

Tracking of Abnormal Cervical Cancer Screening Results: Creating an Electronic Health Record-Based Tool

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*Improving Lives Through the Prevention & Treatment
of Anogenital & HPV-Related Diseases*

ASCCP2018 Annual Meeting

Disclosures

- Merck: Gardasil 9 vaccine vials (drug only) for research study

Overview

- Cervical cancer screening and surveillance challenges
- Study objective
- Methods
- Review of current state practices and resources
- New tools and support measures developed
- Preliminary process outcomes
- Future goals

Background

- Cervical cancer screening and management guidelines recommend follow up of most abnormal results for 2 or more years
- Guideline-based management of abnormal results can become complicated and nuanced
- Screening and surveillance tests are performed in a variety of settings including internal medicine, family medicine, or ob/gyn practices
- Inadequate follow-up can be common, particularly in populations at high risk for cervical cancer

Peterson et al. 2003, Leyden et al. 2005.

Surveillance Challenges at the System Level

- Variable processes exist to track patients with abnormal cervical cancer screening and/or cervical dysplasia requiring surveillance
- Surveillance tracking processes vary in convenience, effectiveness, and time commitment
- Paper logs do not provide a substantial safety net in the larger clinical setting

Dupais et al. 2010

Our Objective

To develop an electronic tracking system and associated workflow for patients with abnormal cervical cytology or cervical dysplasia in order to have a robust safety net for cervical cancer screening and prevention and to reduce the potential for loss to follow up.

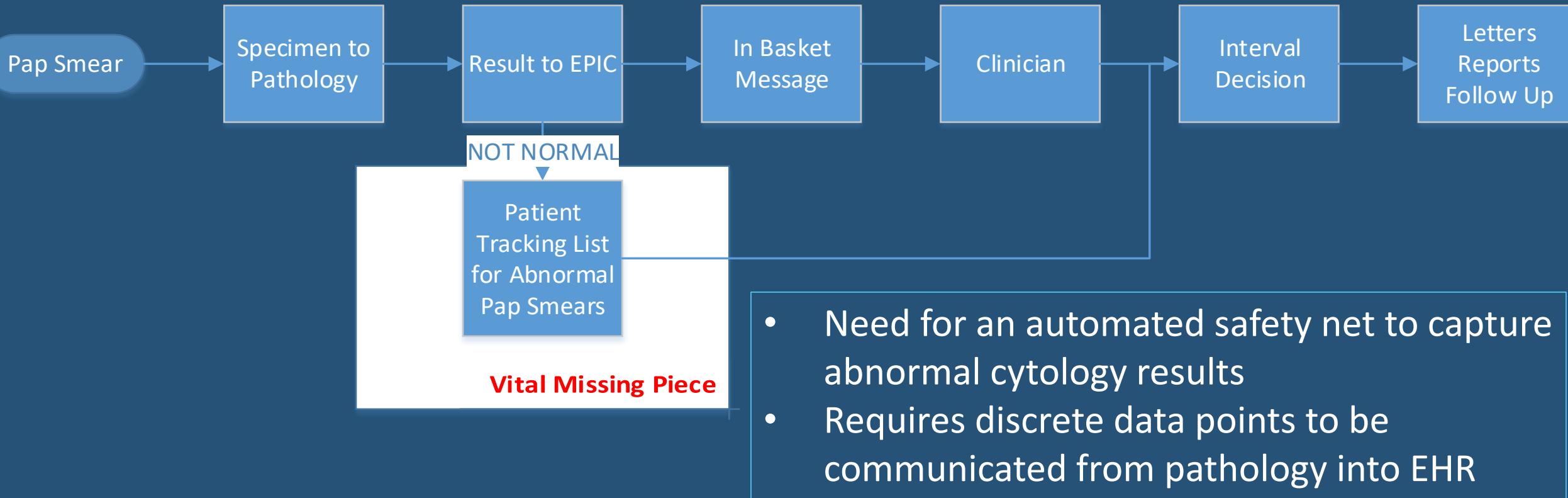
Methods

- Utilize Yale New Haven Hospital's (YNHH) Clinical Redesign efforts
- Bring a multidisciplinary group of stakeholders to the table:
 - Ob/gyn clinicians and nurses from several settings/practices
 - Internal medicine clinicians
 - Pathology
 - YNHHS Joint Data Analytics Team (JDAT)
 - Electronic health records (EPIC) analysts
 - YNHH Internal Consulting Group (ICG)
- Weekly team meetings over 9 months (Oct 2016- June 2017)

Methods

- Develop current state process maps with direct observation and interviews
- Multidisciplinary input and brainstorming on critical needs and potential tools/resources that exist and/or need to be developed to address the critical needs
- Develop and/or refine tools leveraging health information technology
- Create new process maps and procedures to integrate new tools
- Disseminate through education, outreach, stakeholder engagement

Current State and Critical Needs



Identification of Existing Resources

- Health Maintenance section of EHR
- Workbench Reporting functions of EHR

EPIC Systems Corporation (Verona, Wisconsin)



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Health Maintenance (HM)

Health Maintenance ? Close X

[Postpone](#)
[Remove Postpone](#)
[Override](#)
[Remove Override](#)
[Document Past Immunization](#)
[Exclude](#)
[Edit Frequency](#)
[Edit Modifiers](#)
[Report](#)
[Update HM](#)
More ▾

!! New data from outside sources are available for reconciliation. Health Maintenance topics may not be up-to-date.

Reconcile outside data on the chart. [Medications](#)

Due Date	Topic	Frequency	Date Completed			
8/1/2013	Tetanus adult (Td q 10, TDAP once)	10 year(s)				
8/1/2017	Influenza vaccine	1 year(s)	11/8/2016	12/15/2015		
5/19/2018	Chlamydia screening	1 year(s)	5/19/2017	5/19/2017	12/2/2016	12/2/2016
12/22/2020	Cervical cancer screening (Pap Smear)	3 year(s)	12/22/2017	11/8/2016 (Done)		
Completed	HIV screening	Once	6/3/2015			
Completed	HPV vaccine series	Sequential	11/22/2016	8/4/2015	6/3/2015	

Health Maintenance Plans

- Cervical cancer screening, 21-64, 3 yr
- Chlamydia screening, Female 17-24 years
- HIV screening
- HPV vaccine series
- Influenza vaccine >= 18 years
- Tetanus adult 10 yr

Status Legend

- Overdue
- 📅 Due On
- 🕒 Due Soon
- ↻ Postponed

Definitions

- Completed Done with the required satisfactions
- Addressed Overridden with the intention of not completing the topic
- Aged Out No longer eligible based on patient's age to complete this topic
- Excluded Patient marked as never due for this topic

Workbench Reports

My Reports

My Favorite Reports

Folders

HAR	MRN	Name	Pt Clas	Unit	Room
500000263	MR3863291	Zzrhbmaster, Perry	npatien	Sp 52	TRN HB POOL ROOM
500000684	MR3863314	Zzrhbmaster, Samantha	npatien	Sp 52	TRN HB POOL ROOM
500001493	MR3866774	Zzadtmaster, Robertanimal	npatien	Sp 51	YNH ADT MED SURG POOL 1
500010596	MR3870502	Restaurants, Perryone	npatien	Sp 52	TRN HB POOL ROOM
500010600	MR3870503	Restaurants, Perrytwo	npatien	Sp 52	TRN HB POOL ROOM
500010604	MR3870504	Restaurants, Perrythree	npatien	Sp 52	TRN HB POOL ROOM
500010608	MR3870505	Restaurants, Perryfour	npatien	Sp 52	TRN HB POOL ROOM
500010612	MR3870506	Restaurants, Perryfive	npatien	Sp 52	TRN HB POOL ROOM

Create

VNHH Uncoded IP Accounts By Coding Status [12910]

Criteria Display Appearance Summary Print Layout General

Find Hospital Accounts

Filter criteria + Add Enter Search Values Info

Account Class	Relationship	Account Class
1		

Account Class
 Billing Status
 Account Base Class
 Service Area
 Location
 Financial Class
 Total Charges
 Primary Service
 Admission Date
 Inpatient Admission Date
 Discharge Date
 Coder
 Coding Status

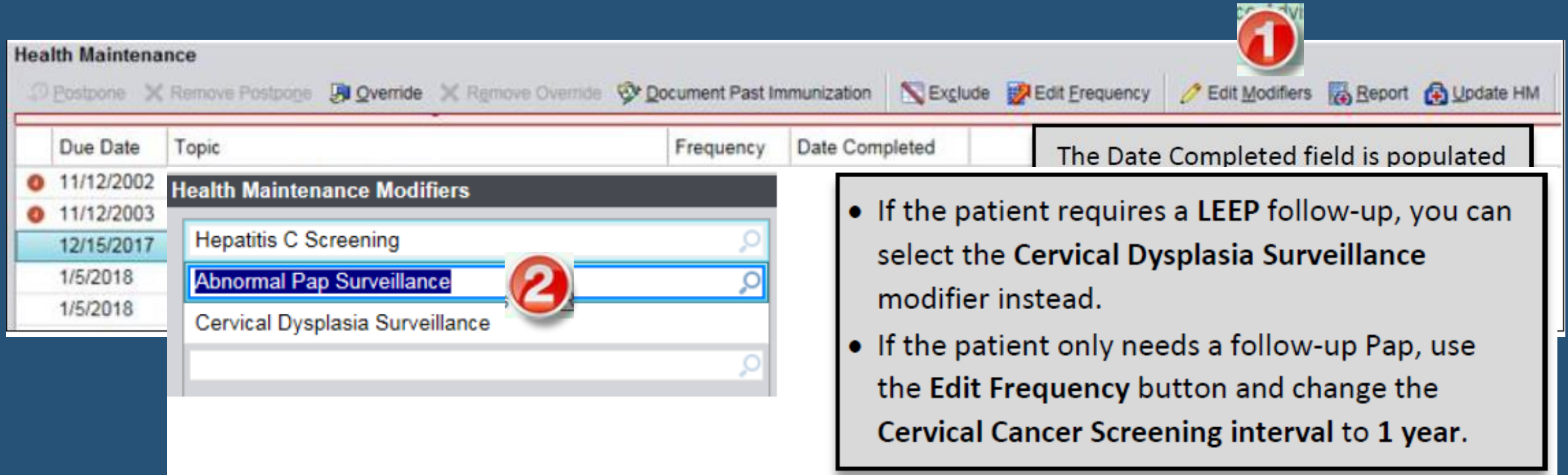
And Or

Find [Hospital Accounts](#) with
 Billing Status:
 Discharged/Not Billed [3]
 AND Account Base Class:
 Inpatient [1]
 AND Location:
 GH PARENT HOSPITAL [10400]

Notify Run Save Save As Restore Close

Tools Developed

- Health Maintenance Modifiers



The screenshot shows a software interface for Health Maintenance. At the top, there are several action buttons: Postpone, Remove Postpone, Override, Remove Override, Document Past Immunization, Exclude, Edit Frequency, Edit Modifiers, Report, and Update HM. A red circle with the number 1 is positioned above the 'Edit Modifiers' button.

Due Date	Topic	Frequency	Date Completed
11/12/2002			
11/12/2003			
12/15/2017			
1/5/2018			
1/5/2018			

The Date Completed field is populated

Health Maintenance Modifiers

- Hepatitis C Screening
- Abnormal Pap Surveillance** (marked with a red circle with the number 2)
- Cervical Dysplasia Surveillance

- If the patient requires a LEEP follow-up, you can select the **Cervical Dysplasia Surveillance** modifier instead.
- If the patient only needs a follow-up Pap, use the **Edit Frequency** button and change the **Cervical Cancer Screening interval to 1 year.**

Tools Developed

Health Maintenance ? Close X

[Postpone](#) [Remove Postpone](#) [Override](#) [Remove Override](#) [Document Past Immunization](#) [Exclude](#) [Edit Frequency](#) [Edit Modifiers](#) [Report](#) [Update HM](#) [More](#)

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Tools Developed

- Health Maintenance Modifiers

Health Maintenance

Postpone Remove Postpone Override Remove Override Document Past Immunization Exclude Edit Frequency Edit Modifiers Report Update HM

Due Date	Topic	Frequency	Date Completed
11/12/2002	Abnormal Pap Surveillance (colpo)	Once	
11/12/2003	Pneumococcal Vaccine 19-64 Medium Risk (1 of 1 - PP...	Sequential	
12/15/2017	Abnormal Pap Surveillance (cervical cancer screening)	1 year(s)	12/15/2016
1/5/2018	Lung Cancer Screening	1 year(s)	1/5/2017 (Done) 12/29/2014 (Done)
1/5/2018	Tuberculosis screening	1 year(s)	1/5/2017 (Done) 1/23/2015 (Done)

The Date Completed field is populated automatically by the system once the test has been resulted in Epic.

Tools Developed

- Customized Workbench Reporting

MRN	Patient	DOB	Age	Sex	Encounter	Prov	PCP	Phone	Cervical Cancer Screening Due Status	Cervical Tracking Date	Cervical Tracking Result	Abnormal Pap Modifier	Cervical Dysplasia Mo
									✓	3/6/18	Non-Tracking		
									✓	2/28/18	Non-Tracking		
									✓	2/8/18	Non-Tracking		
									✓	2/6/18	Non-Tracking		
									✓	2/1/18	Non-Tracking		
									✓	1/31/18	Non-Tracking		
									✓	1/31/18	Non-Tracking		
									✓	1/31/18	Non-Tracking		
									✓	1/31/18	Non-Tracking		
									✓	1/31/18	Non-Tracking		

Tools Developed

- Customized Workbench Reporting

Filters Options Chart Orders Only Encounter Refill Telephone Letter Research Studies Generate Letters HM Modifiers Add to List Send Patients Message Send Staff Message Send Bulk Communication More

Detail Reg Category Refresh Selected

Abnormal Pap Modifier	Cervical Dysplasia Modifier	High Risk HPV Screening	HPV 16/18 Genotyping	Next Colpo/LEEP	Colpo Due Status	LEEP Due Status	My Sticky Note	Pap Smear Due Date	Last Pap addressed
Y		Tracking	Not Applicable	10/01/2018	✓			03/19/2019	03/19/2018
	Y	Tracking	Tracking	06/26/2018		✓		08/05/2018	02/05/2018
Y		Tracking	Not Applicable	05/18/2018	🔄			01/09/2019	01/09/2018
Y		Tracking	Not Applicable	05/04/2018	🔄			01/26/2019	01/26/2018
Y		Tracking	Non-Tracking	04/23/2018	🔄			01/29/2019	01/29/2018
	Y	Non-Tracking	Not Applicable	04/17/2018		🔄		03/05/2019	03/05/2018
Y		Tracking							01/02/2018
Y		Non-Track							01/11/2018
Y		Tracking							01/08/2018

Health Maintenance Recent/Upcoming Visits

Next Visit

Date & Time: 2/12/2018 3:20 PM

Provider: [Redacted]

Department: Primary Care Clinic - Women's Center

Recent Appointments

Date	Time	Status	Provider	Department	Type	Appt Notes
5/22/2018	3:30 PM	Sch	[Redacted]	APC	Pap	2 mo flu
4/17/2018	11:10 AM	Sch	COLPO / LEEP	WOMENS CEN	COLPOSCOPY	Post op appointment, Colpo/LEEP
3/29/2018	2:30 PM	Sch	[Redacted]	PRE ADM TEST	PAT	sx 4/3
3/19/2018	1:40 PM	Comp	[Redacted]	WOMENS CEN	COLPOSCOPY	results
3/5/2018	1:40 PM	Comp	[Redacted]	WOMENS CEN	COLPOSCOPY	colpo - CIN II

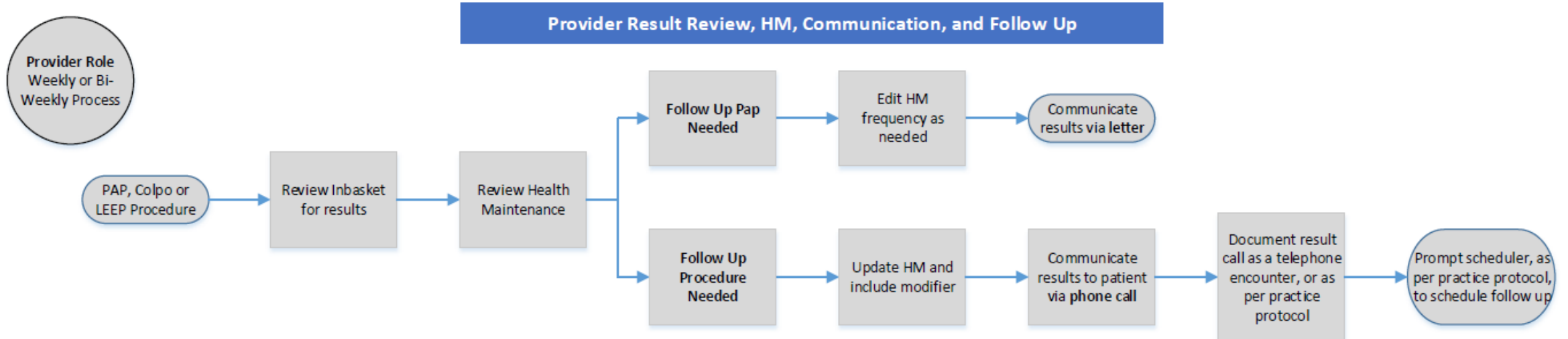
Health Maintenance Recent/Upcoming Visits

Abnormal Pap Surveillance (cervical cancer screening)	Next Due	Status	SmartData
	8/5/2018	Done	SmartData: LEEP PERFORMED
	2/5/2018	Done	SmartData: COLPO PERFORMED
	1/26/2018	Done	Cytology Gyn Cases
	1/12/2018	Done	

Supporting Measures

- Updated Process Map to incorporate use of the new EPIC-based tools

Pap Tracking Workflow



Supporting Measures

- Development of “Standard Operating Procedures” to guide processes and procedures around management and communication of cervical cancer screening results

Procedure	Responsible Party	Mode of Contact	Documentation
1. Normal Result for Routine Screening (Normal and low grade abnormal, not requiring Colpo or LEEP)	Provider	Letter to Patient (min) or Phone call (At discretion)	Visit Note (letter) Telephone encounter (call)
	Operations	Extenuating Circumstances	
	Send letter to PFAS via Inbasket message. PFAS to mail letter.	N/A	
Procedure	Responsible Party	Mode of Contact	Documentation
2. Abnormal Result (Requiring Colpo or Leep)	Provider	Phone call	Telephone encounter (document each individual attempt up to 3x)
	Operations	Extenuating Circumstances	
	Notify scheduler to contact for follow-up via inbasket message.	If unable to contact patient, engage an outreach worker and document attempt to engage outreach.	

Process Outcomes following Rollout

Month (n = abnml results)	HM Updated + Follow up Scheduled	No HM Updated / Follow up Scheduled	HM Updated / No Follow up	No HM Updated / No Follow Up
Month 1 (n=55)	58%	29%	7%	3.6%
Month 2 (n=41)	71%	17%	5%	7.3%
Month 4 (n=67)	77%	13.4%	1.5%	6%
Month 6 (n=50)	70%	22%	2%	6%

Lessons Learned

- Challenges of integrating different data sources and working with text based data
- A multidisciplinary approach is essential in development of tools requiring health IT
- EHR can provide tools but skilled personnel required to utilize tools and develop a routine process to leverage value of tools
- Importance of clinician feedback based on workbench report reviews to facilitate quality improvement

Future Goals

- Development of a Dashboard embedded in EHR to facilitate evaluation of tracking system, its utilization and impact
- Utilization of additional features of the Workbench Reports such as bulk communications to patients and tracking patient outreach
- Expanded dissemination and support for new tracking system across health system and affiliated practices
- Adaptation of tracking system model for other specialties

Summary

- Creation of a Clinical Redesign Team to improve tracking and loss of follow up of patients with abnormal cervical cancer screening results
- Design of an EHR-based tracking system that provides a safety net:
 - Health Maintenance modifiers
 - Pathology discrete data elements
 - Workbench reports
- Additional quality improvement features such as SOP and process map
- Enhanced communication amongst clinicians across health system

Acknowledgements

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- Rodion Rathbone, MD
- David Liu
- Brian Daley
- Karen Otterson, MSN, RN
- Nancy Busch, MA, RN

References

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3. Leyden WA, Manos MM, Geiger AM, et al. Cervical cancer in women with comprehensive health care access: attributable factors in the screening process. *Journal of the National Cancer Institute* 2005;97:675-83.