MetroHealth

Clinical Informatics Fellowship: 2 Year Round Up

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Department of Clinical Informatics
Department of Pathology
The MetroHealth System
Case Western Reserve University

June 7, 2023

Current Happenings

- Wrapping up any outstanding projects
- Reviewing for Informatics Boards
- Looking forward to my upcoming 2 weeks of vacation

AMIA
INFORMATICS PROFESSIONALS. LEADING THE WAY.

Completed Epic Training

- APL 150: Pathologist Builder
- APL 250: Anatomic Pathology Administration
- CLN 145: Notecraft for Physicians
- CLN 150: Physician Builder
- CLN 160: Advance Physician Builder
- CLN 171: Physician Builder Analytics
- CLN 250: Epic User and Security
- LAB 400: Integrated Beaker Build
- Physician Power User
- Beaker Anatomic Pathology Fundamentals

Certificate In Biomedical And Health Informatics

- CRSP 401: Introduction to Clinical Research
- HSMC 432: Introduction to Health Informatics
- PQHS 416: Computing In Biomedical Health Informatics
- HSMC 420: Healthcare Finance

What's Next

- Preparing for my transition to staff in the Department of Pathology as a Pathologist Informaticist and Medical Director for LIS
- Lean Six Sigma Yellow Belt sometime in late 2023 or early 2024

Presentations

AACC 2021 National Conference

- Abstract / Poster
- Accuracy between Two Anti-Nuclear Antibody Platforms: Multiplex Bead-Based Technology vs. Immunofluorescence Assay

API 2022 National Conference

- Invited to be a guest speaker at the Association for Pathology Informatics 2022 National Conference

- Boot camp talk on the Fundamentals of Computer Programming

- Invited to join the Training and Education committee for API following the boot camp

API 2023 National Conference

- Abstract
- Poster presentation
- Improving Autopsy Turnaround Time Using Lean Six Sigma Principles with Define-Measure-Analyze-Improve-Control Cycles

CAP 2023 National Conference

- Upcoming conference October 9, 2023
- Abstract
- Poster presentation
- Evaluating whether an association between hepatitis viruses and lymphoma among patients with HIV exists
- Analysis shows there is an association between HIV-HBV co-infection and lymphoma, but no association between HIV-HCV co-infection and lymphoma

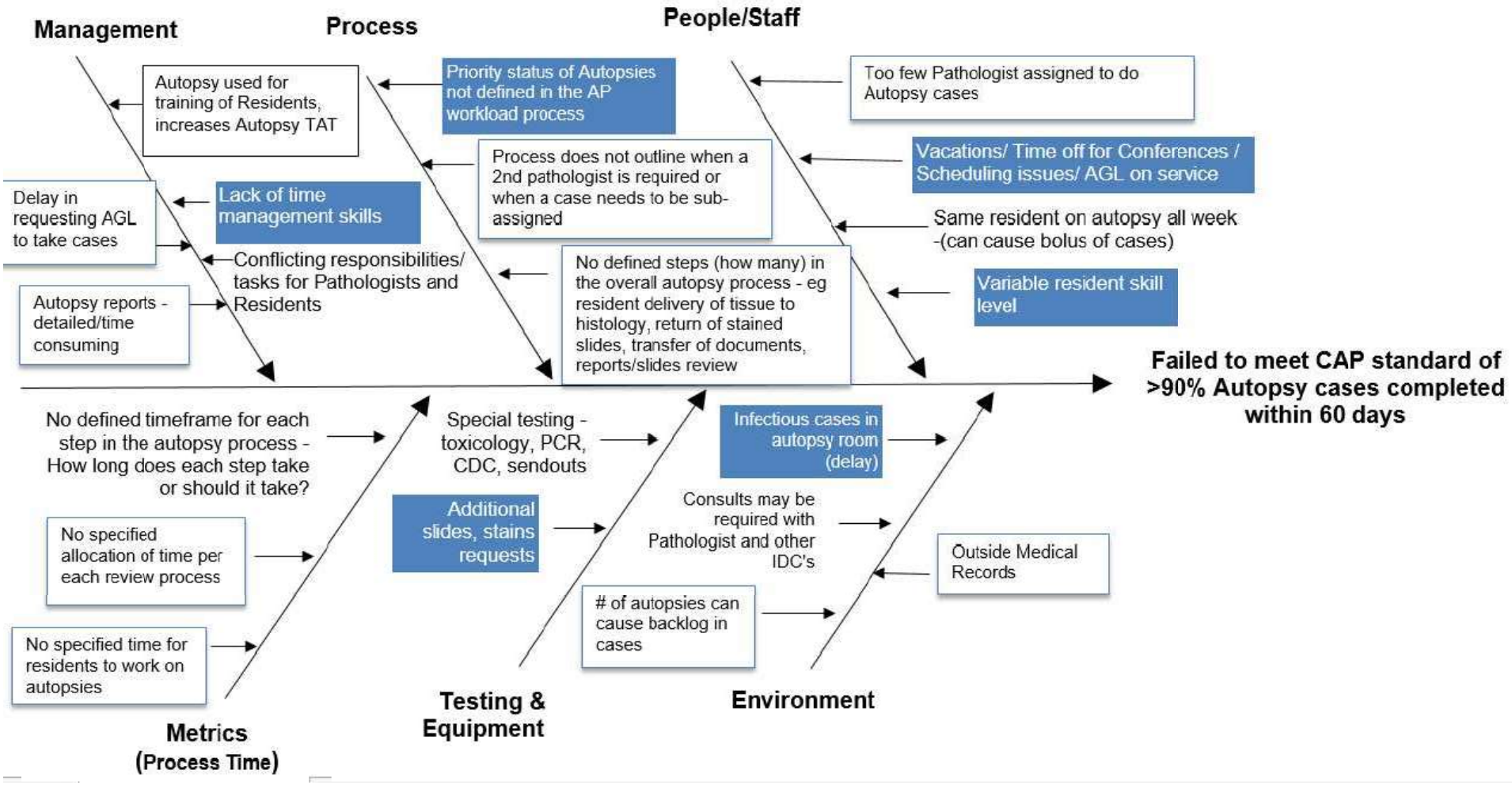
Projects

Improving Autopsy Turnaround Times

Autopsy Turn-Around-Time QI Project

- **Capstone**
- **Need to Improve Autopsy Turn-Around-Time**
  - Failure to meet the CAP standard of 90% of autopsy cases signed out within 60 days
  - Lean Six Sigma is a tried and tested approach to quality improvement that has been used successfully in the
  - Used Lean Six Sigma techniques (Ishikawa diagram, workflow map, process map, and value stream) to address issues in the entire process
  - Decided on a DMAIC (Define – Measure – Analyze – Improve – Control) cycle approach
    - Similar to PDSA (Plan – Do – Study – Act)

Fishbone Diagram: Autopsy TAT

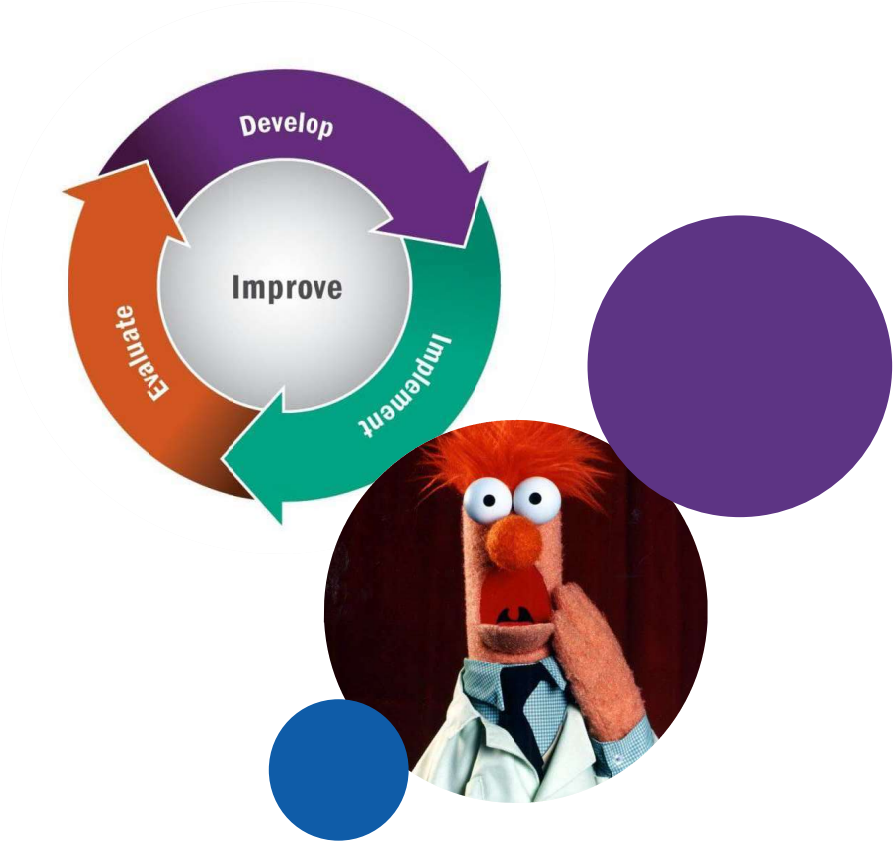


Autopsy Turn-Around-Time QI Project

- **DMAIC Cycle 1**

- We targeted the inconsistent use of a backup pathologist due to lack of guidelines for when to assign them cases. To address this we implemented a cap to the pathologists' active case load and tracked this via an Excel® spreadsheet.

- Next we targeted our trainees' time management and instituted calendar reminders for the trainees by having Outlook® calendar entries automatically created via an Excel® spreadsheet containing important deadlines with regards to the autopsy report.



Autopsy Attending Coverage
Day of Service (Day the Autopsy is performed)

Responsible Attending	Autopsy Number	Accession Date	Signed Out Date	TAT	Assigned Resident
Dr. Baggins	A22-100	9/12/2022	12/12/2022	66	
Dr. Greenleaf	A22-101	9/28/2022	12/12/2022	54	
Dr. Baggins	A22-102	9/28/2022	11/25/2022	43	
Dr. Gamgee	A22-103	10/10/2022	12/5/2022	41	
Dr. Oakenshield	A22-104	10/25/2022	12/10/2022	34	
Dr. Oakenshield	A22-105	10/26/2022	12/11/2022	33	
Dr. Oakenshield	A22-106	10/27/2022	12/12/2022	33	
Dr. Greenleaf	A22-107	10/28/2022			
Dr. Greenleaf	A22-108	11/12/2022			
Dr. Greenleaf	A22-109	11/15/2022			
Dr. Greenleaf	A22-110	11/20/2022			
Dr. Greenleaf	A22-111	11/22/2022			
Dr. Greenleaf	A22-112	11/28/2022			
Dr. Greenleaf	A22-113	12/2/2022			
Dr. Greenleaf	A22-114	12/5/2022			
Dr. Greenleaf	A22-115	12/5/2022			
Dr. Greenleaf	A22-116	12/7/2022			
Dr. Greenleaf	A22-117	12/8/2022			
Dr. Greenleaf	A22-118	12/9/2022			
Dr. Greenleaf	A22-119	12/9/2022			

New Autopsies For The Current Week	
Dr. Baggins	0
Dr. Greenleaf	6
Dr. Gamgee	0
Dr. Oakenshield	0

New Autopsies For The Current Month	
Dr. Baggins	0
Dr. Greenleaf	7
Dr. Gamgee	0
Dr. Oakenshield	0

Total Outstanding Autopsies	
Dr. Baggins	0
Dr. Greenleaf	13
Dr. Gamgee	0
Dr. Oakenshield	0

Annual Average Turn Around Time	
Dr. Baggins	54.50
Dr. Greenleaf	54.00
Dr. Gamgee	41.00
Dr. Oakenshield	33.33

Please read before continuing:

The following spreadsheet will automatically generate the start dates for each of the items under the Subject heading below, after entering the Autopsy Start Date. Once you have entered the autopsy start date below press enter and all other dates will be filled in automatically. Once those dates have been populated you may then press the Add Dates To Calendar button below. You only need to left click the button one time and within less than a minute or so your
Outlook calendar will have created reminders for each of the events related to the autopsy. The dates that are calculated are all weekdays as the formula takes into consideration weekends.

Please do not add rows or make any changes to this worksheet...Thanks!!!

Enter Autopsy Start Date:	**11/28/2022**
Enter Autopsy Number (Axx-xxx):	**A22-050**
Infectious Autopsy	☐

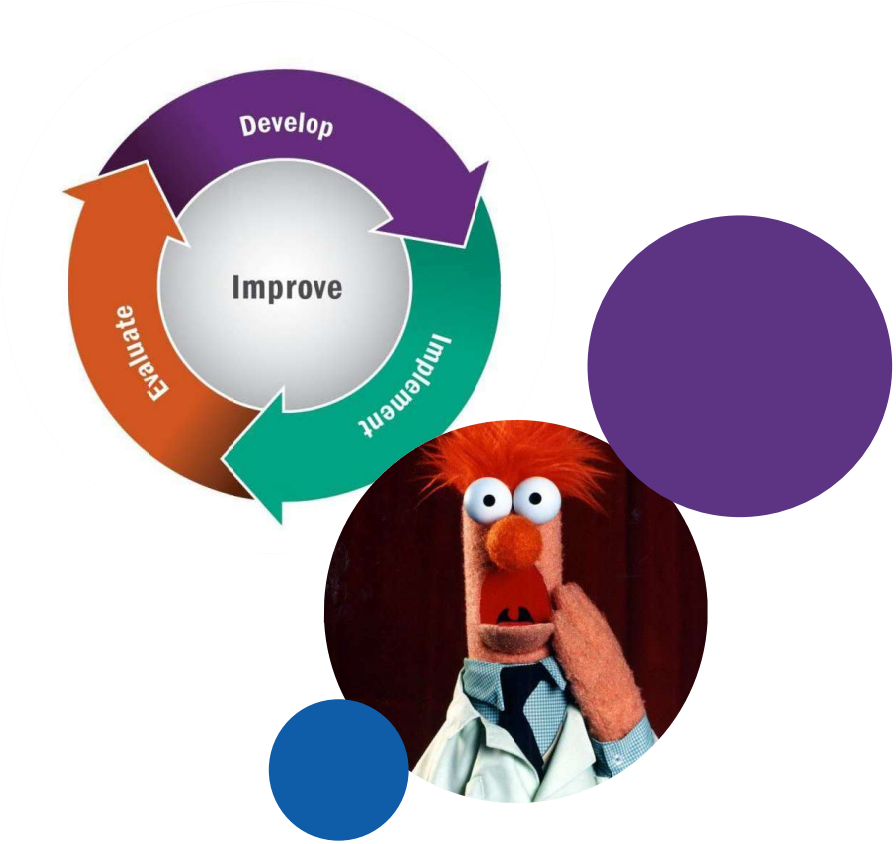
Subject	Location	Due Date
Organ Review and PAD for Autopsy A22-050	Morgue	11/29/22
Gross Description for Autopsy A22-050	Office	12/01/22
Clinical History for Autopsy A22-050	Office	12/07/22
Initial Slide Reivew and schedule reivew with attending for Autopsy A22-050	Office	12/16/22
30-day Reminder for A22-050	Office	01/09/23

Add Dates To Calendar

Autopsy Due Date:	01/27/23
Turnaround Time Days Remaining:	38.00

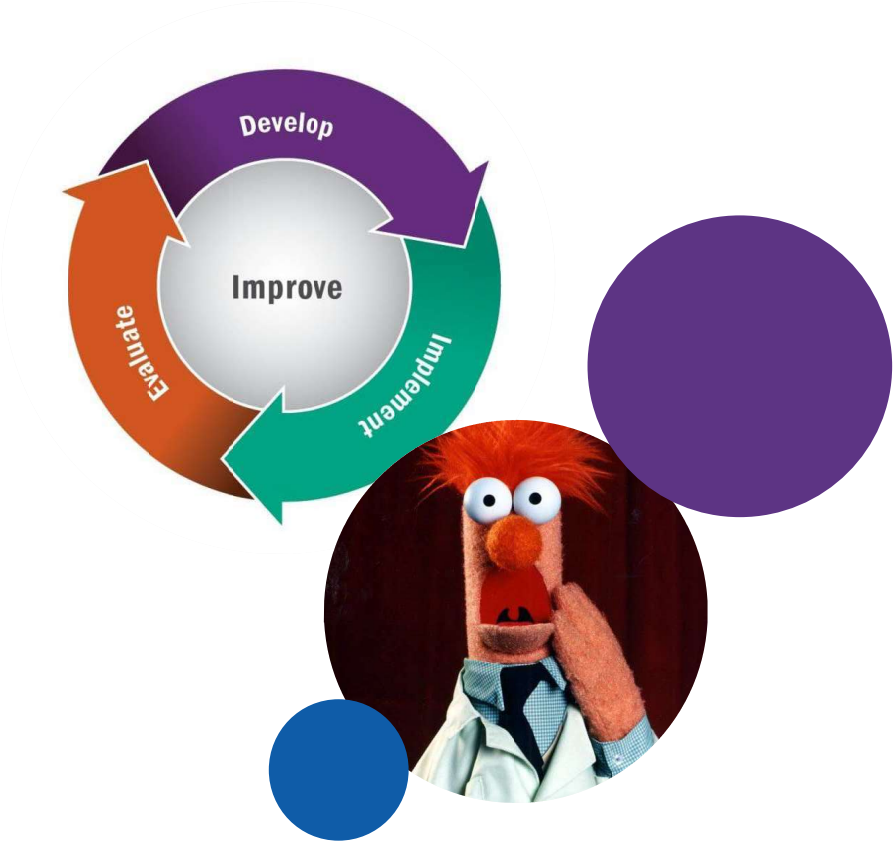
Autopsy Turn-Around-Time QI Project

- **DMAIC Cycle 1**
  - We had 31 autopsies in our pre-implementation period (accession date July 2020 through December 2020)
  - We had 47 autopsies to review in our DMAIC cycle I post-implementation period (accession date August 2021 through January 2022).



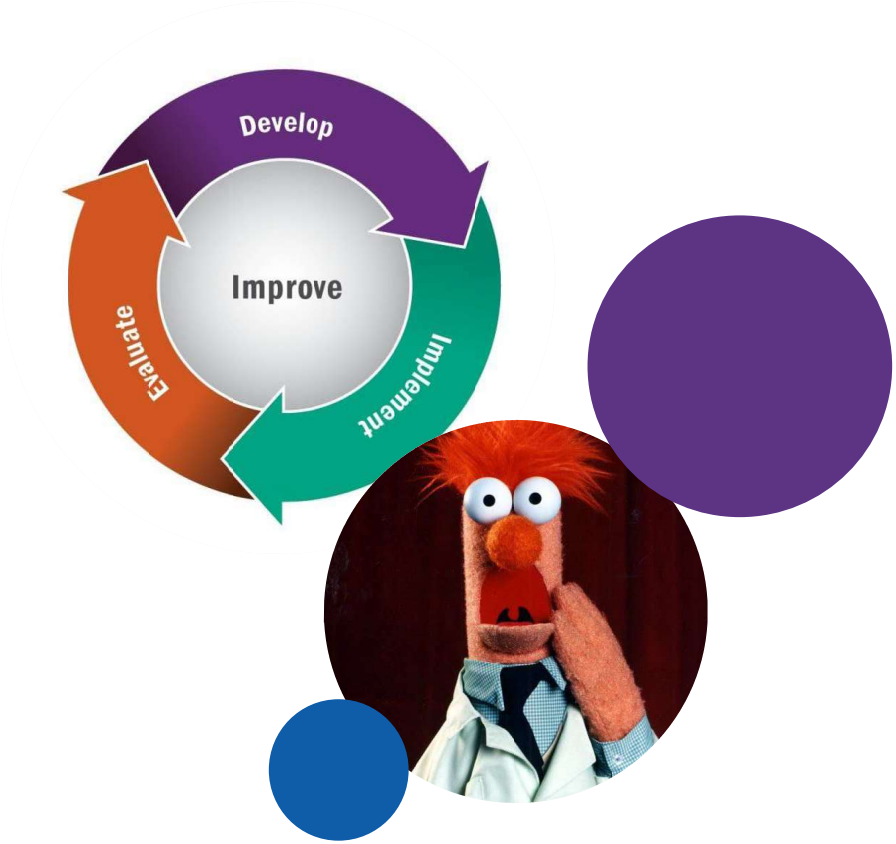
Autopsy Turn-Around-Time QI Project

- **DMAIC Cycle 1 Results**
  - Welch's t-test between our pre-implementation period and our post cycle I interventions period revealed a statistically significant difference in mean turnaround times
    - (t = 4.61984, p = 0.0000176)
  - Interrupted time series analysis using R® to verify that the changes in TAT we were seeing were actually due to our interventions and not to secular trends. The analysis showed the change in TAT was significant and not due to secular trends.
    - (-24.0 (-38.10-[-9.89]), p < 0.01).



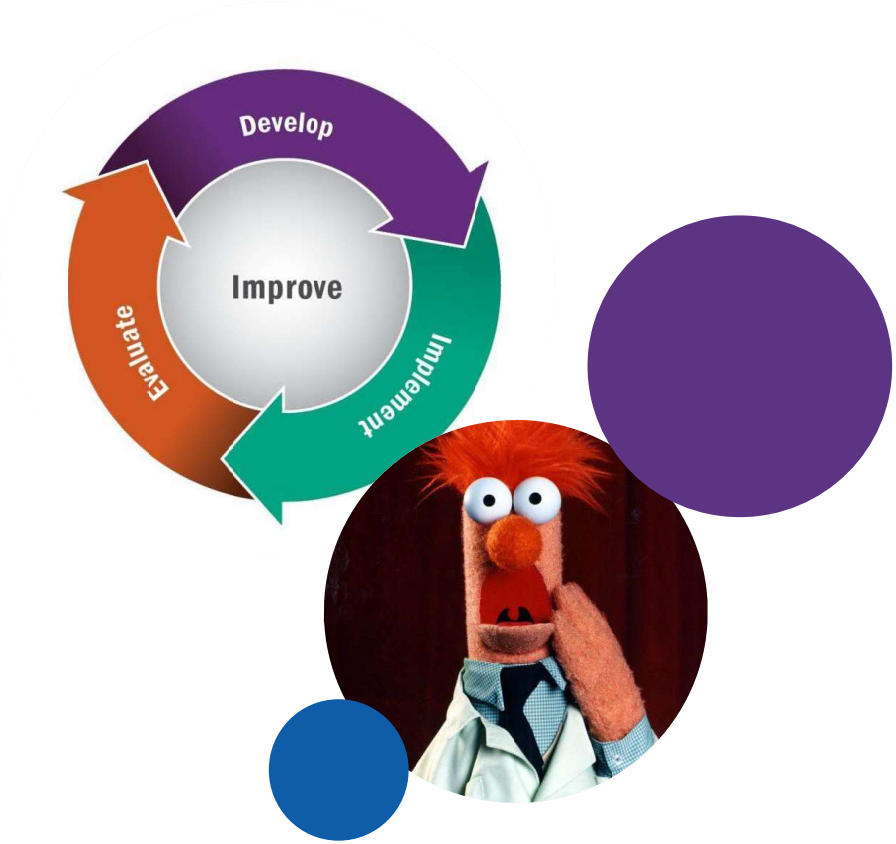
Autopsy Turn-Around-Time QI Project

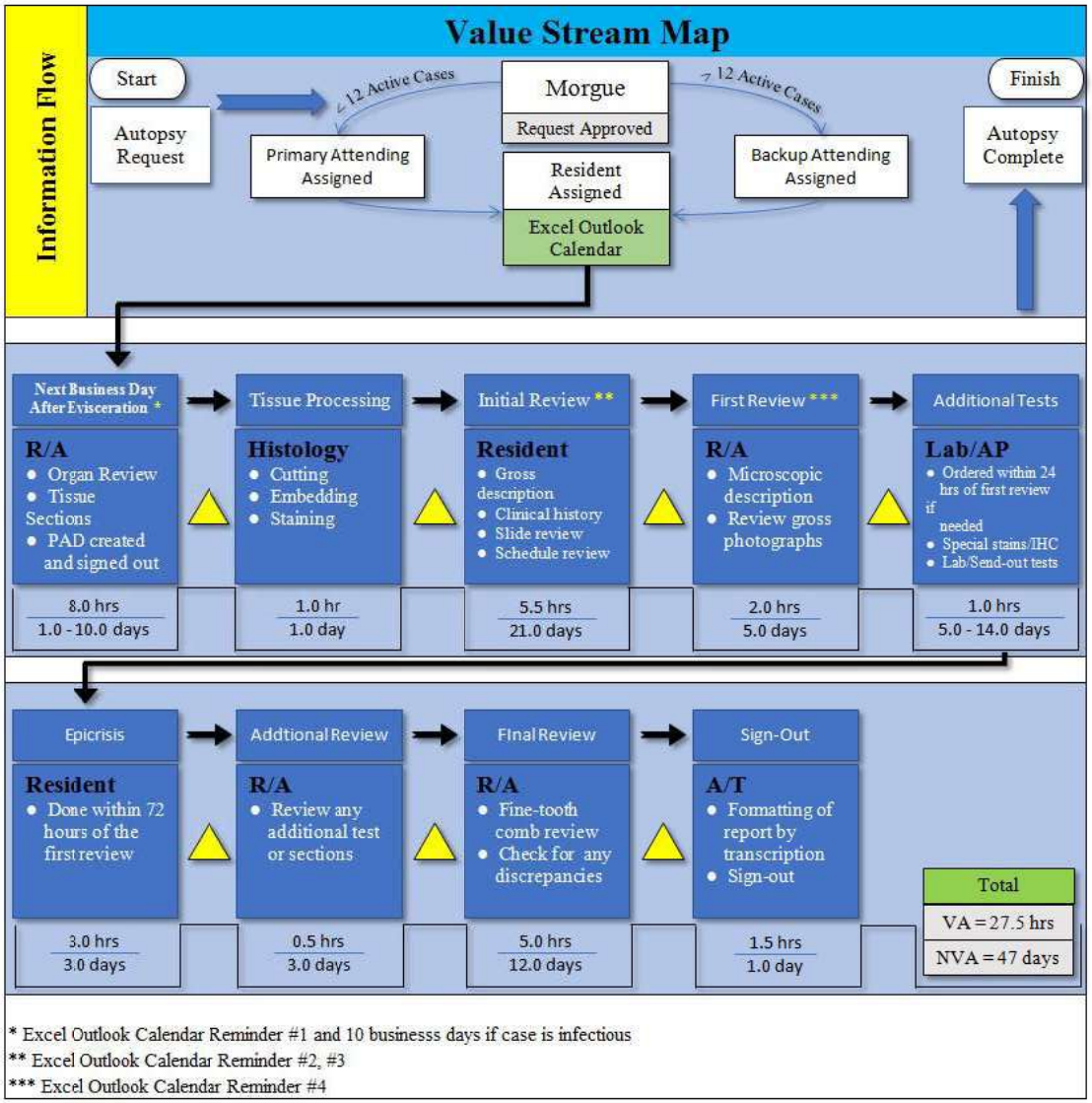
- **DMAIC Cycle 1**
  - Overall our TAT decreased, but we still fell short of consistently meeting the CAP requirement
  - What next?



Autopsy Turn-Around-Time QI Project

- **DMAIC Cycle 2**
  - The second cycle we used a process map and a value stream to identify non-value added time and rework.
  - Both were identified
  - To address this we created dictation friendly autopsy gross description templates in our LIS and implemented real-time dictation.





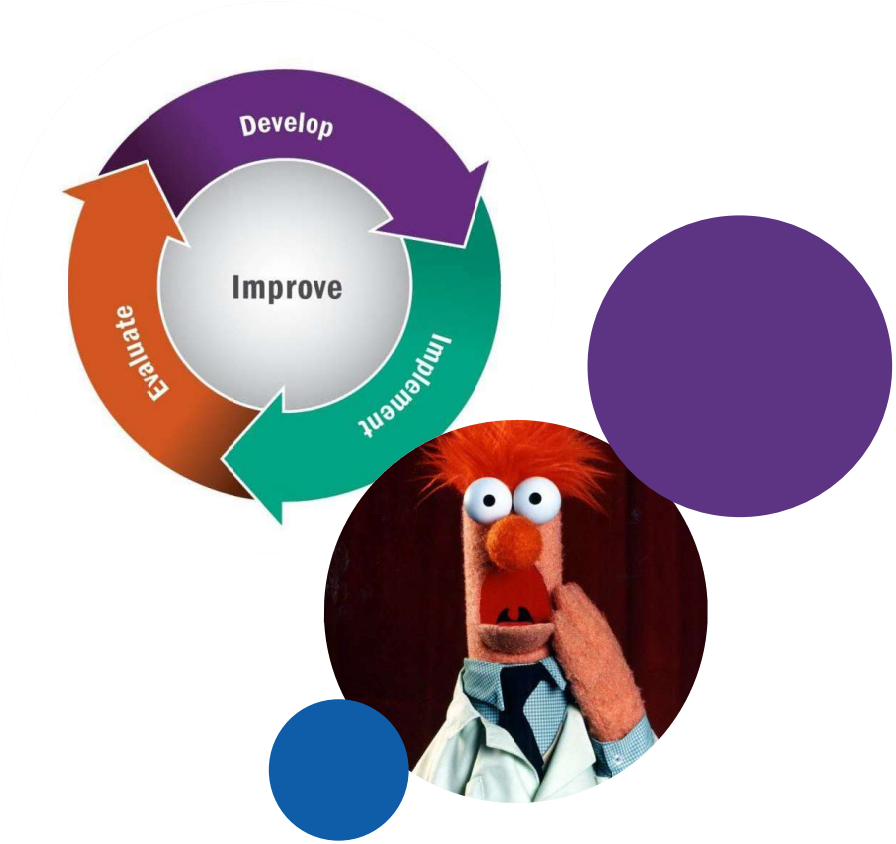
* Excel Outlook Calendar Reminder #1 and 10 businesss days if case is infectious

** Excel Outlook Calendar Reminder #2, #3

*** Excel Outlook Calendar Reminder #4

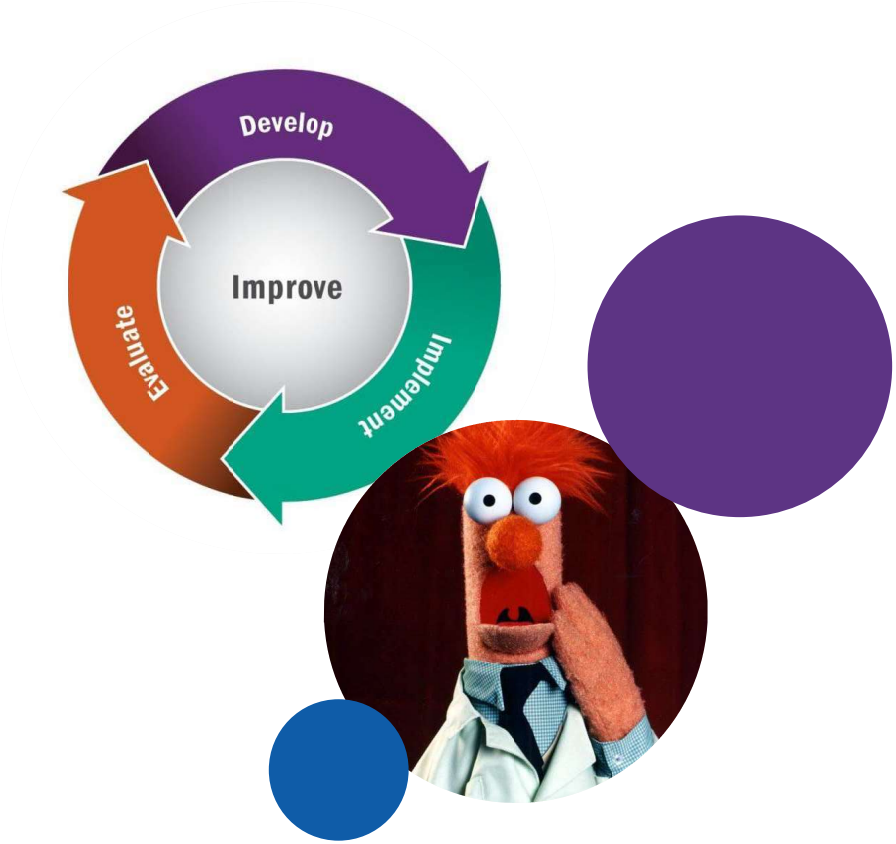
Autopsy Turn-Around-Time QI Project

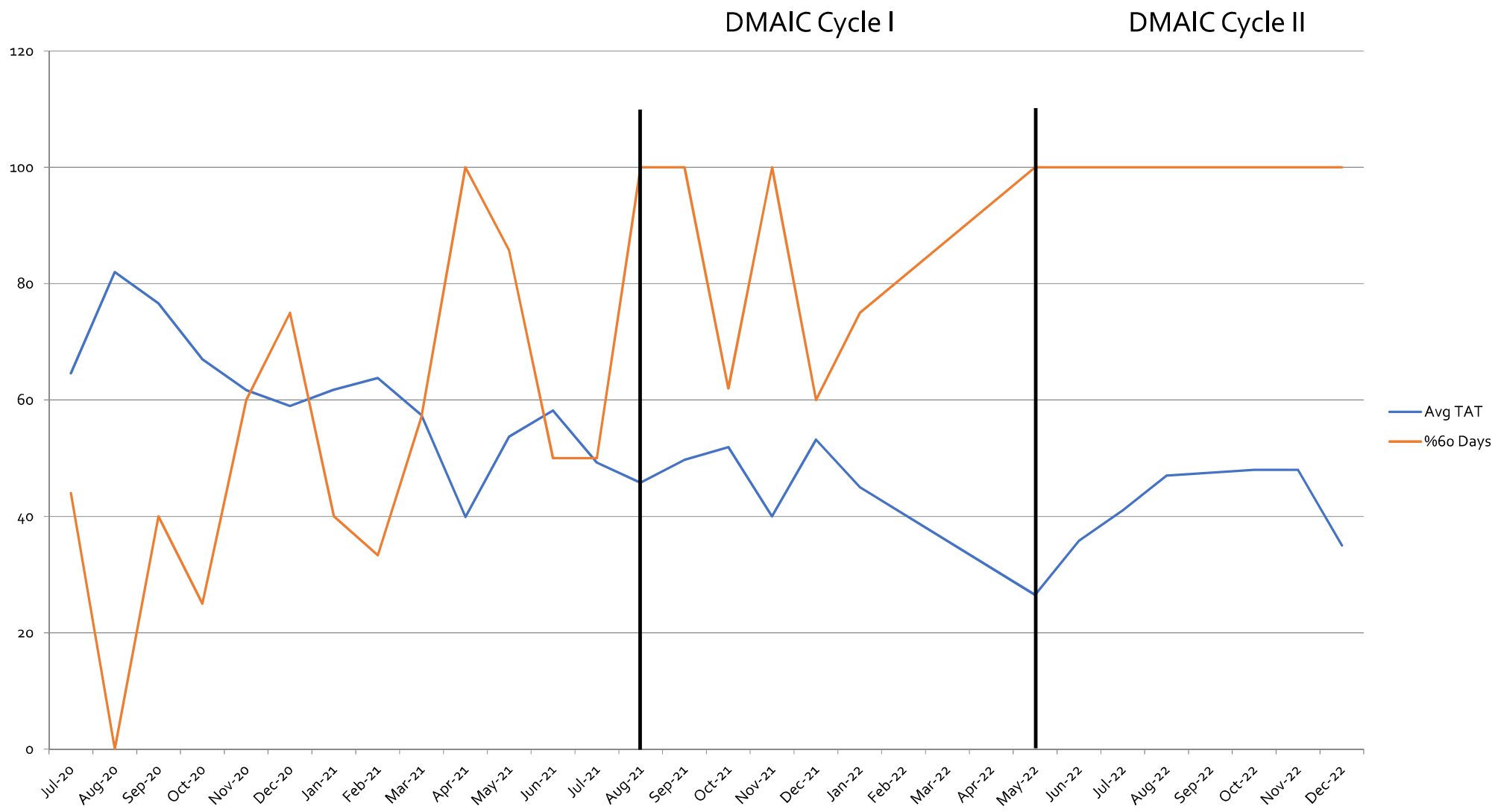
- **DMAIC Cycle 2**
  - We had 25 autopsies to review in our DMAIC cycle II post-implementation period (accession date May 2022 through December 2022)



Autopsy Turn-Around-Time QI Project

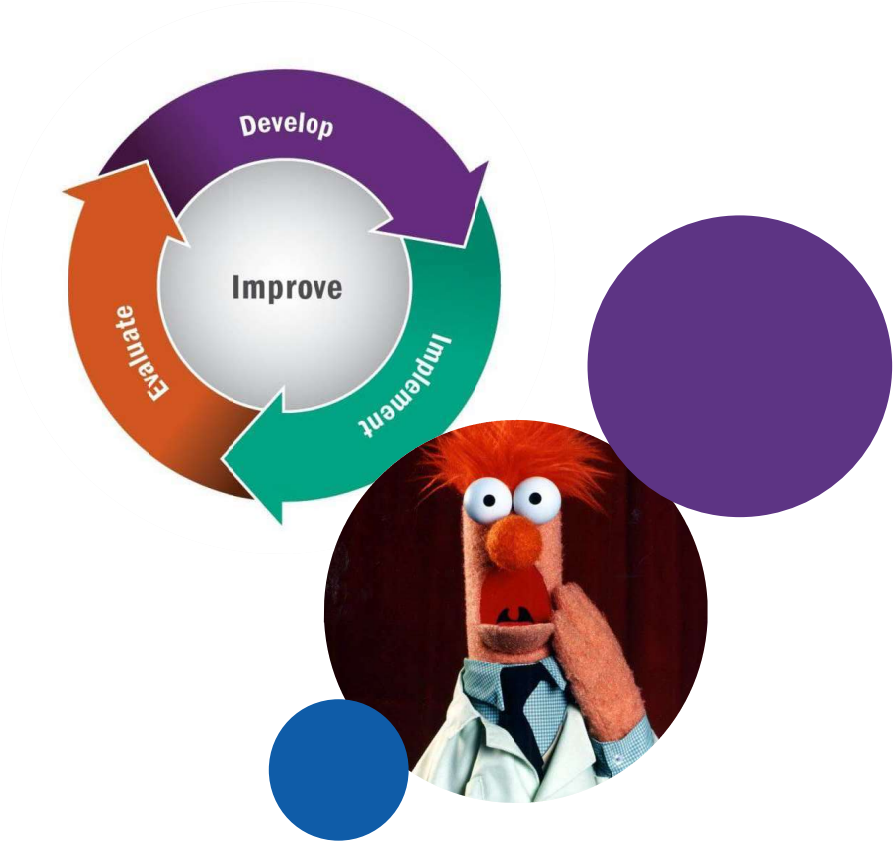
- **DMAIC Cycle 2**
  - Welch's t-test between our post cycle I interventions and our post cycle II interventions revealed that there was no statistically significant difference in mean turnaround times
    - (t = 1.80812, p = 0.0755889)
  - Interrupted time series analysis using R® to verify that the changes in TAT we were seeing were actually due to our interventions and not to secular trends. The analysis showed that the change in TAT was not significant
    - (-6.85 (-22.03-8.33), p = 0.35).




DMAIC Cycle I
DMAIC Cycle II
120
100
80
60
40
20
0
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Avg TAT
%6o Days

Autopsy Turn-Around-Time QI Project

- **Conclusion**
  - Using Lean Six Sigma methods we were able to significantly reduce our autopsy turnaround times and better comply with the CAP guidelines.



Transfer of Discrete Data From Beaker to Beacon

Beaker Updating Beacon Automatically

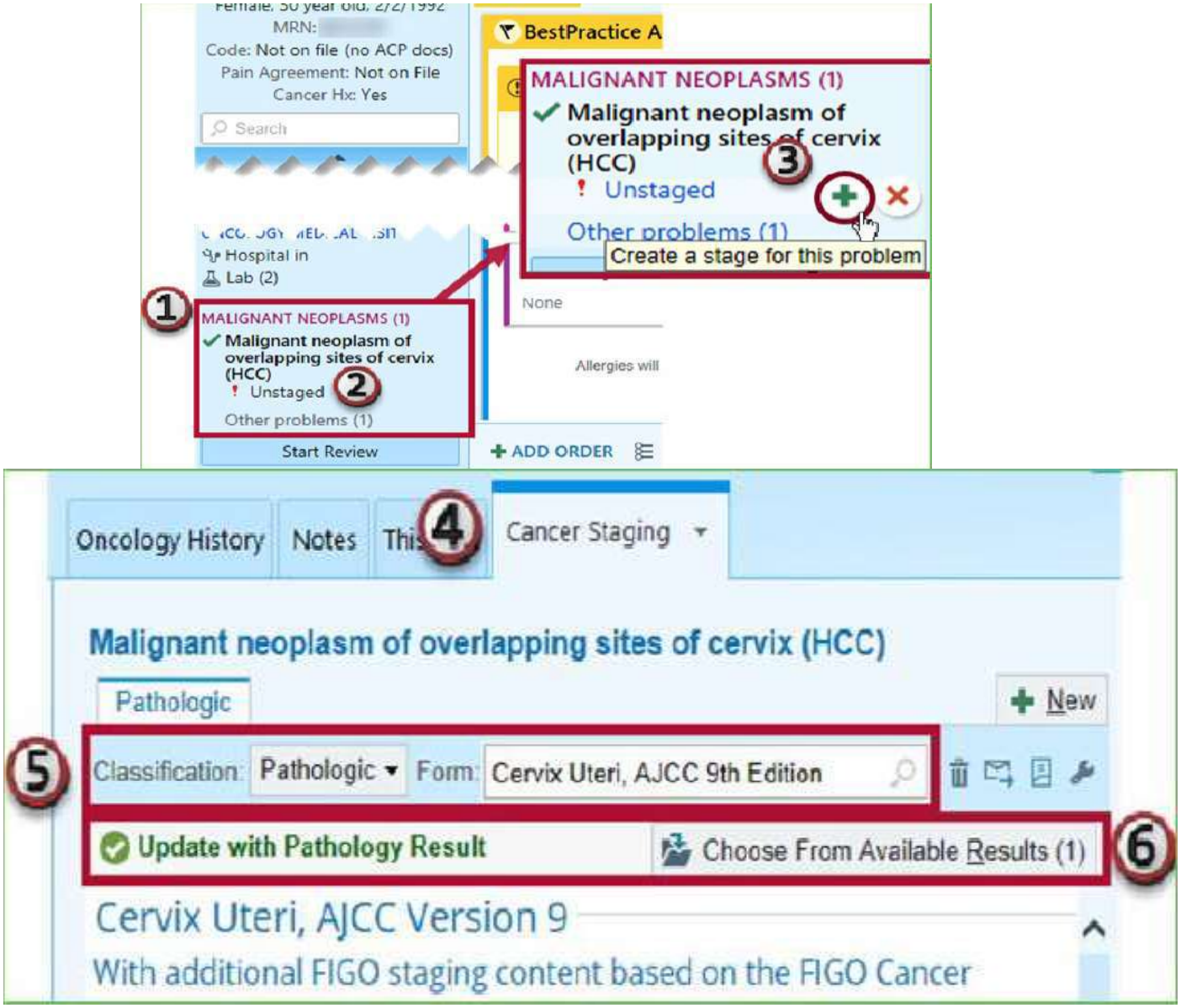
- Getting discrete data from Beaker to Beacon
  - Beaker is the LIS module
  - Beacon is the Oncology module
- Reducing clicks for oncologists
- Avoiding potential errors from the manual transfer of data

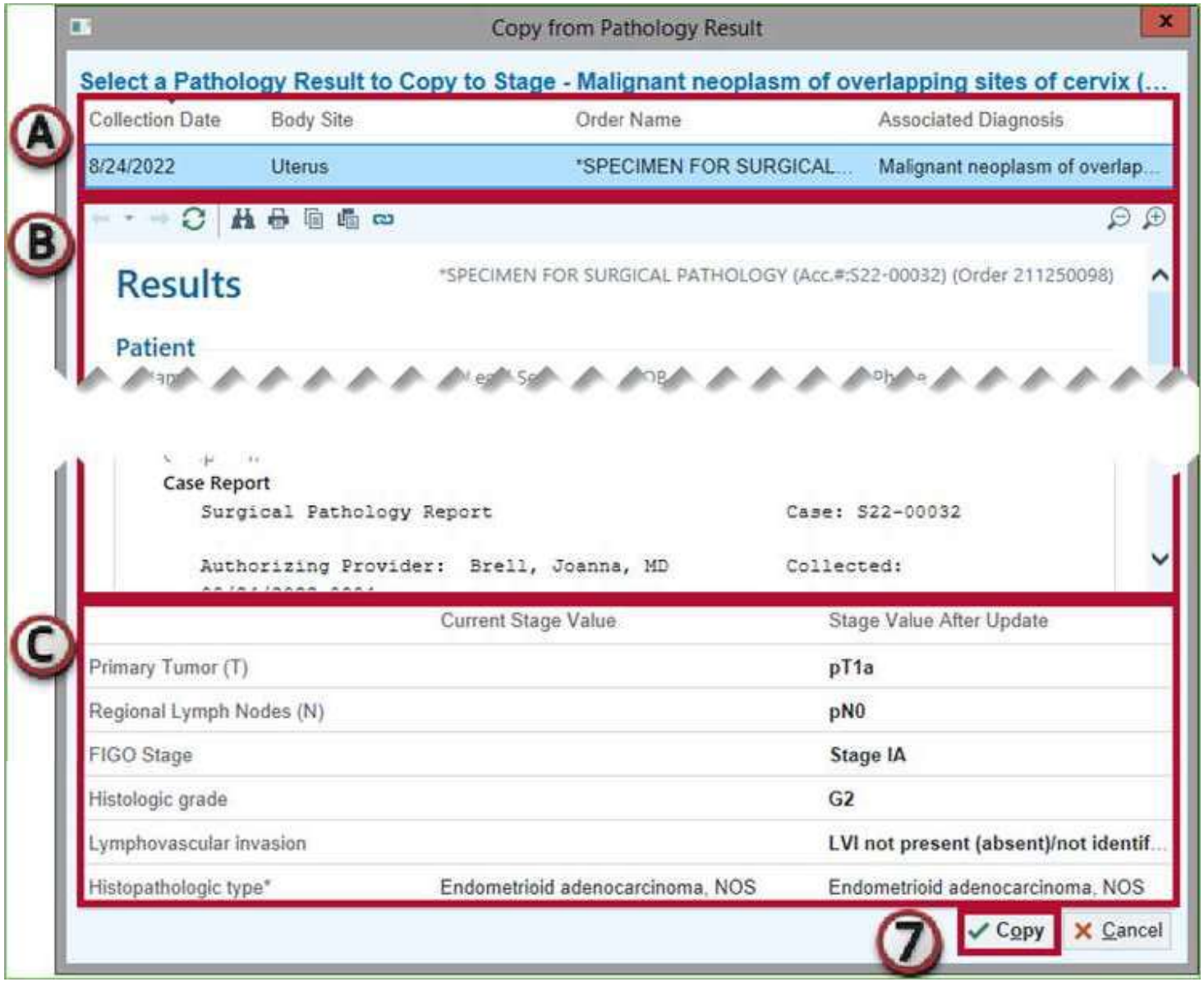
ENDOMETRIUM

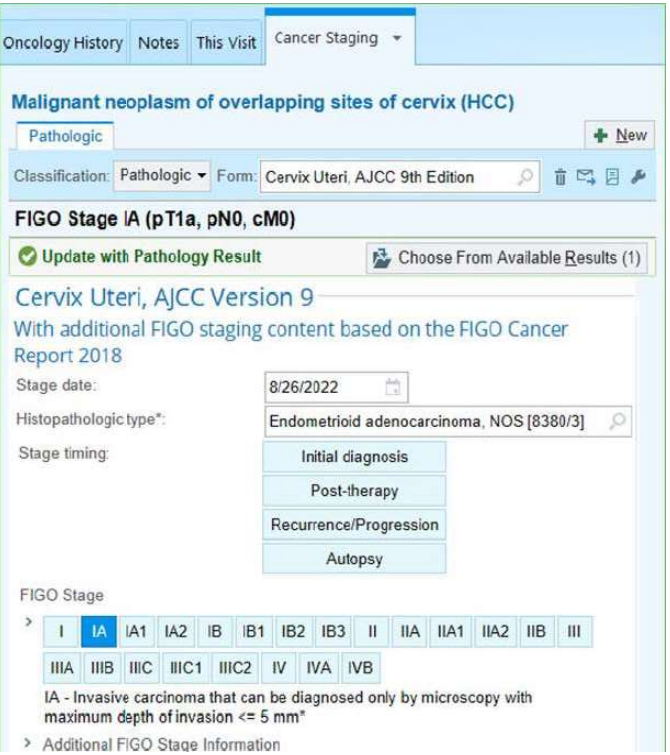
ENDOMETRIUM: HYSTERECTOMY - All Specimens

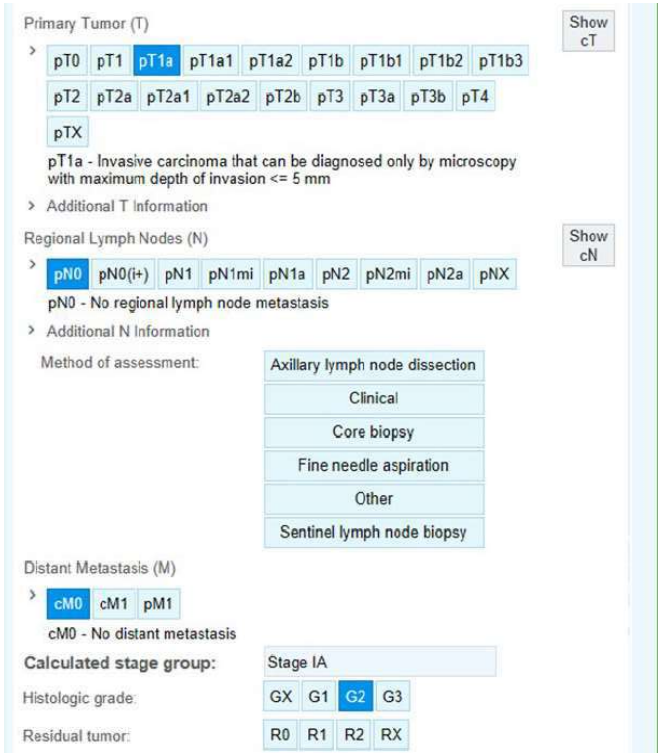
8th Edition - Protocol posted: 12/17/2021

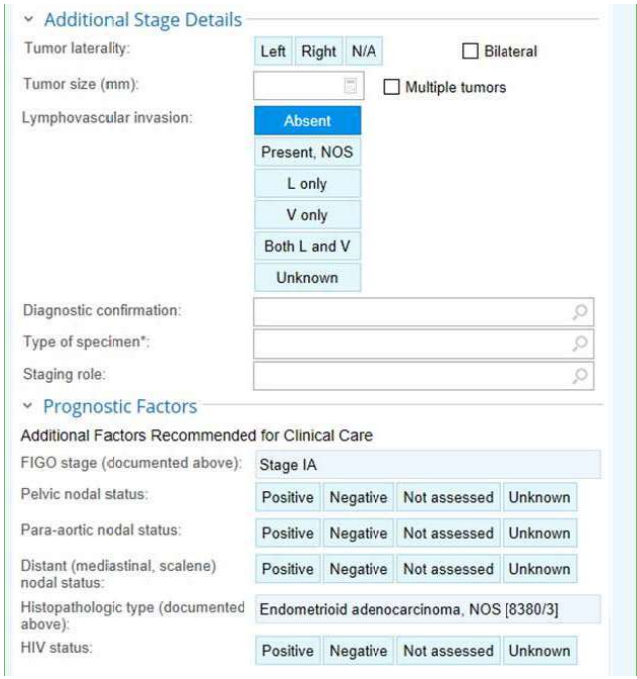
SPECIMEN	
Procedure	Total hysterectomy and bilateral salpingo-oophorectomy
Hysterectomy Type	Laparoscopic
Specimen Integrity	Intact
TUMOR	
Tumor Site	Endometrium
Tumor Size	Greatest Dimension (Centimeters): 8.0 cm
Additional Dimension (Centimeters)	5.4 cm 3.8 cm
Histologic Type	Endometrioid carcinoma, NOS No specific molecular profile (NSMP) endometrioid carcinoma
Histologic Grade	FIGO grade 2
Two-Tier Grading System	Low grade (encompassing FIGO 1 and 2)
Myometrial Invasion	Present
Depth of Myometrial Invasion	3 mm
Myometrial Thickness	20 mm
Percentage of Myometrial Invasion	15 %
Adenomyosis	Present, uninvolved by carcinoma
Uterine Serosa Involvement	Not identified
Lower Uterine Segment Involvement	Not identified
Cervical Stromal Involvement	Not identified
Other Tissue / Organ Involvement	Not applicable
Peritoneal / Ascitic Fluid	Not submitted / unknown
Lymphovascular Invasion (LVI)	Not identified
MARGINS	
Margin Status	All margins negative for invasive carcinoma
Closest Margin(s) to Invasive Carcinoma	Ectocervical / vaginal cuff
Distance from Invasive Carcinoma to Closest Margin	58 mm
REGIONAL LYMPH NODES	
Regional Lymph Node Status	All regional lymph nodes negative for tumor cells


MRN:
Code: Not on file (no ACP docs)
Pain Agreement: Not on File
Cancer Hx: Yes
Search
BestPractice A
MALIGNANT NEOPLASMS (1)
Malignant neoplasm of overlapping sites of cervix (HCC)
Unstaged
3
Other problems (1)
Create a stage for this problem
Hospital in
Lab (2)
1
MALIGNANT NEOPLASMS (1)
Malignant neoplasm of overlapping sites of cervix (HCC)
Unstaged
2
Other problems (1)
Start Review
None
Allergies will
ADD ORDER
Oncology History
Notes
4
Cancer Staging
Malignant neoplasm of overlapping sites of cervix (HCC)
Pathologic
New
5
Classification: Pathologic
Form: Cervix Uteri, AJCC 9th Edition
Update with Pathology Result
Choose From Available Results (1)
6
Cervix Uteri, AJCC Version 9
With additional FIGO staging content based on the FIGO Cancer


Copy from Pathology Result
Select a Pathology Result to Copy to Stage - Malignant neoplasm of overlapping sites of cervix (...
A
Collection Date
Body Site
Order Name
Associated Diagnosis
8/24/2022
Uterus
*SPECIMEN FOR SURGICAL...
Malignant neoplasm of overlap...
B
Results
*SPECIMEN FOR SURGICAL PATHOLOGY (Acc.#:S22-00032) (Order 211250098)
Patient
Case Report
Surgical Pathology Report
Case: S22-00032
Authorizing Provider: Brell, Joanna, MD
Collected:
C
Current Stage Value
Stage Value After Update
Primary Tumor (T)
pT1a
Regional Lymph Nodes (N)
pN0
FIGO Stage
Stage IA
Histologic grade
G2
Lymphovascular invasion
LVI not present (absent)/not identif...
Histopathologic type*
Endometrioid adenocarcinoma, NOS
Endometrioid adenocarcinoma, NOS
7
Copy
Cancel


Oncology History
Notes
This Visit
Cancer Staging
Malignant neoplasm of overlapping sites of cervix (HCC)
Pathologic
New
Classification: Pathologic
Form: Cervix Uteri, AJCC 9th Edition
FIGO Stage IA (pT1a, pN0, cM0)
Update with Pathology Result
Choose From Available Results (1)
Cervix Uteri, AJCC Version 9
With additional FIGO staging content based on the FIGO Cancer Report 2018
Stage date: 8/26/2022
Histopathologic type*: Endometrioid adenocarcinoma, NOS [8380/3]
Stage timing:
Initial diagnosis
Post-therapy
Recurrence/Progression
Autopsy
FIGO Stage
I IA IA1 IA2 IB IB1 IB2 IB3 II IIA IIA1 IIA2 IIB III
IIIA IIIB IIIC IIIC1 IIIC2 IV IVA IVB
IA - Invasive carcinoma that can be diagnosed only by microscopy with maximum depth of invasion <= 5 mm*
Additional FIGO Stage Information


Primary Tumor (T)
Show cT
pT0 pT1 pT1a pT1a1 pT1a2 pT1b pT1b1 pT1b2 pT1b3
pT2 pT2a pT2a1 pT2a2 pT2b pT3 pT3a pT3b pT4
pTX
pT1a - Invasive carcinoma that can be diagnosed only by microscopy with maximum depth of invasion <= 5 mm
Additional T Information
Regional Lymph Nodes (N)
Show cN
pN0 pN0(i+) pN1 pN1mi pN1a pN2 pN2mi pN2a pNX
pN0 - No regional lymph node metastasis
Additional N Information
Method of assessment:
Axillary lymph node dissection
Clinical
Core biopsy
Fine needle aspiration
Other
Sentinel lymph node biopsy
Distant Metastasis (M)
cM0 cM1 pM1
cM0 - No distant metastasis
Calculated stage group: Stage IA
Histologic grade: GX G1 G2 G3
Residual tumor: R0 R1 R2 RX


Additional Stage Details
Tumor laterality: Left Right N/A Bilateral
Tumor size (mm): Multiple tumors
Lymphovascular invasion:
Absent
Present, NOS
L only
V only
Both L and V
Unknown
Diagnostic confirmation:
Type of specimen*:
Staging role:
Prognostic Factors
Additional Factors Recommended for Clinical Care
FIGO stage (documented above): Stage IA
Pelvic nodal status: Positive Negative Not assessed Unknown
Para-aortic nodal status: Positive Negative Not assessed Unknown
Distant (mediastinal, scalene) nodal status: Positive Negative Not assessed Unknown
Histopathologic type (documented above): Endometrioid adenocarcinoma, NOS [8380/3]
HIV status: Positive Negative Not assessed Unknown


Additional Registry Data Collection Variables
P16 status: Positive Negative Not assessed Unknown
Supplementary Materials
Emerging Prognostic Factors for Clinical Care, Risk Assessment Models, and Recommendations for Clinical Trial Stratification
Prognostic Factor Comments
Treatment Planning and Staging Comments
References & Copyright Info
Sign
Sign & Accept
Save & Close
Cancel

Smaller Projects

Tracking Patients for Cancer Care Follow-up

- Thinking about follow-up care for patients who have a biopsy result positive for cancer
- Track patients with a positive biopsy result to see how many are being seen by an oncology service (medical, radiation, surgical)
- The report will look at patients with a positive biopsy
    - 6 months retrospectively to see how many were seen by an oncology service and how many patients were not
    - Look 2 months into the future to see how many have a scheduled appointment with an oncology service (radiation, medical, surgical)

Replacing Abbreviations in CBC

- Currently when a patient receives the results of a CBC the only components that are not abbreviated are Hemoglobin, Hematocrit, and Platelets. For all other components the patient see the abbreviations (i.e. RBC, WBC, MCV…)
- In order to create more patient friendly pathology reports we want to have these abbreviations spelled out. So all components of the CBC will have the abbreviation replaced with the non-abbreviated terminology.
- This is already being done for the lipid panel.
- Next steps would be to think about other labs that should have the external name not show an abbreviation (Thyroid function test, liver function test, etc…)

LOINC Mapping

- LIS is reviewing all offered labs to see how many of those do not have an associated LOINC code and looking at all unmapped LOINC codes to see which should be mapped (these two lists do not match up 100% of the time)
- Currently our procedure does not state that when a current test is changed (method, reagent, specimen source) or a new test is added a LOINC should be mapped
    - A new procedure is being written to include this important detail
    - This should help keep everything current and mapped going forward


Thank You!!!

MetroHealth

Clinical Informatics Fellowship In Review

Eric Kim, MD, PhD

6/14/2023

Biomedical Informatics Committee Meeting

Formal certifications

Epic certifications

- Physician builder
- Physician builder analytics
- Notecraft for physican builders
- Chronicles programmer

Clinical informatics certificate program

- Introduction to clinical research
- Health care information systems
- Computational biomedical informatics
- Healthcare finance

Track My Health: Consumer grade device integration

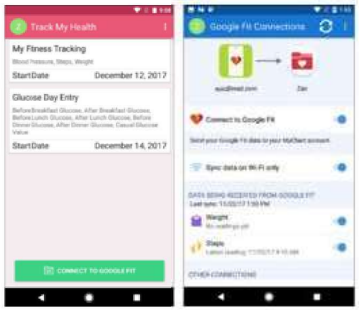
Consolidated into: MC105 MyChart Patient-Driven Monitoring

Apple HealthKit

- Height
- Weight
- Pulse
- Blood Pressure
- Step Count
- Blood Glucose
- Temperature
- Pulse Oximetry
- Peak Flow

Google Fit

- Height
- Weight
- Pulse
- Blood Pressure
- Step Count
- Blood Glucose
- Distance walking/running



Withings

- Weight
- Blood Pressure
- Pulse

Fitbit

- Steps
- Weight

MetroHealth

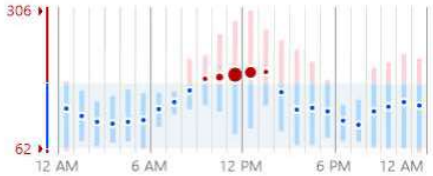
Track My Health: Detailed home biometry for clinical decision r

Health Trends: Details (Jul 6, 2022 - Today) | Back to overview

View past: 3 Months | Month | Week | Show Trend Line

Blood Glucose mg/dl · Last 1463 values. More values exist.

Range: 70 - 180 (80%)



148
Mean

Last 1463 values by hour.

Number of values ≥200: 211
Standard deviation: 47
Estimated HgbA1C (%): 6.77

Jul 31, 22 10:47 AM - Aug 1 11:07 AM		Aug 1, 22 11:12 AM - Aug 2 11:32 AM		Aug 2, 22 11:37 AM - Aug 3 11:57 AM		Aug 3, 22 12:02 PM - Aug 4 12:22 PM		Aug 4, 22 12:27 PM - Aug 5 3:47 PM	
7/31	10:47 AM 264	8/1	11:12 AM 238	8/2	11:37 AM 219	8/3	12:02 PM 160	8/4	12:27 PM 153
	10:52 AM 266		11:17 AM 238		11:42 AM 217		12:07 PM 159		12:32 PM 154
	10:57 AM 265		11:22 AM 239		11:47 AM 216		12:12 PM 158		12:37 PM 155
	11:02 AM 263		11:27 AM 237		11:52 AM 215		12:17 PM 158		12:42 PM 158
	11:07 AM 266		11:32 AM 236		11:57 AM 215		12:22 PM 158		12:47 PM 153
	11:12 AM 269		11:37 AM 235		12:02 PM 217		12:27 PM 157		12:52 PM 154
	11:17 AM 271		11:42 AM 237		12:07 PM 215		12:32 PM 156		12:57 PM 166
	11:22 AM 266		11:47 AM 240		12:12 PM 211		12:37 PM 156		1:02 PM 166
	11:27 AM 261		11:52 AM 241		12:17 PM 210		12:42 PM 157		
	11:32 AM 262		11:57 AM 241		12:22 PM 208		12:47 PM 159		

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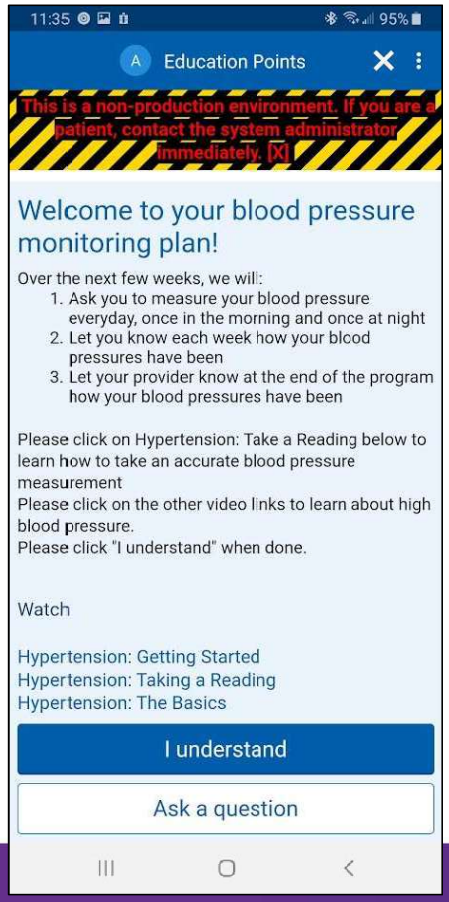
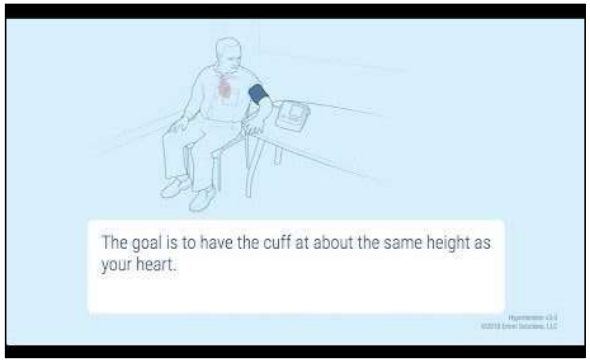
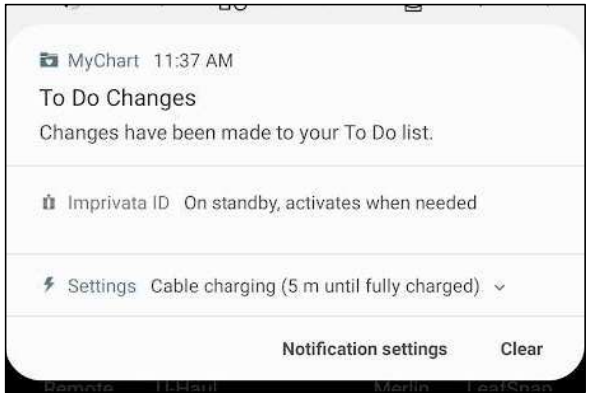
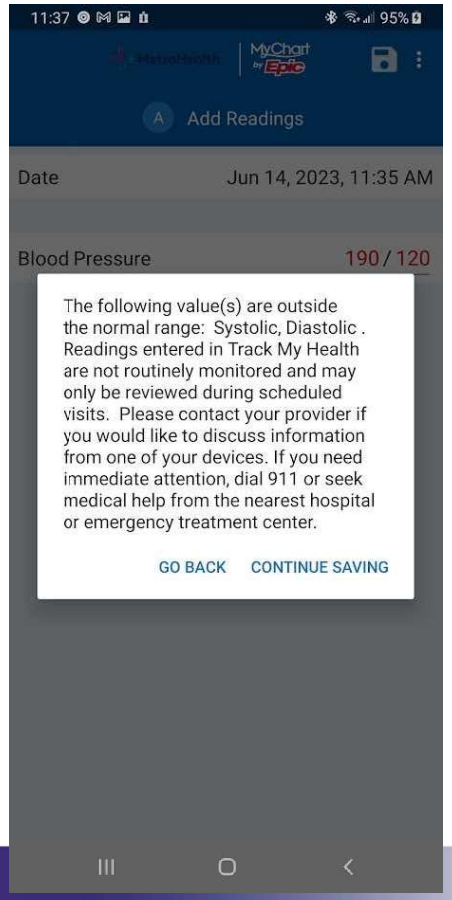
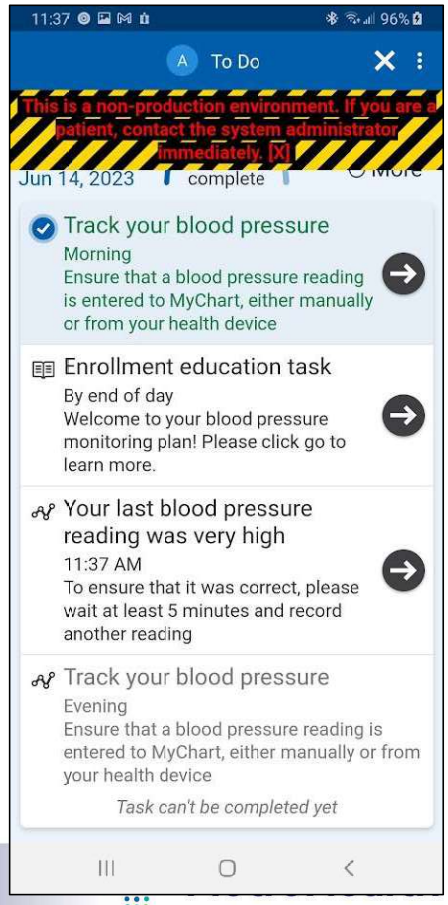
Hypertension Care Companion: Patient facing virtual care



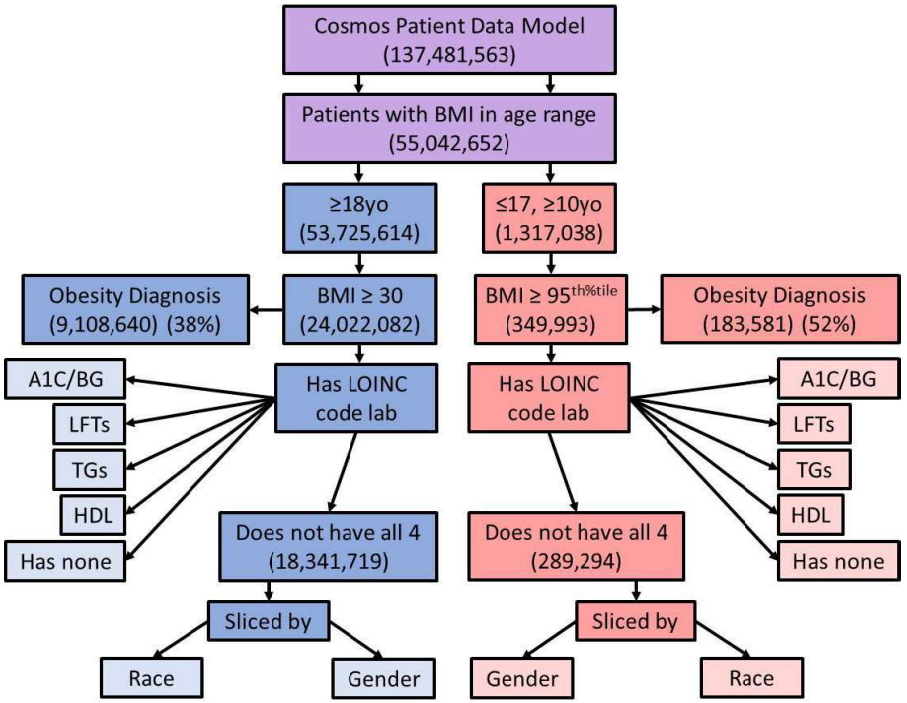








COSMOS: Metabolic syndrome screening in pediatric patients

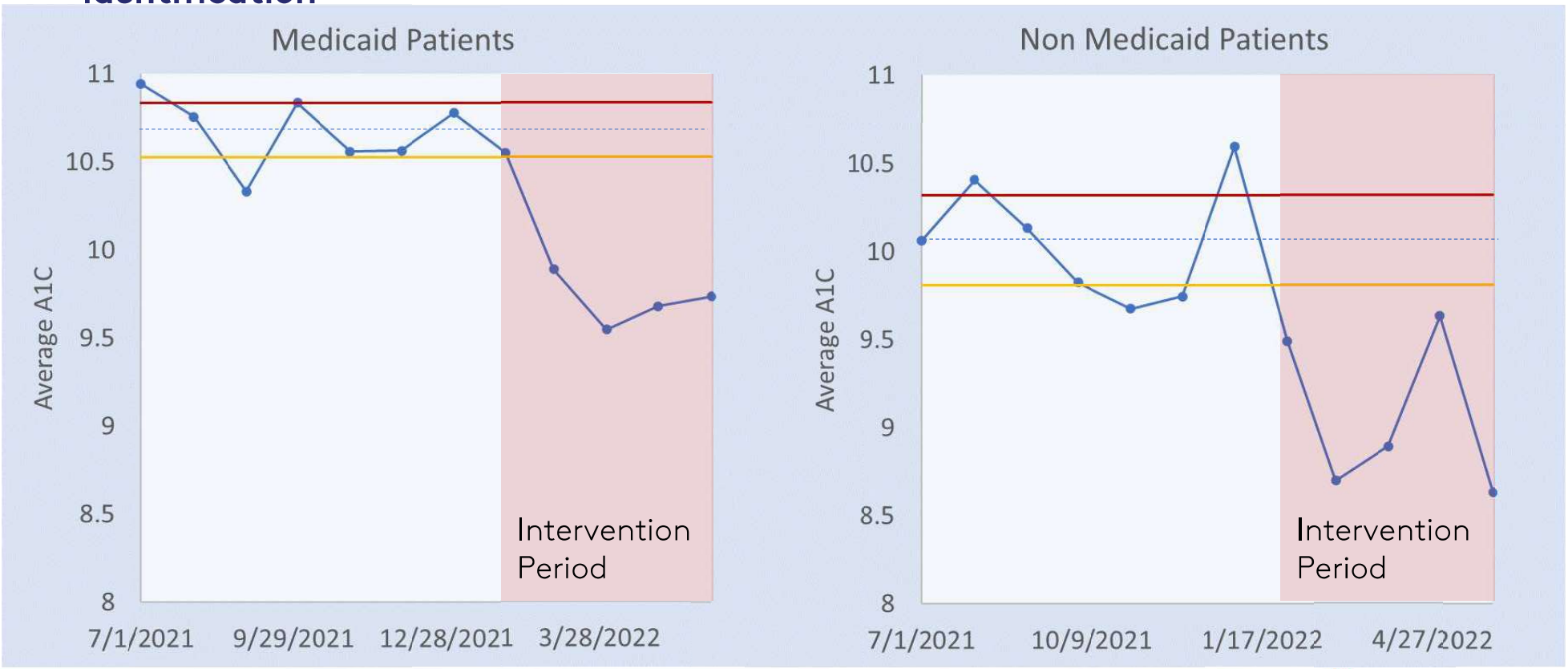


Characteristic	Adult	Pediatric
BMI consistent with obesity	45% (24,022,082/53,725,614)	27% (349,993/1,317,038)
Obesity BMI with diagnosis of obesity	38% (9,108,640/24,022,082)	52% (183,581/349,993)
Among patients with BMI in obese range		
HDL performed	40% (9,676,508/24,022,082)	28% (97,943/349,993)
TG performed	42% (10,000,474/24,022,082)	28% (98,367/349,993)
Fasting BG or A1C performed	36% (8,614,323/24,022,082)	27% (94,790/349,993)
LFTs performed	55% (13,245,496/24,022,082)	33% (115,045/349,993)
Without all 4 metabolic syndrome labs performed	76% (18,341,719/24,022,082)	83% (289,294/349,993)
With no metabolic syndrome labs performed	36% (8,674,884/24,022,082)	59% (204,788/349,993)

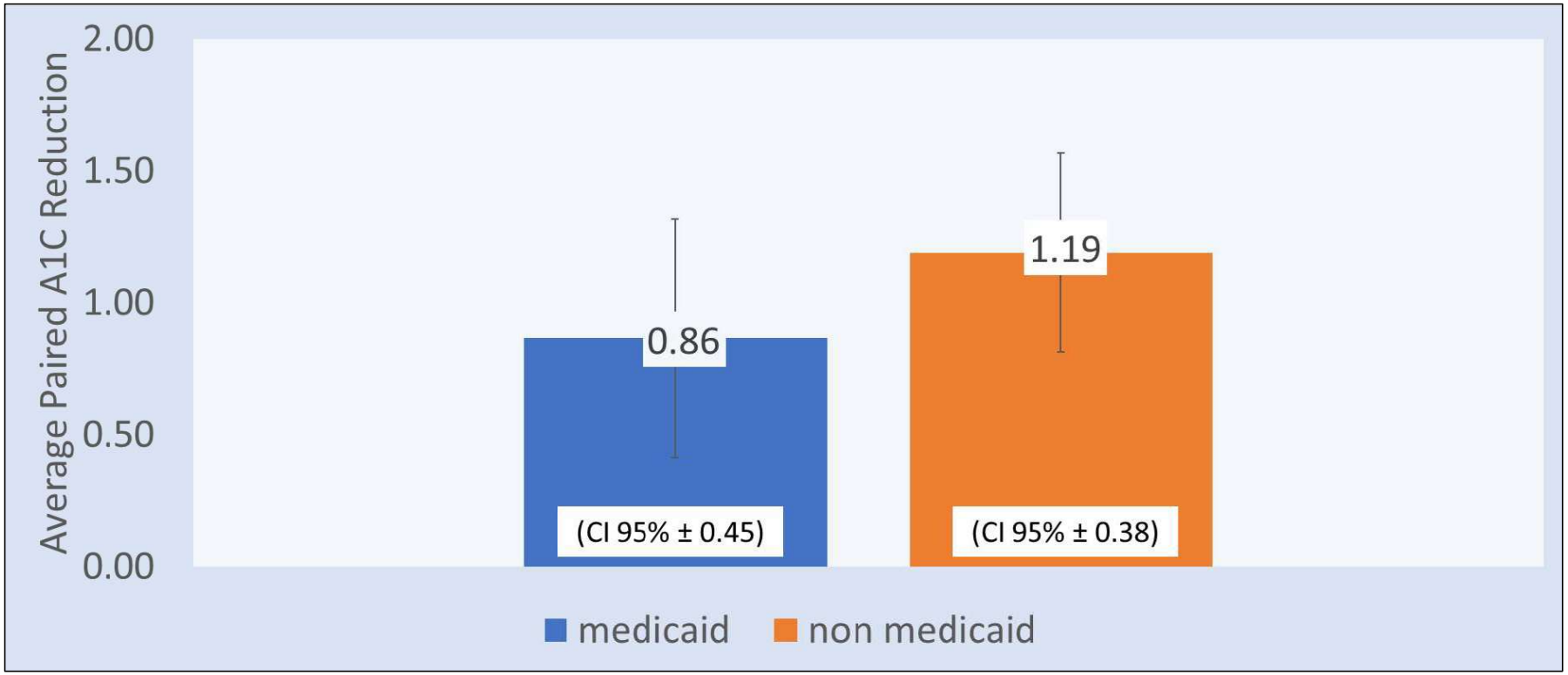
Characteristic	Adult	Pediatric
Meeting 3+ of 5 criteria for metabolic syndrome diagnosis	31% (7,603,048/24,317,964)	3% (34,364/1,063,952)

Kim EG, Kaelber DC. Phenotypic prevalence of obesity and metabolic syndrome among an underdiagnosed and underscreened population of over 50 million children and adults. Front Genet. 2022;13:961116. Published 2022 Sep 6. doi:10.3389/fgene.2022.961116

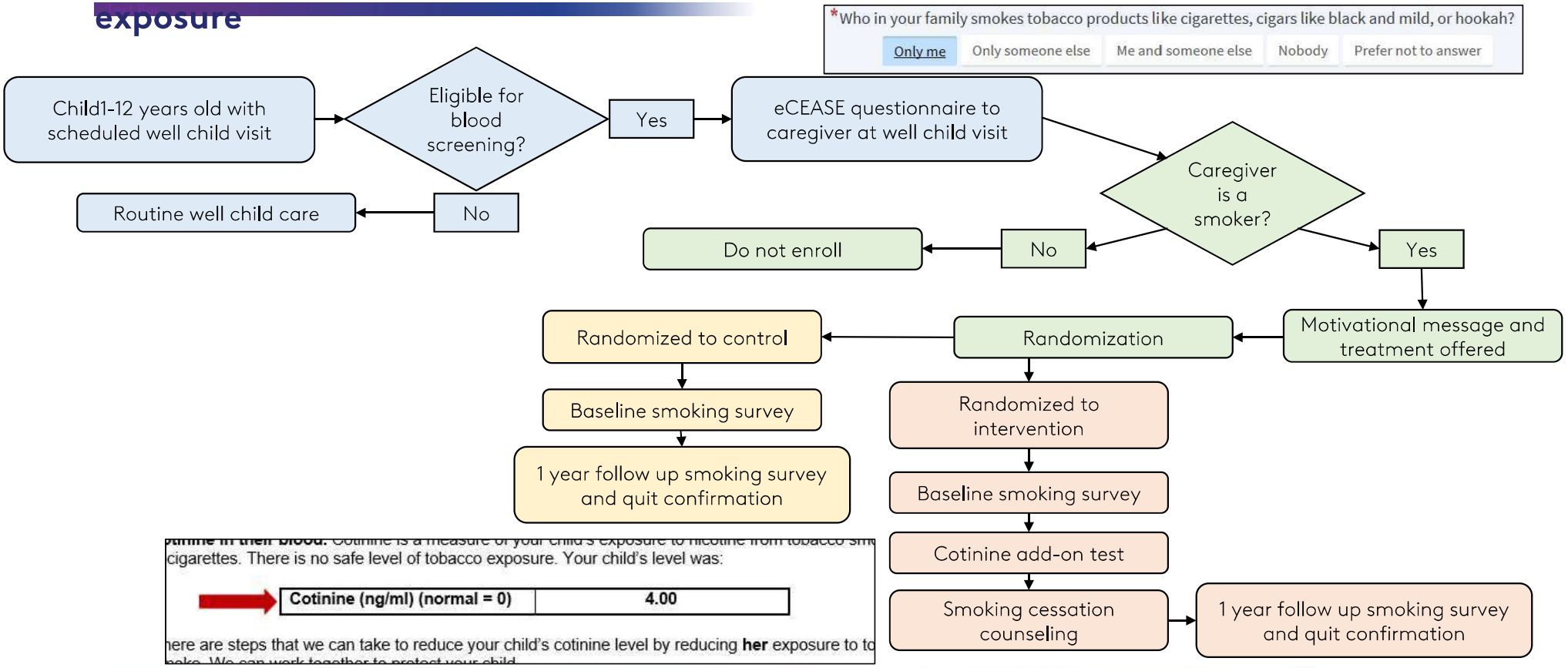
Diabetic Outreach: Ohio City Clinic diabetic care outreach and barriers identification



Diabetic Outreach: Paired A1C reduction in Medicaid vs non Medicaid patients



ABC Quit Study: Using biological nicotine screening to reduce pediatric smoke exposure



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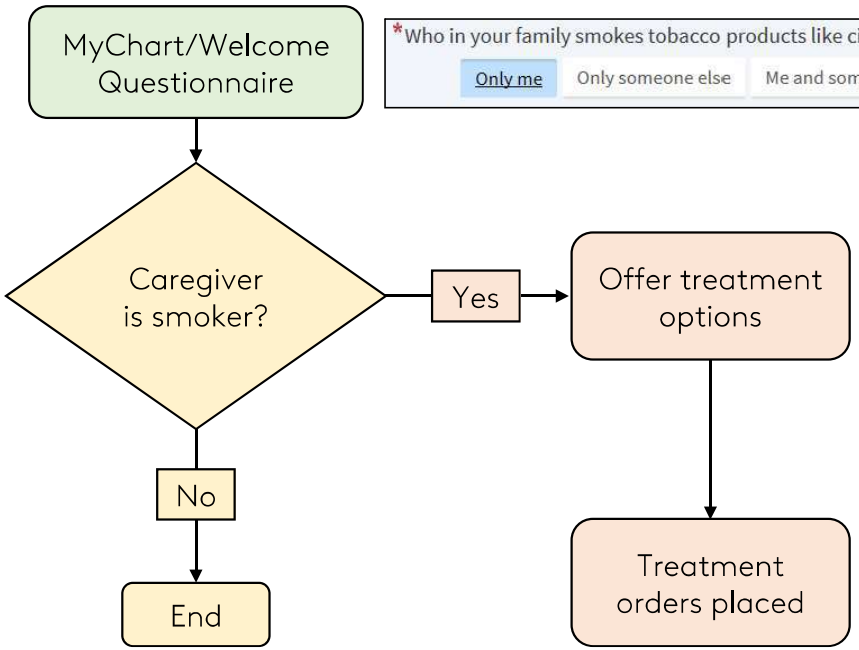
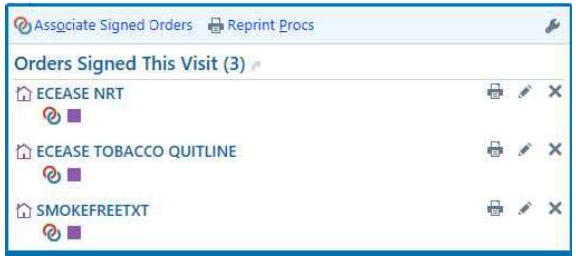
ABC Quit Study: eCEASE system for identification and treatment of caregiver smoking





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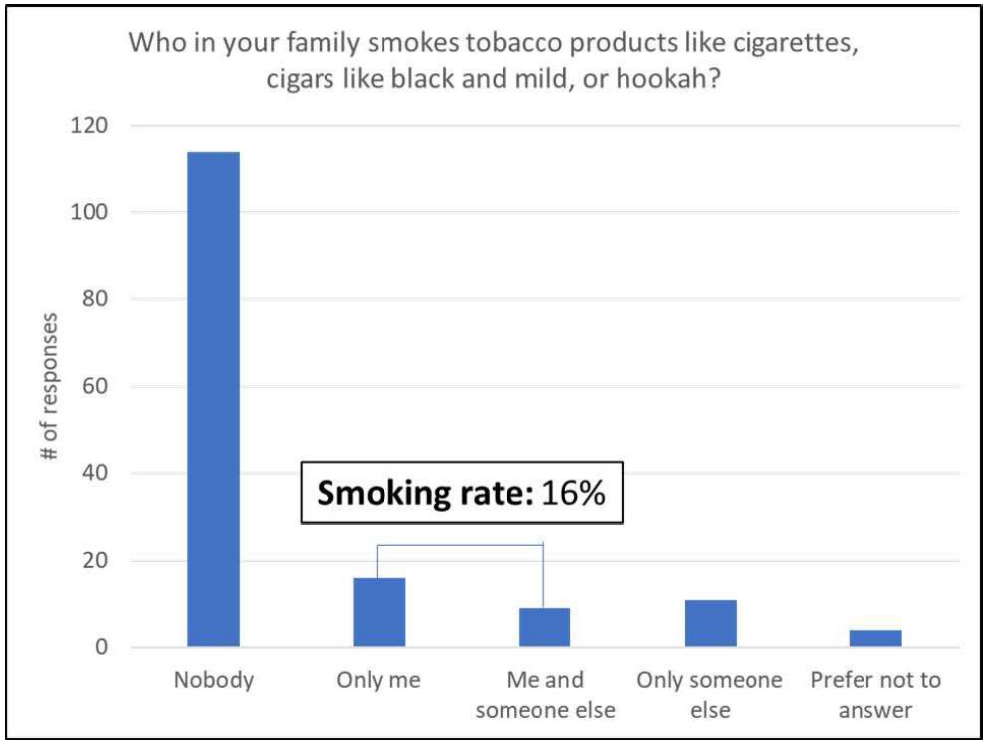
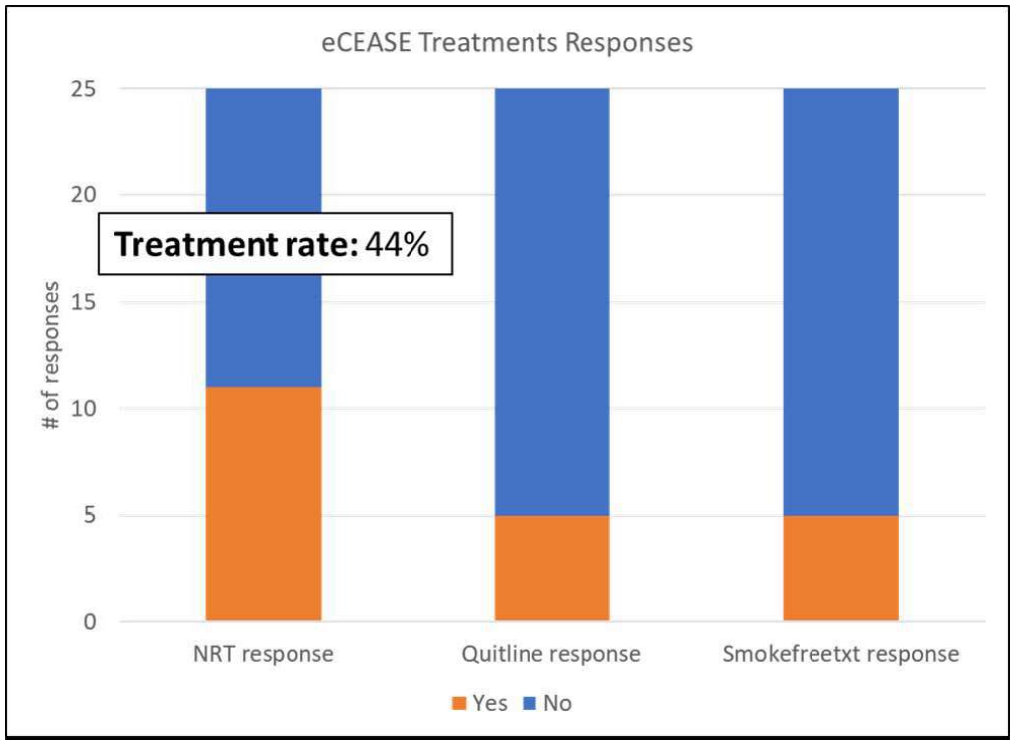
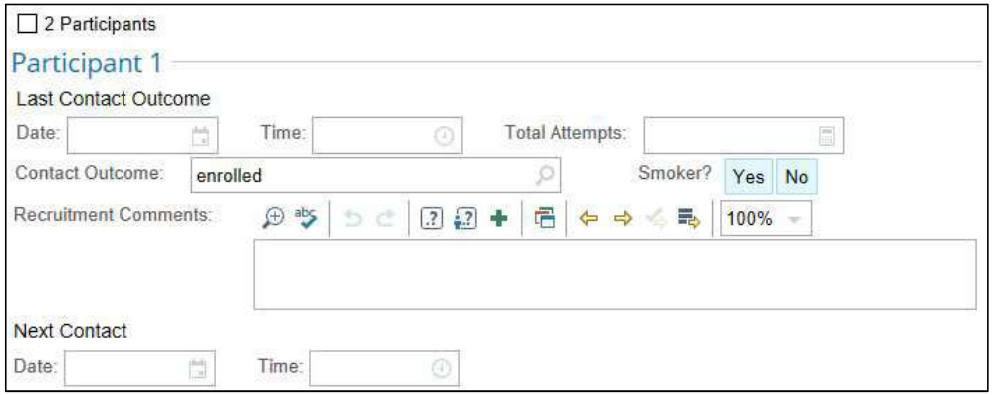
ABC Quit Study: eCEASE utilization



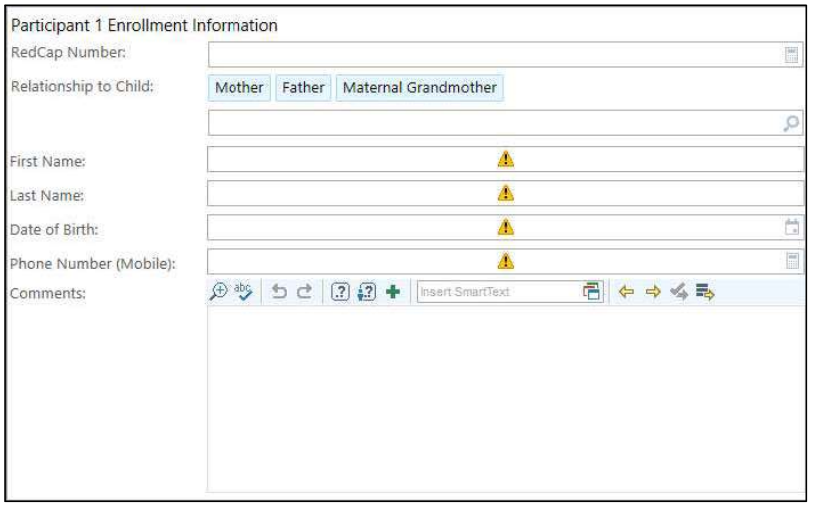


ABC Quit Study: Recruitment outreach tracking and organization

Outreach tracking SmartForm



Participant enrollment SmartForm



Reporting workbench report to drive coordinator workflow

Patient	RSH Start	Study Branch	CBC Order?	Last Hgb	Cotinine Order?	Last Cotinine	Phone	Next Date	Next Time	Last Date	Last Time	Smoker?	# Attempts	Last Outcome	Rec Comments
Test, Amy	03/28/2023	CEASE + BIO		02/21/2022	yes	03/21/2023	888-222-3636	05/28/2023	12:01 PM	05/26/2023	9:00 AM	no	2	enrolled	Test rec
Test, Another	02/08/2023	CEASE + BIO			yes	02/07/2023	216-444-4444						2		

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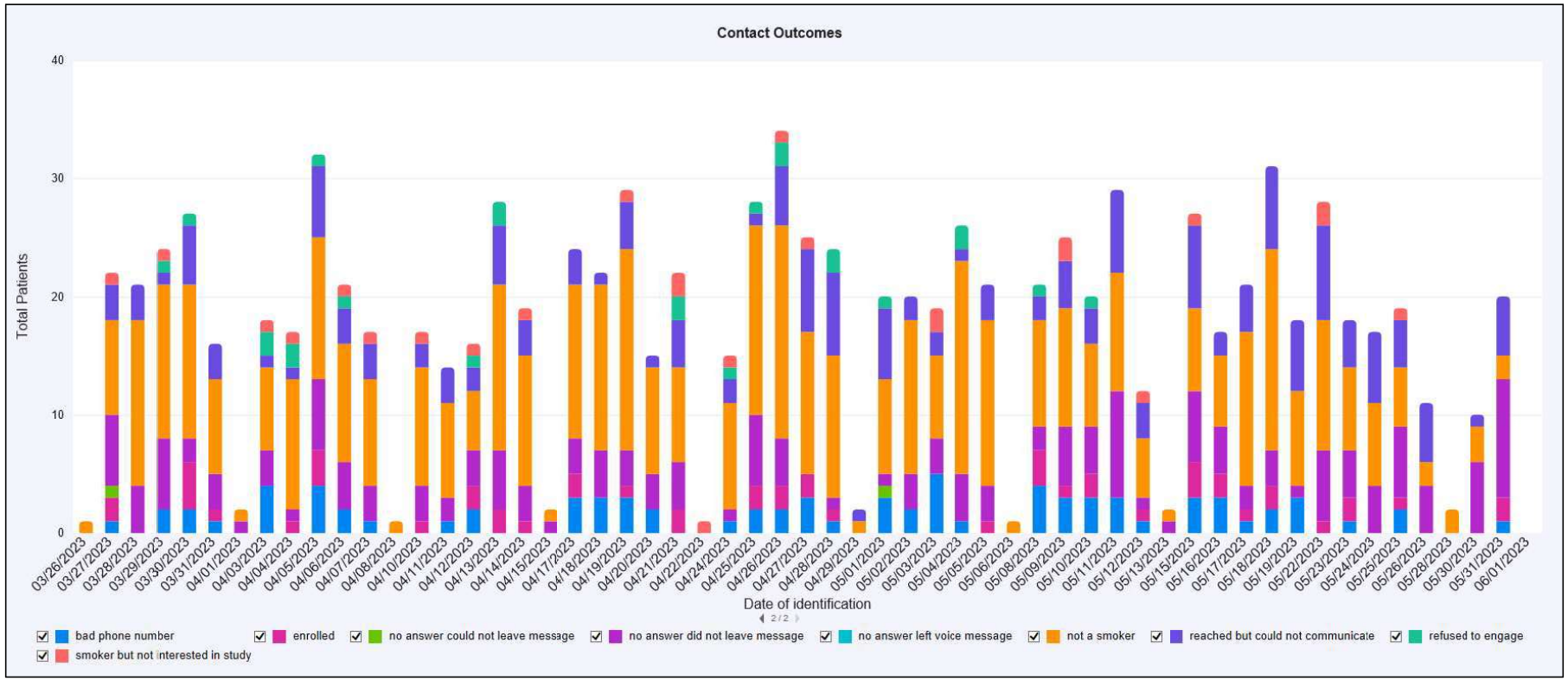
ABC Quit Study: Recruitment outreach reporting

Text Box



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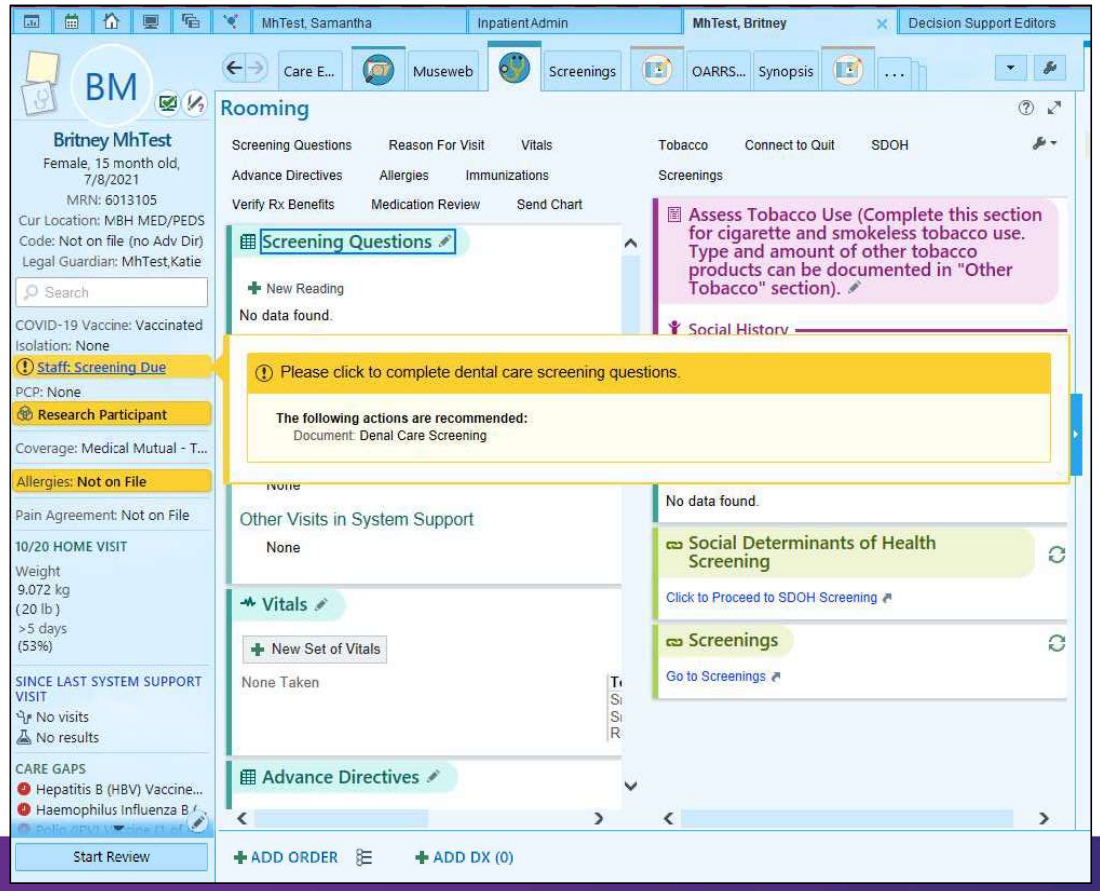
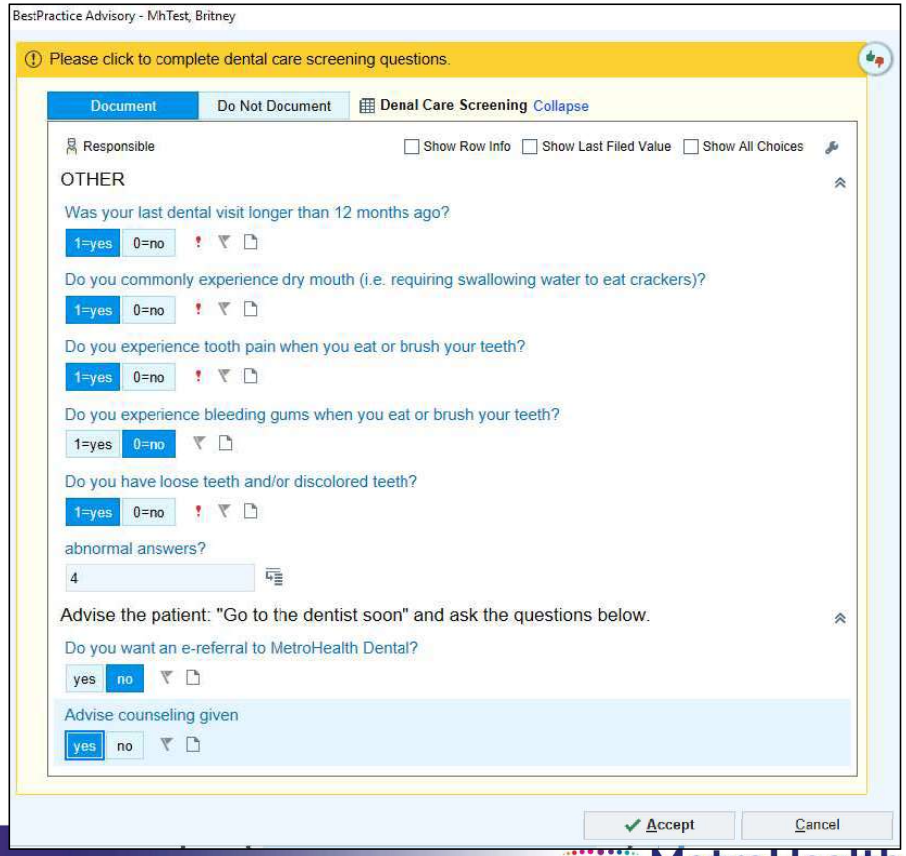
Oral health in primary care study: Staff based screening with referral





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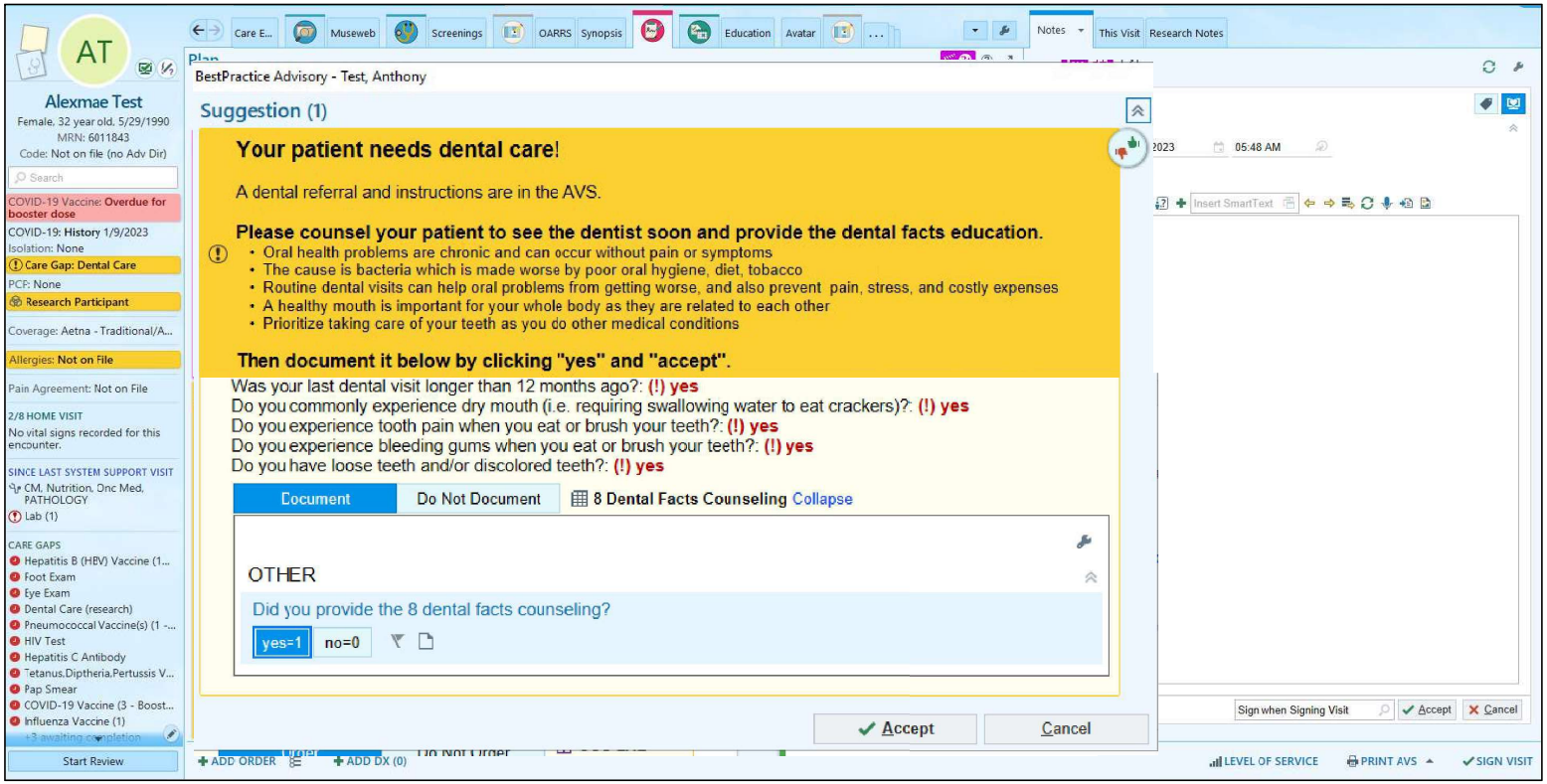
Oral health in primary care study: Provider based education



Nelson S, Kim EGR, Kaelber DC. Integrating Oral Health into Primary Care: Perspectives for Older Adults [published online ahead of print, 2023 Apr 21]. J Dent Res. 2023;220345231165011. doi:10.1177/00220345231165011

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To the future!

Director of Informatics - Virtual Care Enterprise

- Telemedicine
- Care Companion for maternity, track my health, patient education
- Hello World
- Virtual Chronic Disease Management and Hospital in the Home
- Equity in digital care!

Research informatics

- Continuing support to the PARTICS Implementation Project, Oral Health in Primary Care Project, and NIDA Project
- Recruitment outreach tracking
- Lab information systems automated line
- Clinical decision support for research
- Disparities in digital care!

Thank you so much for everything!

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