IMPACT OF A MULTIMODAL ANALGESIC PATHWAY IN REDUCTION OF INTRAOPERATIVE AND POST OPERATIVE OPIOID USE IN VETERANS UNDERGOING TOTAL KNEE ARTHROPLASTY

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Patient Centered Care...Second to None...One Veteran at a Time

Aim Statement

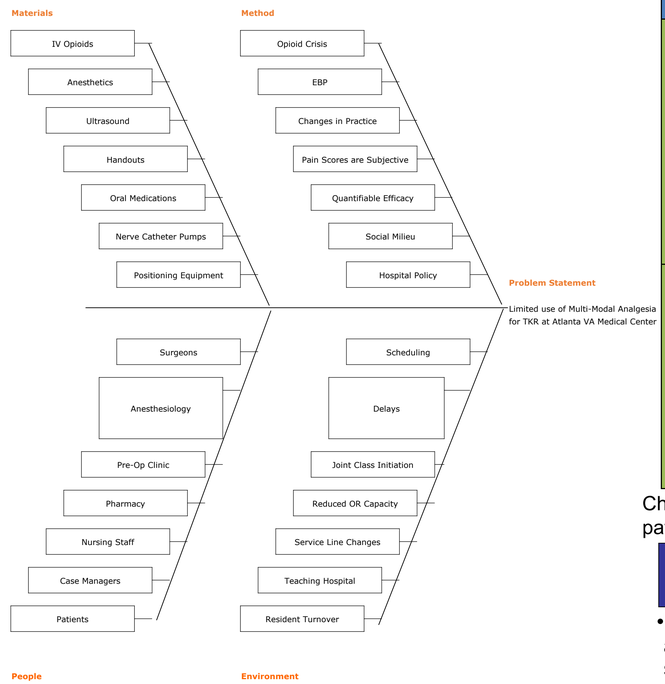
This Quality Improvement initiative focuses on veteran patients undergoing total knee arthroplasty (TKA) at the Atlanta VA Medical Center from summer 2019 through March 2020. Through implementation of a multi-modal analgesic pathway, the expected measurable benefit is 50% reduction of oral morphine equivalents (OME) consumption in the operating room, the post-anesthesia recovery area (PACU) and at 24-hrs post-PACU discharge.

Background

The US is in the midst of an opioid epidemic. The perioperative period is a time when reducing opioid intake can make a difference in the numbers of patients who become chronic users. Emerging research indicates that 27% of chronic opioid patients first began to use them immediately post-operatively and that up to 7% of opioid naïve patients become chronic users three months post operatively. 8,000 patients undergo operative interventions yearly at the AVAMC and a significant proportion are prescribed opioids for post-op pain. Interventions designed to reduce the number of TKA patients who utilize opioids in the immediate post-op period will have beneficial effect on the health system in terms of reducing cost (by reducing length of stay and presence of side effects and pharmacy costs).

As part of our anesthesiology department-wide pain QI initiative, we initiated a multimodal analgesic pathway for patients undergoing TKA surgery. Multimodal analgesia consists of using analgesic modalities (gabapentinoids, acetaminophen, regional and neuraxial anesthesia techniques and local infiltration by the surgeon to target different pain pathways to reduce opioid utilization and related adverse effects.

Analysis

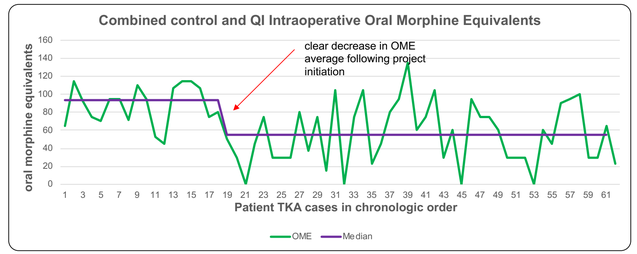


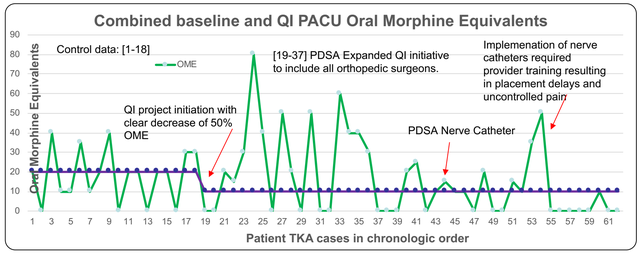
Actions/Tests of Change

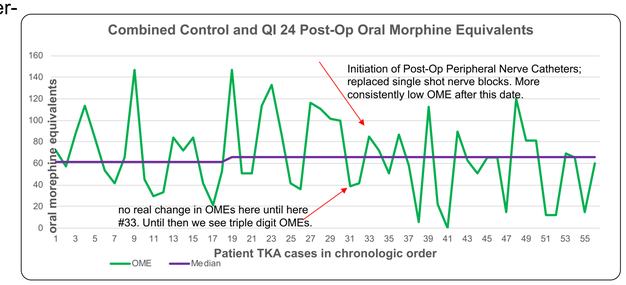
Difficulty/Benefit Matrix	Low Impact	High Impact
Hard	Anesthesia preop clinic orders day-of-surgery pre-medications; must consider patient medical conditions and dosage when ordering and requires DOS nursing staff review delayed medication orders. Order durable med equipment (epidural poisitoning device) for OR	Met with individual orthopedic surgeons for buy-in re: spinal anesthesia. Collaborated with ortho nurse case mgr, PA and surgeon to initiate a monthly 'Joint Class' for patients planned for TKA and THA. Anesthesia NP also presents, provides info on anesthesia and pain mgt. Provide hands-on training on placement of peripheral nerve catheters (PNC) to all department anesthesiologists and transition to PNC from single shot nerve blocks.
Easy	Design information sheets describing nerve blocks, spinal anesthsia and multimodal analgesia to review with and provide to patients during their interview in preop anesthesia clinic. Provide pharmacy orders and On-Q pumps to fill for peripheral nerve catheters.	Used Thursday dept. mtg time to educate CRNAs and Anes MDs on multimodal analgesia clinical pathway we designed. Provided monthly follow up for feedback on QI progress. Involvement of dept. leadership in support of project. Met with PACU nurse manager about ERAS and provided PACU nurses education/side effects of spinal anes, goal for reduced narcotics and plan for nerve catheters. Coordinate for acute pain service follow-up of patients with PNCs POD1. Met with OR nursing staff and ATAs to ensure no disruption in workflow with spinal anesthesia and equipment/personnel availability.

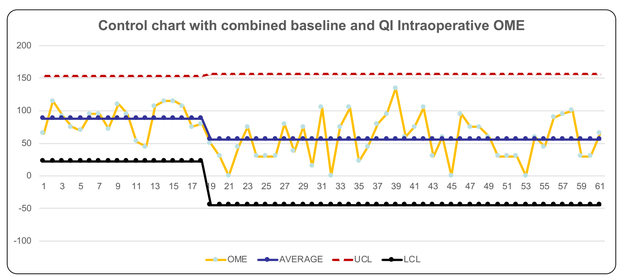
Change concepts employed: change the work environment, provider-patient interface, focus on variation, focus on service provided.

Results – Run charts









Measures

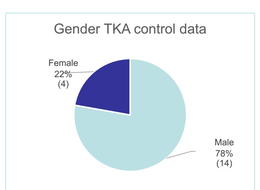
- Process measures – utilization of the multimodal analgesic pathway, consideration of all TKA patients for spinal anesthesia, patient education in the anesthesia preop clinic to include hand-outs on multimodal analgesia, patient attendance at joint class, POD1 follow-up by acute pain nurse
- Objective measures – reduction in intraop, PACU and 24-hour OME, reduced pain score, reduced length of stay
- Balancing measures - feedback on workflow impact from OR nurses with change from general to spinal anesthesia, increased PACU LOS due to spinals and post-op nerve catheter placement.

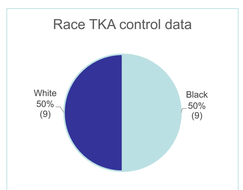
Reflection/Follow-up

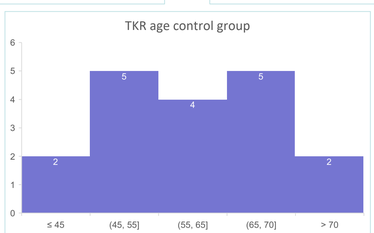
- In reflection, we emphasize the success of our project was due to a committed multi-disciplinary team (surgery, anesthesia, preop and PACU nurses, technicians) led by a strong surgeon-anesthesiologist partnership.
- Next steps? SPS chart to better analyze data. Formalize (write-up) our clinical pathway for TKA patients at the Atlanta VA.

From the above run charts we achieved our goal in the PACU with reduction of OME by 50%. We also saw a statistically significant decrease in opiate use in the operating room. While we did not see any change at 24-hours post-PACU discharge compared to baseline data, we do see a reduction of OME following introduction of the peripheral adductor nerve catheter in Dec 2019.

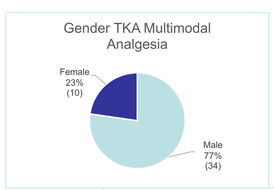
Baseline Conditions

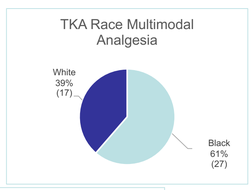


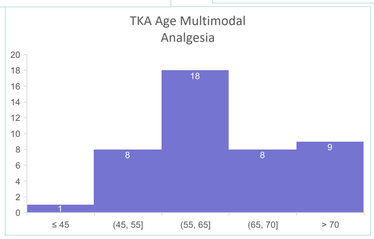




Results - demographics







Customized Music Therapy to Deprescribe Psychotropic Medications in a Skilled Nursing Facility

Hyunseok Oh, MD, Jamie Bass, DO

INTRO

- Stricter regulations limit use of psychotropic medications in skilled nursing facilities
- Novel methods needed to control symptoms

METHODS

- N = 40
- 11 on psychotropics
- NPI-Q scores pre-intervention & one month intervals
- Given customized mp3 players from 5PM to 9PM

RESULTS

- NPI-Q scores decreased from mean score of 22.4 to 21.46
- Overall facility psychotropic use decreased from 13.2% to 8.8% in 3 months

DISCUSSION

- Customized music therapy improves NPI-Q scores and augments deprescribing of psychotropics

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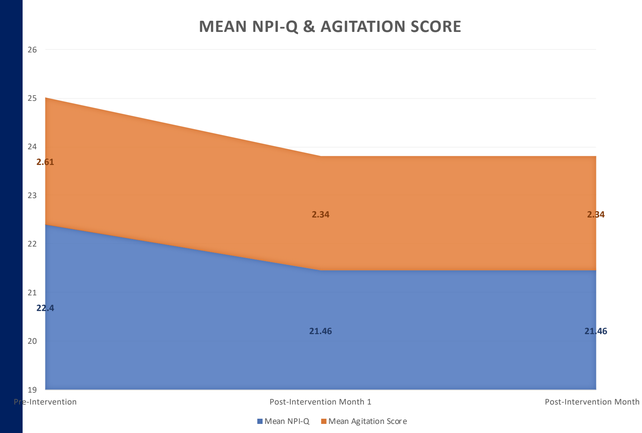
Individualized music therapy for residents of an area skilled nursing facility **improves** NPQ-I & **agitation** scores, and augments deprescribing of psychotropic medications.

	Pre-Intervention	Post-Intervention Month 1	Post-Intervention Month 2
Mean NPI-Q	22.4	21.46	21.46
Mean Agitation Score	2.61	2.34	2.34



Author Disclosures: Support for purchase of mp3 players through Arthur M. Blank Foundation.

Implementation of a Standard Protocol to Reduce Infection Following Implant-Based Breast Reconstruction

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Aim Statement

1. We aim to reduce variability in implant-based breast reconstruction surgery by implementing a standard protocol of infection prevention measures, with a goal of 80% protocol compliance over the next 3 months.
2. We aim to reduce the incidence of surgical site infection following immediate breast reconstruction with implants / tissue expanders at EUH by 50% over the next 12 months.

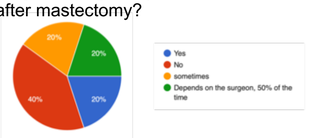
Background

- Infection following implant-based breast reconstruction leads to increased rates of hospital readmission, re-operation, patient and hospital expense, higher rates of reconstructive failure with attendant physical and psychological morbidity.

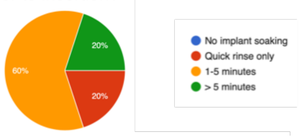
Baseline Conditions

- **There is significant variability regarding individual surgeon protocols for prevention of implant infection.**

Do you change drapes after mastectomy?

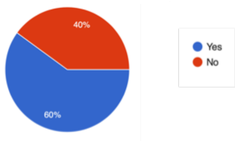


Do you soak the breast implant prior to insertion?

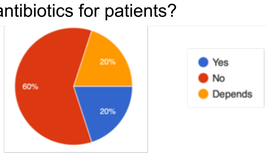


★ - Modifiable risk factor

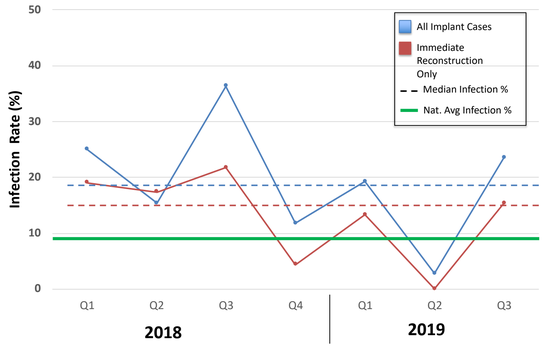
Do you change gloves before handling the breast implant?



Do you prescribe post-op antibiotics for patients?

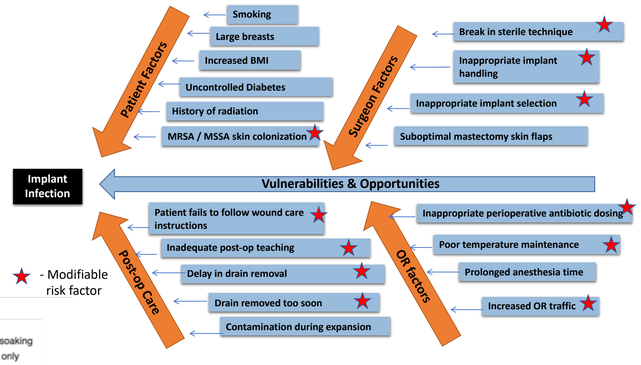


- **Infections following implant reconstruction at EUH are higher than the national average.**

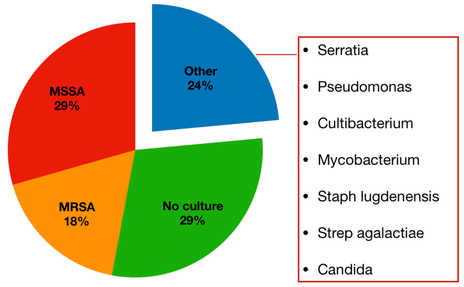


Analysis

- **Patient, surgeon and environmental factors all contribute to increased rates of infection.**



- **Primary causative organisms of implant infections at EUH are MSSA and MRSA .**



- Serratia
- Pseudomonas
- Cultibacterium
- Mycobacterium
- Staph lugdenensis
- Strep agalactiae
- Candida

Measures

- **Primary Outcome Measure:** rate of infection following immediate implant-based reconstruction at EUH
  - **# implant infections / # of immediate implant-based reconstructions**
- **Process Measures:**
  1. Pre-operative patient skin decolonization compliance (attestation form)
  2. Intra-operative patient protocol compliance (protocol checklist)
  3. Post-operative patient teaching compliance (checklist and signature form)
- **Balancing Measures:**
  1. Time for procedure completion (operative time before vs after protocol implementation)
  2. Patient satisfaction with pre- and post-operative education experience (follow-up phone call after discharge)

Actions/Tests of Change

Evidence-based "best practices protocol" for implant-based reconstruction

Pre-operative Phase	Intra-operative Phase	Post-operative Phase

• **Skin Decolonization**
  • Intranasal mupirocin for 5 days prior to surgery
  • Hibiclens showers for 5 days prior to surgery
• **Revised pre-operative educational brochure**
	• **Prepping and draping** performed or supervised by plastic surgery resident.
	• All team members strongly encouraged to **double glove.**
	• Drapes secured with staples, **ioban strips**.
	• **Acellular dermal matrix – fenestrated** (pie-crusted) on back table prior to insertion
	• **PIGS** protocol for implant insertion (see below)
	• Drain – one per side – 15F blake drain.
	• **Closing tray** – clean instruments available for use after placement of implant
	• Dressings – Sterstirips for incision, biopatch and tegaderm for drains
		• Post-operative IV antibiotics to be continued for **24 hours** and no longer.
		• **Revised, simplified and standardized teaching / discharge instructions** regarding wound care, dressing changes, drain care, and showering.

Test of change #1
- Single surgeon
- Single institution
- Intra-operative and post-operative phase of care only
- 1.5 months, 7 cases

Feasibility of interventions

1. Protocol modified
2. Best practices data presented to group
3. Protocol adopted by division

Test of change #2
- All surgeons
- Single institution
- Intra-operative and post-operative phase of care only
- 2 weeks, 5 cases

Additional challenges specific to individual techniques

1. Feedback evaluated at faculty meeting
2. Pre-op phase of care

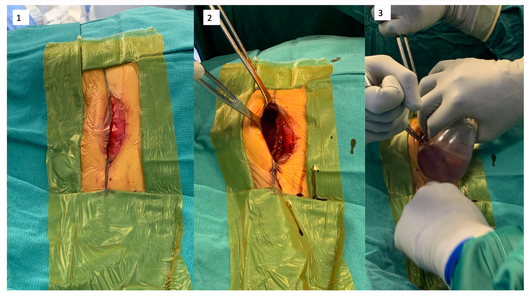
Test of change #3
- All surgeons
- Single institution
- All phases of care
- 1 month

Currently underway

P.I.G.S. Protocol:

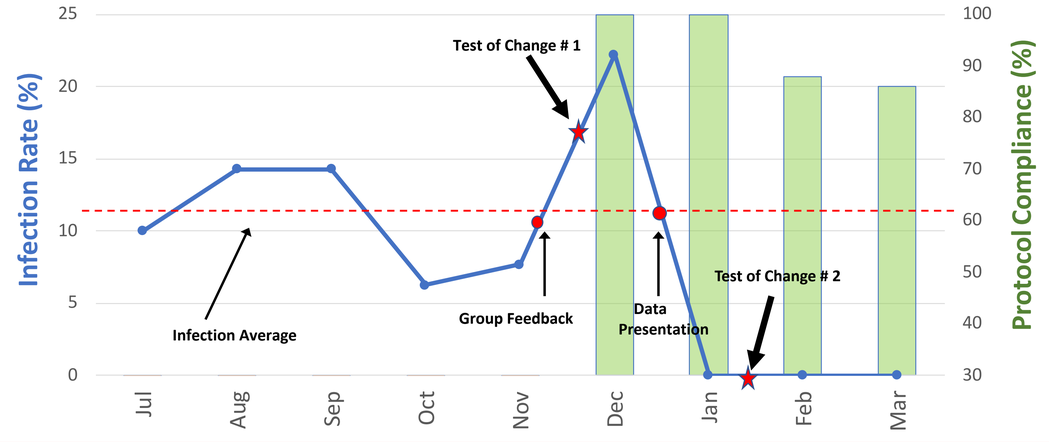
- **P – Pocket.** Mastectomy cavity irrigated with irrisept.
- **I – Implant**. Implant soaked in irrisept prior to placement
- **G – Gloves.** All team members don fresh gloves prior to handling implant.
- **S – Sterile field.** All unnecessary instruments / personnel off the field; incision re-draped with green towels and ioban.

"Pause for P.I.G.S. !!!"



Field preparation and implant insertion using PIGS technique

Results – Implant Infection and Protocol Compliance



- **Group protocol compliance averaged 91% over the course of two change cycles.**
- **Of 21 implant reconstructions performed under protocol, we have had 0 readmissions and 0 reoperations for infection.**

Code Seizure: Closing the Gaps in the Treatment of Status Epilepticus

Ebtisam Alumin Osman MD, Denise Chen MD, Rhea Battle PharmD, Hiba A. Haider MD FACNS

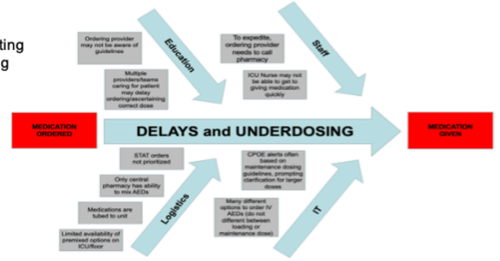
Aim Statement

We aim to (1) reduce the time taken to administer antiseizure drugs (ASDs) to inpatients in status epilepticus at EUH to < 1 hr in over 80% of patients and (2) reduce the incidence of underdosing by 50% over a 2-month period.

Background

Status epilepticus is a neurological emergency, characterized by recurrent or prolonged seizures that fail to self-terminate. The longer seizures are allowed to continue, the harder it is to fully control them. Delays in treatment as well as underdosed administration of antiseizure drugs (ASDs) is linked to increasingly refractory seizures and an increased need for sedative-anesthetic agents that are accompanied by antecedent morbidity and the need for mechanical ventilation (Alvarez et al, Epilepsia 2015). Delayed early management is common; in one study early ASD dosing met published AES Guidelines in as little as 14-23% of cases (Sathe et al, Ann Emerg Med 2019). Underdosing is also associated with a cascade of downstream workflow delays that lead to further undertreatment, and increased rates of mortality (Gainza Lein, JAMA Neurol 2018). Multiple factors contribute to this issue (Figure 1).

Figure 1. Factors contributing to non-standardized dosing and/or delayed ASD administration



Baseline Conditions

We studied a baseline convenience sample of inpatients at Emory University Hospital who were admitted with status epilepticus or acute recurrent seizures and received IV loading doses of ASDs: namely Cohort 1, n=20 (2013-2014). Baseline data is presented in Table 1: 50% of patients received AEDs within 60 minutes.

Median doses for various ASDs were also analyzed and are reported in Table 1.

Actions/Tests of Change

We studied the effect of the following Tests of Change:

1. **Dissemination of an institutional status epilepticus protocol** to guide appropriate dosing.

Convenience samples of inpatients at Emory University Hospital who were admitted with status epilepticus or acute recurrent seizures, and received IV loading doses of ASDs were identified:

Cohort 2: n=20 (baseline cohort immediately prior to Status Epilepticus Protocol rollout, late 2017-early 2018)

Cohort 3: n=20 (PDSA cycle #1; mid-late 2019 after Status Protocol Protocol in place for 1 year)

Measures

For each cohort, clinical data was abstracted via retrospective chart review.

1. Assessing Time Delays: Pharmnet data was reviewed to confirm dosing and time of order, verification and administration for each cohort (following each PDSA cycle); the percentage of patients receiving IV ASD loading dose within the recommended time cutoff as per the AES guidelines (i.e. <60 minutes) was reported (Table 1 and Figures 2-4)

2. Assessing Underdosing: Pharmnet data was reviewed to confirm loading doses. Patient-specific weight-based dosing (mg/kg) and total doses (mg) are presented in Tables X. Median doses for all ASDs across all cohorts will be displayed and cumulative improvement after each cycle presented as a Pareto chart.

Analysis

Figure 2. Time to ASD administration (Order to Verification, Verification to Administration, and Total Time) in consecutive cohorts in comparison to median (dashed gray line) vs. benchmark/goal time of 60 minutes (solid gray line)

Figure 3. Total Time to ASD for first and second antiseizure drug (ASD) in consecutive cohorts in comparison to median (blue and gold dashed lines respectively) vs. benchmark/goal time of 60 minutes (red dashed line)

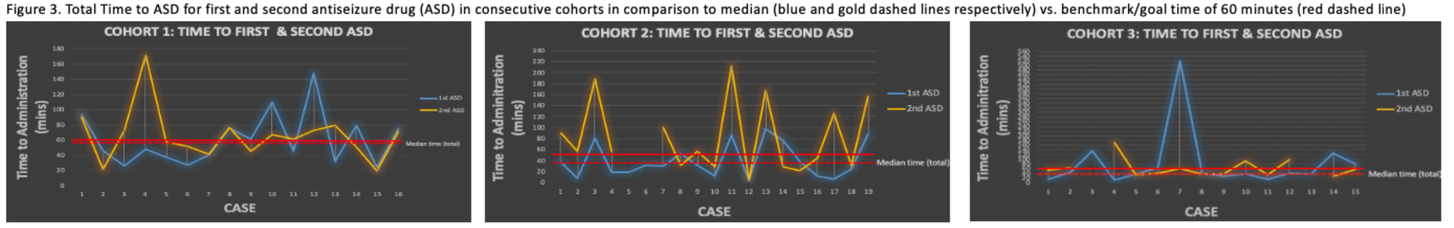
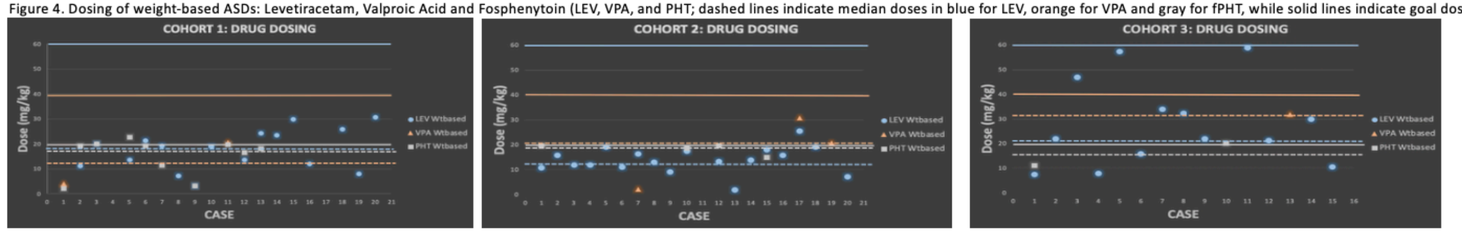


Figure 4. Dosing of weight-based ASDs: Levetiracetam, Valproic Acid and Fosphenytoin (LEV, VPA, and PHT; dashed lines indicate median doses in blue for LEV, orange for VPA and gray for fPHT, while solid lines indicate goal dose)



Results

- Trends toward improvement in time to administration of ASDs was noted (50% of patients received a timely ASD in cohort 1 compared to 65.8% in cohort 2 and 67.9% in cohort 3)
- Delays in time to ASD administration mostly occurred in the period after medication verification.
- There is a signal that delay to first ASD is linked to a delay to second ASD.
- Underdosing was pervasive across all cohorts, mostly seen with LEV and VPA (and to a much lesser extent with PHT)

	COHORT 1 Baseline Conditions n=34	COHORT 2 n=38	COHORT 3 n=28
Cohort characteristic	Baseline cohort 2013-2014	Prior to SE Protocol rollout	PDSA #1: 1 year after SE Protocol rollout
% with ASD given within 60 minutes	50.0%	65.8%	67.9%
Time to ASD	Median 59 min Mean 63 min (Range 19-171)	Median 38 min Mean 67 min (Range 3-371)	Median 42 min Mean 73 min (Range 12-520)
Median time to 1st ASD	47 min	32 min	42 min
Median time to 2nd ASD	64 min	57 min	53 min
Median Dose (Recommended loading dose)	**PHT: 18.7** (20 mg/kg) VPA 12.3 (40 mg/kg) LEV 19.1 (60 mg/kg) LCS 200mg (200-400 mg)	**PHT: 19.1** (20 mg/kg) VPA 20.8 (40 mg/kg) LEV 13.5 (60 mg/kg) LCS 200mg (200-400 mg)	PHT: 15.6 (20 mg/kg) VPA 31.9 (40 mg/kg) LEV 21.9 (60 mg/kg) **LCS 400mg** (400 mg)

Table 1. Cohort 1-3 characteristics; median times to ASDs and median doses

Reflection/Follow-up

- Test whether dosing and delays are associated with:
  - Length of ICU stay, and length of hospital stay
  - Increasing refractoriness (Need for intubation/sedation for seizure control)
  - Number of ASDs at discharge
  - Post-discharge outcome
- Next test of change:
  - **Code Seizure orderset with Automated Paging**: Create a standardized orderset of commonly used ASDs at appropriate doses, tied to an automated paging mechanism that expedites drug mixing and delivery at the central pharmacy (bypassing handoff from other pharmacy locations). The implementation of this test is currently pending completion by IT.
  - Continue data collection for cohort 4 and 5 (pre/post implementation of Code Seizure orderset)
- Barriers / Lessons:
  - IT-dependent changes can be difficult to enact!
  - Changes in parallel pharmacy paging workflows may delay use of automated paging
  - Lack of pharmacy tech coverage

Other tests of change to consider:

- **IV Push:** Administering medications via "IV push" when feasible, eliminating the delays caused by mixing in and transport from the central pharmacy.
- **Hand delivery** of critical medications by pharmacy tech as opposed to tubing (current standard for unscheduled ASDs)
- **RN alert system**: Overhead paging after delivery of medication to alert patient's RN so that medication can be administered
- **Medication Availability:** Making certain ASD options available in relevant ICUs or floor locations to expedite their use.
- [illegible]ular or intranasal medications instead of IV (that can introduce delay if IV access not

Screenshot

Improving Guideline Adherence and Antibiotic Stewardship Through Order-set Rationalization

Problem Statement: Clinical practice guidelines (CPGs) and coupled order sets standardize patient care and disseminate evidence-based practices, leading to higher value patient care 1-3. However, at our institution we identified several CPGs where the appropriate order set was used in <50% of encounters deemed eligible for the CPG.

Figure 1: Overall guideline order set usage for eligible encounters

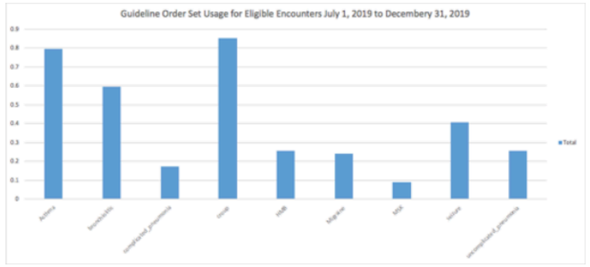


Figure 2: Higher rates of migraine medication bundle use and higher rates with appropriate order set used.

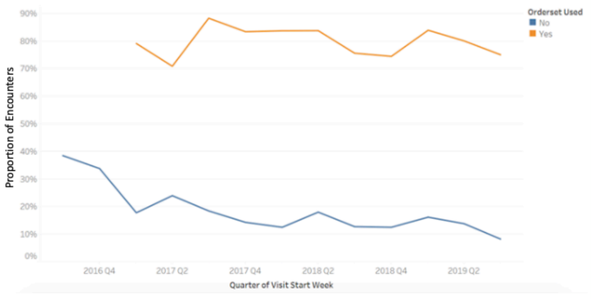
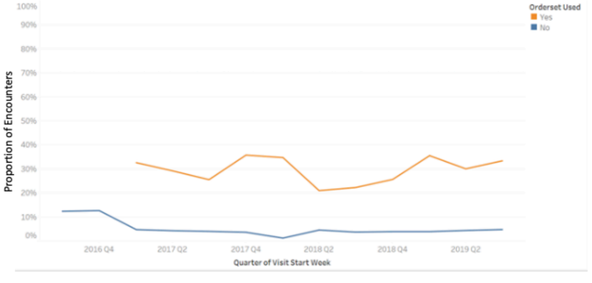


Figure 3: Higher rates of Depakote discharge prescriptions when CPG-OS used.



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Children's Healthcare of Atlanta

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Integrating Clinical Practice Guideline (CPG) order bundles into general admission order-set may **increase CPG adherence.**

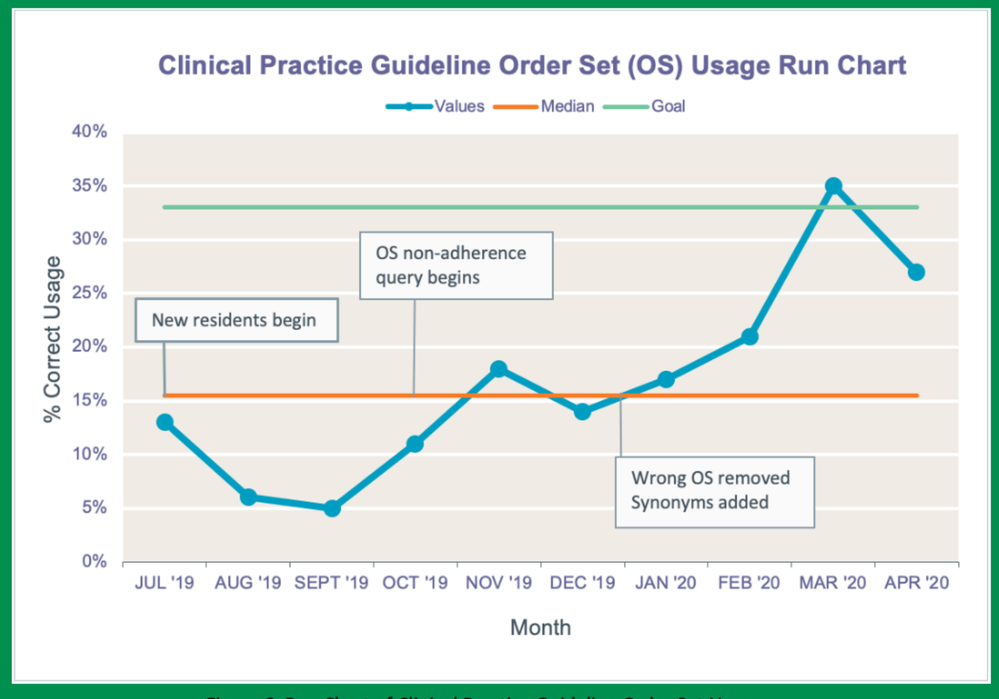


Figure 6: Run Chart of Clinical Practice Guideline Order Set Usage

Aim Statement: Increase pre-determined (Asthma, Heavy Menstrual Bleeding, Musculoskeletal Infection, Community Acquired Pneumonia and Migraine) CPG-specific order set usage for guideline-eligible patients 0-18 years old admitted to Children's Healthcare of Atlanta-Egleston on the general pediatrics service by 20% from July 2020 to June 2021 through implementation of an single, CPG-integrated general pediatrics admission clinical decision support tool.

Analysis:

Figure 4: Fishbone analysis of barriers to CPG adherence.

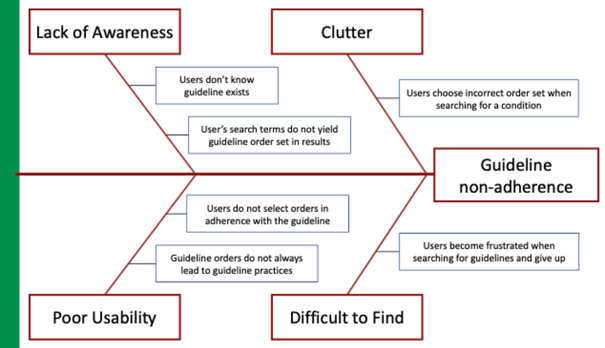
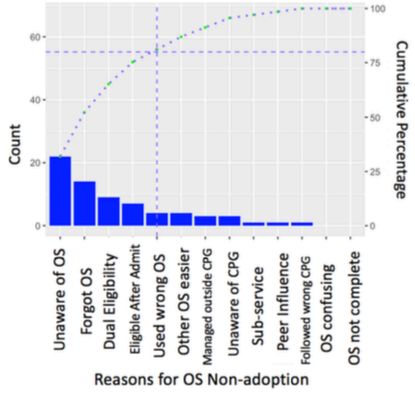


Figure 5: Pareto chart of reasons for order set non-adoption.



Bottom Line

The most common reasons for Clinical Practice Guideline (CPG) order set non-use were lack of awareness of or forgetting the order set

Interventions To Date:

- Review and add synonyms to all underused guideline order sets.
- Identify and retire commonly misused order sets (i.e. mimicker order sets).

Future Interventions:

- Integrate CPG orders into more commonly used order set.
- Migrate guidelines to public facing website with search engine optimization

Family Medicine Resident Wellness Improvement Through an App-Delivered Mindfulness Meditation Intervention

Project Leaders: Mascaro J, Moore M.
Interprofessional Team Members: Aguilar-Alvarado M, Ajirotutu O, Ghose N, Patel P, Villalon-Gomez J.
Trainee Team Members: Baker, B. Holder, A.

Aim Statement

Through the use of a Mindfulness App, there will be an increase in Family Medicine Residents' sleep quality, social wellbeing, overall mindfulness, and subcategories of mindfulness (including describing and nonjudging of inner experience) by the end of a 8-week intervention period.

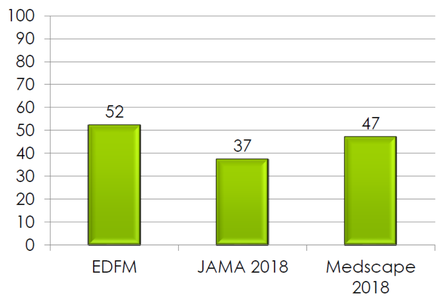
Background

- Higher workplace burnout reported among family medicine residents and physicians than other medical trainees and physicians
- Research shown mindfulness meditation helps reduce stress of medical training and practice
- Smartphone-delivered mindfulness apps offer an intervention to improve well-being and reduce the likelihood of burnout

Baseline Conditions

•Emory FM residents report higher than national average on the Mini-Z Burnout Survey

Burnout



Analysis

•We believe the factors influencing resident well being include:

- Electronic medical record burden
- Poor sleep quality and quantity
- Interpersonal relationships with work colleagues
- Stress over educational requirements (testing and clinical encounter numbers)

Measures

- Acceptability / Interest in the App
- Job Satisfaction
- Stress
- Burnout Level
- Sleep

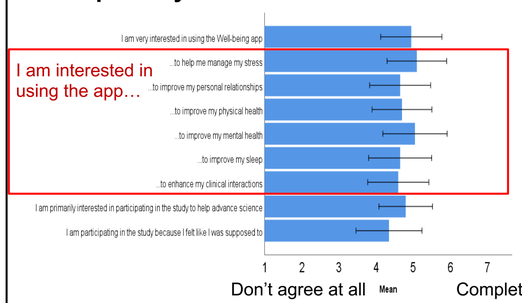
Actions/Tests of Change

- EFMRP trainees were randomized to either receive a phone-based mindfulness meditation application (10% Happier) or to a waitlist group that received the application at the conclusion of the study
- Residents were provided protected time in didactic lecture to complete the self-assessment pre- and post- surveys.
- The randomized participants received the app and an email inviting to participate.

Results

- 26 Residents eligible
- 23 completed at least 1 survey
- 10 completed all study activities

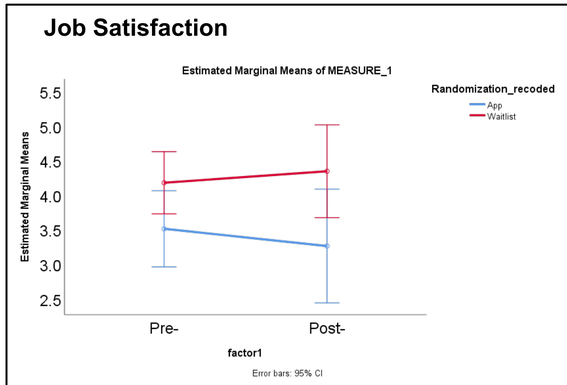
Acceptability



N=20 of 23 residents

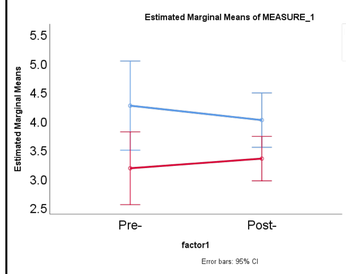
Results

Job Satisfaction



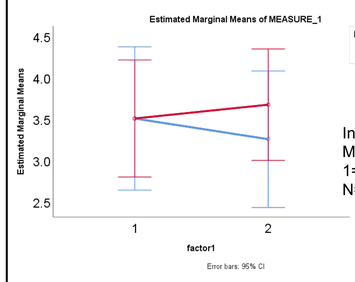
"Overall, I am satisfied with my current job."
1=Strongly agree; 5= Strongly disagree; N=10 of 23 residents

Stress



"I feel a great deal of stress because of my job."
1=Strongly disagree;
5= Strongly agree
N=10 of 23 residents

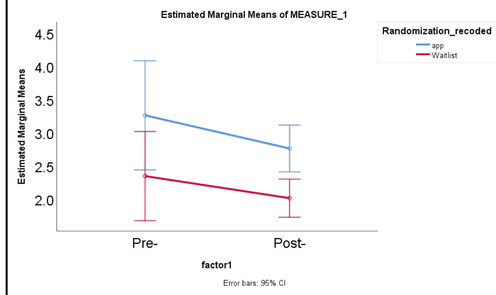
Sleep



In the past SEVEN (7) DAYS,
My sleep quality was...
1=Very poor, 5=Very good
N=10 of 23 residents

Results

Burnout



Using your own definition of "burnout," please select one of the answers below:
1 =I enjoy my work, I have no symptoms of burnout
2 = Occasionally I am under stress, and I don't always have as much energy as I once did, but I don't feel burned out
3 = I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion
4 = The symptoms of burnout that I'm experiencing won't go away. I think about frustration at work a lot
5 = I feel completely burned out. I am at the point where I may need some changes or may need to seek some sort of help.
N=10 of 23 residents

Reflection/Follow-up

•Most residents were interested in the app (80% of respondents agreed that they were very interested in using the app)

•Only one resident randomized to receive the app reported downloading it.

•Low uptake of program although need and desire exists

•Residents need ***protected time*** to engage in wellness activities

•Next Steps

- Explore reasons for limited resident participation
- Evaluate how to feasibly incorporate activities for wellness into resident work activities

Use of Isotonic Maintenance Intravenous Fluids in the Emergency Department – A Quality Improvement Initiative

Bolanle Akinsola, MD; Carolyn Evans, BSN, RN; Qui Burris, Msc; Shabnam Jain, MD, MPH

EMORY UNIVERSITY SCHOOL OF MEDICINE

Children's Healthcare of Atlanta

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Aim Statement

In emergency department patients (age 28 days to 18 years) who are being admitted with maintenance intravenous fluids (at a rate greater than 10ml/hr) to the inpatient ward, we aimed to increase use of isotonic fluids to >80% by December 2019 from baseline of 18% in January 2018.

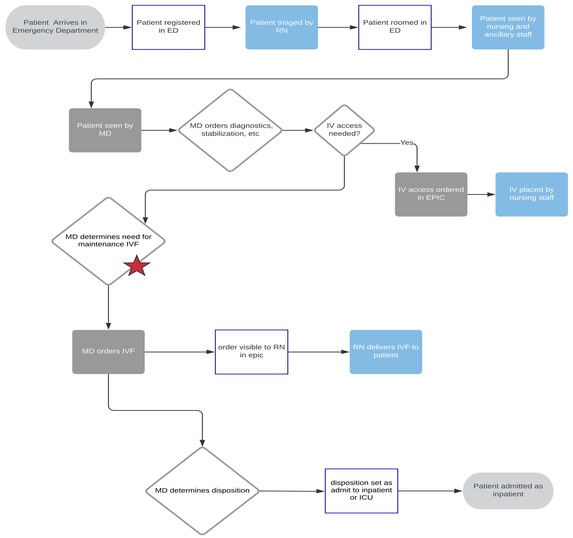
Background

- Maintenance intravenous fluids (MIVF) are commonly used in the emergency department (ED) to provide critical supportive care for children who are acutely ill or when sufficient fluids cannot be provided enterally.
- Hypotonic MIVF have been the standard of care in pediatrics, but concerns about the high incidence of hyponatremia have been raised.
- The American Academy of Pediatrics (AAP) released a clinical practice guideline (CPG) in December 2018 recommending that patients age 28 days to 18 years requiring MIVF receive isotonic solutions with appropriate potassium chloride (KCl) and dextrose (D).

Baseline Conditions

- ED physicians share an unfounded fear of potential risk of hypernatremia in children receiving MIVF.
- The standard prescribing process of hypotonic MIVF is not supported by scientific studies.
- There is no national benchmark for MIVF orders.
- There is high variability in MIVF prescribing practices among ED physicians.

Analysis



Measures

- MIVF is defined as D5 NS +/- KCl; D5 1/2NS +/- KCl; D5 1/4NS +/- KCl; LR fluid combinations, given at a rate >10ml/hr.
- Patients with active chronic medical problems, DI, DKA, severe burns & trauma were excluded.
- Numerator defined as number of eligible patients who received isotonic MIVF; Denominator as total number of eligible patients who received MIVF.
- Compare the percentage use of isotonic MIVF before and after quality improvement (QI) initiative.
- Balancing measures; monitoring frequency of serum electrolyte check within 24 hours of admission and hypernatremia after QI intervention (Jan 2019).

Actions/Tests of Change

- Dissemination of AAP guidelines to ED physicians.
- Education session during ED meetings to inform physicians of QI initiative to adhere to guidelines.
- Electronic medical record (EMR) change to standardize MIVF orders and flag providers when guideline not adhered to.
- Individual feedback provided to ED physicians monthly with data review to improve compliance.

Results

Month/Year	# Isotonic MIVF used	# Total MIVF ordered	% Rate of Isotonic MIVF use
Jan 2018	73	413	17.67
Feb 2018	47	378	12.43
Mar 2018	49	372	13.17
Apr 2018	37	390	9.48
May 2018	45	437	10.29
Jun 2018	49	342	14.32
Jul 2018	53	339	15.63
Aug 2018	82	409	20.04
Sep 2018	105	377	27.85
Oct 2018	158	457	34.57
Nov 2018	183	458	39.95
Dec 2018	241	486	49.58
Jan 2019	207	427	48.47
Feb 2019	193	391	49.36
Mar 2019	231	451	51.21
Apr 2019	198	378	52.38
May 2019	220	409	53.78
Jun 2019	164	314	52.22
Jul 2019	190	346	54.91
Aug 2019	325	422	77.01
Sep 2019	320	389	82.26
Oct 2019	457	530	86.22
Nov 2019	499	571	87.39
Dec 2019	489	578	84.60
Jan 2020	408	465	87.74
Feb 2020	400	432	92.59
Mar 2020	347	381	91.07

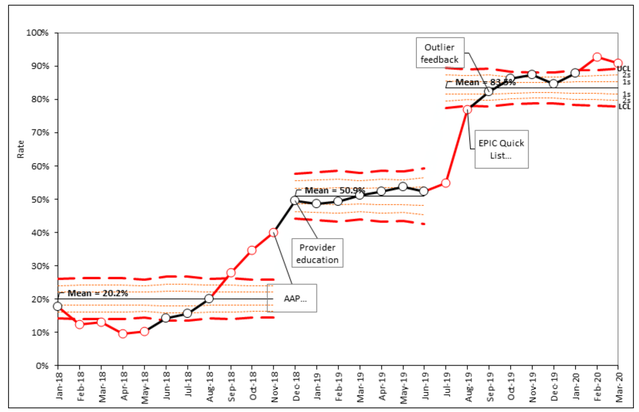
Frequency of serum electrolyte check

	#Serum Electrolyte Check	#Total MIVF	% Serum Electrolyte Check
2018	647	4858	13.31
2019	655	5182	12.63

Results

% ED admissions who received Isotonic MIVF

Jan 2018 – Mar 2020



Conclusion

- The use of isotonic MIVFs improved to > 80% in ED patients admitted to the inpatient setting and it has been sustained.
- There was no statistically significant change in the frequency of serum electrolyte check within 24 hours of admission.
- There was no increase in occurrence of hypernatremia among patients who received isotonic MIVF.
- Rapid implementation of AAP CPG was successful in part because of institutional readiness for change at the time guideline was released.
- Hardwiring isotonic MIVF via EMR change was a key intervention to success.
- There is promise of long-term sustainability.

Improving Quality of Opioid Discharge Education in the Emergency Department

Roslyn Seitz, ENP-C, FNP-C, MPH, Christele Francois, PharmD, BCPS, Lee Economy ENP-FC, FNP-C,, Antoinette Ward, DNP

EMORY HEALTHCARE

Aim Statement

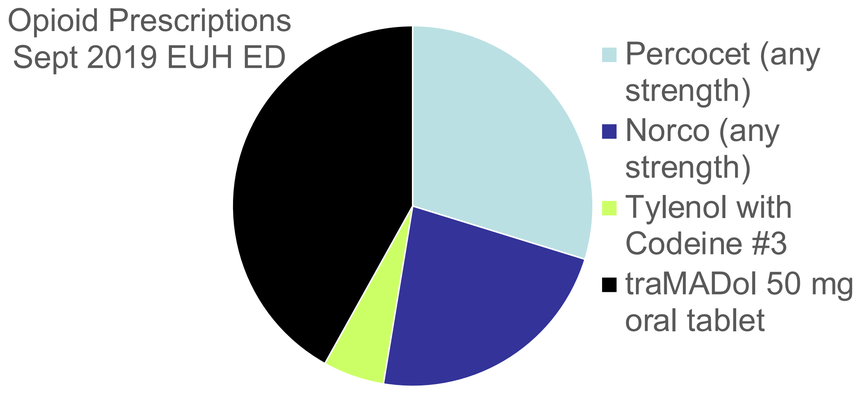
Primary Aim: Improve utilization of printed discharge education to 50% among patients prescribed an opioid from the Emergency Department (ED) over a 4 month period of time.
Second Aim: Improve nursing and provider verbal patient education in 3 key areas of instruction including 1.safe storage 2. transitioning off opioids and 3. safe disposal of medication by self report at baseline and at conclusion of intervention.

Background

According to the CDC, opioid deaths rose 6 times from 1999 to 2017, and approximately 130 Americans die every year. Opioid abuse is a public health crisis in the United States. To address this crisis the CDC has recommended several strategies to prevent opioid use disorder, including:

- Academic detailing
- Quality improvement programs
- Patient education on the safe storage and disposal of prescription opioids

Baseline Conditions



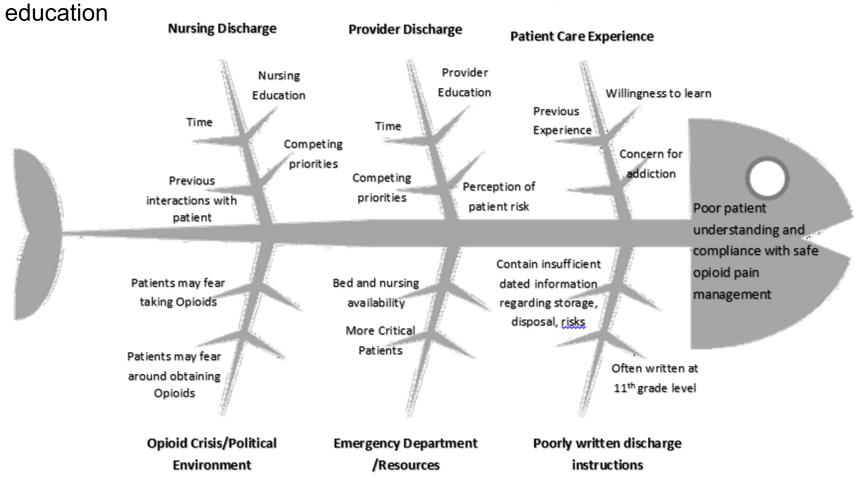
- Chart review at EUH revealed that over a 1 month period of time <5% of patients received written opioid discharge

Dec 2019 Survey of RN and Providers at EUH

Patients Receiving Opioid D/C Education (always/often)		RN	Provider
Side Effects	👍	62%	52.65%
Over-dose	👎	42%	26.32%
Secure Medication	👎	20%	5.26%
Do Not Share Medication	👎	38%	31.58
Transition to non Opioids	👍	60%	78.95%
Signs of Withdrawal	👎	22%	15.79%
Minimum necessary to control pain	👍	72%	73.68%
Disposal	👎	14%	5.26%

Analysis

Patient, provider, nursing conditions, poorly written discharge instructions and political/societal factors contribute to patient discharge instruction and education



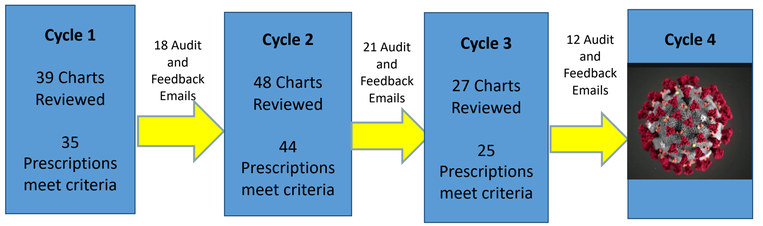
Measures

- Primary Outcome Measure: % utilization of discharge education when provided with a new opioid prescription
- Secondary Outcome Measure: Improvement in self reported education among nurses and providers when discharging a patient with a new opioid with focus on safe storage, transitioning off opioids and safe disposal

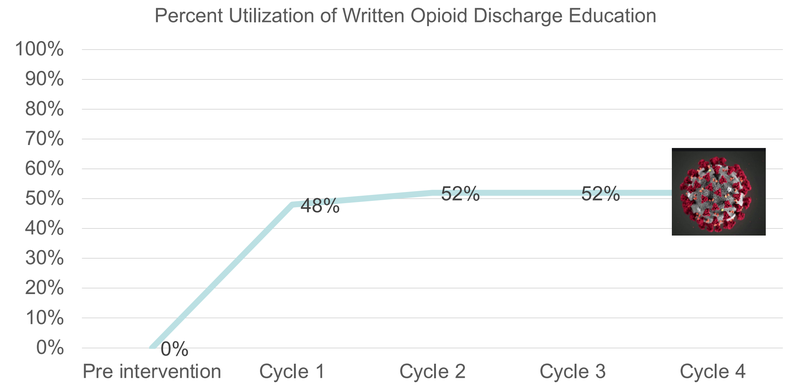
Actions

1. Planning Phase	2. Educational Phase	3. Chart Review/Audit and Feedback Phase
Action 1: Opioid Discharge Instruction updated to reflect best practice and patient friendly language **Action 2:** We engaged Patient and Family Advocate to review intervention and discuss patient perspective **Action 3:** We performed a chart review and provider/nursing survey to determine baseline conditions	**Action 4**: Nursing and Provider Education Presentation at faculty meeting and 1:1 nursing and provider education **We provided >80% of full time nurses and providers educational intervention**	**Action 5.** Chart review We reviewed 100% of charts during the intervention for inclusion of opioid discharge education **Action 6:** We completed 3 PSDA cycles with provider audit and feedback **Future Action**: Complete 4 additional audit and feedback cycles **Future Action:** Repeat Survey for provider and nursing self-report of discharge education

Tests of Change



Results



Future Results: Complete 4 additional audit and feedback cycles
Future Results: Repeat Survey for provider and nursing self-report of discharge education

Reflection/Follow-up

- Quality project was stopped due to COVID -19, redeployment of resources and consideration for nurses and providers that were adjusting to information overload and process change
- Based on early data intervention appears to be improving written material for patients discharged with an opioid prescription
- Next steps: Complete audit and feedback cycles. Complete provider and nursing survey post intervention
- Consider adding QR code or video discharge education for patients
- Consider follow up phone calls to ascertain if change in patient knowledge or behavior resulting from the intervention

NEW ED GUIDELINE FOR FEBRILE INFANT(29-60d)

Decreasing Unnecessary Resource Utilization

Presenters: Gargi Mukherjee, MD, Erin Reynolds, MPH student, Evan Orenstein, MD, Shabnam Jain, MD, and Nicole Hames, MD

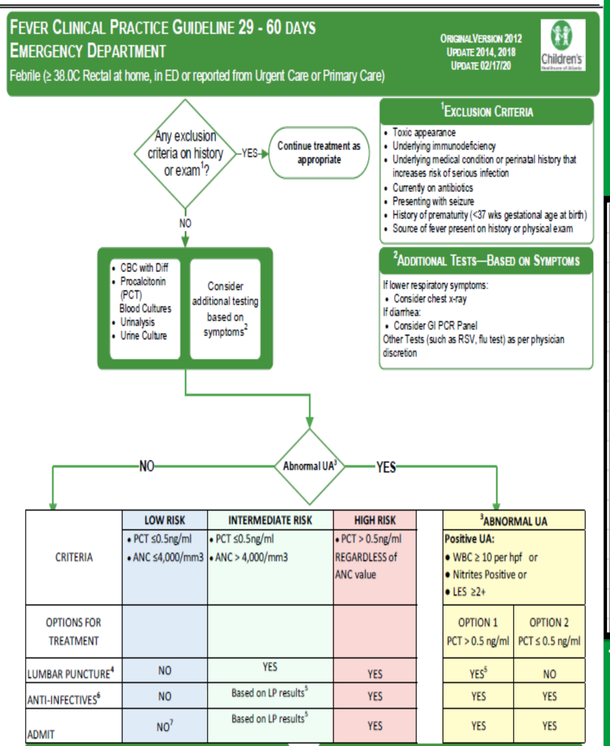
BACKGROUND:

- In the U.S., about 500,000 infants ≤ 60 days old are seen for fevers in Emergency Departments (ED) yearly
- 8 to 13% are diagnosed with a serious bacterial infection (SBI)
- Due to the low specificity of our previous guideline, a larger proportion of lumbar punctures (LPs), empiric antibiotic, and admissions are ordered
- **Population**: Previously healthy 29-60 day old infants presenting with fever, without an obvious focal infection. Both blood and urine culture ordered in ED.

SMART AIM:

- Among otherwise well-appearing, febrile infants in the 29-60day age group, we aim to decrease the number of LPs and hospitalizations by 20% from baseline and empiric antibiotic administration by 10% from baseline in the next 12 months.

NEW GUIDELINE:



Will Rates of LPs, Admissions, and Empiric Antibiotic Administration Decrease with Implementation of a New Guideline Using Procalcitonin To Assess Febrile Infants?

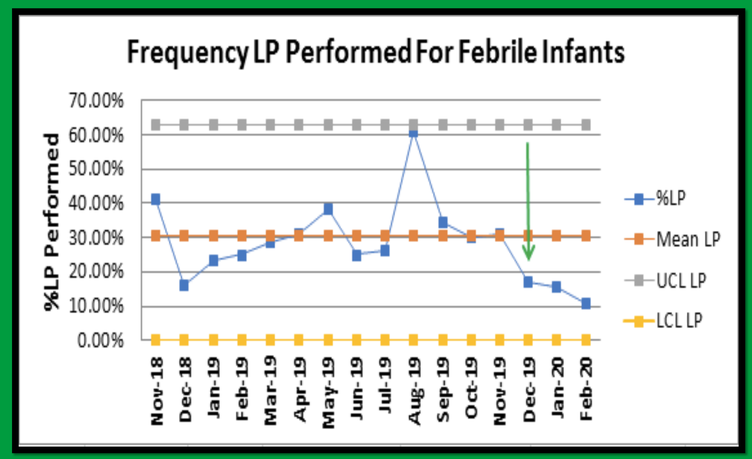


Table 1: The average LP rate was about 31% prior to publishing the new guideline.

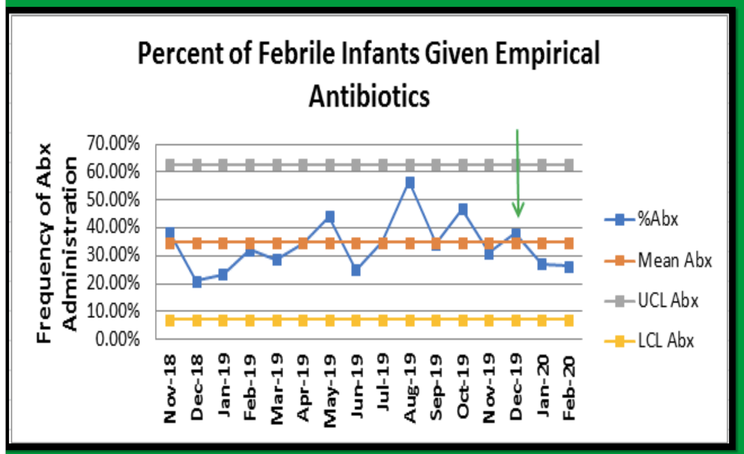


Table 2: On average, infants received empiric antibiotics during 35% of encounters.

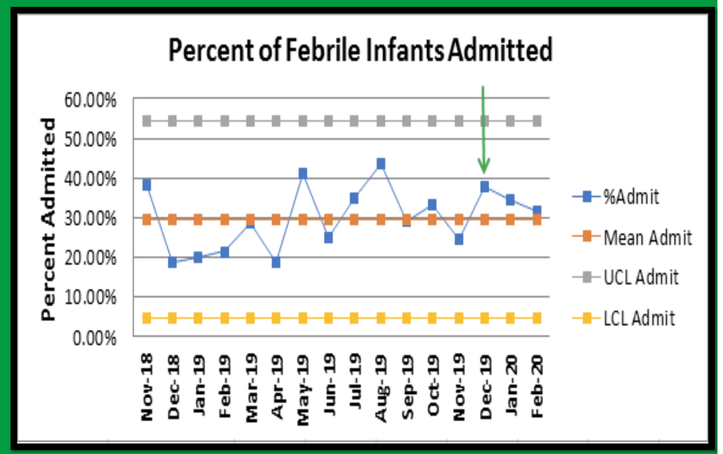


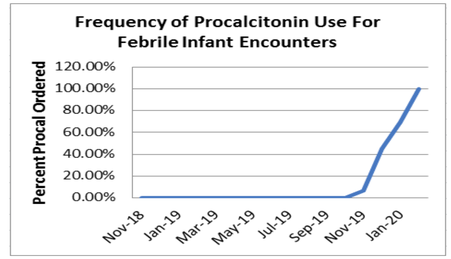
Table 3: The average baseline admission rate was approximately 30%.

Interventions:

- New Clinical Practice Guideline
- Education for ER physicians

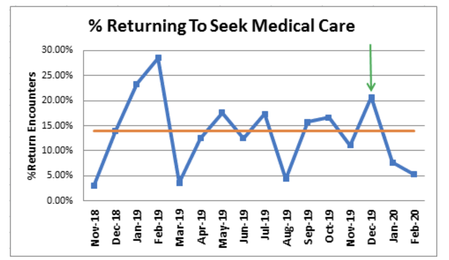
Process Measure:

- Evaluate ED provider use of new clinical practice guideline for 29-60 day old infants presenting with fever by assessing use of associated order set.
  - Use of Old Order Set – 32%
  - Use of Procalcitonin -



Balance Measures:

- Track patients 29-60 days old evaluated for fever to ensure that those with invasive bacterial infections are not missed and less than 2% of serious bacterial infections are missed.
  - Returns to seek medical care within 4 weeks of initial visit



Future Steps:

- Release Order Set For New Guideline
- Analyze Data for Process and Balance Measures
- Continue to Track Post-Intervention Data

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Improving Vaccination Rates in Patients with Inflammatory Bowel Disease

Danielle Shelnut,MD[1]; Harika Gorti, MD[1,2], Corinne Abraham DNP, RN[1,2];
Rosie Cruz-LaPorte, BSN, RN[1]; Laisa Jacob, BSN, CGRN, RN[1]; Meena A. Prasad, MD[1, 2]
[1]Emory University, [2]Atlanta VA Medical Center

Aim Statement

We aim to increase the vaccination rates in veterans with inflammatory bowel disease (IBD) that follow in IBD clinic over 6 months time as compared to data obtained from the prior calendar year. We anticipate to increase vaccine compliance through various methods by 20%.

Background

Recent data suggest that IBD patients do not receive preventative services at the same rate as general medical patients.

Patients with IBD often treated with long-term immune suppressive therapies and may be at increased risk for infection, largely preventable via vaccination.

By identifying current gaps in care, developing a process to determine vaccination needs and a method for delivery, as a GI clinic we could assume responsibility for this aspect of healthcare maintenance for our IBD patients.

Measures

Outcome Measures
Missed opportunities – total # vaccines given/total # indicated

Process Measures
-vaccine not offered
-patient deferred
-patient declined
-vaccine not available

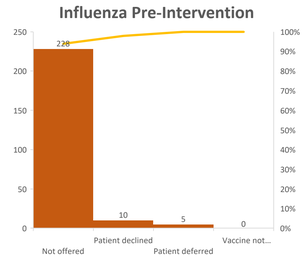
Balancing Measures
-Office visit prolonged due to addressing HCM
-Cost
-Possibility of effecting nurse triage, bottleneck (*staff satisfaction*)
-Improved patient satisfaction

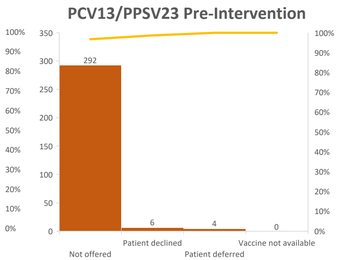
Actions/Tests of Change

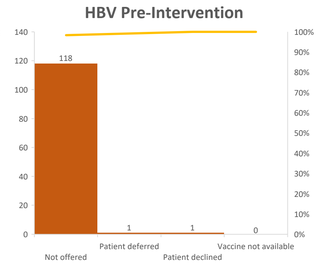
Action/Test of change	Outcome/what was learned?
Made IS rubric	Familiarized users (and team) with criteria for vaccinations; ease of use
Vaccine order menu	Ease of ordering; Educational
Nurse clinic	Venue to vaccinate
RTC order for injection series	Allowed process for patient follow up
Changing IBD Note template	Ease of finding vaccine history, recording +/- missed opportunities
Increased vaccines available in clinic	Increased vaccination rates of select vaccines

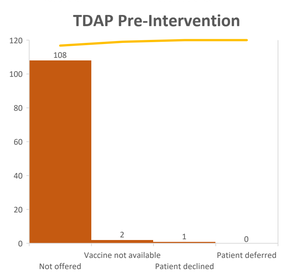
Baseline Conditions

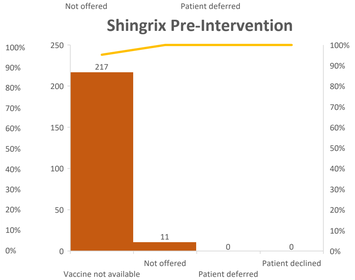
Vaccinations	Median of Missed Opportunities
Influenza	61.92%
PCV13/PPV23	68.33%
HBV	77.46%
TDAP	27.92%
Shingrex	97.06%



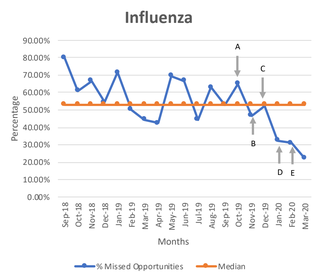


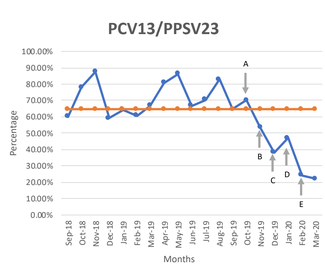


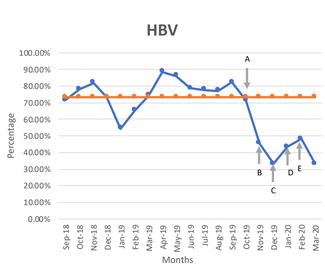


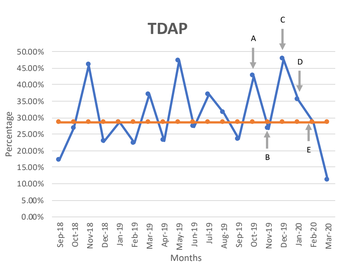


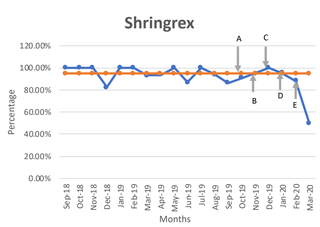
Results





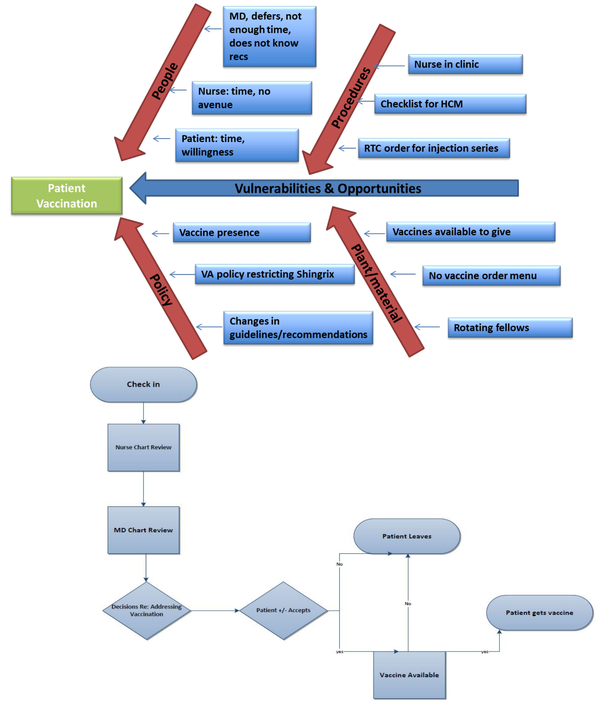






Legend:
A: Start of project
B: Tally sheet, vaccine criteria identified
C: Vaccine template embedded in note
D: Updated vaccine order menu
E: All vaccines in clinic

Analysis



Reflection/Follow-up

The actions/tests of change allowed us to identify deficiencies in our system and contrive methodical interventions.

Use of tally sheets to keep track of real-time data allowed us to identify progress as each change was implemented.

The cumulative effect of each intervention made an impact on reducing the percentage of missed opportunities by more than 20%.

Patients expressed appreciation for the time given to vaccine education and increasing the access to vaccination in IBD clinic.

Moving forward, we plan to sustain this process and expand this process to other VA hospitals through the IBD subcommittee of the National VA Field Advisory Committee.

IMPACT OF ULTRASOUND GUIDANCE IN ASSESSMENT OF MATURITY AND CANNULATION OF NEW ARTERIOVENOUS FISTULA (AVF)

Niraj Karki, Forest Rawls, Rodella Broxton, Troy Walker, Vandana Dua Niyyar

Aim Statement

1. To implement ultrasound-guidance to assess maturity of all new AVF in hemodialysis patients at Emory Dialysis by February 2020.
2. To decrease the infiltration rate of new AVF to < 10% in hemodialysis patients at Emory Dialysis over 6 months.

Background

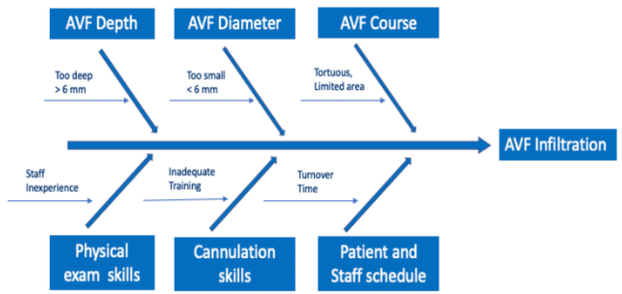
- An arteriovenous fistula (AVF) is the preferred access for hemodialysis (HD) patients despite concerns of high primary failure rates and prolonged time to maturation.
- In the United States, AVF cannulation is done by dialysis staff and usually based on assessment of the access by palpation and physical examination.
- A common complication during cannulation, particularly in new AVF, is needle infiltration.
- AVF infiltration is associated with major morbidity, including additional interventions, prolongation of catheter dependence and access failure.
- Judicious use of ultrasound guidance has been successfully used in difficult peripheral as well as central venous access to reduce iatrogenic injury.
- We hypothesized that the use of portable ultrasound for cannulation of hemodialysis access would minimize infiltration during cannulation of new AVF in HD patients at Emory Dialysis over a 6-month period.

Baseline Conditions

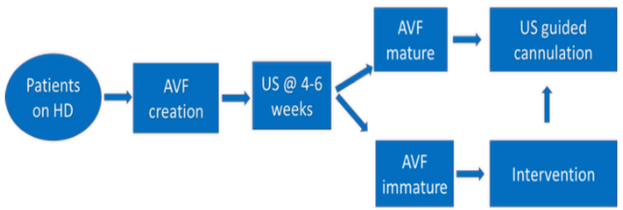
- AVF cannulation at Emory Dialysis has traditionally been done by front-line dialysis staff and is based on subjective criteria for access maturity including physical examination.
- Infiltration data for all AVF was obtained from a retrospective database.
- There were 50 new AVF that were cannulated during a 6-month period in 2016 (1/1/2016 to 6/30/2016).
- Of these, there were 7 infiltrations of new AVF cannulations during this control period.
- The rate of infiltration of new AVF during cannulation was 14% in our dialysis units during the control period.

Analysis

FISH BONE DIAGRAM



PROCESS MAPPING



Measures

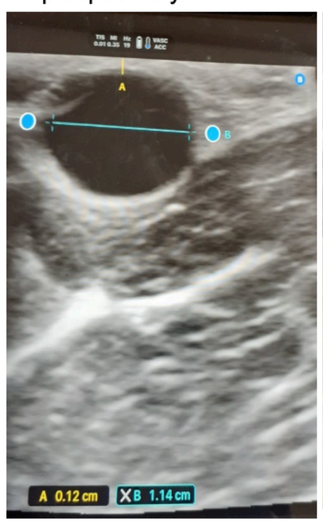
- Study period: 8/15/2019 to 2/14/2020 (6 months).
- Sites: Emory Dialysis; all 4 outpatient HD units.
- Patient population: HD patients with new AVF.
- Intervention # 1: US assessment of all new AVF for maturity and readiness for cannulation. Mature AVF defined by diameter > 6 mm, depth < 6 mm.
- Outcome # 1: Was US utilized to assess maturity of all new AVF in HD patients at Emory?
- Intervention # 2: US guided cannulation of all new AVF deemed mature by above process.
- Outcome # 2: Did US guided cannulation of new AVF result in decreased infiltrations? Infiltration defined by extravasation of blood leading to missed dialysis treatment or prolonged catheter use.

- Rate of Infiltration =

$$\frac{\text{Number of new AVF infiltrations}}{\text{Total number of new AVF created in that period}} \times 100$$

Actions/Tests of Change

- We implemented an educational protocol to train 18 members of our dialysis staff in the use of portable ultrasound for evaluation of dialysis access.
- This included both objective criteria for assessment of maturity of AVF and readiness for use as well as simulation models for cannulation.
- 2 dedicated vascular access coordinators were trained as "access champions" and led the initiative.
- Each of the 4 HD units received their own portable ultrasound machine, which was made freely available to all dialysis staff.
- All new AVF were evaluated by US 4-6 weeks post-operatively.
- Immature AVF were sent for further evaluation/interventions.
- Mature AVF were cannulated under real-time ultrasound guidance.
- All data, including AVF infiltrations, were recorded prospectively.

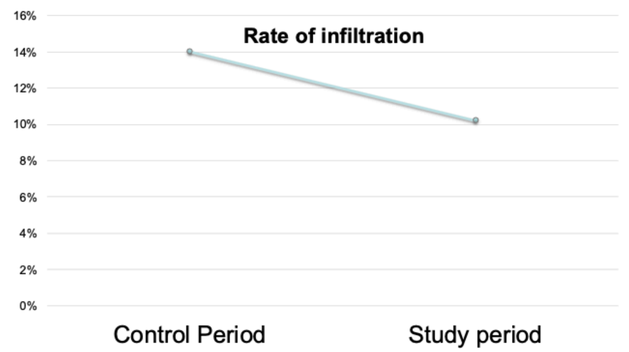


Measurement of diameter

US-guided cannulation

Results

	Control period	Study period
Number of AVF created	50	39
Number of infiltrations	7	4
Rate of infiltrations	14%	10.2%



- 39 patients with new AVF were evaluated during the study period.
- There were only 4 infiltrations (10.2%) of new AVF .
- Rate of infiltration decreased by 3.8%

Reflection/Follow-up

- Use of portable US devices for assessment of maturity and cannulation guidance is feasible even in busy HD units.
- In future studies, we will include multiple US measurements along the course of AVF as they may be more predictive of outcome.
- Infiltrations were reduced with the use of US guidance for cannulation.
- US education should be expanded to include all members of the dialysis staff involved with cannulation.
- Regular competency checks are essential to identify and supplement gaps in knowledge.

Improving Discharge Decision Making for Heart Failure Patients

Olga Turner, DNP, MSN, BSN,
Becky Dean, MSN, APRN, ACNS
Neil Bhatia, MS4

Aim Statement

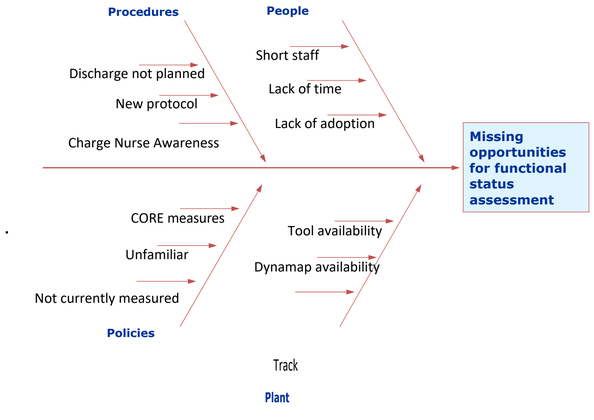
The aim of this project is to improve the determination and prediction of discharge-readiness of heart failure patients on the Heart Failure Unit at Emory University Hospital by implementing a sustainable functional assessment test for 100% of HF patients within one day prior of assumed discharge.

Background

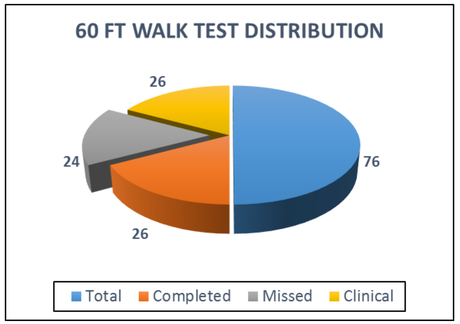
Assessing functional capacity in heart failure patients is crucial for the determination of further interventions, the likelihood of rehospitalization, and ultimately all-cause mortality. Recent studies have shown that walking heart failure patients reduces rehospitalization rates and all-cause mortality. The 6-minute walk test (6MWT) has been proven to be effective in assessing functional status in heart failure due it's simple, inexpensive, and safe design. However, the 6-minute time parameter of the test results in significant limitations such as the increased effect on walking from comorbid conditions and the requirement of more time, physical space, and personnel to conduct the test. As an alternative, the 60-feet walk test (60FtWT) is a tool that accurately assesses functional status in heart failure while potentially mitigating the limitations of the 6MWT by requiring less time, space, and resources; and by reducing confounding effects of other comorbid conditions. This project aims to implement the 60FtWT in a consistent manner that emphasizes its effectiveness in assessing functional capacity in heart failure patients.

Baseline Conditions

The feasibility of implementing the 60FtWT on a heart failure unit at a major academic medical center was conducted. it was noted that there were many missed opportunities to perform the test with patients prior to time of discharge. Barriers to perform the test prior to the day of discharge.



Analysis



Completed	34%
Missed	34%
Clinical	34%

Measures

The 60 Ft Walk Test Assessment Form was used to collect vital statistics pre- and post-test and performance data for each patient completing the walk test. Vital statistics included BP, HR, O2 saturation. Time (seconds) and distance (feet) completed where also measured. Lastly, Perceived Exertion was also noted using the XX exertion scale with 6 being "no exertion at all" and 20 being "maximal exertion".

Patients were excluded from completing the walk test based on the following criteria: refused, getting LVAD implant or OHT, waiting for heart transplant, going to SAR, non ambulatory, transferred to ICU, or death.

60 Ft Walk Test completion times ranged from 60 seconds to 55.8 seconds. Most patients completed the walk test between 19 and 36 seconds.

Actions/Tests of Change

References

Alahdab, M.T., Mansour, I.N., Napan, S., Stamos, T.D., (2009). Six Minute Walk Test Predicts Long-Term All-Cause Mortality and Heart Failure Rehospitalization in African-American Patients Hospitalized with Acute Decompensated Heart Failure. *J. of Cardiac Failure. 15*(2), 130-135.

McCabe, N., Butler, J., Dunbar, S.B., Reilly, C.M. (2017). Six-minute walk distance predicts 30-day readmission after acute heart failure hospitalization. Retrieved from http://www.researchgate.net/publication/317152856_Six-minute_walk_distance_)predicts_30-day_readmission_after_acute_failure_hospitalization

Results

Initially, it was thought that RTAL could be used to flag Estimated Date of Discharge (EDD). The Charge Nurse Report was used to supplement gaps in the RTAL EDD. Barriers for using RTAL and the Charge Nurse Report include:

RTAL patient discharge readiness tool

Unreliable: not all providers completing i.e. only HF versus HMS

Charge Nurse Daily Patient Report

This is a manual process that requires verbal update from RN; not timely or real time reporting

When the pilot was redirected to RNs determining when to perform the 60 ft. walk test, better completion results were achieved.

RN Driven 60 FT Walk Test	
Total Patients	23
Clinically inappropriate	12
Eligible patients	11
Completed Walk Tests	9
% Completed Walk Tests	82%

Reflection/Follow-up

Our research has shown that although literature state that the 60ftWT has the potential to alter readmission rates and all cause mortality, the real-life applicability of the test is entirely dependent upon RN participation. We have concluded from our implementation of this test that this needs to be an RN-driven process for the following reasons:

1. RNs are in the best position to know when the patients are ready for discharge as they are in daily contact with patients. Thus they know best when to administer the test. When they are engaged sustainability of the test is optimized
2. Extrinsic, computer-automated tools such as RTAL are unreliable in their current state and depend too greatly on physician input, which was quite unpredictable

Follow-up studies may seek to do the following

1. Implement a clear protocol for nurses to be at the forefront of administering and monitoring this test
2. Re-examine other potential technical tools like RTAL that may be aid RNs or physicians in determining discharge readiness of HF patients
3. Correlate and compare the date aggregated from further testing of the 60ftWT with existing data from applications of the 6-minute walk test

Syphilis in the ED – Current State

Background

- A syphilis epidemic has emerged in the last 15 years among men who have sex with men (MSM), as well as men who are HIV-positive
- Many of these patients present to the EUHM ED with dysuria or symptoms of a sexually transmitted infection (STI)
- ED visits are opportunities for early detection, treatment, and developing relationships with an infectious diseases care team

Aim Statement

Increase the rate of syphilis testing for any male who presents to EUHM ED with symptoms of dysuria or a STI by 50% by February 29, 2020

Patient Characteristics
men with dysuria or STI symptoms (July-Sept 2019)

	ED Visits, n*
Total ED visits*	245
Known HIV+	54 (22%)
Documented MSM	36 (15%)
Known HIV+ and documented MSM	17 (7%)

**Some patients had multiple ED visits*

Take Home Point
Approximately 30% of encounters for men with dysuria or STI symptoms were by those at high risk for syphilis

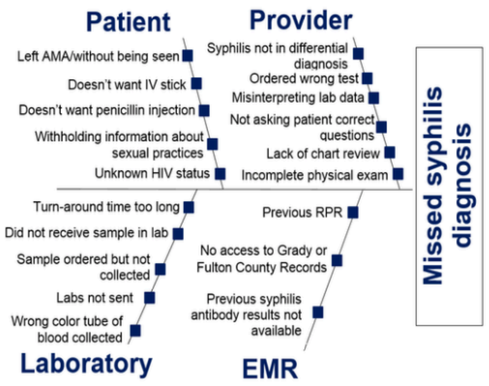
Baseline Data – RPR*
men with dysuria or STI symptoms (July-Sept 2019)

	ED Visits
RPR was sent (n=245)	29 (12%)
Reactive RPRs (n=29)	21 (72%)
Known HIV+ with RPR (n=54)	17 (31%)
Documented MSM with RPR (n=36)	12 (33%)
Known HIV+ and documented MSM with RPR (n=17)	8 (47%)

**RPR (rapid plasma reagin)*

Take Home Points
Only 12% of males with dysuria or STI symptoms were tested for syphilis. Syphilis testing was not performed in 53% of HIV-positive MSM who presented with dysuria or STI symptoms.

Cause and Effect



Take Home Point
Target syphilis being in differential diagnosis

Simple interventions increased testing for syphilis in the EUHM ED, but not in high-risk groups

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[3]Emory University, Rollins School of Public Health
[4]Emory University School of Medicine

Syphilis in the ED – Practice Change

Intervention

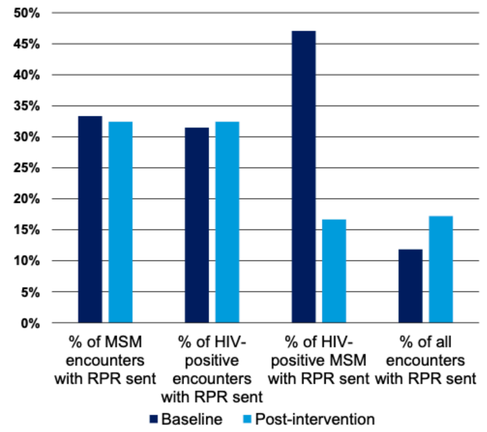
- Provider education via email and verbal updates at faculty meetings
- Flyers posted at ED providers' workstations
- Standardized language about outpatient follow-up to include in discharge paperwork

Sample Flyer

Male with STD symptoms?

Send RPR!

Results



Take Home Points
Overall, more RPR tests were sent on male patients with dysuria or STI symptoms. There was a decrease in the amount of RPR testing sent on HIV+ MSM patients.

Insights/Lessons Learned

- There is a syphilis epidemic in Atlanta, especially within the HIV+ and MSM populations
- Historically, most workups for men with STI symptoms did not include syphilis consideration or RPR evaluation
- Providers do not regularly ask about specific sexual behaviors (barrier use, anal intercourse, etc.) or define patient sexual partners (same sex vs. different sex vs. transgender)
- Despite emails, flyers, and verbal education, providers did not consistently order RPRs on high-risk individuals
- Standardize data collection methods and involve statisticians early on in quality improvement process

Future Directions

- Share these results with ED providers
- Consider updating STD powerplan to include RPR with guidance for high-risk individuals
- Continue to collaborate with EUHM's outpatient ID clinic to ensure appropriate aftercare