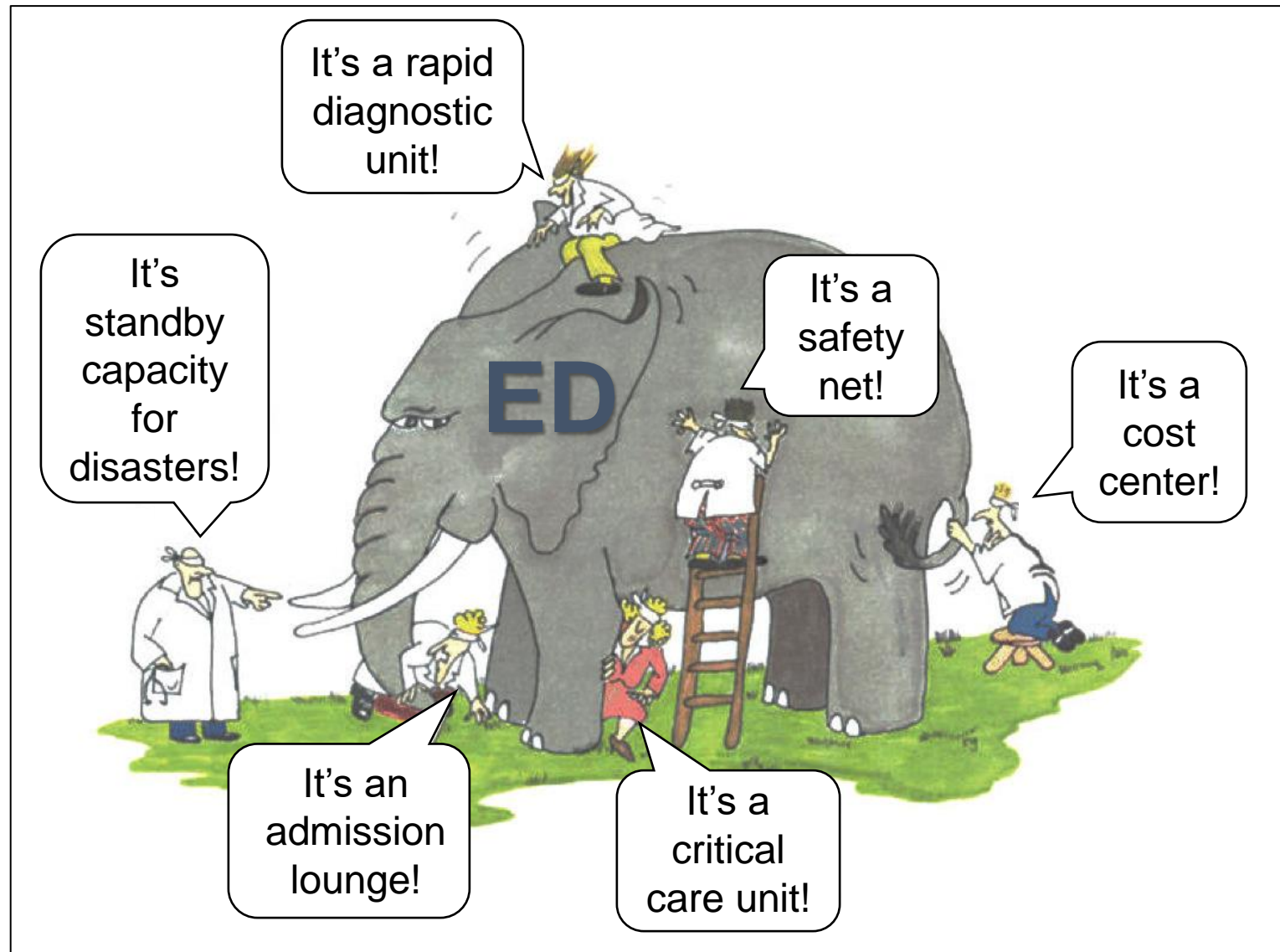
# Orientation to the Emergency Department



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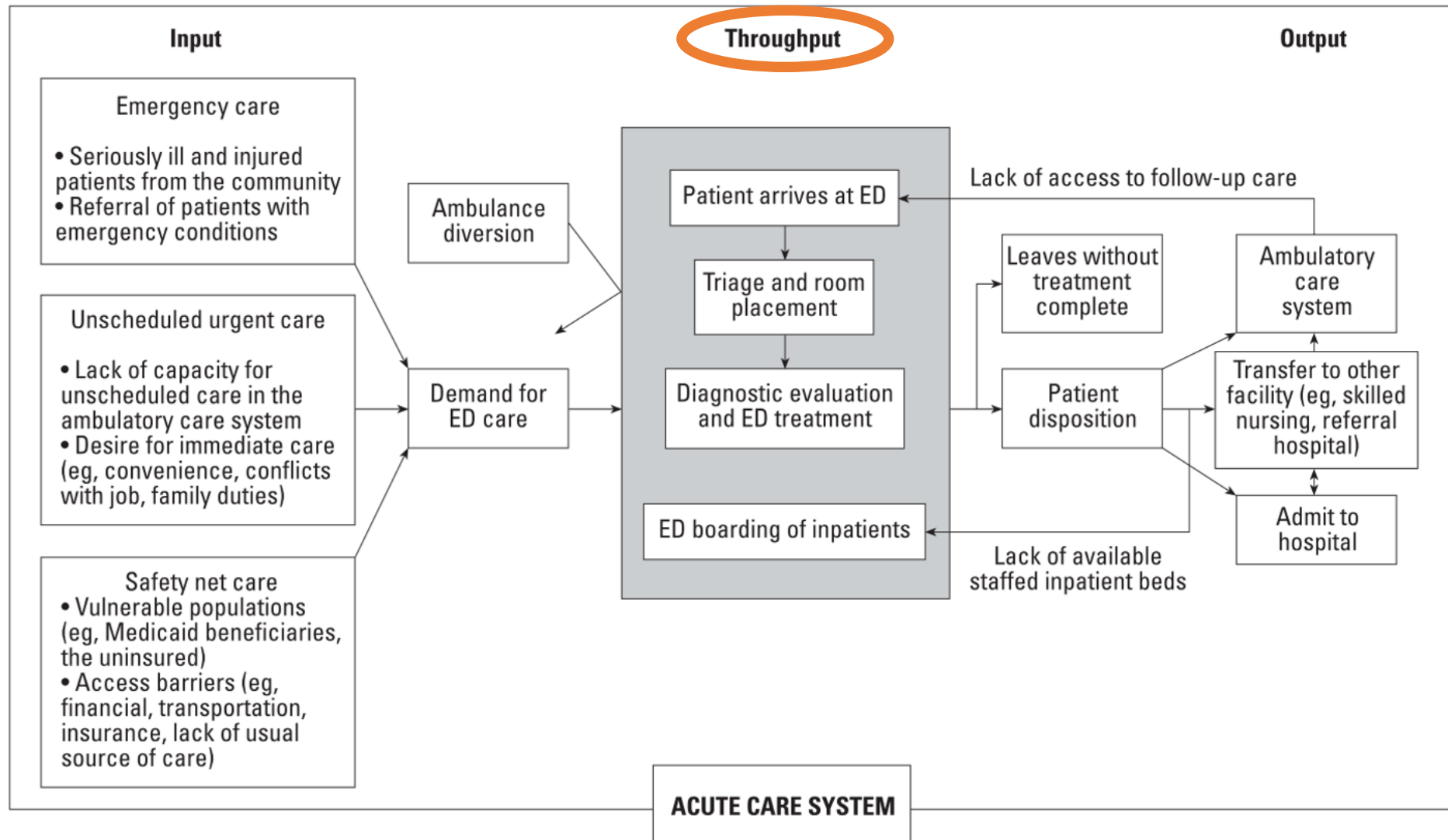


# Orientation: ED Care in the US

## ✓ “Anyone, Anything, Anytime”

- Ethos of utilitarianism
- Safety net culture
- Only location in health care that is always open 24/7/365
- Federally mandated to provide a medical exam for anyone seeking care
- Triage mind set in order of time sensitive health care needs

# Orientation: ED Care in the US



# Orientation: ED Care in the US

- ✓ ~150 million ED visits in the US in 2019
  - = About 1 ED visit for every 2 people in the US
- ✓ Costs
  - Aggregate spending on emergency care is probably 5% - 6% of total national health expenditures
- ✓ More than half of all hospital admissions are sourced from the ED
  - = About 18 million annually
  - Collectively, EDs in the US make the decision to hospitalize about 400,000 times a day across 5,000 EDs

# Orientation: ED Care in the US

## ✓ ED radiology use

- Major modalities:  
MRI < ultrasound < CT < radiographs
- Use of CT continues to increase

**ED care delivery is highly dependent on radiology!**

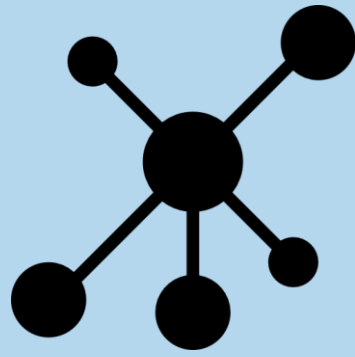
ED Type	MRI Procedures per 100 Patients	Ultrasound Procedures per 100 Patients	CT Procedures per 100 Patients	Simple Radiograph Procedures per 100 Patients
All EDs (n=1,400)	1.8	7	27	48
Under 20k Volume	0.6	4	18	37
20-40k	1.5	6	20	41
40-60k	1.5	9	25	45
60-80k	2.5	10	29	48
80-100k	2.5	9	30	53
Over 100k Volume	3.3	8	20	40
Pediatric EDs	1	5	5	26
Adult EDs	2.5	6	36	50
Freestanding EDs		4	12	36

*From ED Benchmarking Alliance, 2019*



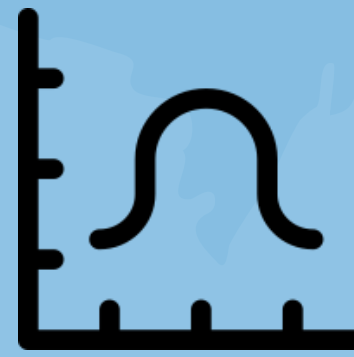
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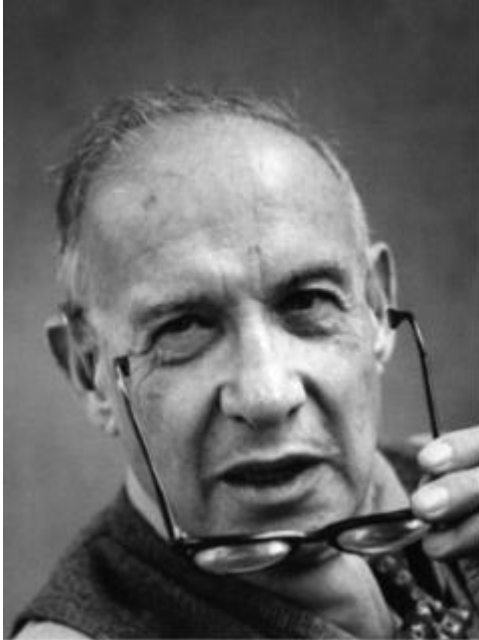
QI in ED imaging

Part III



Role for Radiology

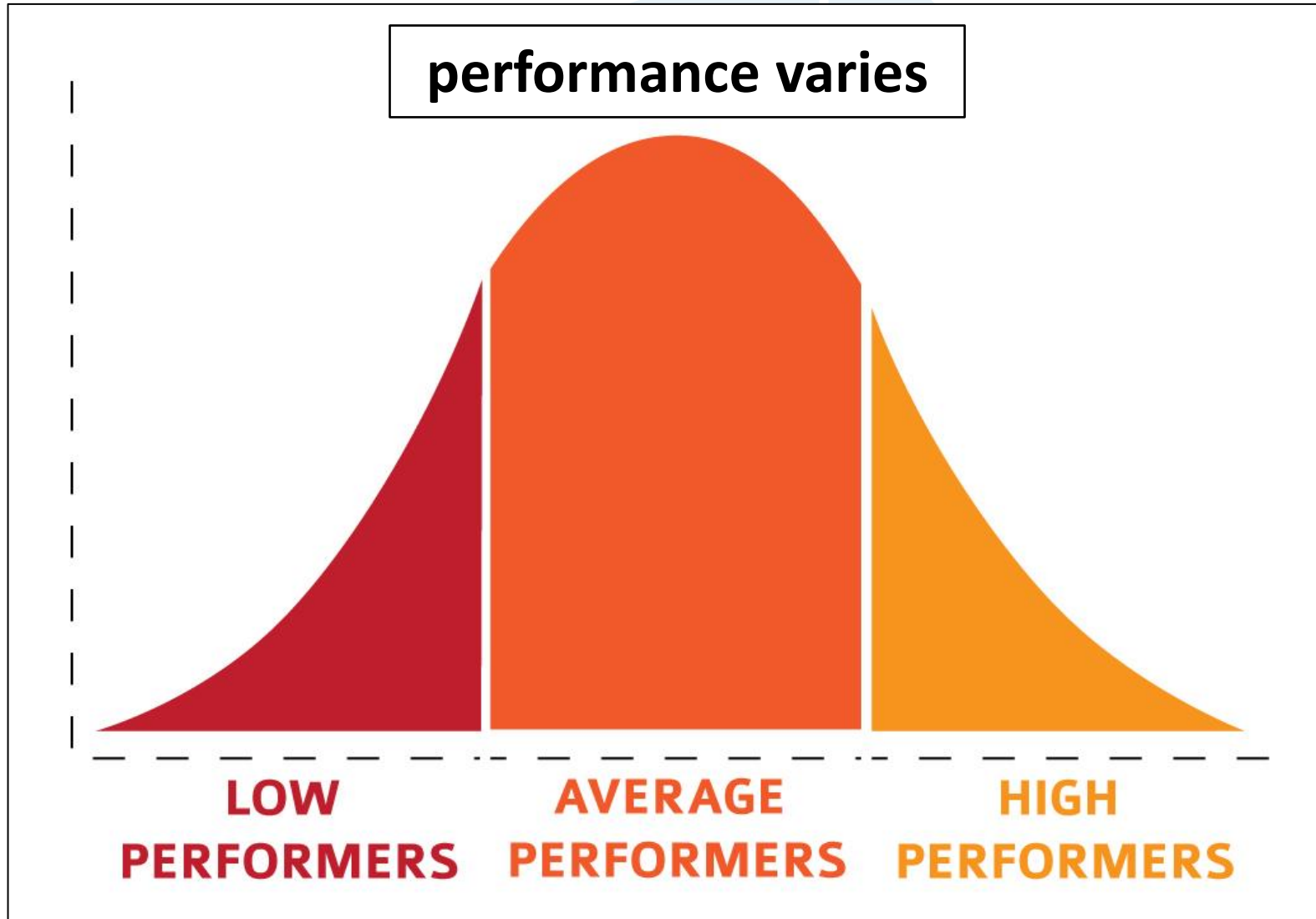
Part IV



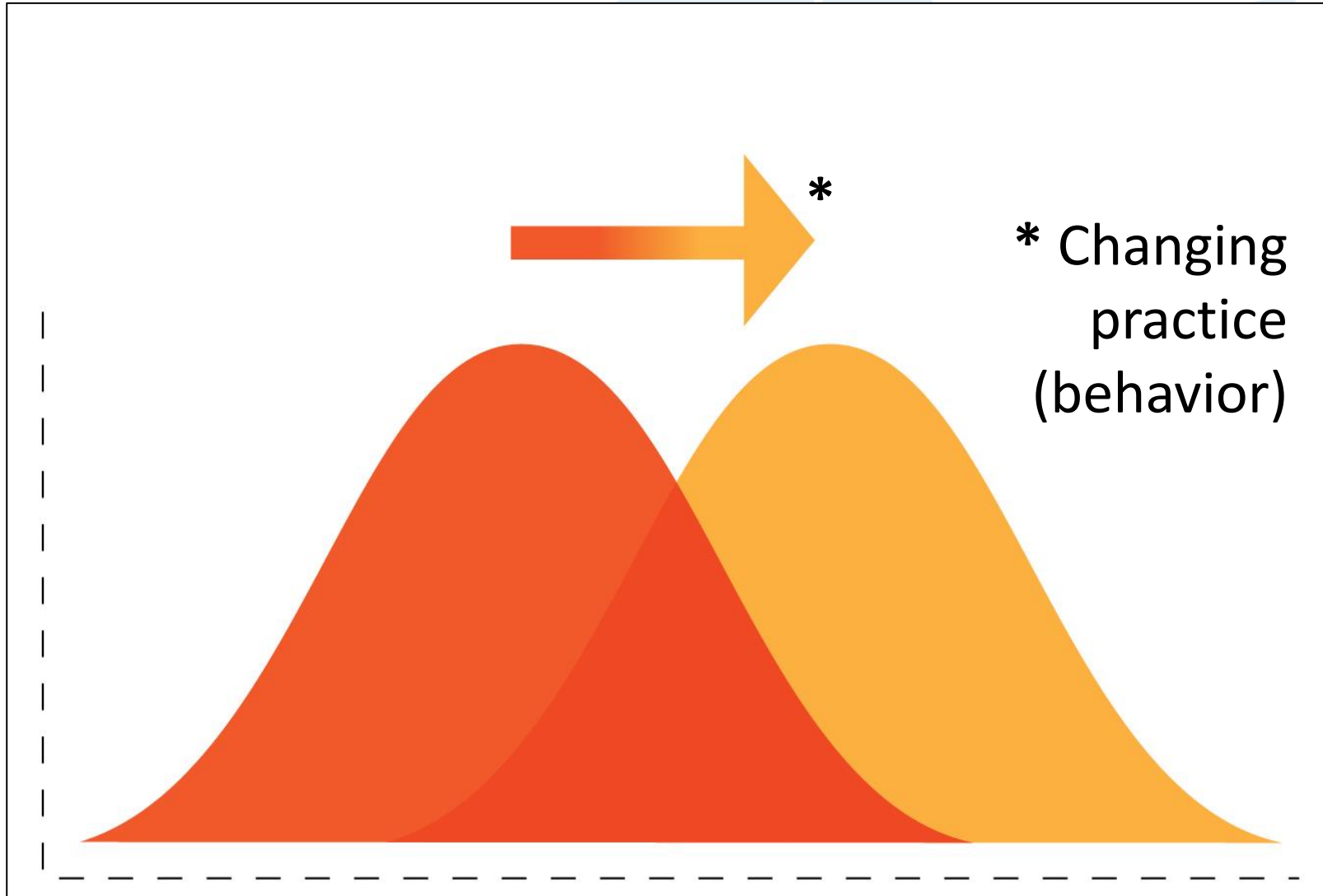
“If you can’t measure it, you can’t improve it.”

- Peter Drucker

# Why Measure in Health Care?



# How Do We Change Performance?





# Who Cares about Performance?



outcomes



# What is the Michigan Emergency Department Improvement Collaborative (MEDIC)?



# What is MEDIC?

That the following assumptions are true:

✓ ***Opportunity***

- Gaps in practice

✓ ***Alignment***

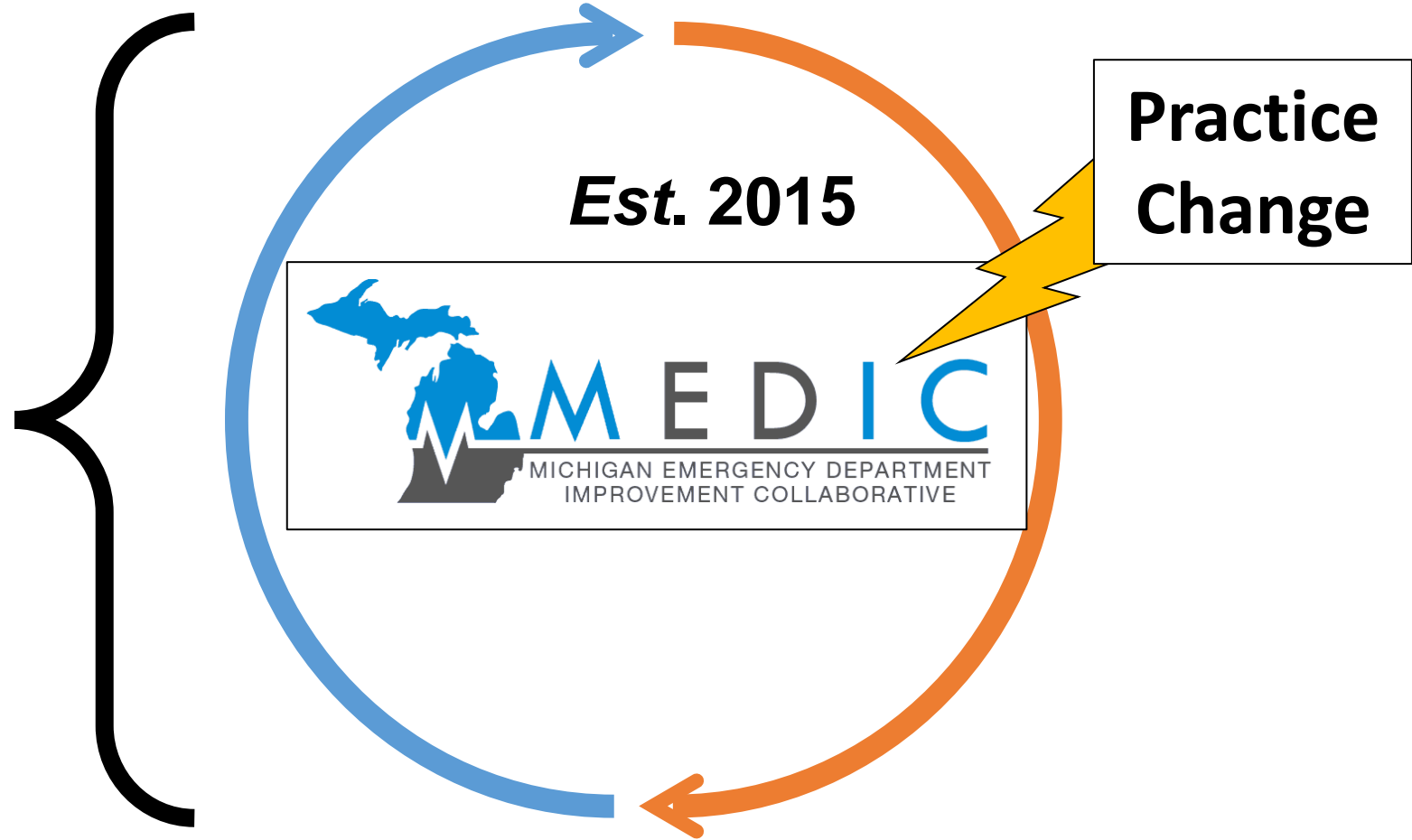
- Payer = Blue Cross Blue Shield of Michigan
- Provider = Hospitals and emergency physicians

✓ ***Community***

- Engagement + leadership

# What is MEDIC?

**Learning  
Collaborative**



# BCBSM Value Partnerships



Obstetrics Initiative    MARCQI MICHIGAN ARTHROPLASTY REGISTRY COLLABORATIVE QUALITY INITIATIVE    I-MPACT    MUSIC Michigan Urological Surgery Improvement Collaborative

HBOM HEALTHY BEHAVIOR OPTIMIZATION FOR MICHIGAN    BMC2    M-TQIP

MVC Michigan Value Collaborative    HMS MICHIGAN HOSPITAL MEDICINE SAFETY CONSORTIUM    MBSC MICHIGAN BARIATRIC SURGERY COLLABORATIVE    MCT2D MICHIGAN COLLABORATIVE FOR TYPE 2 DIABETES    MOOQC MICHIGAN ONCOLOGY QUALITY CONSORTIUM

**MEDIC** MICHIGAN EMERGENCY DEPARTMENT IMPROVEMENT COLLABORATIVE    MPOG MULTICENTER PERIOPERATIVE OUTCOMES GROUP    MROQC Michigan Radiation Oncology Quality Consortium    MSQC Michigan Surgical Quality Collaborative

MAQI<sup>2</sup> Michigan Anticoagulation Quality Improvement Initiative    THE MICHIGAN SOCIETY OF THERAPY & CARDIOVASCULAR NUTRITION    MSHIELD

# MEDIC Membership 2023

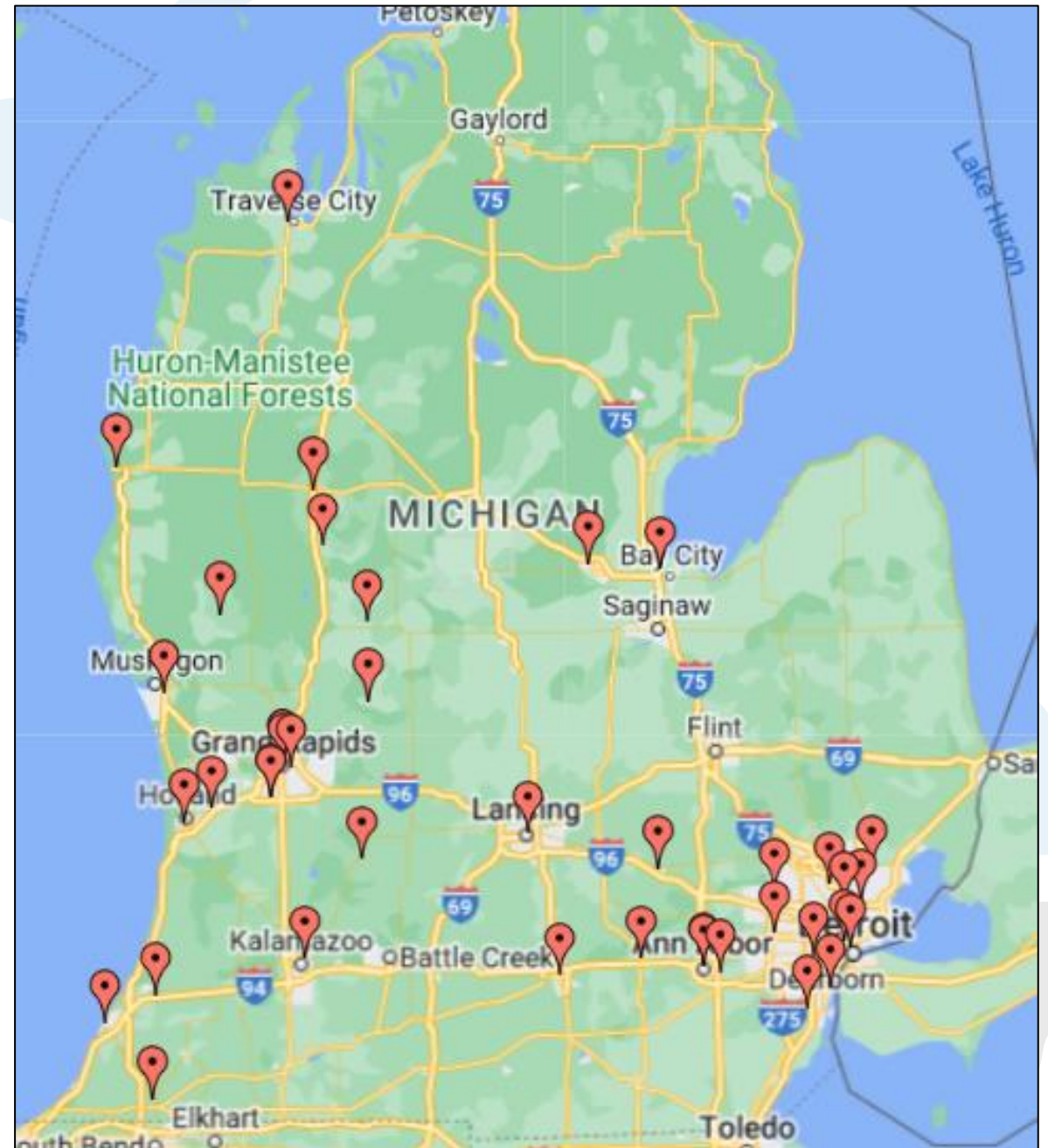
**40** participating sites

**8** different health systems

**ALL** major pediatric EDs in MI

**66%** of all pediatric ED visits in MI represented

**46%** of all ED visits in MI represented



OUR PARTNERS

40 participating sites & growing



ALL major pediatric EDs in MI



**8+ million**  
ED visits in registry

**600,000+**  
abstracted ED visits in registry

**Automated Electronic Data**

**Manual Chart Abstraction**

Every ED visit

- Patient demographics
- Chief complaints
- Vital signs
- Triage score
- Timestamps
- Procedure codes
- Diagnostic codes
- Disposition
- Provider

Specific to core quality initiatives

- Minor head injuries (symptoms, findings)
- CT scans for suspected PE
- Pediatric respiratory illnesses
- Chest pain and asthma related visits
- Opioid related visits



On demand real time reporting via tableau platform

Coordinating center customized reports



# Current Quality Initiatives



CT FOR MINOR HEAD INJURY



CT FOR SUSPECTED PULMONARY EMBOLISM



CXR IN PEDIATRIC RESPIRATORY ILLNESS



DISCHARGE FOR CHILDREN WITH ASTHMA




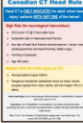
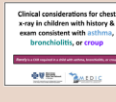


SAFE DISCHARGE FOR ADULTS WITH LOW RISK CHEST PAIN



NALOXONE DISTRIBUTION FOR OPIOID HARM REDUCTION

# Impact

MEDIC QI Impact

<b>MEDIC Quality Initiative<sup>^</sup></b>	↑ <u>diagnostic yield in CT scans for suspected pulmonary embolism</u>	↑ <u>appropriate use of head CT scans in adult minor head injuries</u>	↓ <u>use of chest x-rays in children with asthma, croup, or bronchiolitis</u>	↓ <u>use of head CT scans in intermediate risk pediatric minor head injuries</u>	↑ <u>rate of safe discharge for adults with low-risk chest pain from the ED</u>
<b>MEDIC-Endorsed Practice</b>	 <u>Pause Pre PE Algorithm</u>	 <u>Canadian CT Head Rule</u>	 <u>Clinical Considerations for CXR in Children w/ Asthma, Croup, or Bronchiolitis</u>	 <u>PECARN Minor Head Injury CT Rule</u>	 <u>HEAR+T Pathway</u>
<b>Low Value Care Avoided<sup>†</sup></b>	<b>14,075</b> chest CT scans <i>avoided</i> in adults with suspected PE, 2017-2022	<b>13,124</b> head CT scans <i>avoided</i> in adults with minor head injury, 2017-2022	<b>9,247</b> chest x-rays <i>avoided</i> in children with asthma, bronchiolitis, or croup, 2017-2022	<b>800</b> head CT scans <i>avoided</i> in children with minor head injury, 2017-2022	<b>2336</b> hospital admissions <i>avoided</i> in adults with low-risk chest pain, 2020-2022 <sup>††</sup>
<b>Estimated Cost Avoided</b>	\$1324/scan* <b>\$18.64 million</b>	\$933/scan* <b>\$12.24 million</b>	\$174/x-ray* <b>\$1.61 million</b>	\$933/scan* <b>\$747,000</b>	\$15,000/admit** <b>\$35.03 million</b>

\*Estimated cost/scan & cost/x-ray from fairhealthconsumer.org, zip code 48201, as performed at a hospital outpatient facility without anesthesia, for an insured patient by an in-network provider

\*\*Estimated cost/admit of a low-risk adult chest pain patient from <https://www.hospitalcostcompare.com/drgs/313>

<sup>†</sup> Estimated avoided scans, x-rays, hospital admissions calculated using the difference between baseline performance prior to MEDIC interventions & current improved performance

<sup>^</sup> MEDIC quality initiative for discharge of children with asthma is still in the pilot phase & thus not included here

<sup>††</sup> New quality initiative, only active as of 2020

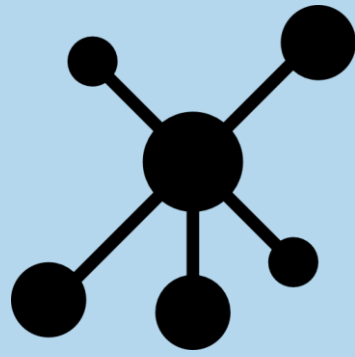


= \$68.2 million avoided



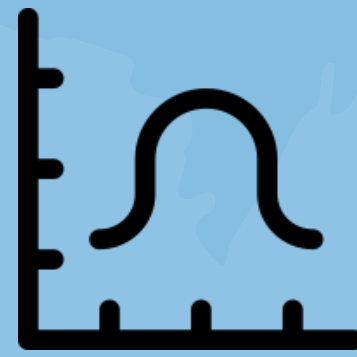
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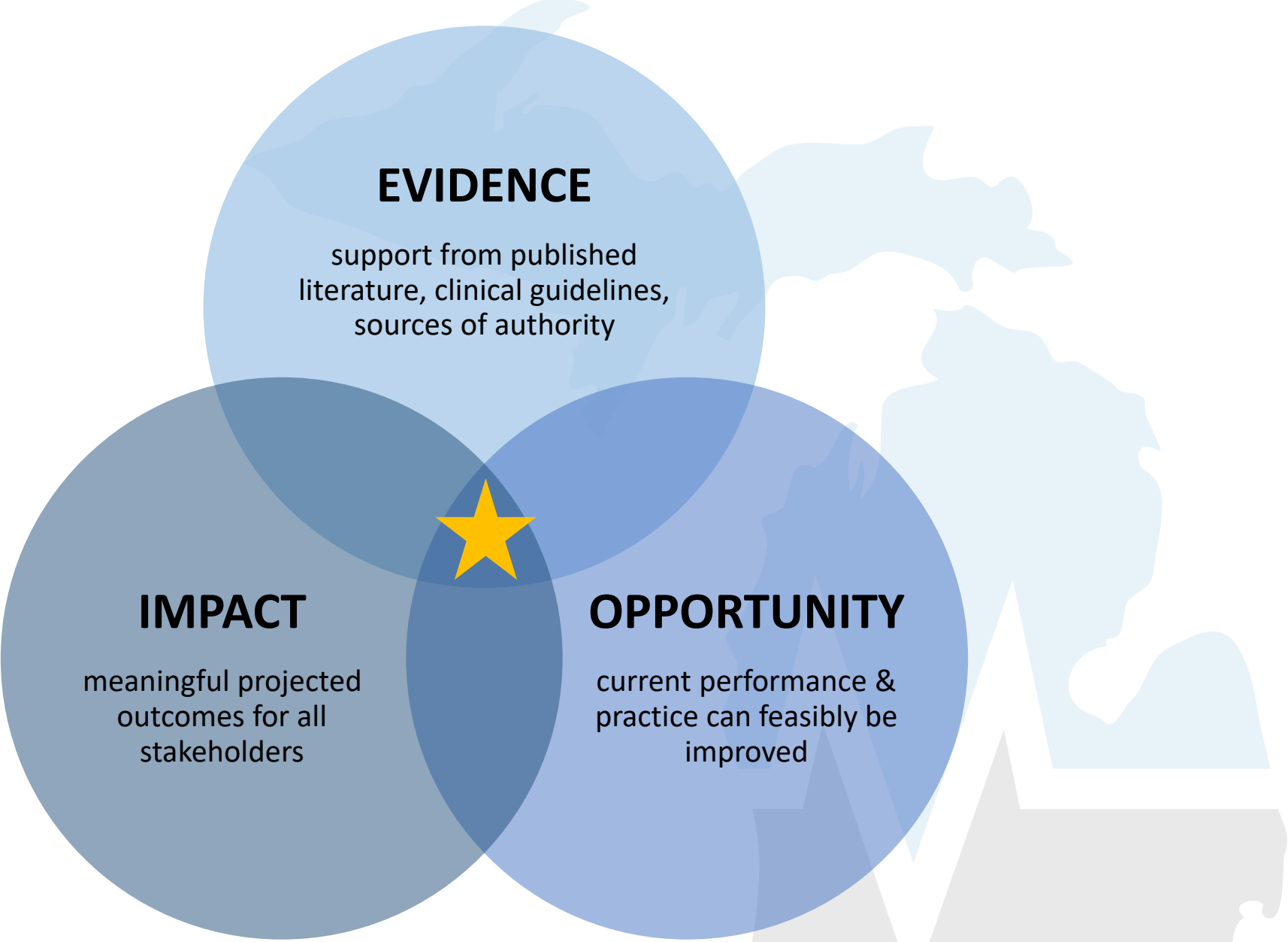
Part III



Role for Radiology

Part IV

# Quality Improvement Framework



# Characteristics of Quality Measurement

## ✓ **Evidence**

- Support from literature

## ✓ **Fair**

- Within the scope of the ED

## ✓ **Actionable**

- Discriminate between low/high performers

## ✓ **Feasible**

- Collect data
- Meaningful measurement

# Evidence Guiding ED Diagnostic Imaging

*Annals of Emergency Medicine*  
*An International Journal*

CLINICAL POLICY

Critical Issues in the Evaluation and Management of Adult Patients Presenting to the Emergency Department With Suspected Pulmonary Embolism

TRAUMA/C

Clinical Policy: Neuroimaging and Decisionmaking in Adult Mild Traumatic Brain Injury in the Acute Setting

**The Canadian CT Head Rule for patients with minor head injury**

*Ian G Stiell, George A Wells, Katherine Vandemortele, R Douglas McKnight, Richard Verbeek, Robert E Worthington, for the CCC Study Group*

**Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study**

*Nathan Kuppermann, James F Holmes, Peter S Dayan, John D Hoyle, Jr, Shireen M Atabaki, Richard Holubkov, Frances M Nadel, David Monroe, Rachel M Stanley, Dominic A Borgianni, Mohamed K Badawy, Jeff E Schunk, Kimberly S Quayle, Prashant Mahajan, Richard Lichenstein, Nathan A Lillis, Michael G Tunik, Elizabeth S Jacobs, James M Callahan, Marc H Gorelick, Todd F Glass, Lois K Lee, Michael C Bachman, Cooper, Elizabeth C Powell, Michael J Gerardi, Kraig A Melville, J Paul Muizelaar, David H Wisner, Sally Jo Zuspan, J Michael Dean, Sandra L Wootton-Gorges, for the Pediatric Emergency Care Applied Research Network (PECARN)\**

**THE LANCET**

**PEDIATRICS**<sup>®</sup>

OFFICIAL JOURNAL OF THE

Variation and Trends in ED Use of Radiographs for Asthma, Bronchiolitis, and Croup in Children

# Evidence Guiding ED Diagnostic Imaging



An initiative of the ABIM Foundation

American College of Emergency Physicians



## Five Things Physicians and Patients Should Question

### 1 Avoid computed tomography (CT) scans of the head in emergency department patients with minor head injury who are at low risk based on validated decision rules.

Minor head injury is a common reason for visiting an emergency department. The majority of minor head injuries do not lead to injuries such as skull fractures or bleeding in the brain that need to be diagnosed by a CT scan. As CT scans expose patients to ionizing radiation, increasing patients' lifetime risk of cancer, they should only be performed on patients at risk for significant injuries. Physicians can safely identify patients with minor head injury in whom it is safe to not perform an immediate head CT by performing a thorough history and physical examination following evidence-based guidelines. This approach has been proven safe and effective at reducing the use of CT scans in large clinical trials. In children, clinical observation in the emergency department is recommended for some patients with minor head injury prior to deciding whether to perform a CT scan.



An initiative of the ABIM Foundation

American College of Emergency Physicians



## Five More Things Physicians and Patients Should Question

### 7 Avoid CT pulmonary angiography in emergency department patients with a low-pretest probability of pulmonary embolism and either a negative Pulmonary Embolism Rule-Out Criteria (PERC) or a negative D-dimer.

Advances in medical technology have increased the ability to diagnose even small blood clots in the lung. Now, the most commonly used test is known as a CT pulmonary angiogram (CTPA). It is readily available in most hospitals and emergency rooms. However, disadvantages of the CTPA include patient exposure to radiation, the use of dye in the veins that can damage kidneys and high cost.

Certain findings in a patient's medical history put them at very low risk for having a blood clot in the lung. In some cases, a negative D-dimer may be additionally used to screen for the possibility of a clot. If patient historical factors and physical examination are negative (if the physician chooses to order it), evidence shows that the risk of an undiagnosed blood clot is very low. Such a strategy saves the risk of radiation, kidney injury and the high cost of a CTPA.



An initiative of the ABIM Foundation

American Academy of Pediatrics –  
Section on Emergency Medicine and the  
Canadian Association of Emergency Physicians



## Five Things Physicians and Patients Should Question

### 1 Do not obtain radiographs in children with bronchiolitis, croup, asthma, or first-time wheezing.

Respiratory illnesses are among the most common reasons for pediatric emergency department (ED) visits, with wheezing being a frequently encountered clinical finding. For children presenting with first-time wheezing or with typical findings of asthma, bronchiolitis, or croup, radiographs rarely yield important positive findings and expose patients to radiation, increased cost of care, and prolonged ED length of stay. National and international guidelines emphasize the value of the history and physical examination in making an accurate diagnosis and excluding serious underlying pathology. Radiography performed in the absence of significant findings has been shown to be associated with overuse of antibiotics. Radiographs should not be routinely obtained in these situations unless findings such as significant hypoxia, focal abnormalities, prolonged course of illness, or severe distress are present. If wheezing is occurring without a clear atopic etiology or without upper respiratory tract infection symptoms (eg, rhinorrhea, nasal congestion, and/or fever), appropriate diagnostic imaging should be considered on a case-by-case basis.

# Implementation Support

### Canadian CT Head Rule

Head CT is **ONLY INDICATED** for adult minor head injury<sup>1</sup> patients **WITH ANY ONE** of the below<sup>2</sup>:

**High Risk (for neurological intervention)**

- GCS score <15 @ 2 hours after injury
- Suspected open or depressed skull fracture
- Any sign of basal skull fracture (hemotympanum, 'raccoon' eyes, cerebrospinal fluid otorrhea/rhinorrhea, Battle's sign)
- Vomiting ≥2 episodes
- Age ≥65 years

**Medium Risk (for brain injury on CT)**

- Amnesia before impact ≥30min
- Dangerous mechanism (pedestrian struck by motor vehicle, occupant ejected from motor vehicle, fall from height >3ft or 5 stairs)

<sup>1</sup> minor head injury: loss of consciousness, definite amnesia, or disorientation in patients with a GCS score of 13-15

<sup>2</sup> exclusions: use of antiplatelets or anticoagulants, pre-existing bleeding disorders, penetrating skull injury, acute focal neurological deficits, unstable vital signs associated with major trauma

Stiell, IG et al. The Canadian CT Head Rule for patients with minor head injury. *Lancet*. 2001;357(9266), pp.1391-1396.

MEDIC MICHIGAN EMERGENCY DEPARTMENT IMPROVEMENT COLLABORATIVE

HOME INITIATIVES COLLABS MEDIA MEMBERS CRISIS RESPONSE CONTACT

- CT for Minor Head Injury
- CT for Suspected Pulmonary Embolism
- CXR in Pediatric Respiratory Illness
- Discharge for Children with Asthma
- Safe Discharge for Adults with Low Risk Chest Pain
- Naloxone Distribution for Opioid Harm Reduction
- Pediatric Weight Capture

New AAP & CAE Guidelines align with MEDIC Initiatives

### PAUSE PRE PE

"Reasonable and prudent emergency care does not dictate that all patients with a sign or symptom of PE must be tested for PE. Nor does it dictate that a patient with one or more risk factors for PE must undergo testing for PE in the absence of a sign or symptom of PE."

-Kline J & Kibbel C. Emergency Evaluation for Pulmonary Embolism. Part 2: Diagnostic Approach. 2015.

Assess Pre-Test Probability (Clinical Gestalt)

- LOW Pre-Test Probability of PE (<15%)
  - Apply PERC
    - PERC Factors: Age ≥50, Heart rate ≥100, Room air O<sub>2</sub> saturation <95%, Unilateral leg swelling, Hemoptysis, Recent surgery or trauma (≤4 wks prior requiring treatment w/ general anesthesia), Prior PE or DVT, Exogenous estrogen use.
    - PERC Interpretation: If no criteria are positive, then <2% chance of PE.
    - Outcome: No further PE evaluation indicated.
- ELEVATED Pre-Test Probability of PE (≥15%)
  - Apply Wells
    - Wells Criteria: Clinical signs + symptoms of DVT = 3 pts, PE is #1 diagnosis OR equally likely = 3 pts, Heart rate >100 = 1.5 pts, Hemoptysis = 1 pt, Immobilization ≥3 days OR surgery in prior 4 wks = 1.5 pts, Prior PE or DVT = 1.5 pts, Malignancy w/ treatment w/ 6 months OR palliative = 1 pt.
    - PE Unlikely Wells ≤4 pts: Age-adjusted d-dimer.
      - Outcome: No imaging indicated.
    - PE Likely Wells ≥4 pts:
      - Outcome: Imaging indicated.

"If probability of PE is <2%, harms of testing are greater than benefits"

Last updated: 6/22/2019

Chughtai Study Investigators. Effectiveness of Managing Suspected Pulmonary Embolism Using an Algorithm Combining Clinical Probability, D-Dimer Testing, and Computed Tomography. *Ann Intern Med*. 2006;144(10):717-724. doi:10.1093/ajcp/144.10.717.

Wells GA, Costantino MR, Kibbel C, et al. Prospective multicenter evaluation of the pulmonary embolism rule-out criteria. *Journal of Thrombosis and Haemostasis*. 2006;6(5):772-780. doi:10.1111/j.1538-7836.2006.01244.x

Kline JA, Kibbel C. Emergency Evaluation for Pulmonary Embolism. Part 2: Diagnostic Approach. *The Journal of Emergency Medicine*. 2015;49(1):104-117. doi:10.1054/jem.2014.2424

Kline JA, Mitchell AA, Kibbel C, et al. Clinical Criteria to Prevent Unnecessary Diagnostic Testing in Emergency Department Patients with Suspected Pulmonary Embolism. *Journal of Emergency Medicine*. 2012;42(1):101-108. doi:10.1016/j.jemermed.2011.08.019

Hughes M, Van Es L, Desjardis P, et al. Age-Adjusted D-Dimer Cutoff Levels to Rule Out Pulmonary Embolism. *Annals of Internal Medicine*. 2014;161(11):731-737. doi:10.7554/ajcp.2014.161.11.731

Chughtai M, Kibbel C, Wells GA, et al. Diagnostic accuracy of unenhanced low-dose CT for acute PE in patients with negative transthoracic echocardiography, venous ultrasound, and ventilation-perfusion scintigraphy. *Journal of Emergency Medicine*. 2013;44(2):124-130. doi:10.1016/j.jemermed.2012.10.022

Wells GA, Anderson DR, Rodin M, et al. Derivation of a Simple Clinical Model to Estimate the Probability of Pulmonary Embolism: Increasing the Model Utility with the Unenhanced D-Dimer. *Thrombosis and Haemostasis*. 2000;80(3):414-420. doi:10.1054/tha.2000.343300

### PECARN Pediatric Minor Head Injury CT Guidelines for Children Age <2 Years

- GCS <15
- Palpable skull fracture
- AMS\* (agitation, somnolence, slow response, repetitive questioning)

YES TO ANY → Head CT Indicated High Risk: 4.4% risk of ci-TBI

NO TO ALL → Observation vs CT using shared decision-making Intermediate Risk: 0.9% risk of ci-TBI

- Scalp hematoma (excluding frontal)
- LOC >5 seconds
- Not acting normally per parent
- Severe mechanism of injury (Fall >3ft, MVA w/ejection, rollover, or fatality, bike/ped vs vehicle w/o helmet, struck by high-impact object)

YES TO ANY → Observation vs CT using shared decision-making Intermediate Risk: 0.9% risk of ci-TBI

NO TO ALL → Head CT NOT Indicated Low Risk: <0.02% risk of ci-TBI

Clinical decision-making factors in favor of:

**Observation**

- Isolated symptoms & historical features
- Vomiting, LOC, severe headache, severe mechanism of injury in isolation are NOT associated with increased risk of ci-TBI
- Physician experience
- Parental preference
- Consider using Head CT Choice Decision Aid to facilitate shared decision-making

**CT using shared decision-making**

- Multiple symptoms
- Worsening findings on observation (AMS, headache, vomiting)
- \*Post-traumatic seizure is considered to be altered mental status (AMS)

Kuppermann N, Holmes JF, Dayan PS, et al. Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study. *The Lancet*. 2009;374(9696):1160-1170.

### PECARN Pediatric Minor Head Injury CT Guidelines for Children Age 2+ Years

- GCS <15
- Signs of basilar skull fracture
- AMS\* (agitation, somnolence, slow response, repetitive questioning)

YES TO ANY → Head CT Indicated High Risk: 4.3% risk of ci-TBI

NO TO ALL → Observation vs CT using shared decision-making Intermediate Risk: 0.8% risk of ci-TBI

- Vomiting
- LOC
- Severe headache
- Severe mechanism of injury (Fall >5ft, MVA w/ejection, rollover, or fatality, bike/ped vs vehicle w/o helmet, struck by high-impact object)

YES TO ANY → Observation vs CT using shared decision-making Intermediate Risk: 0.8% risk of ci-TBI

NO TO ALL → Head CT NOT Indicated Low Risk: <0.05% risk of ci-TBI

Clinical decision-making factors in favor of:

**Observation**

- Isolated symptoms & historical features
- Vomiting, LOC, severe headache, severe mechanism of injury in isolation are NOT associated with increased risk of ci-TBI
- Physician experience
- Parental preference
- Consider using Head CT Choice Decision Aid to facilitate shared decision-making

**CT using shared decision-making**

- Multiple symptoms
- Worsening findings on observation (AMS, headache, vomiting)
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Kuppermann N, Holmes JF, Dayan PS, et al. Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study. *The Lancet*. 2009;374(9696):1160-1170.

### Clinical considerations for CXR in children with history & exam consistent with asthma, bronchiolitis, or croup

If NONE of the below are present, question your reason for a CXR.

	ASTHMA 2-17 yrs old	BRONCHIOLITIS 2mo-2yrs old	CROUP 6mo-3yrs old
HISTORY OF PRESENT ILLNESS	Fever ≥38°C (100°F) for ≥72 hrs		
	Chest pain		
	Suspected foreign body ingestion or choking episode in past 2 wks		
PAST MEDICAL HISTORY	<ul style="list-style-type: none"> <li>Cerebral palsy &amp;/or neuromuscular disease</li> <li>Prematurity (&lt;37 weeks gestation)</li> <li>Bronchopulmonary dysplasia</li> <li>Tracheostomy</li> <li>Cystic fibrosis</li> </ul>	<ul style="list-style-type: none"> <li>Ciliary dyskinesias</li> <li>Congenital heart disease</li> <li>Sickle cell disease</li> <li>Immunosuppression (cancer, HIV/AIDS, transplant)</li> </ul>	
EXAM FINDINGS	Toxic, ill appearance, somnolent, lethargic, or listless		
CLINICAL COURSE	Focal lung exam findings (decreased breath sounds, rales, rhonchi) or crepitus		
	Worsening clinical status: Vital signs and/or exam findings and/or requiring escalation of care		

Presence of one or more of these does **NOT** automatically require a CXR.

\*If wheezing is occurring without a clear atopic etiology or URI symptoms, diagnostic imaging may be considered on a case-by-case basis.



# Audit & Feedback

<https://medicqi.org/>

For Members

- MEDICLink
- MEDIC Tableau Reporting
- Request Access to MEDIC Tableau Reports

MEDIC  
MICHIGAN EMERGENCY DEPARTMENT  
IMPROVEMENT COLLABORATIVE

Registry Reporting Interface

- SITE PERFORMANCE DASHBOARD
- ALL MEASURES DASHBOARD
- CT FOR MINOR HEAD INJURY - ADULT
- CT FOR MINOR HEAD INJURY - PEDIATRICS
- CT FOR SUSPECTED PULMONARY EMBOLISM
- CXR IN PEDIATRIC RESPIRATORY ILLNESS
- SAFE DISCHARGE FOR CHILDREN WITH ASTHMA
- SAFE DISCHARGE FOR ADULTS WITH LOW RISK CHEST PAIN
- PHYSICIAN SCORECARD
- ABSTRACTION STATUS REPORT

ARBOR RESEARCH COLLABORATIVE FOR HEALTH

Blue Cross Blue Shield of Michigan

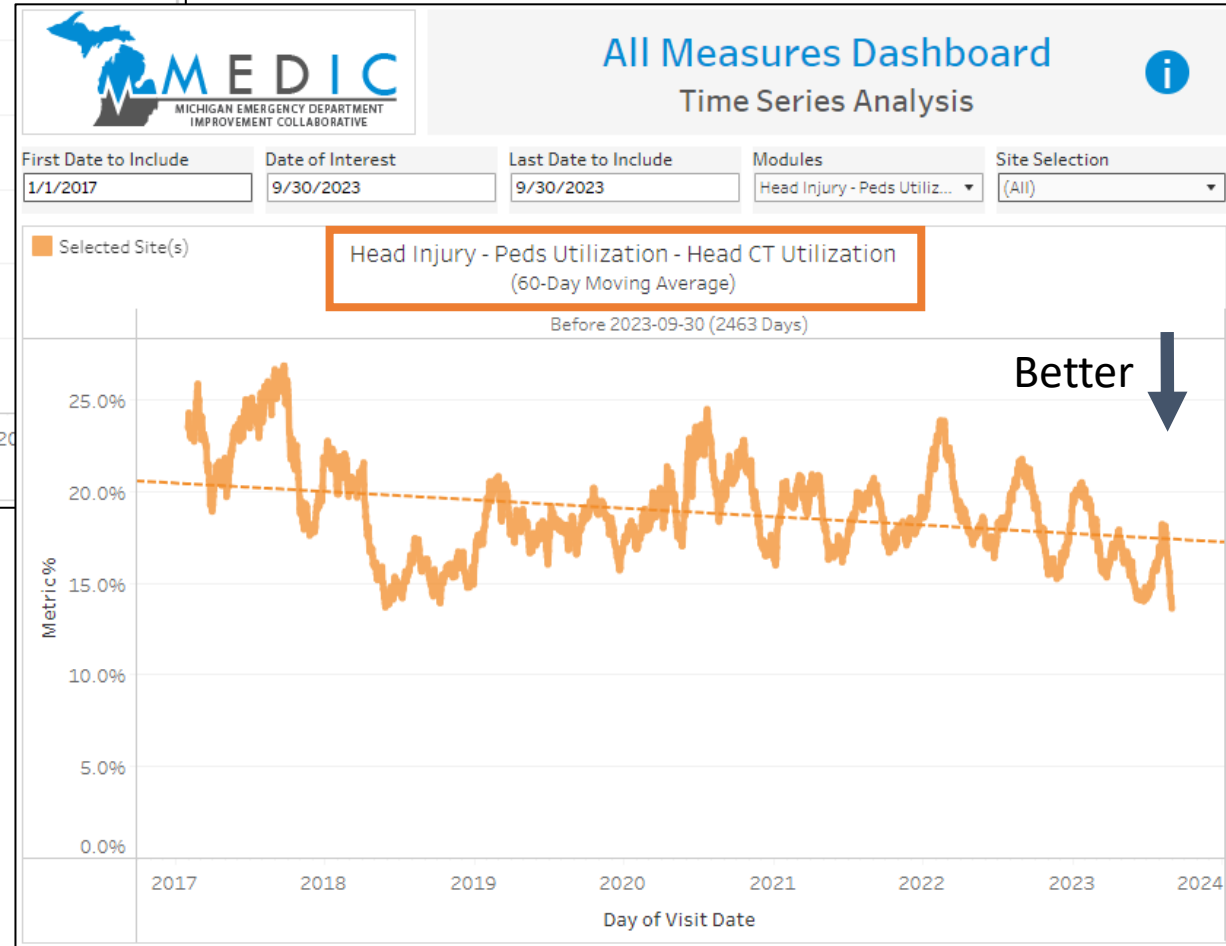
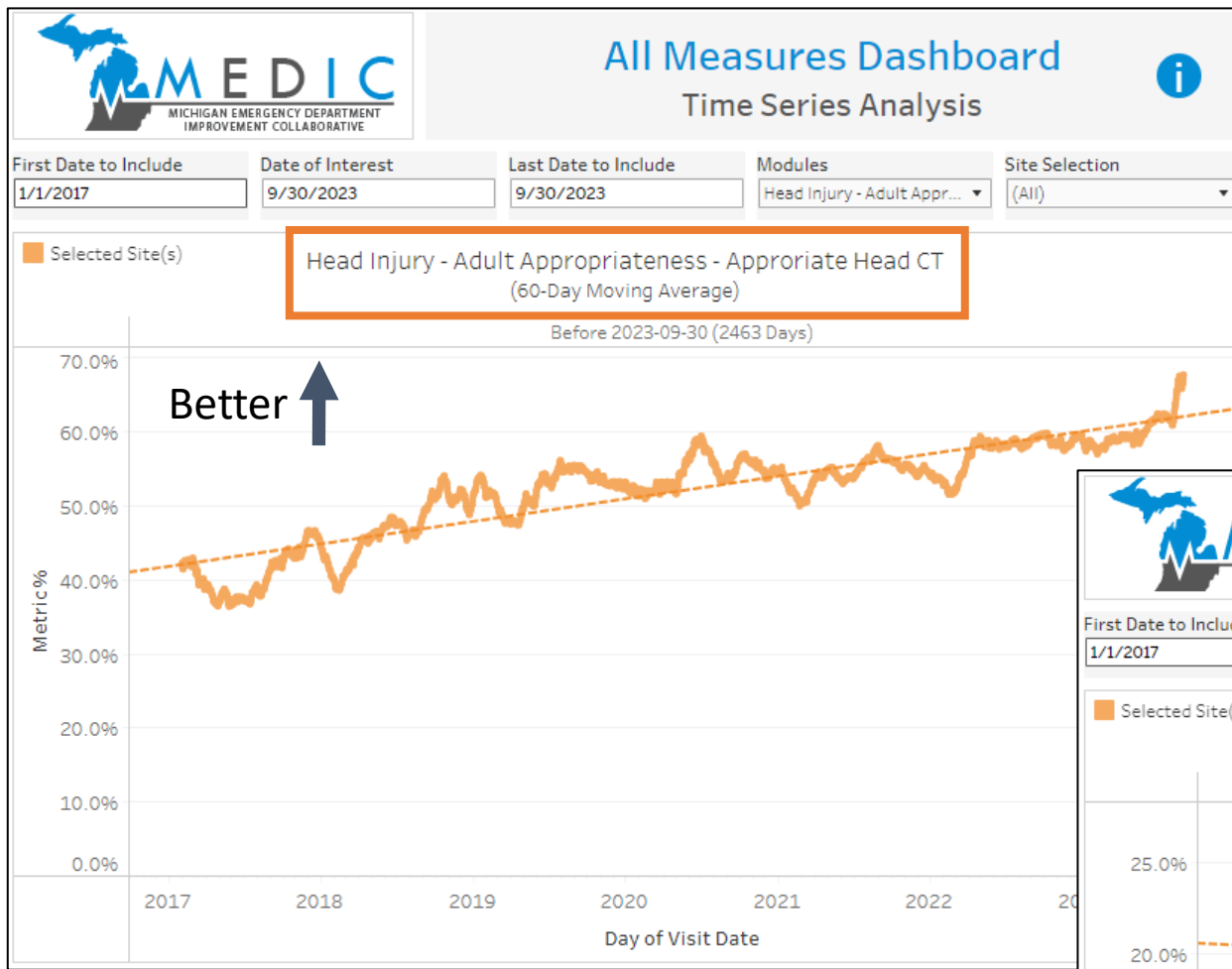
## Analytics:

- ✓ Ranking charts
  - *Site vs site*
  - *Physician vs physician*
- ✓ Outlier detection reports
- ✓ Time series analyses
- ✓ Balancing measures
- ✓ Disparities dashboard

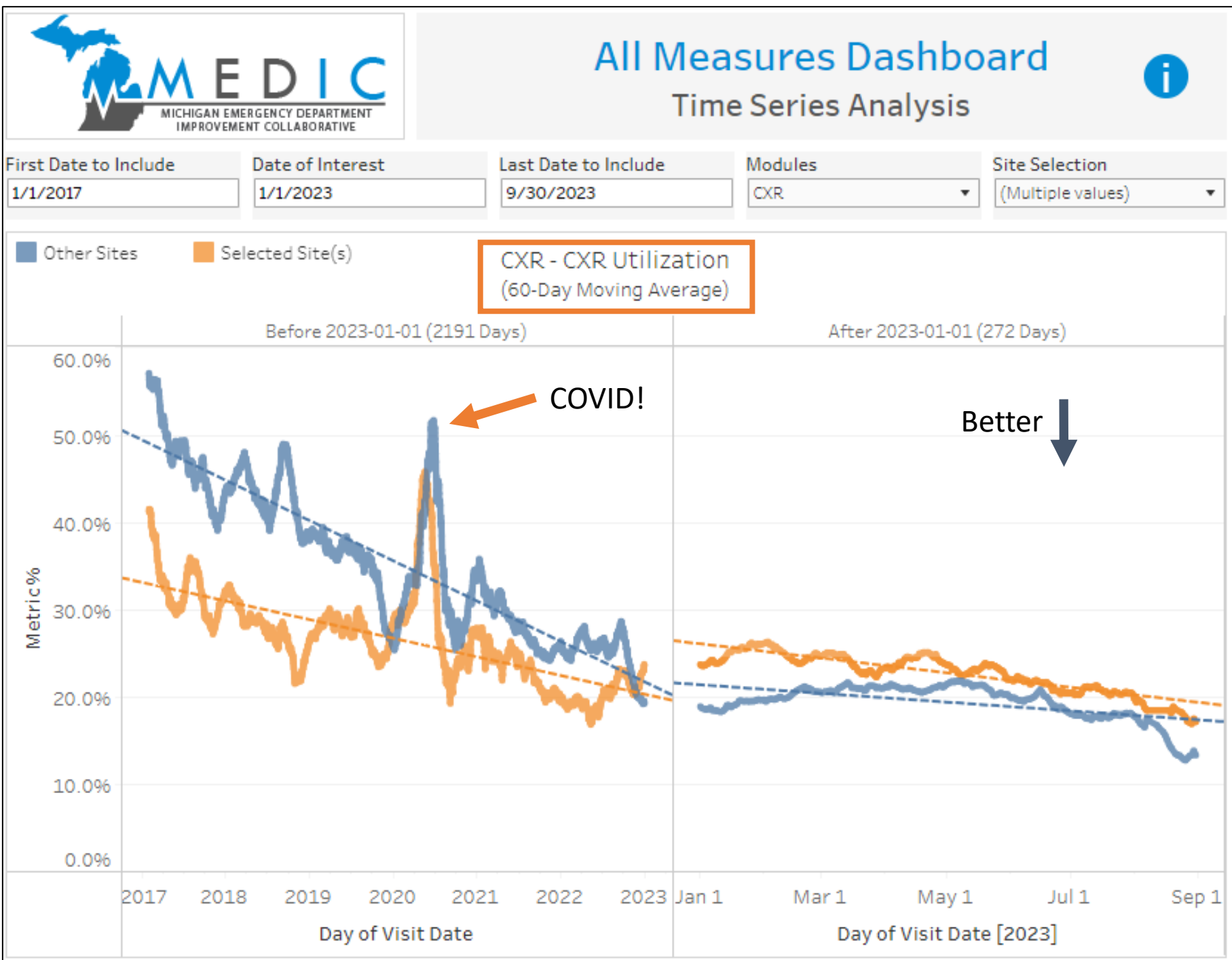
# Ranking Charts



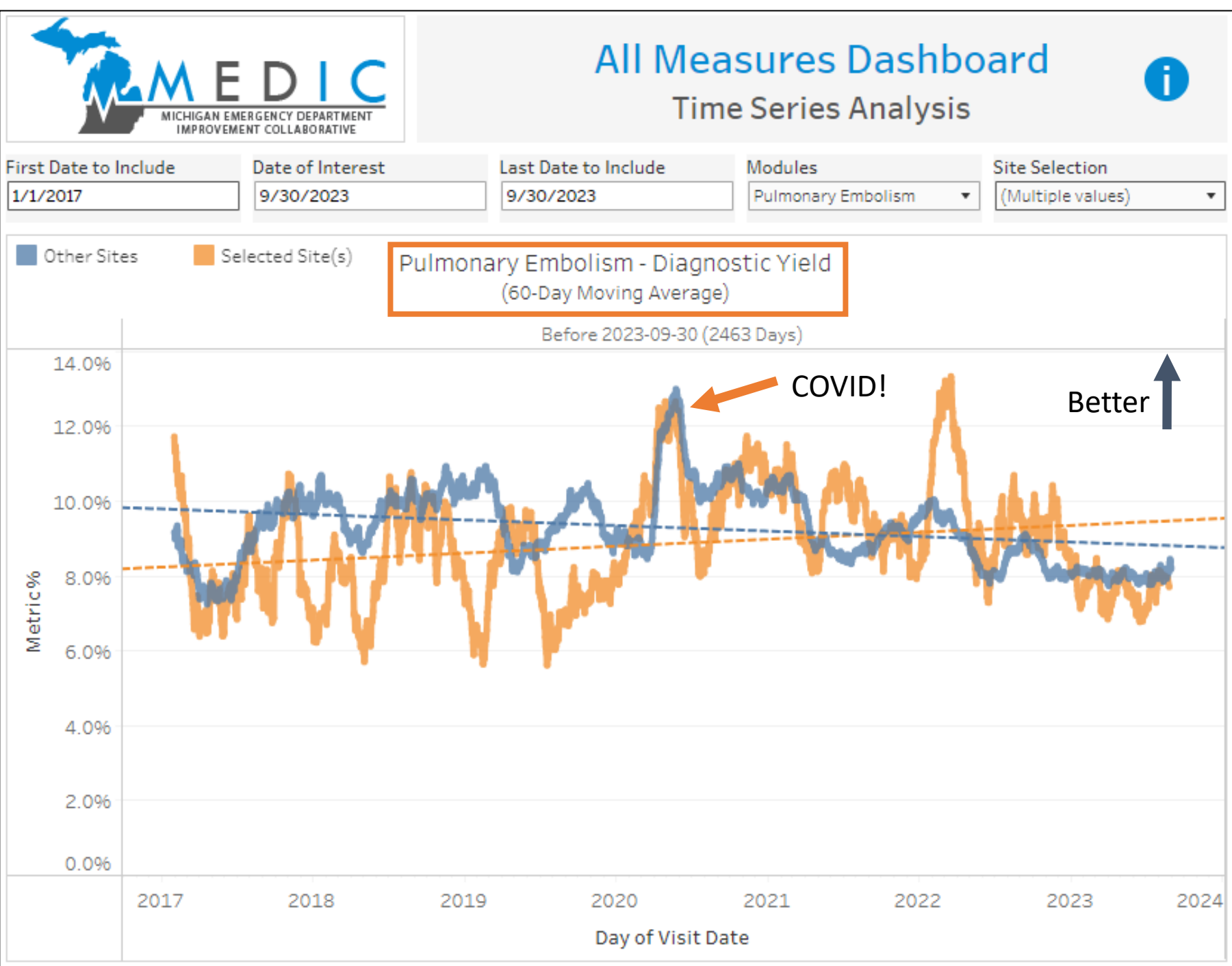
# Time Series



# Time Series



# Time Series



# Outlier Detection



## All Measures Dashboard

### Outlier Detection



Modules  
Pulmonary Embol..

P4P Year  
FY 2023

Selected Facility

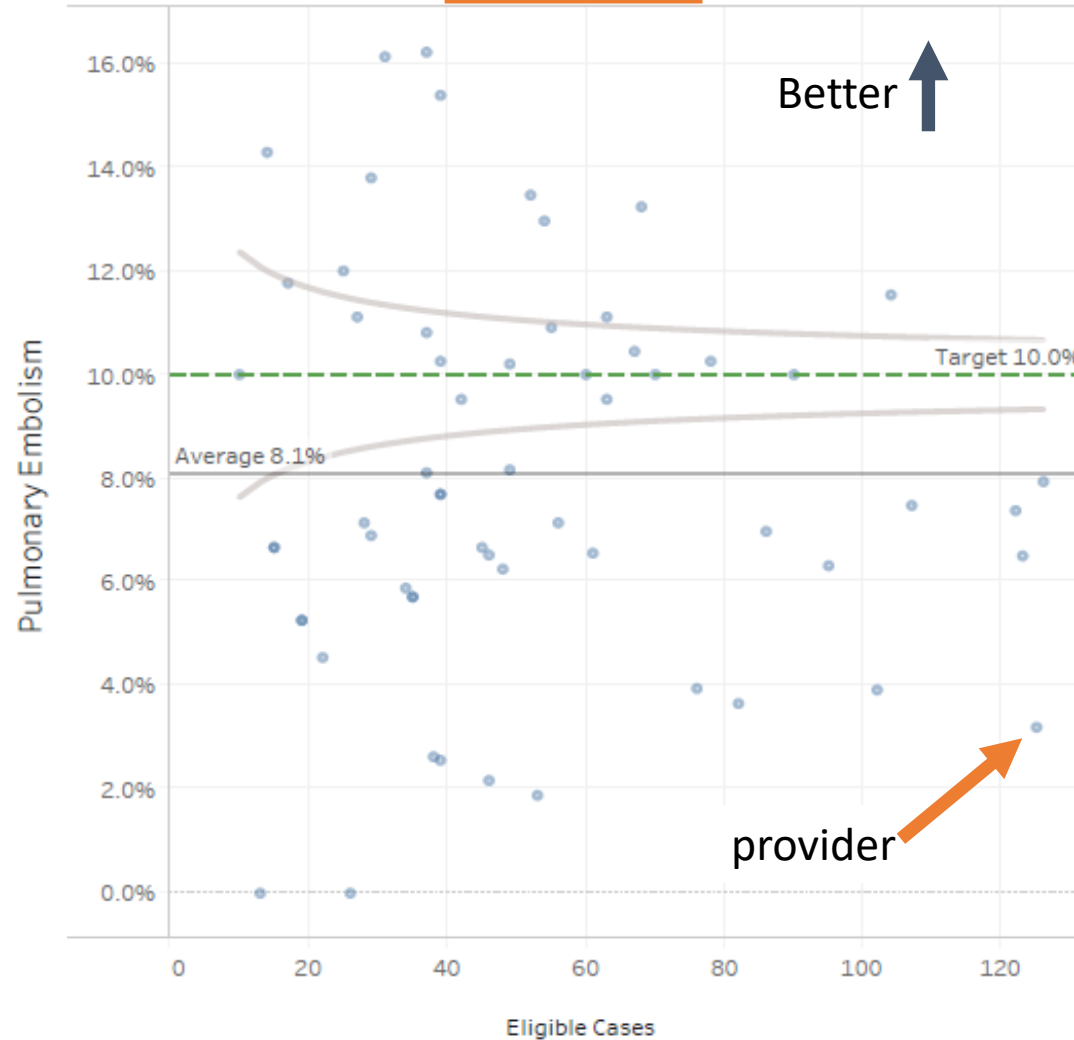
Selected Provider

Min/Max Cases  
10 to 2,000

Hide Provider  
True

Show Target  
True

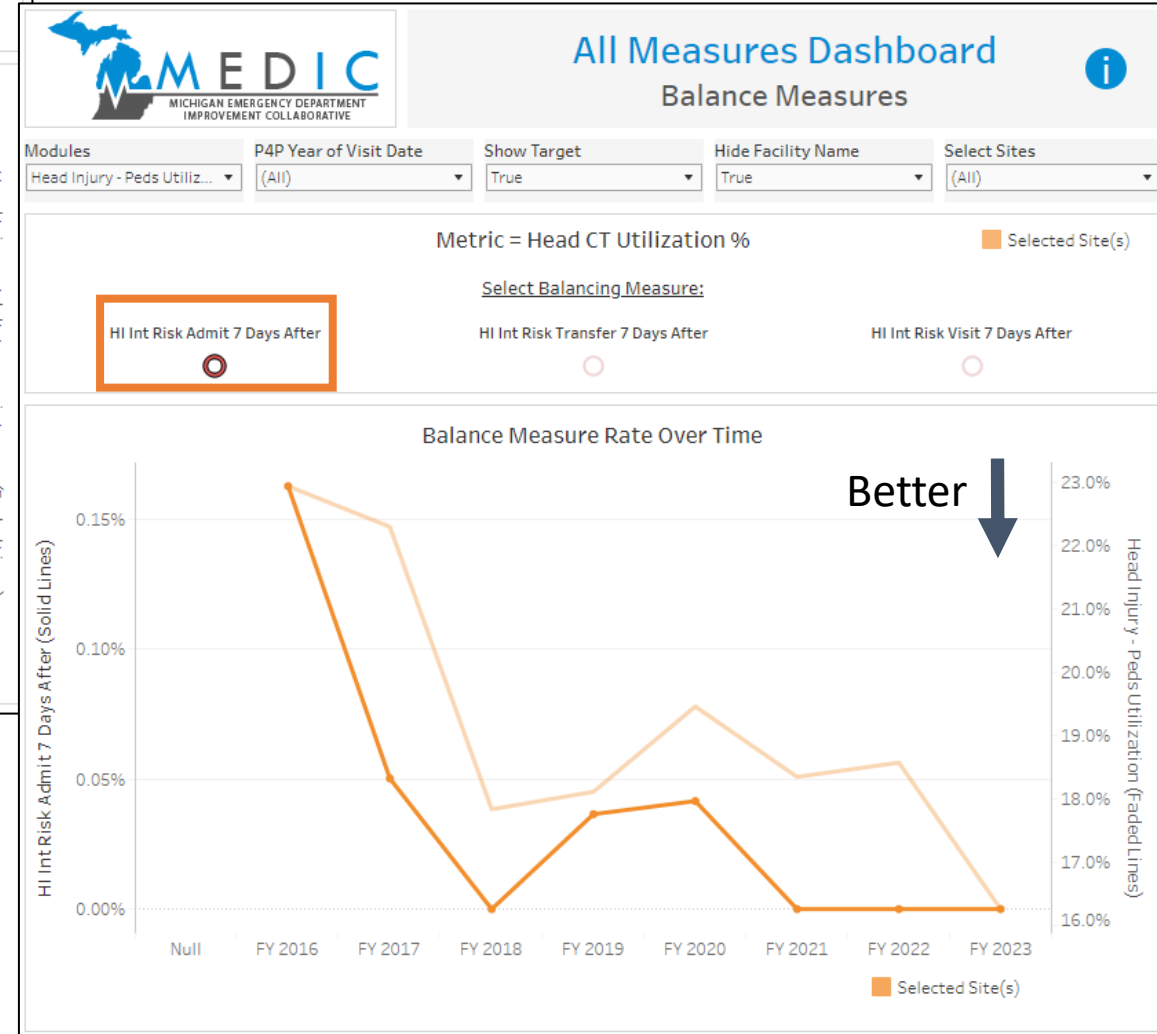
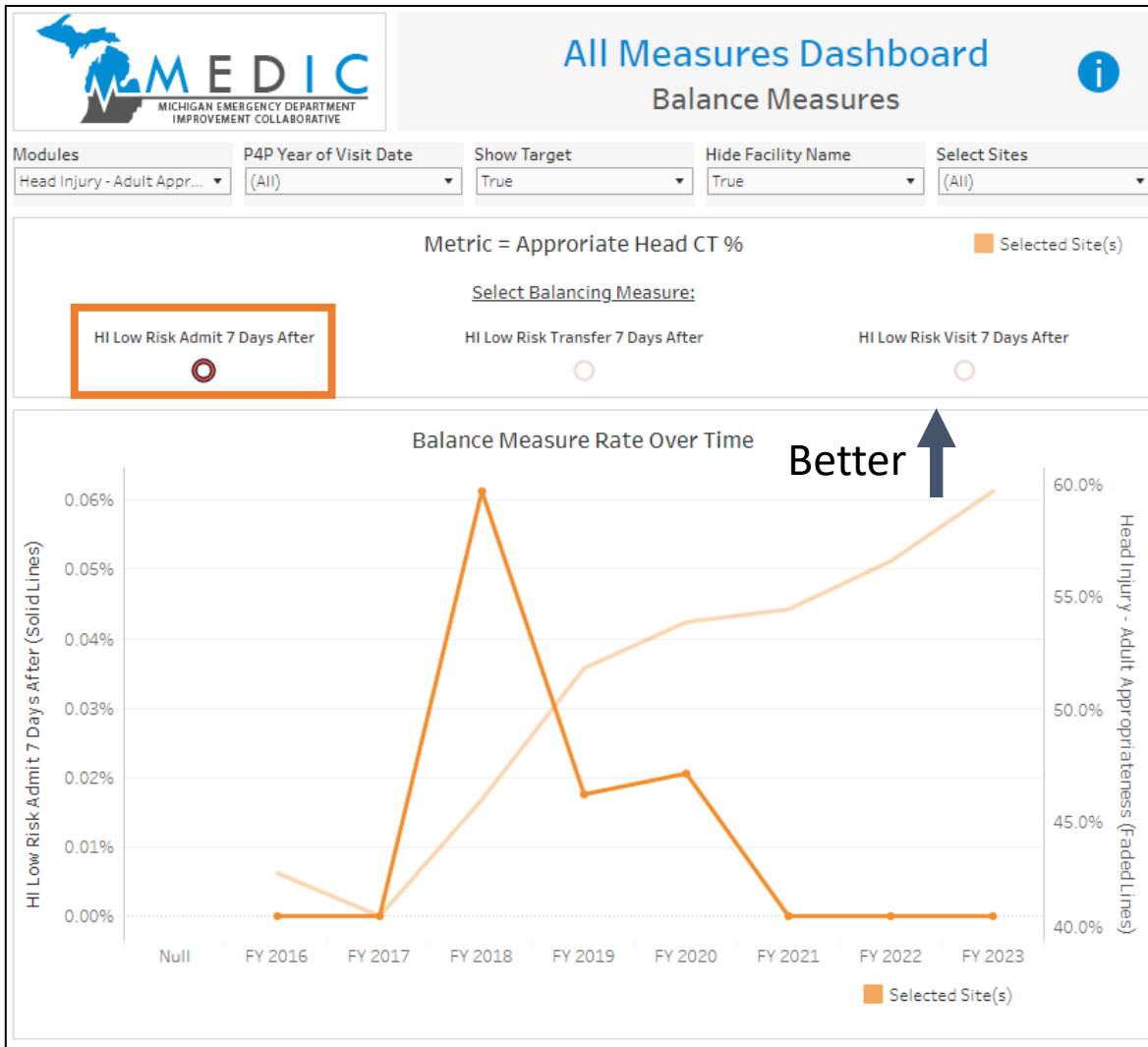
FY 2023 - Diagnostic Yield by # Cases



Provider Rank List

Other Provider	1	16.2%
Other Provider	2	16.1%
Other Provider	3	15.4%
Other Provider	4	14.3%
Other Provider	5	13.8%
Other Provider	6	13.5%
Other Provider	7	13.2%
Other Provider	8	13.0%
Other Provider	9	12.0%
Other Provider	10	11.8%
Other Provider	11	11.5%
Other Provider	12	11.1%
Other Provider	12	11.1%
Other Provider	14	10.9%
Other Provider	15	10.8%
Other Provider	16	10.4%
Other Provider	17	10.3%
Other Provider	17	10.3%
Other Provider	19	10.2%
Other Provider	20	10.0%
Other Provider	20	10.0%
Other Provider	20	10.0%
Other Provider	20	10.0%
Other Provider	24	9.5%
Other Provider	24	9.5%
Other Provider	26	8.2%
Other Provider	27	8.1%
Other Provider	28	7.9%
Other Provider	29	7.7%
Other Provider	29	7.7%
Other Provider	31	7.5%

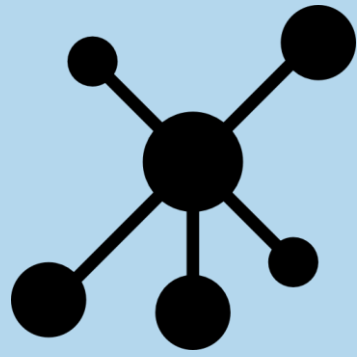
# Balancing Measures





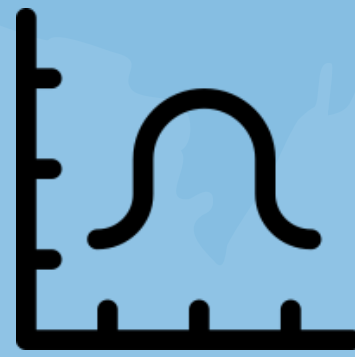
Orientation to ED

Part I



MEDIC overview

Part II



QI in ED imaging

Part III



Role for Radiology

Part IV





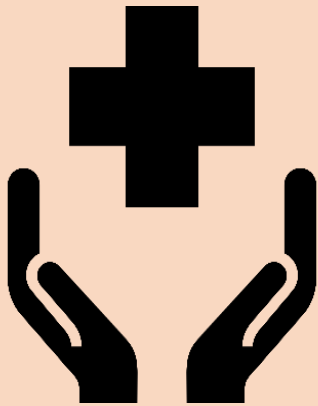
“If you can't describe what you are doing as a process, you don't know what you're doing.”

- W. Edwards Deming

# Quality Improvement Mindset & Principles

- ✓ *Approach humbly & with curiosity*
- ✓ Solicit stakeholder input & ownership
- ✓ Establish the urgency of the problem
- ✓ *Build a coalition*
- ✓ Invest in the relationships, time, and resources
- ✓ *Solutions are local*
- ✓ Go to the gemba
- ✓ Design with the end in mind
- ✓ Make the right thing the easier thing
- ✓ Learn and adapt
- ✓ Reinforce feedback loops
- ✓ Consider the intervention moment

# Barriers and Facilitators to Improvement in the ED



Knowledge Gap

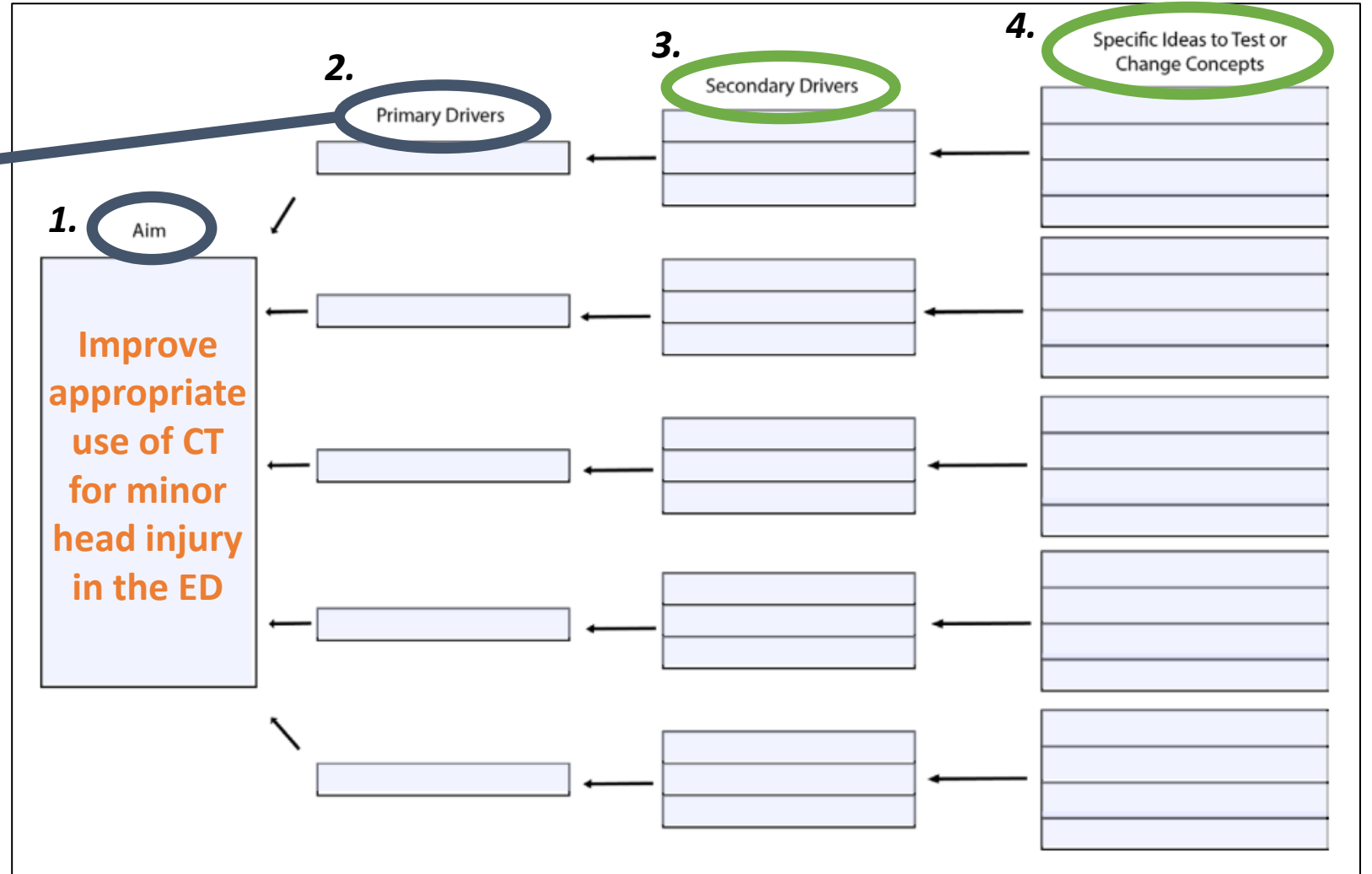
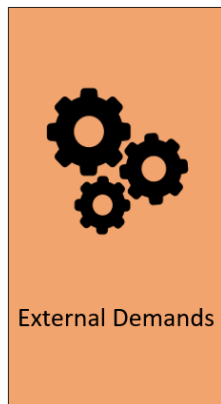
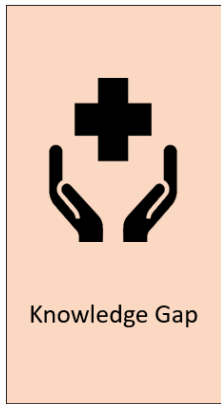


Priority Gap

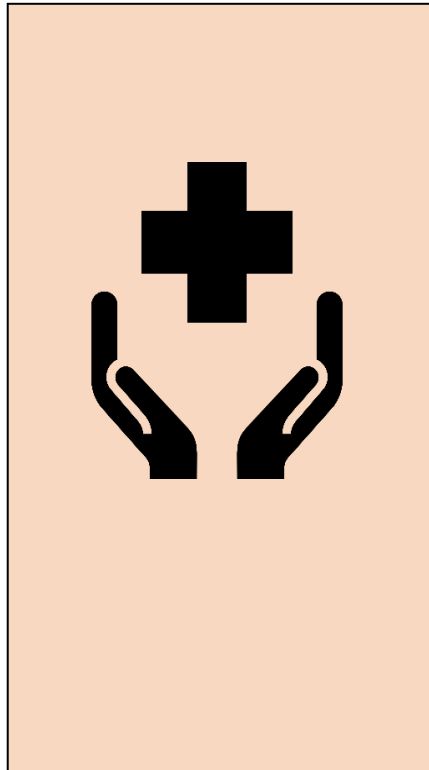


External Demands

# Driver Diagram



# Knowledge Gap



## Secondary drivers

- Awareness of evidence
- Trust in the evidence
- Application of evidence into every day practice

ED providers

## Change concepts

Grand rounds

Academic detailing

Clinical decision support

Radiology

# Priority Gap



Secondary drivers

- Not important to individual clinician
- Not aligned with institutional goals
- Quality agenda deprioritized

ED providers

Change concepts

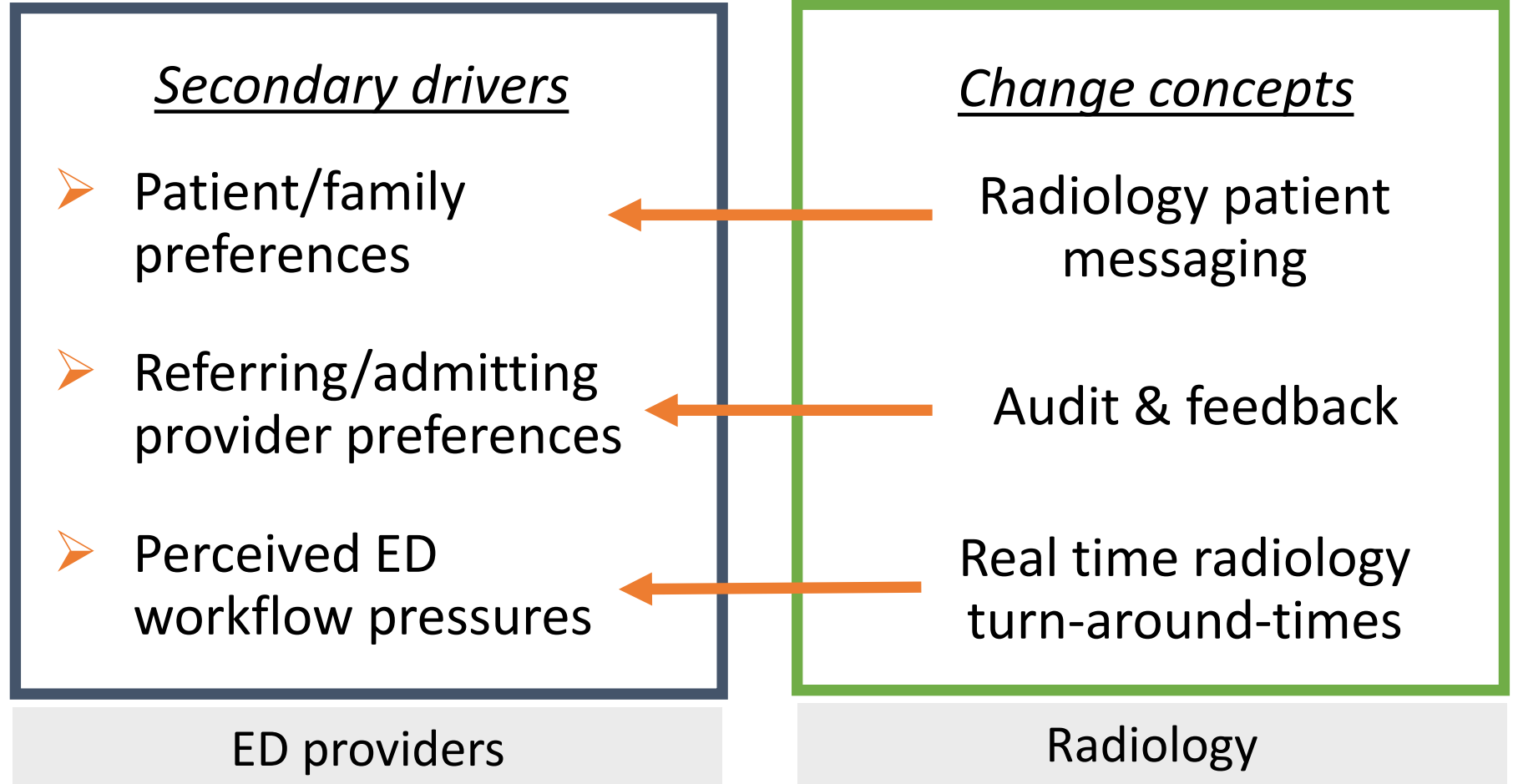
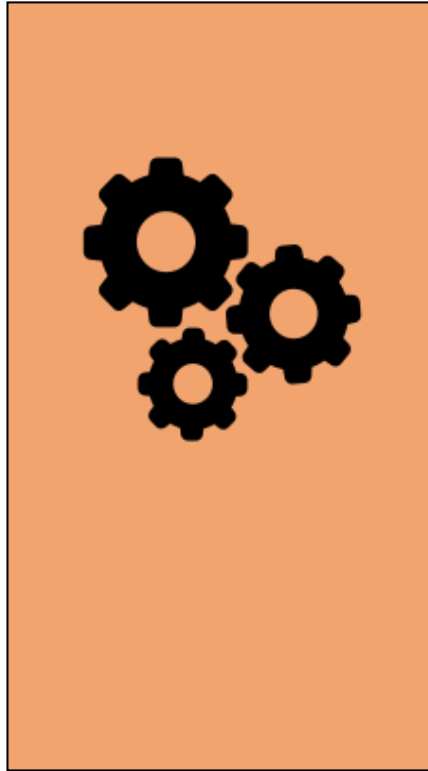
Grand rounds

Radiology leadership support

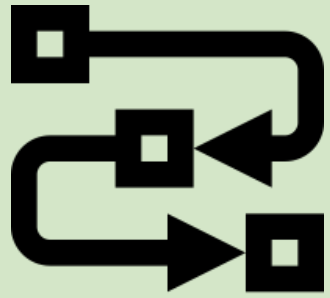
Radiology



# External Demands



# Summary Thoughts!



Radiology  
essential to  
ED care



Leverage the  
evidence



Build/join the  
coalition



Act locally



Always with  
humble  
inquiry



Orientation to ED  
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MEDIC overview  
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Knowledge Gap

Priority Gap

External Demands

Barriers and Facilitators to Improvement in the ED

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Summary thoughts

# Questions