

Report on a QI Project Eligible for MOC – ABMS Part IV and AAPA PI-CME

MEDIC CT Use for Minor Traumatic Pediatric Head Injury

Instructions

Determine eligibility. Before starting to complete this report, go to the Michigan Medicine MOC website [<http://www.med.umich.edu/moc-qi/index.html>], click on “Part IV Credit Designation,” and review sections 1 and 2. Complete and submit a “QI Project Preliminary Worksheet for Part IV Eligibility.” Staff from the Michigan Medicine Part IV MOC Program will review the worksheet with you to explain any adjustments needed to be eligible. (The approved Worksheet provides an outline to complete this report.)

Completing the report. The report documents completion of each phase of the QI project. (See section 3 of the website.) Final confirmation of Part IV MOC for a project occurs when the full report is submitted and approved.

An option for preliminary review (strongly recommended) is to complete a description of activities through the intervention phase and submit the partially completed report. (Complete at least items 1-20.) Staff from the Michigan Medicine Part IV MOC Program will provide a preliminary review, checking that the information is sufficiently clear, but not overly detailed. This simplifies completion and review of descriptions of remaining activities.

Questions are in bold font. Answers should be in regular font (generally immediately below or beside the questions). To check boxes, hover pointer over the box and click (usual “left” click).

For further information and to submit completed applications, contact either:

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Report Outline

Section	Items
A. Introduction	1-6. Current date, title, time frame, key individuals, participants, funding
B. Plan	7-10. Patient population, general goal, IOM quality dimensions, ACGME/ABMS competencies 11-13. Measures, baseline performance, specific aims 14-17. Baseline data review, underlying (root) causes, interventions, who will implement
C. Do	18. Intervention implementation date
D. Check	19-20. Post-intervention performance
E. Adjust – Replan	21-24. Post-intervention data review, underlying causes, adjustments, who will implement
F. Redo	25. Adjustment implementation date
G. Recheck	26-28. Post-adjustment performance, summary of individual performance
H. Readjust plan	29-32. Post-adjustment data review, underlying causes, further adjustments, who will implement
I. Reflections & plans	33-37. Barriers, lessons, best practices, spread, sustain
J. Participation for MOC	38-40. Participation in key activities, other options, other requirements
K. Sharing results	41. Plans for report, presentation, publication
L. Organization affiliation	42. Part of UMHS, AAVA, other affiliation with UMHS

QI Project Report for Part IV MOC Eligibility

A. Introduction

1. **Date** (*this version of the report*): October 8, 2018

2. **Title of QI effort/project** (*also insert at top of front page*):

Michigan Emergency Department Improvement Collaborative (MEDIC): CT Use for Minor Traumatic Pediatric Head Injury

3. **Time frame**

- a. **MOC participation beginning date – date that health care providers seeking MOC began participating in the documented QI project** (*e.g. date of general review of baseline data, item #14c*): June 9, 2017
- b. **MOC participation end date – date that health care providers seeking MOC completed participating in the documented QI project** (*e.g., date of general review of post-adjustment data, item #29c*): June 1, 2018

4. **Key individuals**

a. **QI project leader** [*also responsible for confirming individual's participation in the project*]

Name: Michele M. Nypaver, MD

Title: Professor, Dept. of Emergency Medicine (EM) & Pediatrics, Co-Director, Michigan Emergency Department Improvement Collaborative (MEDIC)

Organizational unit: Dept. of EM/ Division of Children's Emergency Services

Phone number: 734.763.9299 (Nypaver direct office)/ Admin: Heidi Zayan 734.763.9849

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Mailing address: CW 2-737 / 1540 E. Hospital Drive. SPC 4260/ Ann Arbor, MI 48109

b. **Clinical leader who oversees project leader regarding the project** [*responsible for overseeing/"sponsoring" the project within the specific clinical setting*]

Name & Title:

i) Prashant Mahajan MD, MPH, MBA, Dept of EM Vice Chair & Children's Emergency Services Division Chief

ii) Keith Kocher MD MPH MEDIC Director

Organizational unit: Michigan Medicine Dept. of EM

Phone number: Prashant Mahajan: 734.232-3729

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Mailing address: CW 2-737 / 1540 E. Hospital Drive. SPC 4260/ Ann Arbor, MI 48109

5. **Participants**

a. **Approximately how many physicians (by specialty/subspecialty and by training level) and physicians' assistants participated for MOC?**

Profession	Specialty/Subspecialty (<i>fill in</i>)	Number (<i>fill in</i>)
Practicing Physicians	Pediatrics/Pediatric EM	46
Fellows	Pediatric EM	6
Residents		0

Physicians' Assistants	(Not applicable)	0
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6. How was the QI effort funded? (Check all that apply.)

- Internal institutional funds (e.g., regular pay/work, specially allocated)
- Grant/gift from pharmaceutical or medical device manufacturer
- Grant/gift from other source (e.g., government, insurance company)
- Subscription payments by participants
- Other source (*describe*): The platform for the MEDIC program is funded by the BLUE CROSS BLUE SHIELD OF MICHIGAN (BCBSM) Value Partnerships Collaborative Quality Improvement (CQI) program.

The Multi-Specialty Part IV MOC Program requires that QI efforts include at least two linked cycles of data-guided improvement. Some projects may have only two cycles while others may have additional cycles – particularly those involving rapid cycle improvement. The items below provide some flexibility in describing project methods and activities. If the items do not allow you to reasonably describe the steps of your specific project, please contact the UMHS Part IV MOC Program Office.

B. Plan

7. Patient population. What patient population does this project address (e.g., age, medical condition, where seen/treated):

Children < 18 years visiting any of _6 (Cohort 1)___ emergency departments in the MEDIC collaborative network that qualify as a minor head injury eligible case per MEDIC pediatric head injury algorithm.

The MEDIC (Michigan Emergency Department Improvement Collaborative) collaborative includes both children's and general emergency departments, now representing~ 30% of all Michigan emergency visits. MEDIC creates a robust platform for cross disciplinary quality improvement activity. Built on a framework of clinical data sharing via the MEDIC registry, this collaborative allows for both clinician consensus building and performance measurement using detailed ED visit data collected supplemented by manual abstraction as compared to reports from administrative data analysis.

8. General purpose.

a. Problem with patient care (“gap” between desired state and current state)

(1) What should be occurring and why should it occur (benefits of doing this)?

Children meeting evidence-based selection criteria (PECARN *Pediatric Emergency Care Applied Research Network* clinical prediction rules) for low risk head injury (HI) rarely have clinically important brain injury and do not routinely require CT scanning in the emergency department. Rigorous validated clinical decision rules are now available to clinicians to facilitate emergency (EM) / pediatric emergency (PEM) physicians' imaging decision making in children with minor head injuries. Consistent use of these clinical decision rules would result in safer, more appropriate care and lower costs

(2) What is occurring now and why is this a concern (costs/harms)?

Despite the availability of clinical decision rules, there is evidence of continued overuse of CT scanning in children visiting EDs with minor traumatic brain injury (mTBI) in the United States, particularly in general EDs where 85% of pediatric ED visits occur. Overuse of CT scanning in

children visiting EDs with minor traumatic brain injury exposes children to unnecessary, dangerous radiation with potential for long term increased risk of cancer in humans; this risk is increased especially in young children, and in those with repeated radiation from a lifetime of potential additional CT scanning. CT scanning also induces unnecessary healthcare costs and adds supplemental risk in those children requiring sedation medications to complete the CT scan.

b. Project goal. What general outcome regarding the problem should result from this project?
(State general goal here. Specific aims/performance targets are addressed in #13.)

The goal of this project is to improve appropriate head CT utilization in children visiting MEDIC EDs for minor traumatic brain injury, decreasing overall CT use in the PECARN LOW RISK and PECARN INTERMEDIATE RISK patient cohorts.

We plan to:

- 1) collaborate with a network of general EM & pediatric EM physicians to discuss evidence, derive consensus and share best practice interventions for CT mTBI utilization and
- 2) share de identified practice data to inform individual physicians, institutions and the MEDIC collaborative site level CT utilization data from the MEDIC registry to reduce unnecessary CT use in children < 18 years visiting all types of emergency departments with mTBI.

9. Which Institute of Medicine Quality Dimensions are addressed? [Check all that apply.]
(<http://www.nationalacademies.org/hmd/~media/Files/Report%20Files/2001/Crossing-the-Quality-Chasm/Quality%20Chasm%202001%20%20report%20brief.pdf>)

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Effectiveness | <input type="checkbox"/> Equity | <input checked="" type="checkbox"/> Safety |
| <input type="checkbox"/> Efficiency | <input checked="" type="checkbox"/> Patient-Centeredness | <input type="checkbox"/> Timeliness |

10. Which ACGME/ABMS core competencies are addressed? (Check all that apply.)
(<http://www.abms.org/board-certification/a-trusted-credential/based-on-core-competencies/>)

- | | |
|---|---|
| <input checked="" type="checkbox"/> Patient Care and Procedural Skills | <input checked="" type="checkbox"/> Medical Knowledge |
| <input checked="" type="checkbox"/> Practice-Based Learning and Improvement | <input type="checkbox"/> Interpersonal and Communication Skills |
| <input type="checkbox"/> Professionalism | <input type="checkbox"/> Systems-Based Practice |

11. Describe the measure(s) of performance: (QI efforts must have at least one measure that is tracked across the two cycles for the three measurement periods: baseline, post-intervention, and post-adjustment. If more than two measures are tracked, copy and paste the section for a measure and describe the additional measures.)

Measure 1

- **Name of measure** (e.g., Percent of . . . , Mean of . . . , Frequency of . . .):
Rate (%) of children at **LOW Risk** for TBI who received CT imaging

- **Measure components** – describe the:

Denominator (e.g., for percent, often the number of patients eligible for the measure):
Number of eligible children < 18 years meeting PECARN criteria for **LOW Risk** for TBI

Numerator (e.g., for percent, often the number of those in the denominator who also meet the performance expectation):
Number of these children who received CT imaging

- **The source of the measure is:**

- An external organization/agency, which is (*name the source*):

- Internal to our organization and it was chosen because (*describe rationale*):

This measure was translated from published medical evidence reporting a clinical prediction rule for pediatric minor traumatic brain injury in children < 2 years and those 2-17 years. These rules were validated across a large sample of children visiting a network of US Children's Hospitals. The clinical decision rule was subsequently validated in follow up studies from the Pediatric Emergency Care Applied Research Network (PECARN) as well as other settings. The sentinel article was authored by Kuppermann, N et al. Lancet 2010.

- **This is a measure of:**

- Process – activities of delivering health care to patients

- Outcome – health state of a patient resulting from health care

Measure 2

- **Name of measure** (*e.g., Percent of . . . , Mean of . . . , Frequency of . . .*):

Rate (%) of eligible children at **INTERMEDIATE Risk** for TBI receiving CT imaging

- **Measure components** – *describe the:*

Denominator (*e.g., for percent, often the number of patients eligible for the measure*):

Number of eligible children < 18 years meeting PECARN criteria for **INTERMEDIATE Risk** for TBI

Numerator (*e.g., for percent, often the number of those in the denominator who also meet the performance expectation*):

Number of these children who received CT imaging

- **The source of the measure is:**

- An external organization/agency, which is (*name the source*):

- Internal to our organization and it was chosen because (*describe rationale*):

This measure was translated from published medical evidence reporting a clinical prediction rule for pediatric minor traumatic brain injury in children < 2 years and those 2-17 years. These rules were validated across a large sample of children visiting a network of US Children's Hospitals. The clinical decision rule was subsequently validated in follow up studies from the Pediatric Emergency Care Applied Research Network (PECARN) as well as other settings. The sentinel article was authored by Kuppermann, N et al. Lancet 2010.

- **This is a measure of:**

- Process – activities of delivering health care to patients

- Outcome – health state of a patient resulting from health care

(If more than two measures are tracked across the two cycles, copy and paste the section for a measure and describe the additional measures.)

12. Baseline performance

a. **What were the beginning and end dates for the time period for baseline data on the measure(s)?** June 1, 2016 – May 31, 2017

b. **What was (were) the performance level(s) at baseline?** *Display in a data table, bar graph, or run chart (line graph). Can show baseline data only here or refer to a display of data for all time periods attached at end of report. Show baseline time period, measure names, number of observations for each measure, and performance level for each measure.*

SEE ATTACHMENT 1: Baseline Performance SPC Charts.

Summary

Measures	Baseline Period 6/1/16– 5/31/17
Low risk with CT imaging	
N	65/522
%	12%
Intermediate risk with CT imaging	
N	352/1650
%	21%

13. Specific performance aim(s)/objective(s)

- a. **What is the specific aim of the QI effort?** *“The Aim Statement should include: (1) a specific and measurable improvement goal, (2) a specific target population, and (3) a specific target date/time period. For example: We will [improve, increase, decrease] the [number, amount percent of [the process/outcome] from [baseline measure] to [goal measure] by [date].”*

MEDIC will demonstrate a Collaborative wide decrease in pediatric (< 18 years) HI head CT use:

- i) In LOW RISK children decrease average head CT use from a baseline of 12% to ≤ 6% by June 1, 2018.
- ii) In INTERMEDIATE RISK children decrease average head CT use from a baseline of 21% to ≤ 19% by June 1, 2018.

b. How were the performance targets determined, e.g., regional or national benchmarks?

Performance targets were derived by consensus among MEDIC members and the MEDIC coordinating center informed by medical evidence (i.e., achievable targets).

14. Baseline data review and planning. Who was involved in reviewing the baseline data, identifying underlying (root) causes of problem(s) resulting in these data, and considering possible interventions (“countermeasures”) to address the causes? (Briefly describe the following.)

- a. **Who was involved?** Support documents for Q14a-c see ATTACHMENT 2 & 3. Initially, MEDIC leadership, clinical champions and MEDIC abstractors from each member institution. Subsequently the institution’s ED physicians. Clinical champions engaged the physicians at their respective sites.
- b. **How?** (e.g., in a meeting of clinic staff) MEDIC leadership, clinical champions, and MEDIC abstractors attend MEDIC Collaborative Wide (CW) meetings. Clinical champions then held meetings with their institution’s ED physicians.
- c. **When?** (e.g., date(s) when baseline data were reviewed and discussed) Baseline data were given in hard copy and were discussed with clinical champions at the June 9, 2017 MEDIC collaborative wide meeting (Blue Cross Blue Shield of Michigan Lyon Meadows Conference Center, South Lyon MI). Clinical champions subsequently disseminated this information to/with their institution’s ED physicians by July 30th, 2017.

Use the following table to outline the plan that was developed: #15 the primary causes, #16 the intervention(s) that addressed each cause, and #17 who carried out each intervention. This is a simplified presentation of the logic diagram for structured problem solving explained at <http://ocpd.med.umich.edu/moc/process-having-part-iv-credit-designation> in section 2a. As background, some summary examples of common causes and interventions to address them are:

Common Causes	Common Relevant Interventions
<i>Individuals: Are not aware of, don't understand.</i>	<i>Education about evidence and importance of goal.</i>
<i>Individuals: Believe performance is OK.</i>	<i>Feedback of performance data.</i>
<i>Individuals: Cannot remember.</i>	<i>Checklists, reminders.</i>
<i>Team: Individuals vary in how work is done.</i>	<i>Develop standard work processes.</i>
<i>Workload: Not enough time.</i>	<i>Reallocate roles and work, review work priorities.</i>
<i>Suppliers: Problems with provided information/materials.</i>	<i>Work with suppliers to address problems there.</i>

15. What were the primary underlying/root causes for the problem(s) at baseline that the project can address?	16. What intervention(s) addressed this cause? (Summary of MEDIC Interventions)	17. Who was involved in carrying out each intervention? (List the professions/roles involved.)
Providers not aware of PECARN decision rules	MEDIC clinical champions use physician meetings to introduce and discuss this MEDIC QI measure, review evidence.	Local QI team of clinical champion, abstractor, QI personnel & IT personnel + local providers
Providers can't remember PECARN decision rules at time of patient eval/CT ordering	Electronic health record physician order sets, embedded PECARN rules to/with radiology ordering. Accessibility for providers to Internet link to MDCALC (online risk calculator for PCARN head injury) Local signs/placards for PECARN rules in work environment Low tech "cheat" cards for individual provider use	Local QI team of clinical champion, abstractor, QI personnel & IT personnel + local providers
Providers have limited/no ability to self-monitor CT utilization - cannot know/see current practice pattern	MEDIC regular distribution of collaborative & institutional data in hard copy at collaborative wide meetings and encourage login/self-monitoring (all providers) through the MEDICQI.org website, available 24/7 to all providers at all member institutions. MEDIC Clinical champions have admin rights to view and distribute their institutional & provider level performance for periodic review on demand. Some MEDIC Clinical Champions have integrated MEDIC performance review at regular group or individual events (Example at	Local QI team of clinical champion, abstractor, QI personnel & IT personnel + local providers

	morbidity and mortality conferences or at regular faculty reviews)	
Patient/parent pressures to perform CT because they are not aware of benefits and harms of additional diagnostic examinations ~ no patient information to support MD correct actions (patient education)	MEDIC sites developed patient/parent informational tools to post in patient rooms	Local QI team of clinical champion, abstractor, QI personnel & IT personnel, nurse educators

Note: If additional causes were identified that are to be addressed, insert additional rows.

Each site’s QI team, including at minimum the local clinical EM/PEM champion, their respective abstractor(s), local physician faculty and other disciplines/units (e.g. information technology staff, radiology) planned, designed and implemented interventions tailored to their specific emergency department. The timing and operational implementation of these interventions then occurred as directed by the local clinical champions and their team. Some sites chose several interventions while others chose just one (meeting our MEDIC CW requirement for at least one intervention/site).

C. Do

18. By what date was (were) the intervention(s) initiated? (If multiple interventions, date by when all were initiated.)

Each site’s clinical champion and QI team directed the timing of each intervention. All sites began implementing interventions by fall 2017 (August through December 2017). Sites directed the timeline for deployment of their site’s interventions (local control). All sites deployed at least one intervention by early December 2017.

D. Check

19. Post-intervention performance measurement. Are the population and measures the same as those for the collection of baseline data (see items 10 and 11)?

Yes No – If no, describe how the population or measures differ:

20. Post-intervention performance

a. What were the beginning and end dates for the time period for post-intervention data on the measure(s)?

a. Beginning: August 1, 2017 – January 31, 2018. Report out occurred at the Feb 2, 2018 CW meeting.

Because MEDIC goal is to work as a team on performance, data were collected from the point of the earliest intervention implementation to the last date before report out. We realize that this will underrepresent the impact of interventions because some sites did not implement an intervention until early December. (The full impact would be evident in the Dec 2017 and Jan 2018 data.

b. What was (were) the overall performance level(s) post-intervention? Add post-intervention data to the data table, bar graph, or run chart (line graph) that displays baseline data. Can show baseline and post-intervention data incrementally here or refer to a display of data for all time periods attached at end of report. Show baseline and post-intervention time periods and measure names and for each time period and measure show number of observations and performance level.

See attachment 1.

Summary

Measures	Baseline Period	Post-Intervention
	6/1/16– 5/31/17	Period 8/1/2017 – 1/31/18
Low risk with CT imaging		
N	65/522	22/314
%	12%	7%
Intermediate risk with CT imaging		
N	352/1650	438/1925
%	21%	23%

b. Did the intervention(s) produce the expected improvement toward meeting the project’s specific aim (item 13.a)?

Goals for each measure were not met yet in the first cycle. For Low risk CT use, imaging rates dropped to near goal. For intermediate risk children, rates actually increased slightly. (Since interventions were not in place at all sites until early December, the results from Aug-Nov may underrepresent the effects of the interventions.)

E. Adjust – Replan

21. Post-intervention data review and further planning. Who was involved in reviewing the post-intervention data, identifying underlying (root) causes of problem(s) resulting in these new data, and considering possible interventions (“countermeasures”) to address the causes? (Briefly describe the following.)

a. Who was involved? (e.g., by profession or role)

Same as #14? Different than #14 (describe):

b. How? (e.g., in a meeting of clinic staff)

Same as #14? Different than #14 (describe):

c. When? (e.g., date(s) when post-intervention data were reviewed and discussed)

Post intervention data were reviewed and discussed again at the Feb 2, 2018 collaborative wide meeting. Again these data were given in hard copy SPC charts for individual site performance as well as CW measurement on the two HI measures. MEDIC clinical champions then disseminated this work to their respective institutions and made adjustments (Feb 2, 2018 – Feb 29, 2018).

Use the following table to outline the next plan that was developed: #22 the primary causes, #23 the adjustments(s)/second intervention(s) that addressed each cause, and #24 who carried out each intervention. This is a simplified presentation of the logic diagram for structured problem solving explained at <http://ocpd.med.umich.edu/moc/process-having-part-iv-credit-designation> in section 2a.

Note: Initial intervention(s) occasionally result in performance achieving the targeted specific aims and the review of post-intervention data identifies no further causes that are feasible or cost/effective to address. If so, the plan for the second cycle should be to continue the interventions initiated in the first cycle and check that performance level(s) are stable and sustained through the next observation period.

22. What were the primary underlying/root causes for the <u>problem(s)</u> following the <u>intervention(s)</u> that the project can address?	23. What adjustments/second intervention(s) addressed this cause? (Summary of adjustments)	24. Who was involved in carrying out each adjustment/second intervention? (List the professions/roles involved.)
Providers don't have easy access to PECARN decision rules at time of patient eval/CT ordering	Revisions / modifications to order sets, electronic record medical decision making supplements, reminder "cheat" cards. Refining order sets/electronic health record modifications.	Local site QI teams (clinical champion, abstractors, quality leads, education leads) + local providers
Providers still have limited ability to see and self-monitor CT utilization	Integration of this MEDIC QI measure into members' institutional quality tracking (including regular individual clinician annual reviews, departmental & individual clinician performance reviews with added reimbursement ramifications, unblinding MEDIC data at institutional group meetings and reminding providers how / to access their own data on the MEDIC platform)	Clinical champions, local quality teams, departmental leadership.+ local providers
Patient/Parent pressures to perform CT persist	Refining where/how to post, make available patient information on head injury guidelines for CT.	Clinical champions, abstractors, local nursing staff & quality leads.

Note: If additional causes were identified that are to be addressed, insert additional rows.

F. Redo

25. By what date was (were) the adjustment(s)/second intervention(s) initiated? (If multiple interventions, date by when all were initiated.)
By March 1, 2018.

G. Recheck

26. Post-adjustment performance measurement. Are the population and measures the same as indicated for the collection of post-intervention data (item #21)?

Yes No – If no, describe how the population or measures differ:

27. Post-adjustment performance

a. What were the beginning and end dates for the time period for post-adjustment data on the measure(s)? March 1, 2018 – May 31, 2018

b. What was (were) the overall performance level(s) post-adjustment? Add post-adjustment data to the data table, bar graph, or run chart (line graph) that displays baseline and post-intervention

data. Can show here or refer to a display of data for all time periods attached at end of report. Show time periods and measure names and for each time period and measure show the number of observations and performance level.

See Attachment 3.

Measures	Baseline Period 6/1/1– 5/31/17	Post-Intervention Period 8/1/2017 – 1/31/18	Post-Adjustment Period 3/1/18 – 5/31/18
Low risk with CT imaging			
N	65/522	23/314	7/108
%	12%	7%	6%
Intermediate risk with CT imaging			
N	352/1650	438/1925	62/430
%	21%	21%	14%

c. Did the adjustment(s) produce the expected improvement toward meeting the project's specific aim (item 13.a)?

For Low risk CT use, imaging rates continued to drop and essentially reached goal (6.4% actual vs. 6% goal). For intermediate risk children, performance was reduced even lower than goal (14% actual vs. 19% goal).

28. [Item no longer required.]

H. Readjust

29. Post-adjustment data review and further planning. Who was involved in reviewing the post-adjustment data, identifying underlying (root) causes of problem(s) resulting in these new data, and considering possible interventions ("countermeasures") to address the causes? (Briefly describe the following.)

a. Who was involved? (e.g., by profession or role)

Same as #21? Different than #21 (describe):

b. How? (e.g., in a meeting of clinic staff)

Same as #21? Different than #21 (describe):

c. When? (e.g., date(s) when post-adjustment data were reviewed and discussed)

June 1, 2018 (BCBSM Lyons Meadow Conference Center ~ MEDIC collaborative wide meeting). Dissemination of information from clinical champions to their respective institutions June 1, 2018-June 30, 2018).

Use the following table to outline the next plan that was developed: #30 the primary causes, #31 the adjustments(s)/second intervention(s) that addressed each cause, and #32 who would carry out each intervention. This is a simplified presentation of the logic diagram for structured problem solving explained at <http://ocpd.med.umich.edu/moc/process-having-part-iv-credit-designation> in section 2a.

Note: Adjustments(s) may result in performance achieving the targeted specific aims and the review of post-adjustment data identifies no further causes that are feasible or cost/effective to address. If so, the plan for a next cycle could be to continue the

interventions/adjustments currently implemented and check that performance level(s) are stable and sustained through the next observation period.

30. What were the primary underlying/root causes for the <u>problem(s)</u> following the <u>adjustment(s)</u> that the project can address?	31. What further adjustments/ intervention(s) might address this cause?	32. Who would be involved in carrying out each further adjustment/intervention? <i>(List the professions/roles involved.)</i>
Providers still don't have access to PECARN decision rules at time of patient eval/CT ordering	Revisions / modifications to order sets, electronic record medical decision making supplements, reminder "cheat" cards. Refining order sets/electronic health record modifications.	Local site QI teams (clinical champion, abstractors, quality leads, education leads)
Providers still have limited/no ability to self-monitor CT utilization (cannot know/see current practice pattern)	Integration of this MEDIC QI measure into members' institutional quality tracking (including regular individual clinician annual reviews, departmental & individual clinician performance reviews with added reimbursement ramifications, unblinding MEDIC data at institutional group meetings and reminding providers how / to access their own data on the MEDIC platform)	Clinical champions, local quality teams, departmental leadership.
Patient/Parent pressures to perform CT persist - but no easy way to make patient information available	Refining where/how to post, make available patient information on head injury guidelines for CT.	Clinical champions, abstractors, local nursing staff & quality leads.

Note: If additional causes were identified that are to be addressed, insert additional rows.

33. Are additional PDCA cycles to occur for this specific performance effort?

- No further cycles will occur.
- Further cycles will occur, but will not be documented for MOC. *If checked, summarize plans:*
- Further cycles will occur and are to be documented for MOC. *If checked, contact the UM Part IV MOC Program to determine how the project's additional cycles can be documented most practically.*

I. Reflections and Future Actions

34. Describe any barriers to change (i.e. problems in implementing interventions listed in #16 and #23) that were encountered during this QI effort and how they were addressed.

- MEDIC chose to work as a team to establish a common QI platform of education while implementing our CT scan for HI measures. While this served us well, we did not fully control the local QI resources at each member site and clinical champions were allowed to direct intervention planning at their discretion.
- Some interventions were deployed later than we had hoped.
- We also discovered some QI resource personnel were being re assigned in some institutions to other jobs/roles within the same institution during the intervention work (e.g. the local QI teams underwent personnel changes which may have led to delays in planning/implementation).
- Some sites experienced changes in their local electronic health record platform limiting their ability to activate intended interventions such as best practice alerts or embed order sets/information regarding CT scanning (“freezes” due to implementation or updates of electronic health records)
- Difficulties with costs associated with developing educational materials for physicians. Teams noted that there is typically no budget for physician quality educational materials at the department/division level.
- It is too early to track best practices for performance improvement in the current MEDIC structure due to trade-offs between allowing local control on interventions and timing with extracting the best interventions related to changes seen.

35. Describe any key lessons that were learned as a result of the QI effort.

- ED physician engagement and team building within MEDIC are key to implementing change at the sites.
- QI measurement “buy in” by site clinical champions requires thorough review of literature and time is necessary with clinical champions for consensus building.
- At the coordinating center level, time and resources are needed to carefully translate evidence to data measurement (including validation) that then must be reviewed & understood by individual clinical champions and MEDIC as a whole.
- ED physicians feel best practice is important and want to do their best, however they do not always have their own data to insure they are practicing according to the best evidence at the time of service. The MEDIC data registry platform allows 24 hr. access to individual, site and collaborative network performance. Convincing clinical champions and local providers to access the MEDIC registry for self-monitoring is a high priority. Clinical champions prefer to be given reports (email and/or hardcopy) but this is changing quickly and more clinical champions are not only reviewing the platform but using the data to inform or align with reporting with their internal data monitoring / physician compliance systems and drive their internal QI work.
- Optimizing “at the elbow” education for our QI measures (or any others) using interventions integrated with electronic health records is preferred by clinical champions because it is typically available to the clinician at the point of decision making & order entry.
- Local QI work of importance to providers must also be balanced with institutional QI priorities. Networking with our clinical champions at collaborative wide meetings and allowing them to present in panel format to their peers on their journey is extremely valuable. Other clinical champions learn and want to talk further about their own similar interventions and/or how to integrate good work done by peer institutions into their own and taking advanced steps to integrate this performance platform into overall QI missions of EM departments (and several have already moved to embrace the MEDIC QI measures into departmental platforms for peer review, physician performance measurement etc.). This is a measure of MEDIC’s success in terms of trust and engagement.
- Financial incentives / penalties tied to performance are drawing interest from clinical champions and their administrators. It is still too early to fully measure & understand the impact of these variables on overall improvement however we will have more information/lessons learned to share after a full cycle of understanding/experience with these rewards in the future.

36. Describe any best practices that came out of the QI effort.

- Some sites with more significant variation in practice have reached out to external physicians who refer patients to their ED in order to move consensus beyond the walls of the ED. Now when children are seen by / or directed to their local ED, these primary care doctors also understand the indications for/against neuroimaging in children with head injury that the ED will now apply to their patients.
- Sites that were able to incorporate clinician educational support during order entry (e.g. order set development) were able to engage ordering EM/PEM physicians “just in time” for clinical care decision making.
- Annual performance in MEDIC-QI measures, including HI is attached to financial rewards through a point system & value based reimbursement system. Improved performance and meeting improvement targets is attached to higher financial reward. As the MEDIC financial performance index is measured from Jan – Jan, we have only the second half of this QI cycle to assess the impact of financial incentives on our CW performance; we hope with continued PDSA cycles on CT for HI to assess further financial impact.

37. Describe any plans for spreading improvements, best practices, and key lessons.

- MEDIC routinely incorporates / requests clinical champions to discuss their improvement journey through panel discussions at each of our collaborative wide meetings where champions describe their QI activities surrounding the MEDIC measures and network with peers. In this way, members of MEDIC interact with their peers to discuss the challenges and/or wins in the daily work on this project, as well as seek answers. These have been received very positively and sites have reached out to one another to share interventions including order sets and operational planning to improve with the best performing sites. Some sites have already adopted work done by peer institutions.
- MEDIC plans to host on its website a collection of interventions implemented by sites (sharing with other MEDIC members with their permission).
- MEDIC actively shares through scholarship lessons learned through this collaborative via EM & PEM society meetings/abstracts and manuscripts, also to be posted on our website. Abstracts have been accepted for both verbal and poster presentation. A manuscript of this work will be submitted in October 2018.

38. Describe any plans for sustaining the changes that were made.

- MEDIC will continue to actively measure, share and incentivize CT for HI quality work through 2018 until re assessment in June 2019; CT for HI will remain part of our financial performance index.
- MEDIC plans to continue to offer reporting platform on the HI QI measure and will plan for periodic assessment of CT for HI performance if this QI measure must sunset to accommodate future QI work within the collaborative.

J. Minimum Participation for MOC

39. Participating directly in providing patient care.

a. Did any individuals seeking MOC participate directly in providing care to the patient population?

Yes No *If “No,” go to item #39.*

b. Did these individuals participate in the following five key activities over the two cycles of data-guided improvement?

- Reviewing and interpreting baseline data, considering underlying causes, and planning intervention as described in item #14.
- Implementing interventions described in item #16.
- Reviewing and interpreting post-intervention data, considering underlying causes, and planning intervention as described in item #21.
- Implementing adjustments/second interventions described in item #23.

- Reviewing and interpreting post-adjustment data, considering underlying causes, and planning intervention as described in item #29.

Yes No *If “Yes,” individuals are eligible for MOC unless other requirements also apply and must be met – see item # 40.*

40. Not participating directly in providing patient care.

- a. Did any individuals seeking MOC not participate directly in providing care to the patient population?

Yes No *If “No,” go to item 40.*

- b. Were the individual(s) involved in the conceptualization, design, implementation, and assessment/evaluation of the cycles of improvement? (E.g., a supervisor or consultant who is involved in all phases, but does not provide direct care to the patient population.)

Yes No *If “Yes,” individuals are eligible for MOC unless other requirements also apply and must be met – see item # 40. If “No,” continue to #39c.*

- c. Did the individual(s) supervising residents or fellows throughout their performing the entire QI effort?

Yes No *If “Yes,” individuals are eligible for MOC unless other requirements also apply and must be met – see item # 40.*

41. Did this specific QI effort have any additional participation requirement for MOC? (E.g., participants required to collect data regarding their patients.)

Yes No *If “Yes,” describe:*

Individuals who want their participation documented for MOC must additionally complete an attestation form, confirming that they met/worked with others as described in this report and reflecting on the impact of the QI initiative on their practice or organizational role. Following approval of this report, the UMHS QI MOC Program will send to participants an email message with a link to the online attestation form.

K. Sharing Results

42. Are you planning to present this QI project and its results in a:

Yes No Formal report to clinical leaders?

Yes No Presentation (verbal or poster) at a regional or national meeting?

Yes No Manuscript for publication?

L. Project Organizational Role and Structure

43. UMHS QI/Part IV MOC oversight – indicate whether this project occurs within UMHS, AAVA, or an affiliated organization and provide the requested information.

University of Michigan Health System

• Overseen by what UMHS Unit/Group? (name):

• Is the activity part of a larger UMHS institutional or departmental initiative?

No Yes – the initiative is (name or describe):

Veterans Administration Ann Arbor Healthcare System

• **Overseen by what AAVA Unit/Group? (name):**

• **Is the activity part of a larger AAVA institutional or departmental initiative?**

No Yes – the initiative is:

An organization affiliated with UMHS to improve clinical care

• **The organization is (name):**

• **The type of affiliation with UMHS is:**

Accountable Care Organization (specify which member institution):

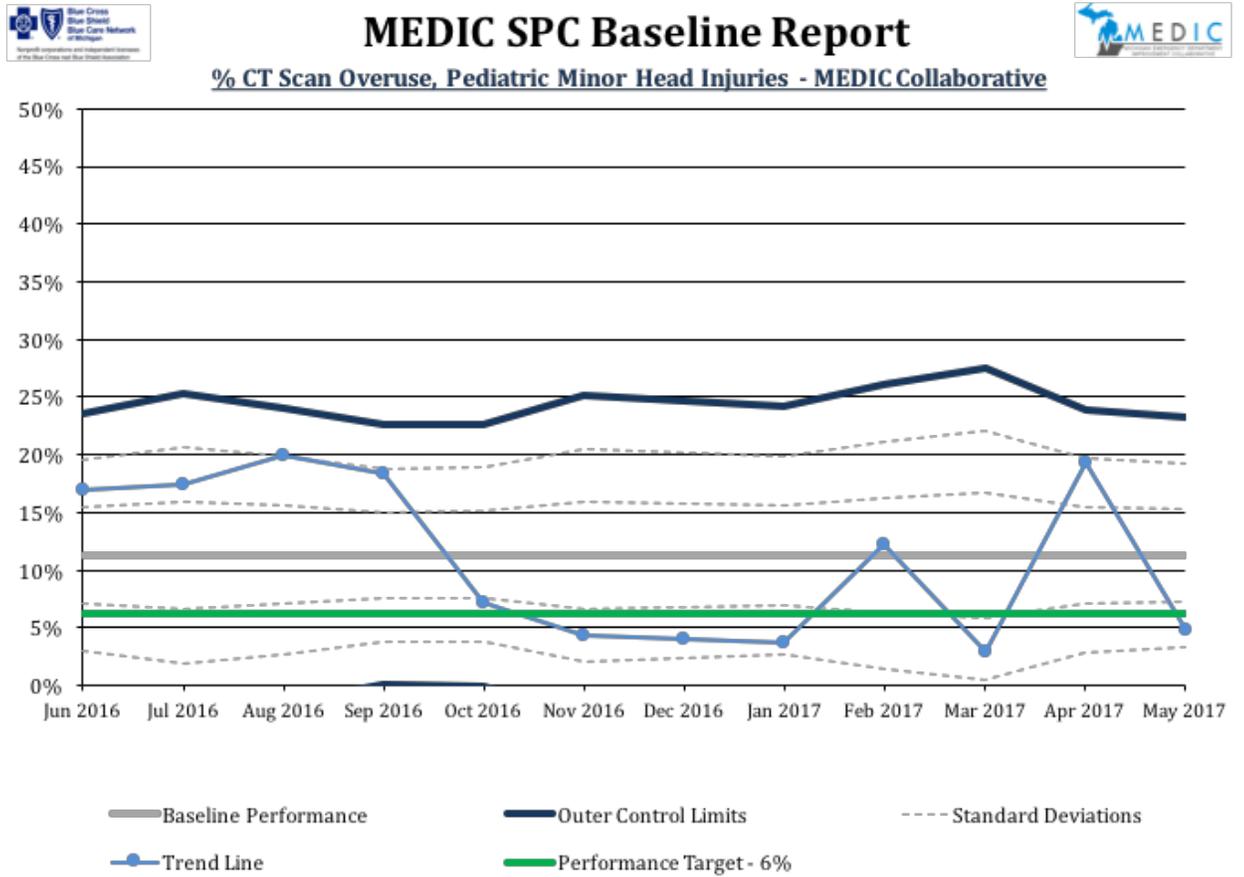
BCBSM funded, UMHS lead state-wide Collaborative Quality Initiative (specify which):

Michigan Emergency Department Improvement Collaborative

Other (specify):

ATTACHMENT 1: MEDIC HEAD INJURY

a) HEAD INJURY OVERUSE LOW RISK: Baseline (June 1, 2016-May 31, 2017)



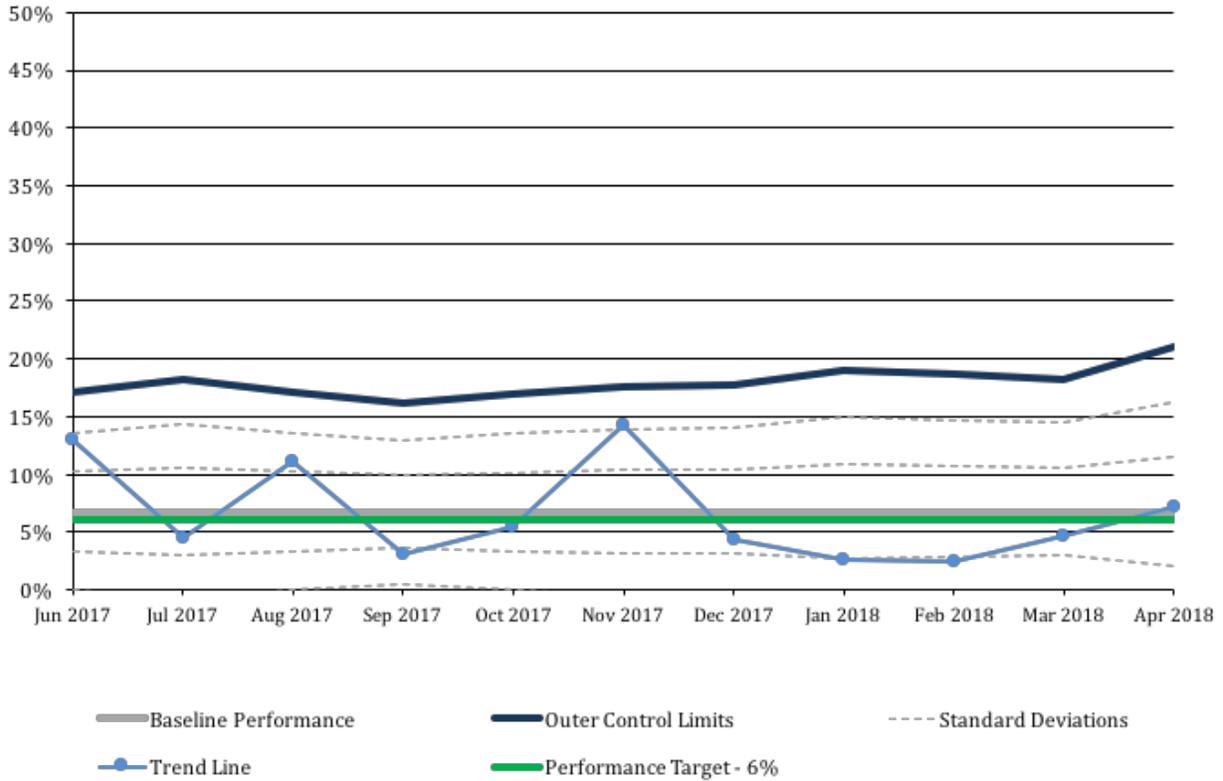
- b) HEAD INJURY OVERUSE LOW RISK: post intervention (Feb 2018) & post adjustment measurement periods (June 2018*). * Data still being analyzed.



MEDIC SPC Performance Report

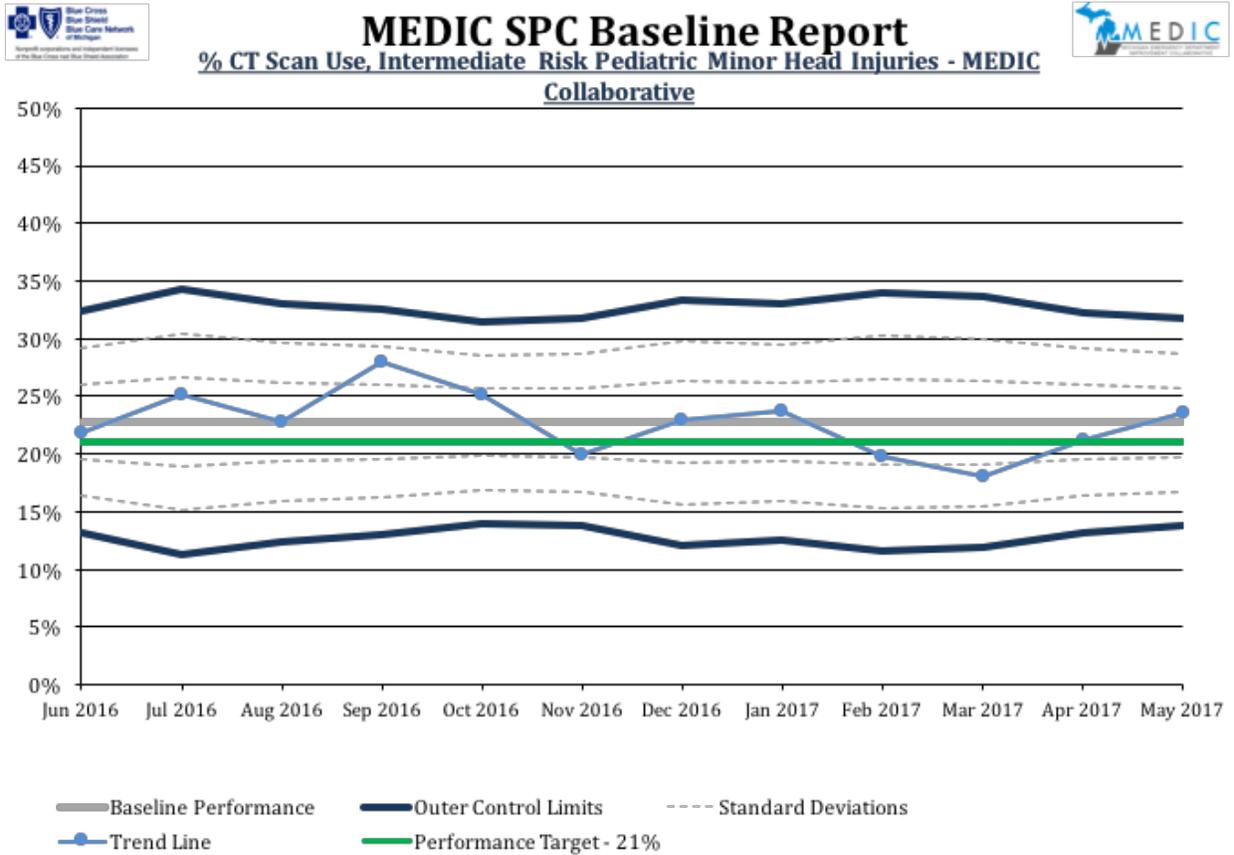


% CT Scan Overuse, Pediatric Minor Head Injuries - MEDIC Collaborative

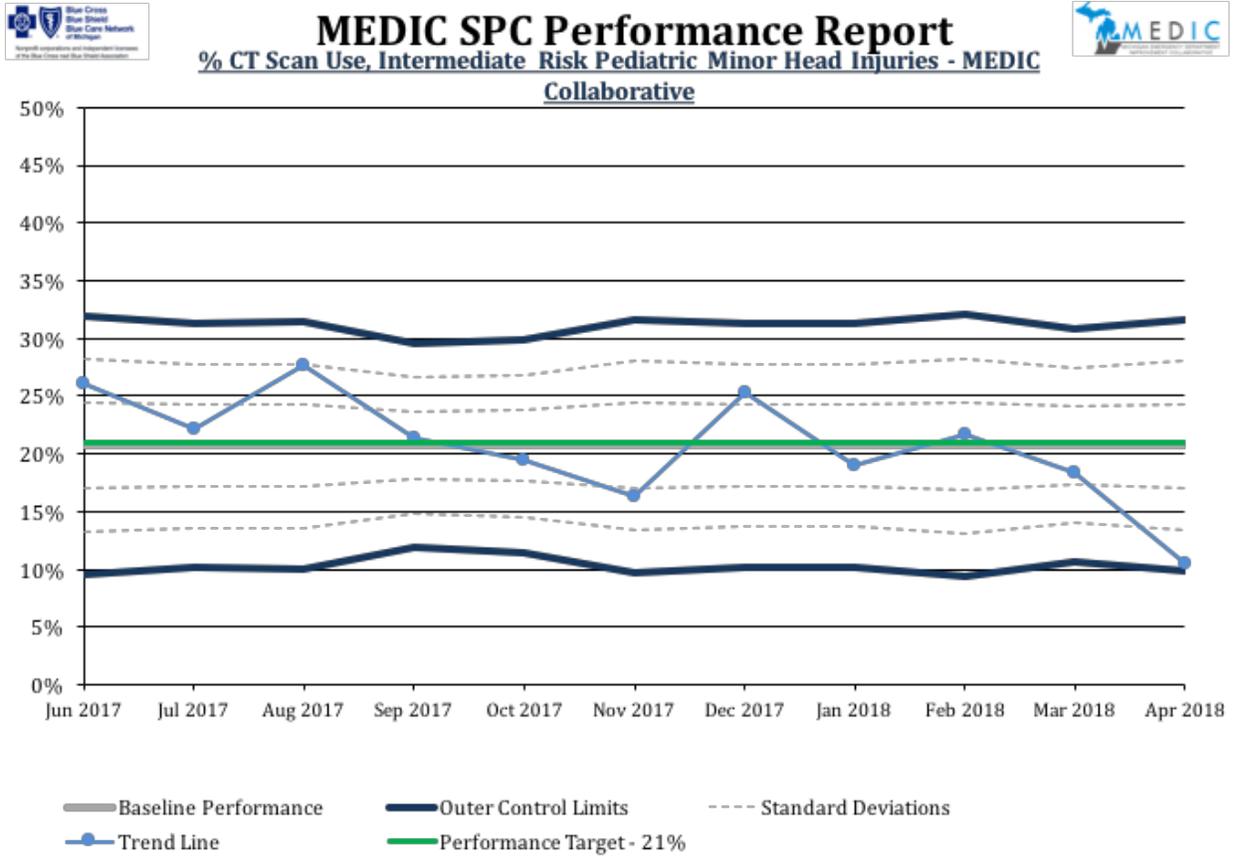


ATTACHMENT 1: MEDIC HEAD INJURY

c) HEAD INJURY INTERMEDIATE RISK: Baseline (June 1, 2016-May 31, 2017)



d) HEAD INJURY INTERMEDIATE RISK: Post intervention measurement periods (Feb 2018 & June 2018*). *Data still being analyzed



ATTACHMENT 2. SUMMARY of MEDIC Collaborative Wide Meeting June 2017. Development of key driver diagrams, Head Injury

SAMPLE INTERVENTIONS BY KEY DRIVER

LIMIT RISK OF MISSING INTRACRANIAL PATHOLOGY

EMR Interventions:

- Embed within electronic health record some resources to remind providers of PECARN/Canadian rules before ordering head CT
- Embed decision support for providers to ensure correct risk stratification with a hard stop (yes / no options that facilitate correct assignment of risk in that particular patient)
- Enhance neurologic exam in EMR to include more detailed neurologic findings (instead of simply normal vs abnormal)
- Build in an option to allow providers to select “clinical judgement” (with details) to opt out of rules when necessary and create a method to review/track these

Observation Interventions:

- Observation in an appropriate ED place with enough time for re assessment to inform decision rules

Discharge & Follow up Interventions:

- ED follow up phone call within 24 hrs. for patients discharged without head CT (especially children)
- Create specific head injury discharge instructions with warning signs (standardize content), instructing patients on specific clinical signs that should prompt them to return to the ED
- Create a head injury discharge checklist
- Create a mechanism for follow up within 24h if appropriate
- Create a mechanism for follow up outside the ED if appropriate
- Create a mechanism to monitor for return visits of patients presenting with head injury

Educational Interventions:

- Make educational items available within exam room describing head injury imaging rules and why they're being used (have educational tools/talking points at bedside for provider - patient/family discussions, use of illustrations or pictures to optimize education for all learning styles)
- Make available a clear summary of head injury imaging rule including risk stratification information for ALL providers to use in in the clinical spaces of the ED
- Communication/education directed to PCPs about Canadian/PECARN head injury risk stratification (consistency of message for pts)
- Create a head injury assessment, imaging guideline including risk stratification tool for PCPs

- Teach / insure providers structure questions related to head injury for patient/family that are appropriate to patient level of understanding/educational level
- Create an educational tool for open discussion of head injury imaging risk / benefit with patient/family

Administrative Interventions:

- Support clinicians to recognize that their overuse target rate may not be zero
- Create a mechanism to transmit / share patient information across EDs for head injury patients (to better understand revisits to other institutions)

PROVIDER SELF-MONITORING OF PERSONAL PRACTICE

- Embed rates of personal head CT use in EMR (dashboard) w/ability to link to chart (enhance self-monitoring opportunities within standard doctor workflow while reviewing – signing charts)
- Include head CT use for head injury in departmental peer review process
- Include head CT imaging practice guidelines (including rules) within department policy / procedures
- Set a department goal for head CT utilization
- Create a mechanism for automatic feed of information to providers on head injury case outcomes & follow up (example: departmental peer review process or ED nurse follow up on head injury cases with automatic copy to treating provider)

PHYSICIAN-PATIENT ENGAGEMENT TO SUPPORT SHARED DECISION MAKING

- Create educational tool for use by provider with patients/family to facilitate education & conversation about head injury rules, risk / benefit of imaging, and clinical signs and symptoms that direct imaging/no imaging (Example: pre-made information sheets in rooms)
 - Adopt structured communication talking points for all providers to standardize conversations with patients/families
 - Standardize method for discharge of head injured patients to include a follow up appointment made at the time of ED service
 - Create mechanism for PCP engagement to set appropriate expectations for patients/families on imaging after head injury
- Include patients/families on hospital QI committee

OPTIMIZE PHYSICIAN DECISION SUPPORT

EMR interventions:

- Use codified physician exam data to inform decision rule (Example: detailed descriptors for “abnormal” neurologic exam)
- Embed the CANADIAN/PECARN rules into the radiology electronic ordering system (Example: prompts for required answers to questions that inform the decision rule application)
- Embed the CANADIAN/PECARN rules into the EMR provider note structure or links to guidelines within the note/document
- Leverage the medical history in the EMR to trigger imaging decision support in head injured patients (Examples: Coumadin use, Hemophilia)
- Create a triage pre-screening tool for head injury patients aligned with CT imaging decision rules

Education Interventions:

- Optimize and disseminate CANADIAN/PECARN head injury imaging education to all ED providers (Examples: lectures to providers on head injury imaging rules, online learning mandated modules with standardized content, standardize collection of head injury history data aligned with imaging rules to be used by all providers)
- Create an educational tool for families & physicians that is easy to use and not time consuming
- Create head injury rule reminder cards for provider badges
- Create educational head injury rule prompts for all patient care rooms
- Adopt a system wide consensus driven message for CT use in head injury by all providers

Administrative Interventions:

- Review departmental data on head CT utilization by patient population

ATTACHMENT 3. MEDIC HEAD Injury Key Driver Diagram – Collaborative Wide Meeting

