

# Improving EKG Monitoring on the Inpatient Psychiatric Unit

Radu Iliescu MD, Samuel Sheffield MD, Jennifer Leavitt MD, Asia Peek MD MBA MPH, Joonhee Cho MD, Elizabeth LaSalvia MD, Rohn Friedman MD

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## Introduction/Problem

Patients with serious mental illness are at increased risk for metabolic syndrome and cardiovascular disease and have a higher relative risk of death from cardiovascular disease.

Many psychiatric medications, especially atypical antipsychotics, can cause or exacerbate cardiovascular and metabolic conditions by increasing the risk of weight gain, dyslipidemia, and insulin resistance. Additionally, many psychiatric medications can increase the risk for arrhythmias. Patients with SMI receive less screening and fewer preventive medical services compared with the general population. Studies report potential benefit in obtaining EKGs for the purpose of risk stratification and ongoing monitoring when prescribing these medications.

**Problem #1: Screening EKGs on the inpatient psychiatric unit were inconsistently obtained and not readily available for review due to an unclear and convoluted process.**

**Problem #2: There was no standardized way to determine when to order screening EKGs on the inpatient psychiatric unit.**

## Aim/Goal

**AIM Statement #1:** To improve the percentage of EKGs completed and available for review by MDs within 24 hours on Deaconess 4 to 85% before April 1<sup>st</sup> 2019.

**AIM Statement #2:** To improve the percentage of EKGs ordered for patients who may benefit from screening on admission to 90% by April 1<sup>st</sup> 2019.


## The Team

- Jennifer Leavitt, MD (Psychiatry Resident)
- Asia Peek, MD (Psychiatry Resident)
- Samuel Sheffield, MD (Psychiatry Resident)
- Joonhee Cho, MD (Psychiatry Resident)
- Radu Iliescu, MD (Psychiatry Resident)
- Kari Phillips, RN,BSN (Deac 4 Unit Based Educator)
- Marianne Blander (EKG Clinical Manager)
- Leah Schweitzer, MD (Inpatient Psych Attending)
- Liliana Smurawska, MD (Inpatient Psych Attending)
- Rohn Friedman, MD (QI Project Supervisor)
- Elizabeth LaSalvia, MD (QI Project Supervisor)

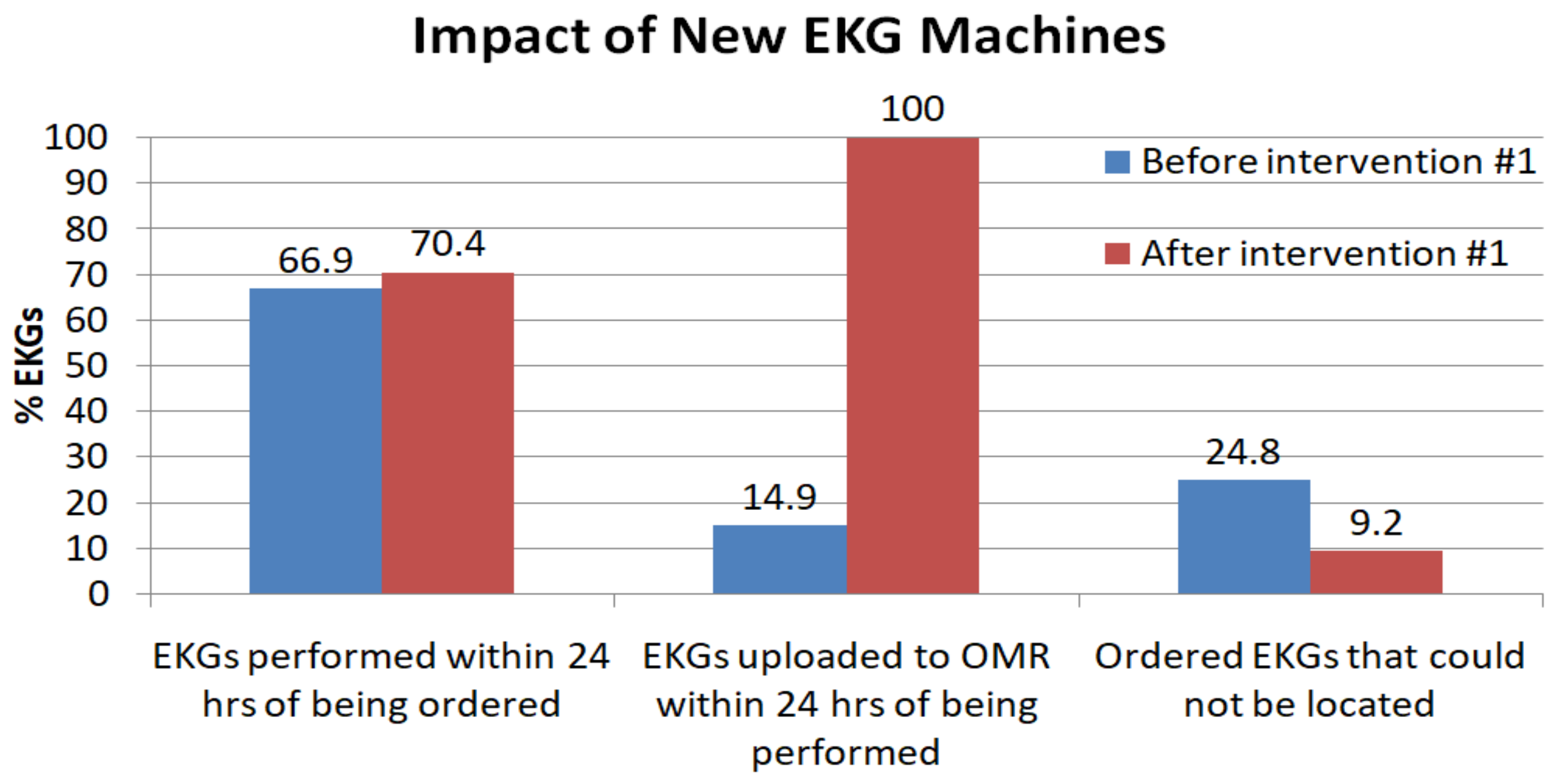
## The Interventions

- Solicited input from Deac 4 staff and EKG clinical manager to understand the EKG recording process.
- Intervention #1 (weeks 16-32):** Determined that obtaining a Deac 4 EKG machine with automatic uploading of EKGs into OMR would be a high impact, attainable intervention – hospital-wide EKG machine renewal was already planned.

- Intervention #2 (weeks 24-32):** reviewed the best available literature and developed EKG Guide Cards to assist with the decision of ordering screening EKGs on admission to inpatient psychiatric unit (Deac 4).

FRONT OF CARD		BACK OF CARD	
<b>Guide for EKG Screening in Psychiatric Admissions</b>		<b>Commonly prescribed QTc-prolonging medications</b>	
Obtain EKG on admission if <u>any</u> of the following:			
<input type="checkbox"/> Age > 60		Amitriptyline	
<input type="checkbox"/> Hx of cardiovascular disease (CVD) or arrhythmia		Aripiprazole	
<input type="checkbox"/> Risk factors for CVD or arrhythmia: metabolic syndrome, electrolyte abnormalities, systemic illness (e.g. liver / renal / thyroid disease), stimulant use, significant family history of CVD		Atomoxetine	
<input type="checkbox"/> Receiving QTc-prolonging meds - flip card for list		Azithromycin	
<small>1. Gregory RJ Gen Hosp Psych 26 (2004) 405-410; 3. Richardson J. NHS Foundation Trust 2015. Appendix 2. 2. Poncet A. PLoS ONE 10(6) 2015 1-14. 4. Sood TR et al. Emerg Med Clin N Am 27 (2009) 669-683.</small>		Buprenorphine	
		Chlorpromazine	
		Citalopram	
		Clarithromycin	
		Clomipramine	
		Clozapine	
		Desipramine	
		Diphenhydramine	
		Donepezil	
		Erythromycin	
		Escitalopram	
		Fluconazole	
		Fluoxetine	
		Fluvoxamine	
		Haloperidol	
		Hydroxyzine	
		Imipramine	
		Levofloxacin	
		Memantine	
		Methadone	
		Metoclopramide	
		Metronidazole	
		Olanzapine	
		Omeprazole / Pantoprazole	
		Ondansetron	
		Paliperidone	
		Paroxetine	
		Quetiapine	
		Risperidone	
		Sertraline	

## Results/Progress to Date



[Hyperlink to Process Map](#)

**Fig. 1** Effect of introducing machines with automatic EKG uploading on the rates of timely EKG completion, timely EKG uploading into OMR, and availability of EKGs for review. || [Hyperlink for Process Map](#)

**For more information, contact:**

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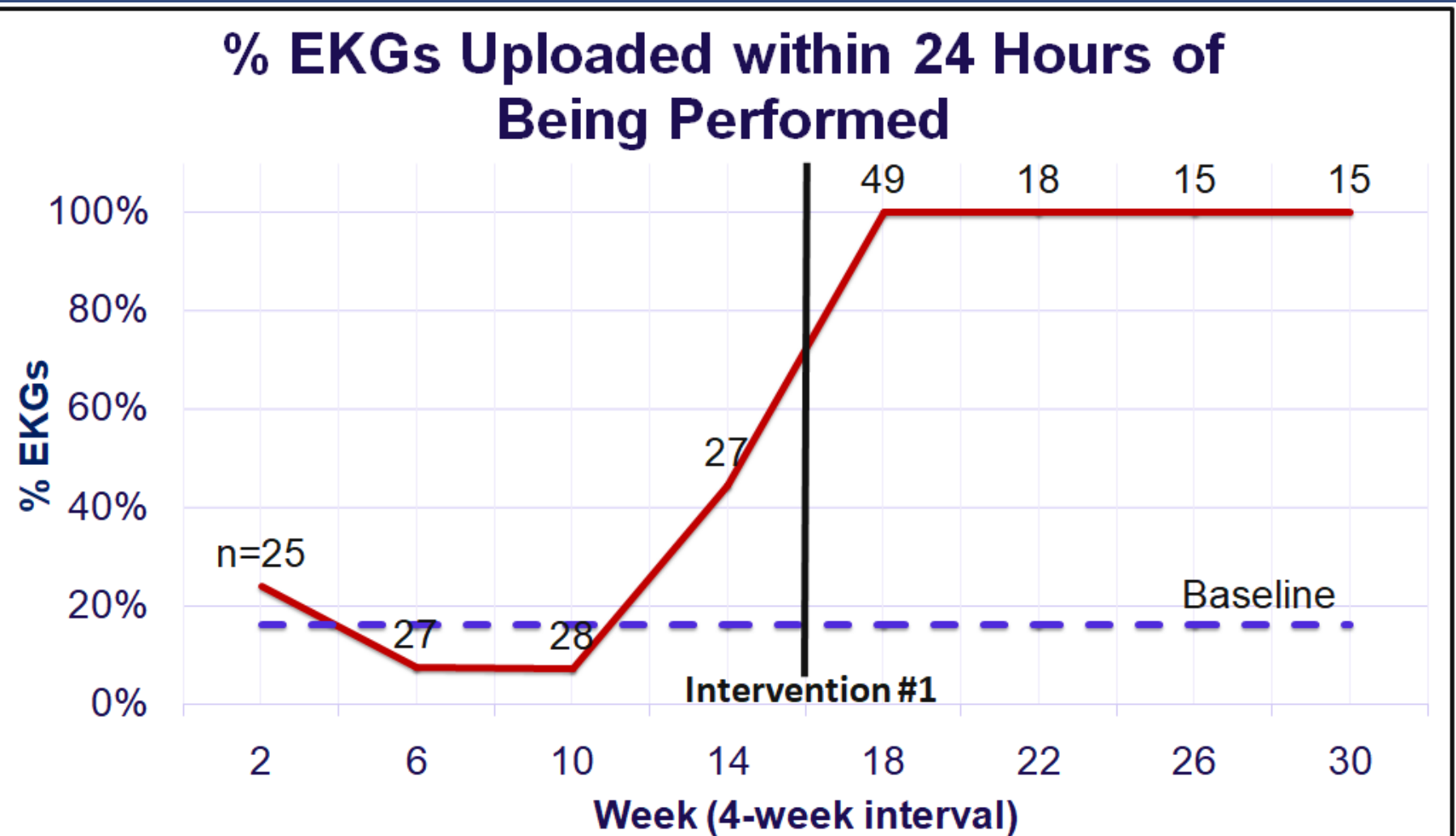
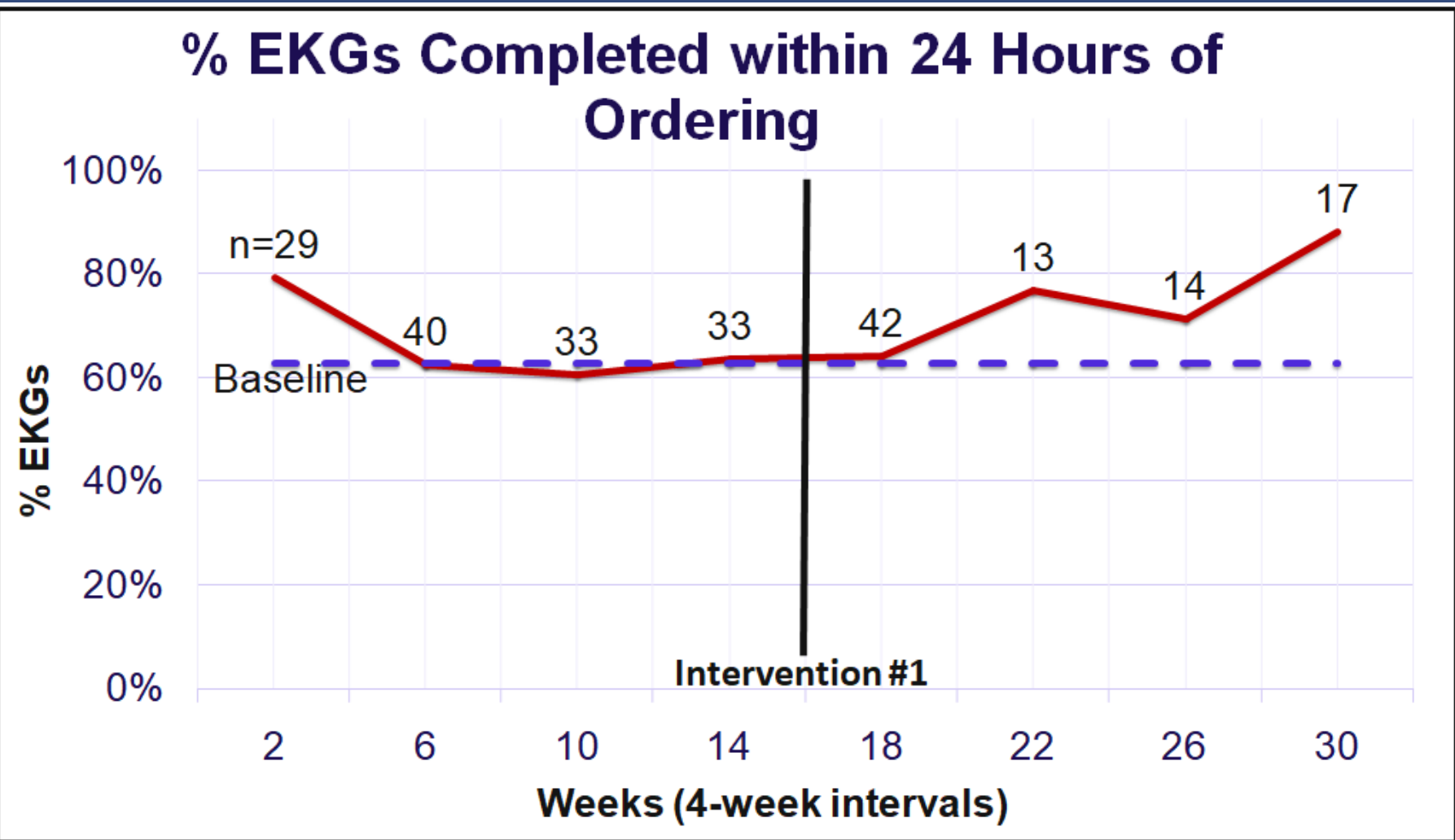




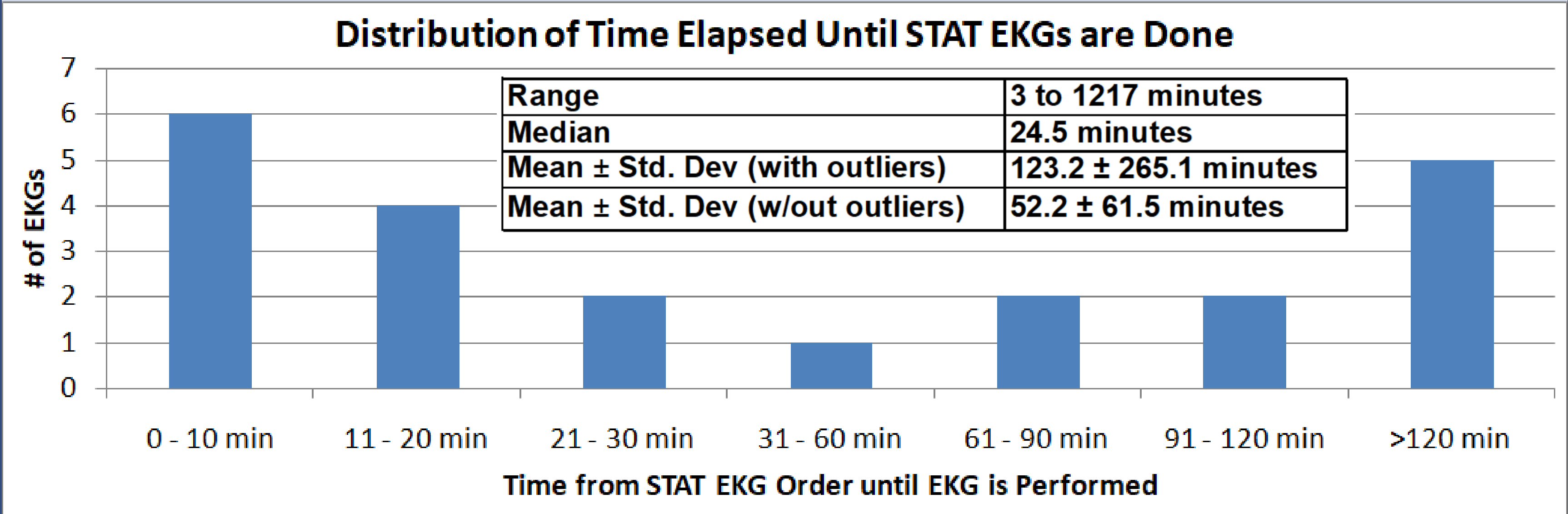
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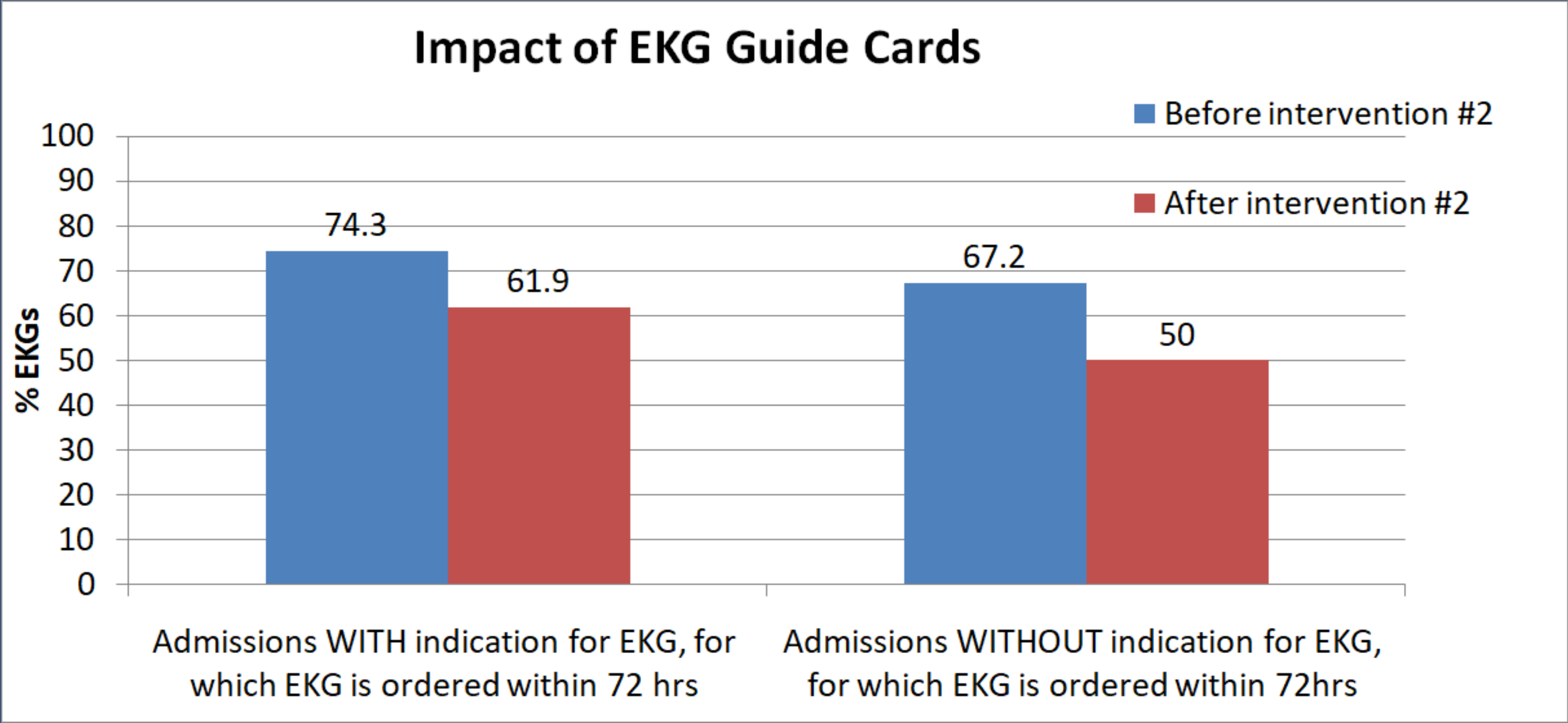
## More Results/Progress to Date



**Fig. 2** Run chart showing the effect of the new EKG machines on the rates of timely EKG completion and timely EKG uploading into OMR.



**Fig. 4** Time from order to completion for the 22 STAT EKGs ordered during the study period (Aug 20<sup>th</sup> 2018 – Mar 26<sup>th</sup> 2019) – only 3 STAT EKGs (not outliers) were obtained using old EKG machines



**Fig. 3** The effect of introducing EKG Guide Cards on patterns of EKG ordering for patients admitted to the inpatient psychiatric unit (Deac 4).

## Lessons Learned

- The new EKG machines (high impact intervention) were much more successful at improving patient care than the EKG Guide Cards (low-impact intervention).
- Working on this project led to detection of shortcomings in the process of obtaining STAT EKGs.

## Next Steps

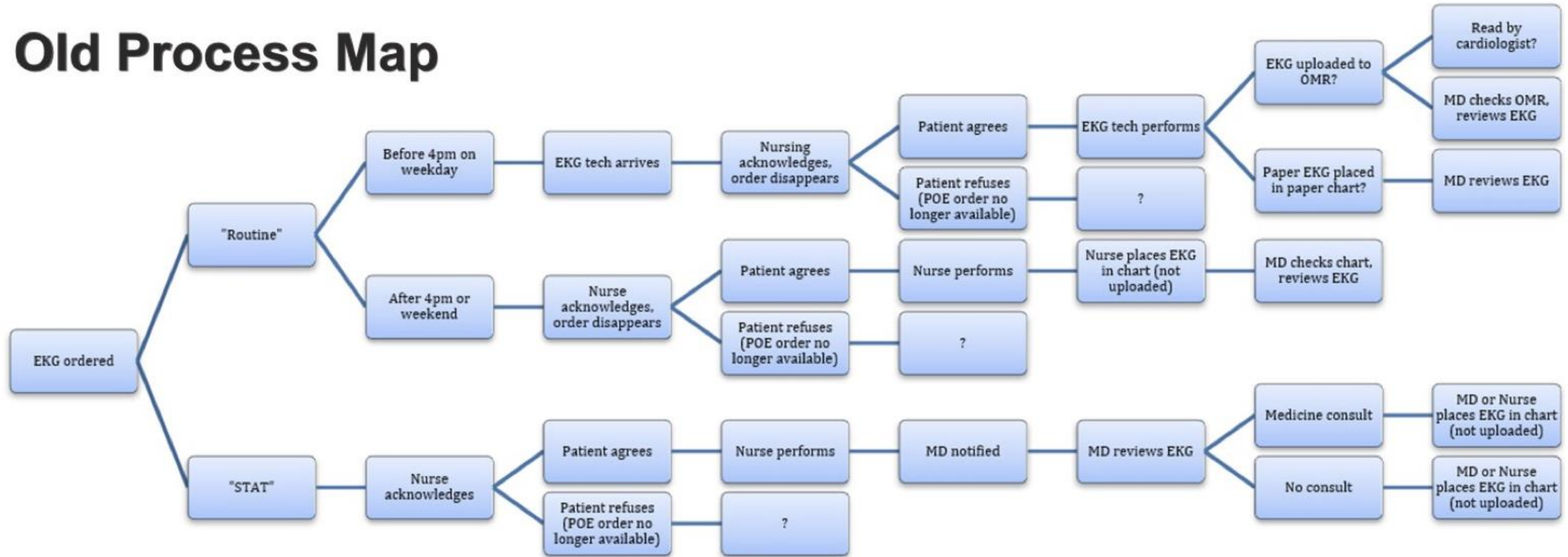
- Will perform additional PDSA cycles to further improve the timely completion of EKGs on Deac 4 and to improve patterns of EKG ordering; higher-impact interventions will be considered (e.g. intervention in POE).
- Additional departments will be included in this ongoing QI work (e.g. Cardiology, Billing Department).
- Additional quality improvement work will be dedicated to decreasing time of obtaining STAT EKGs on Deac 4.

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# Old Process Map



# New Process Map

