HOUSE

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Journal of the University of Washington
Housestaff Quality and Safety Committee

UW Medicine
GRADUATE
MEDICAL EDUCATION
HOUSESTAFF QUALITY
& SAFETY COMMITTEE

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In This Issue of HOUSE

Articles

Front Cover Art –
"Golden Dreams," acrylic on canvas with gold leaf collage. Inspired by Persian calligraphy, this artwork is an ode to "Golden Dreams," a famous Persian piano piece.

Artist Megan Zare, MD, is a Pediatric Radiology fellow at Seattle Children's Hospital. She has painted for over 25 years, and has exhibited her work in group and solo exhibitions in Iran, China, and the United States. Working in watercolors and acrylics, her works are abstract/figurative modern, inspired by her Persian background encompassing Persian calligraphy and poetry. Her work has won multiple awards and top honors, and can be seen at www.meganzare.com

A Note from the Editors

Dear UW Medicine Reader,

This new year, many of us will make resolutions. The turn of the calendar year offers a fresh chance to improve something in our lives, our habits, the world around us. We take this time of year as an opportunity to re-evaluate how we can do better, and there is some comfort in knowing that around the nation, others are doing the same. We might even share our resolutions, or probe others about theirs, in order to feel supported in our actions of self betterment.

But in the world of quality improvement, this process does not wait for a holiday or flip of the calendar. That's the beauty of QI - those who work in quality and safety have carefully honed an eye to continually search for opportunities for improvement. It is a daily activity, a routine part of the workflow, and an ongoing, iterative process, rather than an occasional effort marked by a holiday and great fanfare.

In this issue, as we do each year in HOUSE, we try to offer a little celebration for the amazing work that our housestaff are conducting every day, in every department, in every hospital. We highlight projects to improve quality of care across settings ranging from the medical ICU at UW, the trauma/surgical ICU at Harborview, all the way to outpatient rheumatology and VA mental health clinics. Others are employing technology to better connect residents to ongoing QI work through our exciting QI Match release, and we hear from residents on our HQSC who had the chance to learn about how the aviation industry approaches safety through a Boeing site visit.

All the work we do through HQSC is empowered by the extraordinary leadership of our co-chairs, Stephanie Carr and Alicia Fuhrman, as well as our wonderful faculty mentors and the incredible support and investment of the hospital administration. We also owe a great debt to Chen Wu, Irving Ye and Nick Meo who started this journal in 2015, and paved the way for us to celebrate and promote QI work throughout the UW system.

I hope you enjoy reading this issue of HOUSE, and maybe this new year, our resolutions won't end with the holiday.

Sincerely,

Jacob Stein, MD/MPH, Editor In Chief
Jared Bozeman, MD, Executive Editor
Jay Zhu, MD, Executive Editor

Getting Involved in Quality Improvement and Patient Safety

University of Washington residents and fellows have numerous opportunities to participate in improving healthcare delivery. From providing resident input in administrative meetings, to earning a certificate in quality improvement (QI) and patient safety (PS), to finding and implementing personal projects – trainees at all levels are encouraged and supported. Below are some of the more popular avenues to get involved:

Housestaff Quality and Safety Committee

Formed in 2011, the UW Housestaff Quality & Safety Committee (HQSC) is a trainee-led organization with members comprising a range of academic divisions. HQSC functions in partnership with the UW Patient Safety and Quality Coordinating Committee and the Graduate Medical Education Committee, with the goal of engaging members in the quality and safety work pursued throughout UW training sites. PGY-2 residents and above are welcome to this group. Applications are sent out in the spring for the following year. Members attend monthly meetings throughout the year to learn the skills needed to become future leaders in QI and patient safety. Because of impressive year-over-year growth, HQSC has debuted a new leadership team to better serve our members in areas of publication, technology, development, and outreach.

Certificate Program: Motivated HQSC members can earn a certificate in quality improvement and patient safety by consistently attending monthly meetings, completing an IHI Open School online training course, and undertaking a longitudinal project with some kind of output (i.e. publication, presentation).

Liaisons Program: The Liaisons program is a less demanding way to get involved in administrative meetings around the UW training sites. This group is open to all trainees, including interns. A monthly calendar is maintained by the Liaisons leadership, with a request that Liaisons attend a minimum of three meetings over the course of the year.

See **uwhqsc.org** for more details.

QI Match

QI Match is a home-grown UW product and was borne out of a desire to connect trainees with QI and PS opportunities under the UW Medicine umbrella. Co-sponsored by the UW Center for Scholarship and Patient Safety, QI Match has been revamped into a robust, interactive platform that allows users to create, search for, and apply to projects. A full re-launch is expected this winter. Login is available to all users with a UW NetID.

See **qimatch.com** for more details, and thank you for your patience through the construction period.

Transformation of Care

UW Medicine is the recipient of a $30 million, four-year award from the Center for Medicare and Medicaid Innovation to serve as a Practice Transformation Network for the WWAMI region (Washington, Wyoming, Alaska, Montana, and Idaho). Oversight for this grant is through the office of the Chief Medical Officer, who is identifying projects in need of resident input before making these opportunities available on QI Match.

See **http://www.uwmedicine.org/about/transformation** for more details.

De-identified Clinical Data Repository (DCDR)

The DCDR is a tool that can be used to query the medical record at UWMC and HMC, returning de-identified data on user-defined patient populations. For example, a user can request: "Provide me a count of patients, age 30-65 with a diagnosis of myocardial infarction, who were discharged within the past six months." It is free for any resident after completion of a short training module.

See **http://www.iths.org/investigators/services/bmi/dcdr** for more details.

Access to Excellence

Access to Excellence is a frequently updated, electronic quality dashboard of key metrics. All metrics are protected and require AMC login to view. Access to Excellence provides detailed quality data on numerous metrics and allows users to search performance information for specific units, services, or departments. This function can provide you with performance information on a specific unit, service, or department. There are also dashboards for key departments/centers of emphasis, accessible by clicking on the department/center's initials in the upper right hand corner. Access to Excellence is a great reference for current QI and PS efforts underway at UWMC and HMC. Each metric has a champion, and his or her contact information is displayed if you would like to reach out. Click on the Access to Excellence banner on the HMC or UWMC intranet webpage to access.

PSN (Patient Safety Network)

Remembering that patient safety starts with front-line care providers, the PSN system is available to all users in the UW Medicine network by simply clicking the desktop icon found on hospital and clinic computers. This is one of the most direct ways of raising attention to issues that affect or have the potential to affect patient care. Here you can report near-miss or harm events and ask for feedback on your submission form from the patient safety office.

HQSC Members and Certificate Awardees 2016-2017

HOUSE CHAIRS

Stephanie Carr –Chief Resident for Quality & Patient Safety, Internal Medicine

Alicia Fuhrman –PGY-4, Physical Medicine & Rehabilitation

HQSC MEMBERS

Abdullah Feroze (Neurosurgery)
Aileen Kim (Radiation Oncology)
Albert Chow (Pediatric Rheumatology)
Alex Mays (Pathology and Laboratory Medicine)
Amy Cheney (Cardiology)
Amy Thomas (Geriatrics)
Andrew Ludwig (General Surgery)
Benjamin Wolpaw (Internal Medicine)
Christopher Ideen (Physical Medicine & Rehabilitation)
Daniel Cho (Plastic Surgery)
Darius Schneider (Metabolism, Endocrinology, Nutrition)
Demetris Haldeos (Occupational Medicine)
Dima Raskolnikov (Urology)
Doug Leedy (Internal Medicine)
Elizabeth Wolpaw (Emergency Medicine)
Emily Bartlett (Emergency Medicine)
Grace Wu (Geriatrics)
Greta Tubbesing (Internal Medicine)
Jaclyn Russell (Pediatric Physical Medicine & Rehabilitation)
Jake Stein (Internal Medicine)
Jamie Oh (General Surgery)
Jared Bozeman (Psychiatry)
Jay Zhu (General Surgery)
Jessica Huang (Anesthesiology)
Jonathan Del Toro (Anesthesiology)
Jill Steiner (Cardiology)
Justin Granstein (Neurology)
Kali Webb (Physical Medicine & Rehabilitation)
Kailey Bolles (Internal Medicine)
Kathryn Bowman (Internal Medicine)
Kavita Pandit (General Surgery)
Kavita Vinekar (Obstetrics & Gynecology)
Kevin Labadie (General Surgery)
Kevin Saiki (Obstetrics & Gynecology)
Kevin Seitz (Internal Medicine)
Leo Liu (Clinical Informatics)
Marie Sears (Internal Medicine)
Mary Kate Thayer (Orthopaedics)
Matt Kelberg (Anesthesiology)
Matt Mesias (Geriatrics)
Matt Spraker (Radiation Oncology)
Meg Curtis (Internal Medicine)
Molly Tolins (Emergency Medicine)
Nathan Sackett (Psychiatry)
Nicole Sharp Cottrell (Pediatric Surgery)
Patrick Bender (Emergency Medicine)
Priya Motz (Occupational Medicine)
Rachel Harper (Emergency Medicine)
Raina Voss (Adolescent Medicine)
Reza Sadeghian (Clinical Informatics)
Rishi Sekar (Urology)
Rugvedita Parakh (Pathology and Laboratory Medicine)
Sandeep Krishnan (Interventional Cardiology)
Samantha Hersrud (Internal Medicine)
Samuel Day (Radiation Oncology)
Sara Parke (Physical Medicine & Rehabilitation)
Sean Matsuwaka (Physical Medicine & Rehabilitation)
Selma Carlson (Cardiology)
Sonali Sheth (Family Medicine)
Song Li (Cardiology)
Tokunbo Akande (Clinical Informatics)
Vidang Nguyen (Cardiology)
Vim Mahadev (General Surgery)
Vlad Golgotiu (Anesthesia)

UW GME GRADUATE QUALITY & SAFETY CERTIFICATE AWARDEES

Alicia Fuhrman –Physical Medicine & Rehabilitation
Andrew Ludwig –General Surgery
Ben Wolpaw –Internal Medicine
Chris Ideen –Physical Medicine & Rehabilitation
Darren Lee –Rehabilitation Medicine
Kendell German –Neonatology
Ryan Martin –Cardiology
Stefanie Deeds –Internal Medicine
Stephanie Carr –Internal Medicine

GENE PETERSON AWARD

Alicia Fuhrman and Stephanie Carr presenting Dr. Mark Snowden of the Psychiatry Department with his Gene Peterson Award, July 7, 2017.

This section features exceptional work conducted by the residents and fellows of UW Medicine in the field of quality improvement.

A Bundled Intervention to Decrease the Duration of Mechanical Ventilation: A Quality Improvement Initiative in the Medical Intensive Care Unit

Authors: Anthony J. Esposito, MD[1]; Patricia A. Kritek, MD, Ed.M.[2]; Basak Çoruh, MD[2]

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ABSTRACT

Prolonged mechanical ventilation has many consequences that affect the patient, institution, and society. In some cases, systems issues contribute to delays in extubation such as after a successful spontaneous breathing trial (SBT). Through a bundled intervention targeting improved communication between providers, our aim was to increase the number of medical intensive care unit patients extubated within 45 minutes of a successful SBT by 25% within 6 months. Data was collected in pre- and post-intervention cohorts utilizing an uncontrolled before-after study. Three months post-intervention, patients were 1.53 times more likely to be extubated in this timeframe, although this result was not yet significant. The mean time from successful SBT to extubation decreased significantly by 29.8 minutes (p=0.02). These results suggest that formalization of provider-to-provider communication regarding extubation of patients who have successfully passed an SBT could lead to earlier ventilator liberation.

INTRODUCTION

The duration of mechanical ventilation has important implications that extend beyond the intensive care unit (ICU). Prolonged intubation is associated with increased risk of ventilator-associated pneumonia, administration of additional sedatives and narcotics, and increased risk of delirium.[1,2] Long-term physical, neuropsychiatric, and quality of life impairments have been demonstrated in survivors of critical illness who underwent mechanical ventilation.[3] Furthermore, prolonged intubation results in increased ICU and hospital length of stay as well as increased cost and resource utilization.[2]

Significant advances have been made over the last decade to minimize the duration of mechanical ventilation. These include pairing of a spontaneous awakening trial with a spontaneous breathing trial (SBT) and "fast-track" cardiac anesthesia protocols, both of which result in earlier extubation.[2,4] A potential systems component to delayed extubation is delay from successful completion of an SBT—a predictor of successful extubation—to actual extubation. Improving provider-to-provider communication regarding extubation plans may decrease this interval.

To address this potential systems issue, a bundled intervention was developed to formalize communication between care providers about extubation plans with a goal of increasing the proportion of patients extubated in the medical ICU (MICU) within 45 minutes of successful completion of a SBT by 25%.

METHODS

An uncontrolled before-after study was conducted in the MICU at University of Washington Medical Center. As a quality improvement initiative, this project was exempt from IRB review. A bundled intervention was implemented via: 1) establishment of a pre-work rounds "huddle" between a MICU team provider, the charge nurse, and the lead respiratory care practitioner to discuss anticipated extubations; 2) use of a pre-established, structured handoff tool to create an extubation contingency plan (e.g., "if passes SBT, OK to extubate") communicated both in written and oral format during evening provider handoffs; and 3) designation of a provider to respond to pages regarding successful SBTs during work rounds, allowing entry of orders and/or assessment of the patient as needed without interrupting workflow.

Medical records were reviewed from two defined time intervals: six months pre-intervention (January 1 - June 31, 2015) and six months post-intervention (March 1 - August 31, 2016). All patients undergoing mechanical ventilation who received an SBT prior to extubation were included. Exclusion criteria included patients with tracheostomies, extubations to comfort measures, alternative liberation strategies than SBT, or clear documentation as to why a delay in extubation occurred. Significant outliers with prolonged delay as determined by Grubbs' test ($p < 0.05$) were also excluded. Patients admitted to the MICU after liver transplant were excluded from analysis as they were directly admitted to the surgical ICU during the post-intervention period.

Documentation of SBT completion time, time of extubation, patient co-morbidities, and documentation of extubation delay were reviewed. Time of successful completion was considered to be time a blood gas was drawn after initiation of an SBT. If a blood gas was not drawn before extubation, time of successful completion was determined to be 30 minutes after initiation of SBT. The primary outcome was extubation within 45 minutes of successful completion of an SBT. Mean time to extubation after successful SBT was analyzed as a secondary outcome.

Statistical analysis was conducted utilizing GraphPad Prism 7 (GraphPad Software, Inc.). Continuous and categorical data were compared via Student's t and chi-squared tests, respectively. Relative risk was determined applying Koopman's asymptotic score. All data are reported as mean ± standard error of mean (SEM) or as percent prevalence. P values are one-sided and considered significant if < 0.05.

Table 1. Characteristics of the Patients at Baseline.*

Characteristic		Pre-Intervention (n = 59)	Post-Intervention (n = 29)	p value
Age – yr		57 ± 2	56 ± 3	0.78
Male Sex – no. (%)		33 (55.9)	12 (41.4)	0.20
BMI – kg/m^2		26.8 ± 0.9	30.2 ± 1.9	0.07
Race – no. (%)	White	43 (72.9)	23 (79.3)	0.51
	Black	3 (5.1)	1 (3.4)	0.73
	Hispanic	4 (6.8)	0 (0)	0.15
	Asian	4 (6.8)	1 (3.4)	0.53
	Other	5 (8.4)	4 (13.9)	0.44
Smoker (Current or Former) – no. (%)		33 (55.9)	14 (48.3)	0.50
Co-morbidities – no. (%)	Diabetes	16 (27.1)	10 (34.5)	0.48
	Liver cirrhosis	10 (17.0)	7 (24.1)	0.42
	Chronic kidney disease	15 (25.4)	4 (13.8)	0.21
	Congestive Heart Failure	9 (15.3)	3 (10.3)	0.53
	Obstructive Sleep Apnea	2 (3.4)	7 (24.1)	<0.01
	Chronic Obstructive Pulmonary Disease	8 (13.6)	4 (13.8)	0.98
	Restrictive Lung Disease	3 (5.1)	4 (13.8)	0.16
Reason For Intubation – no. (%) ¶	Respiratory Failure	27 (45.8)	13 (44.9)	0.93
	Airway Protection	32 (54.2)	16 (55.1)	0.93
Duration of Mechanical Ventilation – days		2.0 ± 0.5	1.2 ± 0.2	0.28

* Plus-minus values are means ± SEM. Except for prevalence of obstructive sleep apnea ($p < 0.01$), there were no differences in baseline characteristics across groups (P values range from 0.07 to 0.98).

¶ Airway protection included patients intubated for emergent procedures who later underwent SBT prior to extubation.

RESULTS

Early post-intervention analysis was conducted three months prior to completion of the study. The pre- (n = 59) and post-intervention (n = 29) cohorts were not statistically different in observed characteristics except for prevalence of obstructive sleep apnea (Table 1). The percentage of patients extubated within 45 minutes of successful completion of an SBT increased from 33.9% to 51.7% (RR = 1.53, 95% CI 0.91 to 2.49), though this change was not significant (p = 0.05) (Figure 1). The mean time to extubation after successful completion of SBT decreased significantly from 86.9 ± 9.0 minutes to 57.1 ± 9.1 minutes (p = 0.02) (Figure 2).

DISCUSSION

Through a bundled intervention designed to improve provider-to-provider communication, the proportion of patients extubated within 45 minutes of completion of a successful SBT increased by 53%, a result that suggests benefit but is not yet significant. With only 29 patients in the post intervention cohort, it will be necessary to re-analyze the data at the completion of six months of study. There was a significant decrease in the mean time to extubation by 29.8 minutes.

The study has limitations, mostly related to design. In particular, an uncontrolled before-after study does not account for other changes in protocol. For example, the MICU, along with all other ICUs, moved to a new space during the intervention and many new educational sessions were held. To limit this confounding, a parallel analysis of a control population would be ideal. Unfortunately, this was not possible as all other ICUs at our institution underwent similar restructuring at the same time. Additionally, our study design is vulnerable to the Hawthorne effect and regression toward the mean. Finally, the true time of completion of an SBT was estimated for patients who did not have a confirmatory blood gas, which potentially underestimates the actual time from SBT to extubation, limiting our power to detect an effect.

CONCLUSION

Improving provider-to-provider communication regarding extubation

Figure 1. Proportion of Patients Extubated within 45 Minutes of Successful Completion of a Spontaneous Breathing Trial

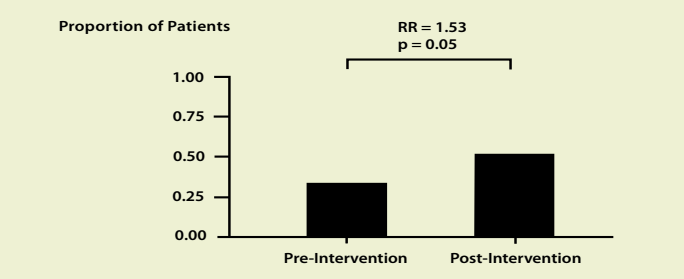
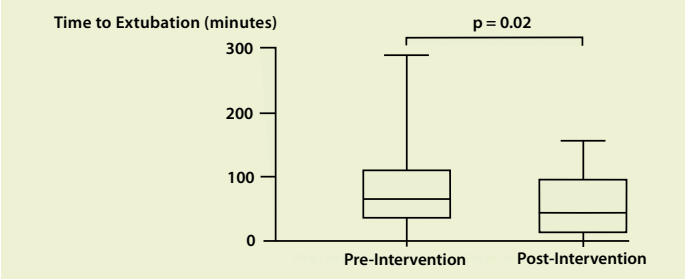


Figure 2. Time to Extubation after Successful Completion of a Spontaneous Breathing Trial



of patients who have successfully passed an SBT can lead to early ventilator liberation. This study demonstrates, with limitation, that a bundled intervention that formalizes communication between providers is a possible solution to this systems issue. The implications of this intervention are inferred to be positive; however, more studies are needed to determine whether there is an increase in unforeseen adverse events or significant changes in process or balancing measures.

Acknowledgements:

The authors would like to thank Musetta Fu, ARNP, PhD, Gayle Garson, MS, EdD, Vinod Chacko, BS, RRT, Kellie Garth-Green, RN, Kevin Patel, MD, and all of the nurses, physicians, and respiratory care specialists who made this project possible.

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Seattle Children's Hospital
Giraffe Entrance

Reducing Inappropriate Stress Ulcer Prophylaxis in the Harborview Medical Center Trauma Surgery Intensive Care Unit

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ABSTRACT

Stress-related mucosal disease and ulceration (SRMD) occur with major stressful physiologic events and has been associated with clinically significant gastrointestinal bleeding. Patients admitted to intensive care units (ICU) are at increased risk for SRMD and often prescribed prophylactic medication which may be unintentionally continued. We retrospectively chart reviewed patients admitted to the Harborview trauma-surgical ICU to determine the rate of inappropriate stress ulcer prophylaxis continued at the time of discharge. Appropriate indications for stress ulcer prophylaxis were determined based on existing recommendations and reviewed by an expert group of physicians and pharmacists. After collection of baseline data, we added an information box to admission order sets educating providers on appropriate indications for stress ulcer prophylaxis. Prior to this intervention, 7% of all admissions resulted in an inappropriate continuation of stress ulcer prophylaxis at the time of discharge from the ICU compared to 5% in the post-intervention group [2% absolute risk reduction (ARR), 45% relative risk reduction (RRR)]. Among all patients initiated on proton pump inhibitors, H2-receptor antagonists or sucralfate, 20% were inappropriately continued on these medications compared to 15% in the post-intervention group (5% ARR, 30% RRR). While inappropriate stress ulcer prophylaxis decreased after the introduction of our intervention, the decrease did not meet our goal of 75% reduction and, based on analysis, we are unable to conclude that the noted reduction was a result of the intervention.

BACKGROUND

Gastrointestinal bleeding from stress-related mucosal disease (SRMD) and stress-induced ulcers was first described in 1969[1] and is thought to be due to a combination of gastric acid secretion, mucosal ischemia, and reperfusion injury.[2] Patients with shock, extensive burns, acute spinal cord injury, or multiorgan failure are noted to be at increased risk.[3] GI hemorrhage from SRMD is fairly infrequent, occurring in approximately 2-6% of patients admitted to the intensive care unit (ICU)[4] but the associated mortality is high.[5] As many ICU patients have significant risk factors for the development of SRMD, many patients admitted to ICUs are initiated on prophylaxis at time of admission.[6]

There are currently three indicated medications for stress ulcer prophylaxis: H2-receptor antagonists (H2 blockers), proton pump inhibitors (PPIs) and sucralfate, with the choice between agents held on an institution-specific basis and clinical scenario.[7,8] Specific indications to prescribe medications for stress ulcer prophylaxis remains controversial given the low incidence of GI hemorrhage. Concurrently, there is potential for adverse events including nosocomial pneumonia and Clostridium difficile infection.[9-11] Several observational studies suggest that unwarranted prescription of stress ulcer prophylaxis continues as patients transfer out of the intensive care unit.[12,13] Taken together, overprescribing of stress ulcer prophylaxis has been highlighted by the American Board of Internal Medicine (ABIM) Choosing Wisely list[14] and there have been several published quality improvement initiatives to decrease the unnecessary utilization of stress ulcer prophylaxis among patients without a strong indication for their use.[15,16]

Harborview Medical Center (HMC) is a 413 bed university-affiliated tertiary care hospital with 36 intensive care unit beds. In order to determine the prevalence of inappropriate prescription of stress ulcer prophylaxis for patients transferring or discharging from the HMC trauma-surgical ICU (TSICU) we collected baseline data from October 2015 to April 2016. We aimed to reduce unnecessary prescription of stress ulcer prophylaxis in patients transferring out of the trauma-surgical ICU by 75% from October 2015 to April/May 2016 by implementing an information box on admission order sets educating providers on appropriate indications for stress ulcer prophylaxis.

METHODS

Study Population: We conducted a retrospective cohort study in patients admitted to the HMC TSICU from October 1, 2015 to June 7, 2016. Eligible patients were greater than 18 years of age with initiation of stress ulcer prophylaxis medications at the time of admission. Exclusion criteria included previous PPI or H2-blocker prescription prior to hospital admission, documented gastrointestinal bleed during hospital course, coagulopathy with an INR >1.5 or platelets <50,000, triple antiplatelet therapy, or history of a solid organ transplant. The study was approved by the Institutional Review Board at University of Washington Hospital System as a quality improvement project, and informed consent was waived.

Data: The Microsoft Amalga Unified Intelligence System (UIS), a data aggregation platform, was initially used to obtain a survey of patients admitted to the HMC TSICU on stress ulcer prophylaxis. Data obtained through UIS included admission date, discharge date, stress ulcer prophylaxis medication name and dosing, INR level, and platelet count on day of ICU discharge. Charts were individually reviewed for exclusion criteria as above, followed by length of ICU admission, length of mechanical ventilation and vasopressor medication, and confirmation of continuation of medication prescription at time of transfer from ICU and hospital discharge. Patients who were discharged from the ICU and then readmitted the same hospital stay were evaluated only once.

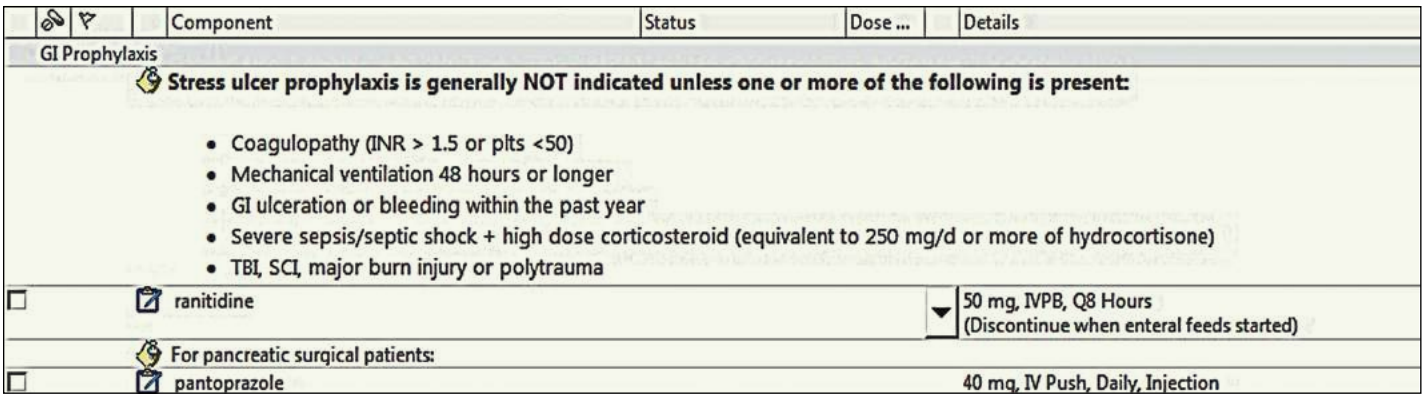
Definition of Inappropriate Use of Stress Ulcer Prophylaxis: Based on existing guidelines from the American Society of Health-System Pharmacists (ASHP)[7] and Eastern Association for the Surgery of Trauma (EAST),[17] we developed criteria defining appropriate use of stress ulcer prophylaxis (Table 1). We also considered continuation of a home PPI or H_2 blocker to be appropriate use. This list of approved stress ulcer indications was then reviewed with a multi-disciplinary team consisting of experienced critical care-trained attendings and pharmacists. For defining coagulopathy, anticoagulants/antiplatelet medications, and steroid use we considered the lab values or prescriptions for the day of discharge/transfer from the ICU. Based on these criteria, we developed an information box to be included in the admission orders for every patient admitted to the HMC TSICU (Figure 1).

Statistical Analysis: Data were imputed into a P chart to determine the mean, upper control limit (UCL), and lower control limit (LCL).[18] P chart was chosen because our data examined the rate of inappropriate stress ulcer prophylaxis continuation over time, the rate was not rare (e.g. >5%), and the sample size was variable. We examined our P chart for runs and trends, respectively defined as a series of points in a row above or below the center line and consecutive points increasing or decreasing.

Table 1. Definition of appropriate stress ulcer prophylaxis

Major Criteria (appropriate if ≥1 are present)	Minor Criteria (appropriate if ≥2 are present)
Mechanical ventilation for >48 hours	Sepsis
Platelets <50,000 or INR >1.5	ICU admission for >1 week
≥3 anticoagulants/antiplatelet medications concurrently	Bleeding for >6 days from unknown site
Recent upper GI bleed Recent solid organ transplant	Use of ≥62.5 mg prednisone equivalent daily

Figure 1. Intervention information box included in HMC TSICU admission powerplan.



RESULTS

Baseline (Pre-Intervention): Our baseline (pre-intervention) group, spanning from October 1, 2015 to April 20, 2016, included 1,196 total admissions to the HMC TSICU, of which 430 (36%) included a prescription for a PPI, H_2 blocker, or sucralfate (Figure 2). Of these 430 prescriptions, there were 256 (60%) for pantoprazole, 153 (36%) for ranitidine, 9 (2%) for lansoprazole, 5 (1%) for pantoprazole and ranitidine, 2 (0%) for lansoprazole and ranitidine, 2 (0%) for sucralfate, 1 (0%) for pantoprazole and lansoprazole, 1 (0%) for omeprazole, and 1 (0%) for sucralfate and ranitidine.

Among these 430 ICU admissions, 236 (55%) had their PPI/H2 blocker continued at discharge from the ICU of which 151 (64%) were deemed to be appropriate (primarily home medication (83%) and upper GI bleeding (15%)). The remaining 85 (36%) of cases with continuation of PPI/H_2 blocker were deemed to be inappropriate. Among these inappropriate prescriptions, there were 22 (26%) patients with a listed indication that did not meet our appropriateness criteria, including anticoagulation/antiplatelet therapy, anemia without clear cause, or protection of hypopharyngeal injury (e.g. vocal cord damage). Among the 85 patients receiving inappropriate stress ulcer prophylaxis, 39 (46%) were transferred to general surgery, 10 (12%) to vascular surgery, 6 (7%) to orthopedics, and 5 (6%) to otolaryngology.

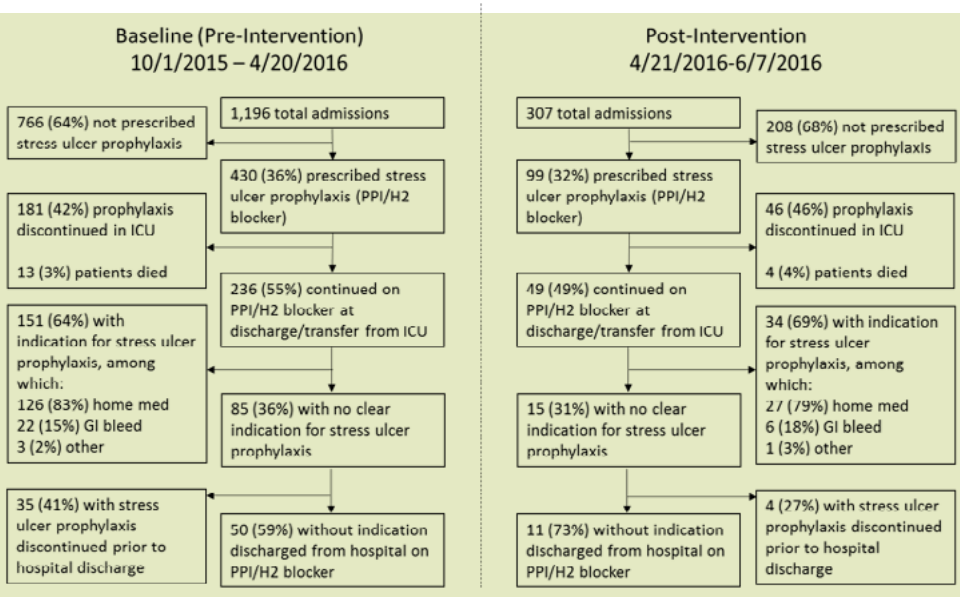
Post-Intervention: On April 21, 2016, our intervention was implemented and every admission order set included an information box with indications for stress ulcer prophylaxis. From this date until June 7, 2016, there were 307 total admissions of which 99 (32%) included some prescription for stress ulcer prophylaxis (Figure 2). 58 (58%) of these prescriptions were for pantoprazole, 38 (38%) for ranitidine, 2 (2%) for lansoprazole, and 1 (1%) for sucralfate. Among the 99 prescriptions, 46 (46%) were discontinued in the ICU and 4 (4%) of patients died in the ICU.

At the time of discharge, 49 prescriptions were continued. 34 (69%) had an appropriate indication for stress ulcer prophylaxis, including 27 (79%) with a PPI/H2 blocker as a home medication and 6 (18%) with upper GI hemorrhage. The remaining 15 (31%) had no indication for stress ulcer prophylaxis meeting our criteria, but 8 (53%)

of these cases had at least one indication meeting minor criteria including steroid use and anticoagulation/antiplatelet therapy. Of note, of the 15 discharged from ICU on inappropriate stress ulcer prophylaxis, 11 (73%) were discharged from the hospital with a prescription for pantoprazole or ranitidine.

Comparison of Pre- and Post-Intervention Periods: Prior to our intervention, 7% of all admissions resulted in an inappropriate continuation of stress ulcer prophylaxis at the time of discharge or transfer to the floor compared to 5% in the post-intervention group [2% absolute risk reduction (ARR), 45% relative risk reduction (RRR)]. Among all patients initiated on proton pump inhibitors, H2-receptor antagonists, or sucralfate, 20% were inappropriately continued on these medications compared to 15% in the post-intervention group (5% ARR, 30% RRR). However, based on our P chart (Figure 3), we were not able to discern any significant decrease resulting from the implementation of our intervention. Our goal was to decrease the rate of inappropriate stress ulcer prophylaxis by 75%, which would result in a goal of 2.5%. In the post-intervention period, 15 of 207 patients (5%) were continued on inappropriate stress ulcer prophylaxis and no weeks reached our goal threshold of <2.5%, with weekly rates ranging from 3-8%.

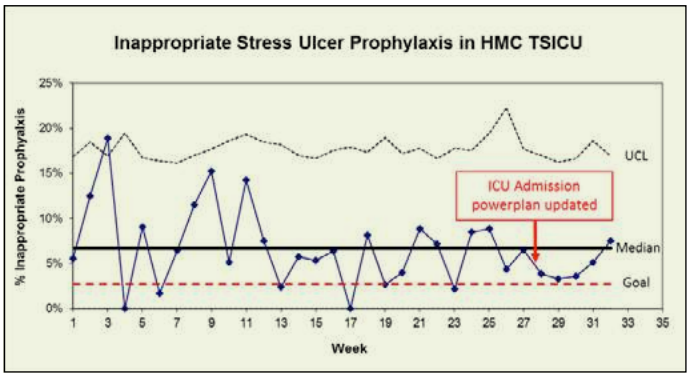
Figure 2. Stress ulcer prophylaxis prescriptions among all HMC TSICU patients in the pre- and post-intervention group.



There was one point occurring outside the control limits, indicative of special cause variation, occurring in week three (10/17/15-10/23/15) when 10 patients (19% of admissions) were discharged on inappropriate stress ulcer prophylaxis. During two weeks in our sample (10/25/15-10/31/15 and 2/6/16-2/12/16), zero patients were discharged on stress ulcer prophylaxis, which equaled the lower control limit (LCL). There were no shifts, runs, or trends observed and we were unable to conclude that the decrease in inappropriate stress ulcer prophylaxis occurring after our intervention was not due to chance alone.

Discussion: In an attempt to decrease the inappropriate use of stress ulcer prophylaxis (PPI, H_2-blocker, sucralfate) at the time of discharge from the Harborview TSICU, we implemented an information box in the ICU admission order set to educate admitting providers on indications for stress ulcer prophylaxis. While the percentage of all admissions resulting in inappropriate stress ulcer prophylaxis decreased from the pre- to post-intervention periods (7% vs. 5%), this did not reach our goal of a 75% reduction. In addition, our weekly analysis using a P chart did not identify any post-intervention trends or runs to suggest that the observed decrease was a result of our intervention.

Figure 3. P chart of weekly inappropriate stress ulcer prophylaxis prescriptions among patients discharging from the HMC TSICU



There are many potential explanations for why our intervention did not significantly change the rate of inappropriate stress ulcer prophylaxis continuation. First, the number of post-intervention weeks was low, potentially limiting the power to detect a meaningful shift in prescribing patterns. Another possible explanation is that inappropriate stress ulcer prophylaxis use started to decrease as we introduced the project to the TSICU thus tempering the impact of our intervention. In fact, discussions with key stakeholders in the TSICU began to occur in mid-November 2015 and in January 2016, there was a discernable decrease in inappropriate use of stress ulcer prophylaxis, suggesting these discussions might have influence prescribing patterns. Alternatively, it is possible that this shift was due to increasingly experienced residents, who were not uniformly ordering stress ulcer prophylaxis for every ICU admission.

This project has a number of weaknesses. As noted, we had a relatively small sample size, particularly in the post-intervention group, raising concerns of a type II error. Second, there was a limitation in medication reconciliation on patients admitted to the TICU, and as a result, 18 out of the 100 cases documented as inappropriate continuation may have actually been taking a PPI or H2-blocker at home, which would discredit their inclusion in our analysis. In addition, due to inconsisten-

cies in stress ulcer prophylaxis recommendations and a relative paucity of evidence on the subject, it remains unclear if some of patients deemed to have inappropriate stress ulcer prophylaxis may in fact benefit from these medications. For instance, hypopharyngeal injuries or treatment with warfarin plus aspirin were perhaps wrongly excluded from our list of appropriate indications for stress ulcer prophylaxis.

Admittedly, the intervention chosen also has an inherent risk of alarm fatigue. An information box was chosen as the intervention as it has the potential to capture and educate a broad range of providers. However, during the one year of our analysis, multiple information text boxes in order sets were instituted, limiting the effectiveness of each individual intervention. As seen in Figure 3, there was an uptick 4 weeks after our intervention, which could be supported by resident fluctuations on service, increase volume in the TSICU, and fatigue of these informational boxes.

Our project had a number of strengths. First, we were able to obtain complete capture of every HMC TSICU admission from October 1, 2015 until June 7, 2016. Through the Amalga system, we captured every patient who received at least one dose of PPI, H_2-blocker, or sucralfate and were able to further obtain in-depth clinical information through chart review. Most importantly, we implemented a sustainable and adaptable intervention. There remain several opportunities to decrease inappropriate stress ulcer prophylaxis at HMC. First, we could bolster efforts to inform practitioners of stress ulcer prophylaxis guidelines with educational interventions including lectures and posters to target residents, advanced care practitioners, pharmacists, and attendings. Second, home medications encompassed the vast majority of "appropriate" stress ulcer prophylaxis prescriptions and we are interested in designing a prospective study to examine 1) why patients are on home PPIs or H_2-blockers and 2) how to intervene on inappropriate prescriptions while patients are hospitalized. Third, a redesign of our intervention to look at both over- and underuse of stress ulcer prophylaxis in order to both minimize stress-induced ulcers and adverse effects of PPIs and H_2-blockers is of interest.

Conclusion: After implementation of an education information box on indications for stress ulcer prophylaxis, the proportion of patients receiving inappropriate stress ulcer prophylaxis at the time of discharge from the HMC TSICU did not significantly decrease. It is possible that the lack of a significant shift in practice patterns was due to an inadequately short post-intervention period and alarm fatigue. Future efforts to address stress ulcer prophylaxis should target both under- and overuse of PPIs and H_2-blockers among ICU patients and include an examination of home medications.

Acknowledgements:

We would first like to thank Drs. Vidang Nguyen and Nathan Tobey for their assistance with the project design and data review. We would also like to thank Ronald Pergamit for his incredible assistance with data extraction from Amalga. Lastly, we would like to acknowledge Trish Kritek, Tzevan Poon, Bazak Coruh, Beth Irvine, Jenny Wong, Susan Cho, David Carlbom, and Joe Cuschieri for their assistance with designing and execution of this QI intervention.

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QI MATCH: A Novel Online Tool to Usher in the 21st Century Clinical Learning Environment

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ABSTRACT

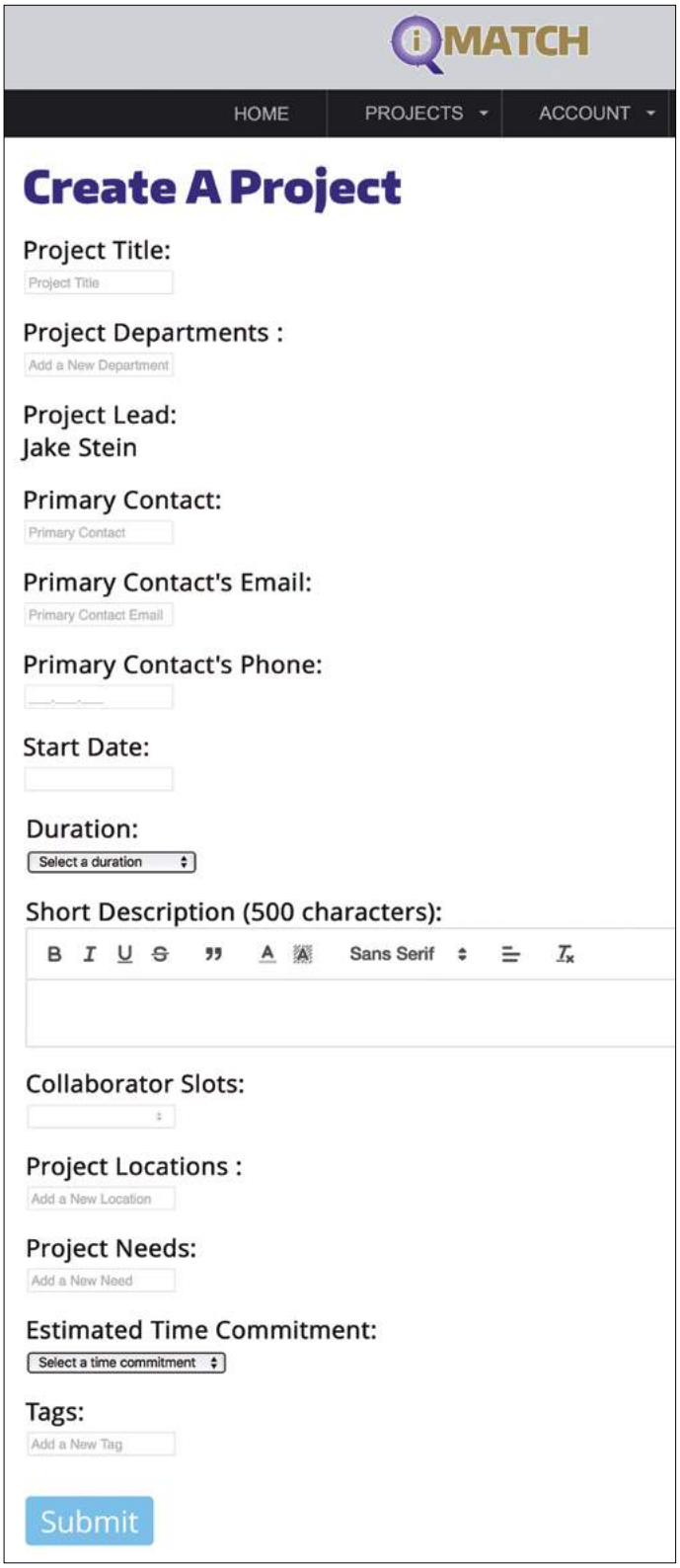
The importance of quality improvement (QI) as a core physician competency is increasingly emphasized by the Accreditation Council for Graduate Medical Education (ACGME). Trainee engagement in QI activities is now an integral part of the Next Accreditation System (NAS) and is a cornerstone of the Clinical Learning Environment Review (CLER) initiative. Experiential learning is essential to cultivate trainees' skills in order for them to develop and institute sustainable systems-based changes for care improvement. There are several obstacles to this training. First, many institutions currently lack standardized and centralized methods by which trainees can access educational opportunities in QI. Second, it is often challenging for housestaff to identify and join projects simultaneously suited to their personal circumstances and aligned with broader organizational goals. Third, it is difficult for institutions to assess how many of their trainees are actively engaged in QI work. QI Match is a novel online matchmaking platform that seeks to address these challenges by providing a central hub and customizable experience for trainees to easily locate and intelligently join QI efforts across the University of Washington (UW).

BACKGROUND

There is a clear need to bolster quality improvement (QI) education across the spectrum of physician training, from medical students to attending faculty.[1,2] The Accreditation Council on Graduate Medical Education (ACGME) now includes QI as a core physician competency within its Next Accreditation System (NAS) and, more recently under its Clinical Learning Environment Review (CLER) program, has begun to evaluate how well U.S. teaching hospitals "engage resident and fellow physicians in learning how to provide safe, high quality patient care."[3,4]

The increased focus by the ACGME on QI creates an alignment of hospital and educational priorities that stands to benefit all stakeholders, especially patients who entrust their well-being to the system and its staff. Despite these incentives, the development of a rigorous

Figure 1. Faculty enter details and short description of project work, which is then posted to the website following a review and curation step by the QI Match steering committee



QI curriculum that incorporates not only didactic instruction for introducing basic methodology but also an experiential component where that methodology can be applied, engrained, and refined is often challenging.[1,2,5,6] In particular, it has historically been difficult for learners to identify projects that harmonize with both personal interests and the operational priorities of the health system. Today, learners come upon QI opportunities largely through word-of-mouth and serendipity. Too often, this results in disjointed QI efforts that generate waste through duplication and strategic misalignment rather than value. Similarly, inadequately supported projects without robust mentorship can precipitate QI burn-out, thus paradoxically extinguishing rather than stimulating trainee enthusiasm. This is particularly worrisome given evidence that lifelong practice patterns are cemented in residency.[7] To overcome these vexing challenges, we have developed a platform called QI Match that allows trainees with an interest in QI to easily find and join operationally-relevant, personally-compatible improvement activities via a central online database.

Methods: QI Match was conceived by members of the Housestaff Quality & Safety Committee (HQSC), an organization for trainees, by trainees, dedicated to improving patient care across the University of Washington (UW), with support from health system executive leadership, our affiliated training hospitals, UW Graduate Medical Education, and the Center for Scholarship in Patient Care Quality & Safety. Initial website design and coding was completed by one of the authors (JC). The platform is currently accessible to all clinical personnel with valid AMC username and password through the following universal resource locator address: https://apps.uwmedicine.org/qimatch.

The platform allows faculty leading improvement efforts to post descriptions of their work and advertise project opportunities to housestaff (Figure 1). Submissions are curated by the QI Match Steering Committee, a panel of quality and safety champions from across UW Medicine, to ensure alignment with strategic priorities, qualification as true QI and not basic research, and articulation of a worthwhile trainee experience. Trainees then browse the site; are able to filter results by topic, department, location, and time commitment; and can announce their interest to investigators directly through the interface (Figure 2).

An upgraded version of QI Match is currently under development by the Department of Orthopaedics & Sports Medicine (Figure 3). Planned enhancements include improved messaging functionality, cleaner user interface, and more advanced indexing, cataloging, and reporting features. The refreshed website will be accessible at http://www.qimatch.com. All screen shots accompanying this manuscript are taken from the new version of QI Match.

As of the time that this article went to press, QI Match had been introduced to a limited audience of health system faculty, HQSC members, and Internal Medicine residents. Continued roll-out across UW Medicine will be pursued pending completion of the platform upgrades.

Results: Currently in early access, QI Match has been introduced to approximately 150 residents and fellows who subscribe to HQSC mailing lists or are undergoing training in Internal Medicine. Faculty engagement via promotional demonstrations is ongoing. Since initial launch in August 2015, 18 projects have been posted to the website and five of these have found matches. Ninety-four users, split evenly between trainees and faculty, have created profiles, and the website now averages roughly 350 unique visits per month (Table 1). More expansive data collection will be possible upon completion of platform upgrades by late winter 2018.

DISCUSSION

Table 1. QI Match facts & figures at-a-glance

Current URL	http://apps.uwmedicine.org/qimatch
Version 2.0 URL	http://www.qimatch.com
Launch date	August 2015
Roll-out status	Early access
Total users	94
Housestaff	45
Faculty	49
Active projects	18
Matched projects	5
Unique site visits per month	350

Although only limited data on user uptake are available at this early point in the product life of QI Match, we believe it and similar online platforms have the potential to fundamentally transform QI education in this country. Today, QI project opportunities at many academic health centers are advertised and stumbled upon largely via word-of-mouth, resulting in endeavors of varying quality. Tomorrow, that process could be facilitated by a comprehensive online database that would offer unparalleled convenience and choice to the user while enhancing alignment of individual learning activities with health system strategic goals. QI Match represents a new breed of educational intervention designed to harness the power of online social networks to resonate with the technology-suffused learners of the 21st century. Furthermore, as software code, QI Match can be disseminated relatively easily. The concept behind it could conceivably be adopted by any institution without need to commit significant capital or human resources.

CONCLUSION

QI Match is not a small test of change; rather, it is novel infrastructure aimed at facilitating key connections between housestaff and faculty for the sole purpose of improving patient care. After all, trainees cannot engage in opportunities that they are unable to perceive. We envision QI Match and similar online platforms serving as hubs of improvement activity within organizations, enabling experiential QI learning for trainees while simultaneously improving enterprise-wide situational awareness, culminating ultimately in a 21st century clinical learning environment that will prove at once better for housestaff and unquestionably safer for patients.

Acknowledgements:

We wish to recognize the steady support and continued contributions of the QI Match Steering Committee, whose membership reads as a veritable Who's Who of quality, safety, and clinical leaders within UW Medicine: Jennifer Best, Patty Calver, Amelia Chappelle, Chris Cottingham, Julie Duncan, Christopher Kim, Trish Kritek, Paula Minton-Foltz, Cindy Sayre, and Anneliese Schleyer. We would also like to thank the early adopters of QI Match—faculty and housestaff alike—for being the wind that fills our sails.

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Disease Activity Measurement in Rheumatoid Arthritis at the University of Washington Roosevelt Rheumatology Clinic

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ABSTRACT

Background: Documenting disease activity in rheumatoid arthritis (RA) is an important measure to maintain the quality of patient care. It also serves as an objective tool for tailoring immunosuppressive therapy. The goal of this project is to increase disease activity documentation rate.

Methods: We identified a cohort of RA patients who were seen in Roosevelt Rheumatology Clinic in October 2015 as pre-intervention group and in March and May 2016 as post-intervention group by using De-identified Clinical Data Repository (DCDR). Individual chart review was performed to verify diagnosis and for disease activity measurements. Interventions included an educational presentation for the first Plan-Do-Study-Act (PDSA) cycle, a patient questionnaire and introduction of electronic medical record (EMR) tools in Epic for the second cycle.

Results: Clinical Disease Activity Index (CDAI) documentation rate was 20% prior to the intervention. It increased to 48% after the first PDSA cycle and stayed at 47% for PDSA cycle 2 despite further interventions. Fellow documentation rate increased from 37% to 78% and attending physician documentation rate increased from 15% to 43%.

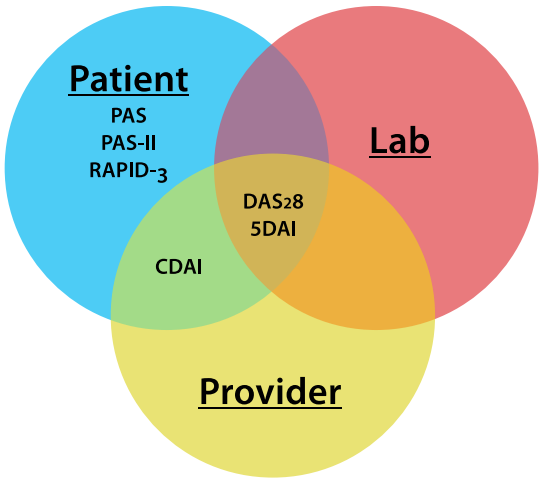
Discussion: CDAI documentation rate improved after the first PDSA cycle but stayed the same after the second one. Identified barriers included busy clinic schedules, forgetfulness, a lack of reminders, and lack of utilization of EMR tools. The rate has improved for both fellow and attending physicians.

Conclusion: An educational intervention successfully increased the frequency of disease activity measurements done in clinic, but levels are still not optimal. Future plans include better utilization of the medical assistants in clinic.

BACKGROUND

Rheumatoid arthritis (RA) is one of the most common autoimmune conditions, and can lead to significant morbidity and mortality if treated inadequately. It is crucial to have a tool to monitor disease activity over time as guidance for the direction of therapy. Numerous studies have shown "treat to target," improves quality of care and increases patient satisfaction.[1,2,3] Disease activity scores have also been widely used in clinical trials to compare the effectiveness of new medications. Incorporation of the disease activity score during daily practice is recommended by the American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR).[4,5]

Figure 1. Core elements of RA disease activity measurements[4]



There are many existing disease activity scores developed for various purposes. ACR recommends using one of the following six: Clinical Disease Activity Index (CDAI), Simplified Disease Activity Index (SDAI), Disease Activity Score with 28-joint counts (DAS28), Patient Activity Scale (PAS) score (PASII), or Routine Assessment of Patient Index Data (RAPID3) score.[4] These scores are composed of three elements: lab results, and global assessment by the patient and the physician, in various proportions (Figure 1).

CDAI is one of the most commonly used tools. It is composed of four parts: joint count for 1) tender and 2) swollen joints, and global assessment of disease activity by both 3) patient, and 4) physician (Figure 2).

Most providers in our clinic use CDAI because it is easy to calculate and easily assessed in real time. It contains both subjective and objective information. The disadvantage is the lack of validated data defining improvement between the two scores at different visits and the requirement for a formal 28 joint count by the physician.[4]

METHODS

We identified a cohort of rheumatoid arthritis patients who were seen in Roosevelt Rheumatology Clinic by retrieving data from De-identified Clinical Data Repository (DCDR). We searched patients who had the following diagnostic codes associated with RA (ICD 9 code 714.0, 714.1, 714.2, or ICD 10 code M05.0-M05.9, M06.00-M06.09) on "facility bills and charges" and "visit diagnoses."

We identified three groups of patients. The pre-intervention group consisted of RA patients who had rheumatology office visits in October 2015. The post-intervention group consisted of RA patients who had rheumatology office visits in March and May 2016. A list of medical record numbers, office visit dates, and diagnosis codes was generated by DCDR. Individual chart review was performed to verify the diagnosis and documentation of disease activity measurement. Inclusion criteria included a diagnosis of rheumatoid arthritis (seronegative or seropos-

Figure 2. Clinical Disease Activity Index (CDAI) form[6]

Clinical Disease Activity Index (CDAI)

Joint	Left		Right	
	Tender	Swollen	Tender	Swollen
Shoulder				
Elbow				
Wrist				
MCP 1				
MCP 2				
MCP 3				
MCP 4				
MCP 5				
PIP 1				
PIP 2				
PIP 3				
PIP 4				
PIP 5				
Knee				
Total	Tender:		Swollen:	

Patient Global Assessment of Disease Activity

Considering all the ways your arthritis affects you, rate how well you are doing on the following scale:

Very Well 0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10 Very Poor

Your Name_____ **Date of Birth** _____ **Today's Date** _____

Provider Global Assessment of Disease Activity

Very Well 0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10 Very Poor

How to Score the CDAI

Variable	Range	Value
Tender joint score	(0-28)	
Swollen joint score	(0-28)	
Patient global score	(0-10)	
Provider global score	(0-10)	
Add the above values to calculate the CDAI score	**(0-76)**	

CDAI Score Interpretation	
0.0 – 2.8	Remission
2.9 – 10.0	Low Activity
10.1 – 22.0	Moderate Activity
22.1 – 76.0	High Activity

itive) by a rheumatologist. Exclusion criteria were non-RA visits, initial visits prior to the RA diagnosis, and ultrasound clinic visits.

The first Plan-Do-Study-Act (PDSA) cycle was an educational intervention regarding disease activity measurements in January 2016. The second PDSA cycle was in late March 2016. It included a patient questionnaire and the introduction of existing electronic medical record (EMR) tools.

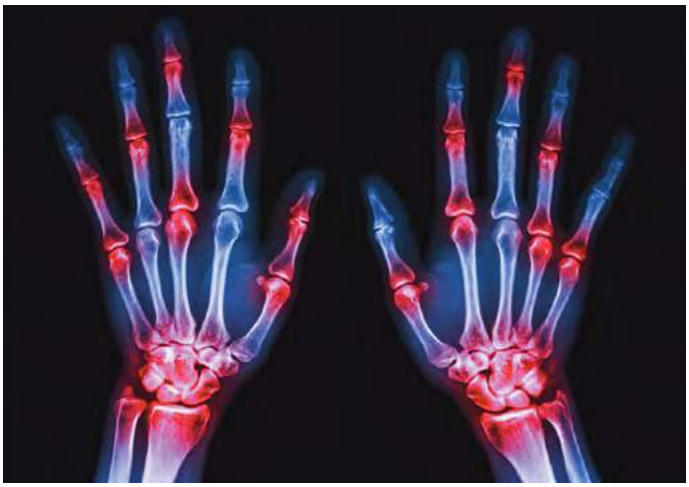
The questionnaire was composed of three parts: the patient and physician global assessment of disease activity and the score chart. It was dispensed by medical assistants. It was designed not only to involve the patients in their care but also serve as a reminder for attending physicians working with rotating residents.

Roosevelt Rheumatology Clinic uses Epic for EMR. The introduction of existing Epic tools included instructions on utilizing flowsheets, as well as a shared dot phrase and template for RA.

RESULTS

In pre-intervention group, a total of 138 RA visits were identified in October 2015. Only 27 (20%) visits had documented CDAI score and 2 (1%) had documented DAS 28.

In the first PDSA cycle, 85 RA visits were identified in March 2016. CDAI documentation was done in 41 (48%) visits and DAS 28 in 1 (1%) visit. In the second PDSA cycle, 77 RA visits were identified in May 2016 and 36 (47%) visits had CDAI documentation (Table 1). Documentation rate of attendings and fellows were 15% and 37%, respectively. These rates improved to 43% and 78% respectively, after the two PDSA cycles (Table 2).



DISCUSSION

CDAI documentation rate improved after the two PDSA cycles but there is still room for improvement. Barriers we attempted to address included educational gaps, utilization of EMR, and the lack of reminders. A major barrier we were unable to eliminate was the time limitations in clinic.

After PDSA cycle 1, CDAI documentation rate had more than doubled. The providers who added a template including the CDAI led to more consistent documentation.

In PDSA cycle 2, a major challenge was the lack of distribution of the form by the medical assistants. This likely contributed to the lack of reminders to complete the CDAI in clinic, possibly resulting in a lack of change from the initial improvement seen in PDSA cycle 1.

Table 1. CDAI documentation rate in Roosevelt Rheumatology Clinic

Roosevelt Rheum	Pre-Intervention	PDSA Cycle 1 (3/1-3/31/2016)	PDSA Cycle 2 (5/1-5/31/2016)
RA visits	138	85	77
CDAI	27 (20%)	41 (48%)	36 (47%)
DAS28	2 (1%)	1 (1%)	0

Table 2. CDAI documentation rate between attending physicians and fellows

CDAI documentation	Oct 2015 (N=138)	May 2016 (N=77)
Attending physicians	16 (15%)	28 (43%)
Fellows	11(37%)	8 (73%)

Comparing the fellow and attending physician group, both groups have shown significant improvement on documentation rate. It is

possible that attending physicians have more time restraints due to higher patient load. Higher rate of fellow documentation underscores the importance of learning this skill during fellowship.

CONCLUSIONS

RA disease activity measurements have been proven to improve quality of care and patient satisfaction. It is also recommended by ACR/EULAR and has become one of the matrices to determine quality of care. Therefore, it is important to incorporate it in the majority of RA visits. With educational interventions, CDAI documentation rate more than doubled, but has not exceeded 50%. Further intervention is warranted.

Acknowledgments:

All faculty, fellows, nurses, and staff in the rheumatology division.

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Evaluating the Assessment of Violence Risk by Mental Health Providers

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ABSTRACT

Current events have led to increased attention on the potential link between mental illness and violent behavior. Mental health professionals are expected to undertake the important task of identifying, assessing, and treating mentally ill patients for risk of violent behavior. A questionnaire was created to evaluate mental health providers' use of a violence risk screening tool and general attitude towards assessing violence at the Veteran's Affairs (VA) Hospital of Puget Sound.

BACKGROUND

Mental health clinicians are commonly tasked with assessing patients' risk for violence, both suicide and violence against others. For the remainder of this abstract, violence refers to violence against others. Although most mental health clinicians receive considerable training in suicide risk assessment, this is not universally true when it comes to violence risk assessment.

To aid clinicians in their assessment of violence risk, the VA Puget Sound (VAPUG) has created a structured template to prompt and assist clinicians regarding risk factors for violence. The template is called the Violence Risk and Comprehensive Assessment (VRCA). The template is available to all clinicians who have access to the VA's electronic medical record.

Previously unknown was whether clinicians at the VAPUG are using the VRCA and the circumstances of its use. As such, a questionnaire was created to evaluate clinicians' use and perceptions of the VRCA.

METHODS

Mental health clinicians across disciplines (MD, LICSW, MSW, RN, and PhD) at the VAPUG were asked to complete a questionnaire about their experience with the VRCA and their approach to violence risk assessment. An email with a link to the survey was sent once and then again seven days later. Providers were informed that their responses were confidential and their participation was entirely optional.

The questionnaire created consisted of both closed and open ended questions. Background questions included topics of respondents' demographics, work site within the VA (e.g. emergency room, outpatient mental health), and duration of employment at VAPUG. Next, a portion of the questionnaire was aimed at assessing their familiarly with the VRCA. Participants were asked if they were aware of the VRCA, how often they use it, when was the last time they used it, circumstances or patient characteristics prompting use of the VRCA, respondent motivations to use the form, whether the tool is useful in clinical practice, and what, if anything, is missing from the existing template to conduct an adequate risk assessment.

Participants were asked open ended questions asking about other resources they use to assess violence, adequacy of support/resources to assess and manage patients with risk factors for violence, and whether the VA should require providers to complete the VRCA under certain circumstances.

RESULTS

There were 48 responses collected. Participants included 34% MDs, 26% social workers, and 30% PhDs. Fifty one percent of participants have worked at the VAPUG for 1-5 years, 17% for 5-10 years, and 21% for >10 years. Nearly all respondents (92%) were aware of the VRCA and 81% felt it was a helpful tool. It had never been used by 30% of participants, yearly by 32%, and every few months by 34%.

Homicidal Ideation was the number one patient factor that led respondents to complete the VRCA, with 46% of respondents ranking this first. The patient's recent physical violence was the second most commonly cited reason for using the VRCA. Liability or documentation purposes was the most common motivation for respondents to use the VRCA; prompts to think about specific risk factors for physical violence was the second most common. Of respondents, 26% felt as though there were elements missing in the VRCA. More than a third (39%) of respondents did not feel as though they had adequate support/resources to adequately assess patients with risk factors for violence. Nearly a third (28%) of respondents use other tools to assess violence. A majority (61%) agreed that there are some clinical situations where it should be required that a VRCA note be completed.

DISCUSSION

Although most providers at the VAPUG are aware of the VRCA template and feel that it is helpful, it is not used particularly often. At most, one third of clinicians use it every few months. This may be due to the infrequency with which clinicians encounter patients where it would be appropriate to use the VRCA, but it may also be because it is not mandatory or change the way patients are managed. Additionally, some providers may rely on other methods, including other structured templates or assessment tools, to assess risk.

A patient's legal involvement and history of making verbal threats were the two lowest ranked reasons prompting use of the VRCA. This may reflect how common these two things are within the veteran population or clinicians' assessments that these risk factors, at least alone, are not as serious as some of the other listed risk factors. It is important to recognize that this QI project did not assess the adequacy or validity of the VRCA itself, but rather respondents' use and perceptions of its utility. No single risk assessment instrument has been found to be infallible.

Responses to the open-ended questions provided additional information. Several respondents compared their knowledge and confidence in performing suicide risk assessments with violence risk

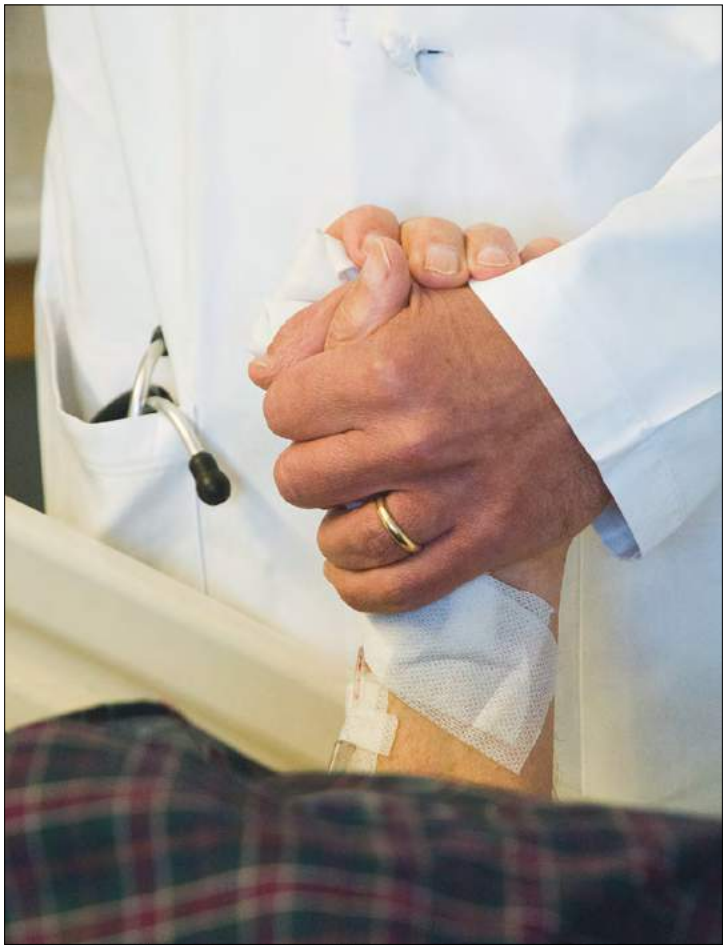
assessment. One respondent commented on the contrast between the Veteran's Administration's strong emphasis on suicide and seemingly minimal attention to violence. Although this is likely not unique to the VA, it underscores clinicians' desire to get more training in the area of violence risk assessment. Perhaps there should be more educational opportunities and time focused on assessing for violent behavior, including domestic violence, as clinicians feel less comfortable with these issues.

CONCLUSION

Although most mental health providers at the VAPUG are familiar with the VRCA template, there is considerable variance in its use and perceived utility across individual clinicians. This initial project provided useful information about clinicians' use of this template and may be used to guide future versions of the template, in addition to increased educational opportunities directed at violence risk assessment.

Acknowledgments:

We thank all of the staff at the VAPUG who completed the survey.



"A Just Culture Flies Higher Than A Blame Culture"

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Recently, a select group of UW residents, fellows, and faculty spent a Saturday morning visiting several Boeing facilities around Boeing field just south of Georgetown. Our own urology resident, Justin Ahn, whose long-time interest has been bringing aviation safety practices to medicine, arranged for this visit. He had previously collaborated with Captain Karsten Liljegren, Boeing's Chief Pilot for Safety, who was incredibly kind to host the group. Several additional Boeing employees volunteered to spend their Saturday morning facilitating this private visit and all deserve a special thank you.

The morning began with a presentation by Captain Liljegren covering, perhaps most appropriately, a bird's eye view of Boeing's safety program. Boeing defines safety as:

"The state in which the possibility of harm to persons or property is reduced to and maintained at or below an acceptable level through a continuing process of hazard identification and safety risk management."

Boeing's Flight Testing & Evaluation department is not your average group of pilots. They rigorously test fly every airplane that rolls out of the factory, not only flying within safety envelopes that aircraft should be operated within, but going well beyond these envelopes to test the extreme limitations of the aircraft systems and structures. They push the boundaries of flight conditions, and thus deal with safety and risk on a daily basis.

Aviation leadership previously came to an important conclusion, particularly with pilots. They noted that a *blame culture* penalizes an individual for an error; however, it fails at preventing future errors at a group or systems level. The fear of disciplinary action, public humiliation, or even losing one's license discouraged pilots from reporting close-calls or unintentional mistakes. Sound familiar? This lack of transparency perpetuated a cycle of near-miss and high risk conditions, unbeknownst to leadership and heads of safety. The Boeing group acknowledged these events as early warning signs that must be corrected, since they cannot afford even one major accident. Borrowing from Heinrich's pyramid theory of safety, they assume that for every 1 major accident there are approximately 30 minor accidents or incidents, 300 near misses, and 3,000 unsafe acts or conditions. Boeing had to be proactive rather than reactive, and shift their focus to the latter categories, rather than wait for the next big accident to occur.

The company found that a *just culture* was safer and allowed the systemic issues to be identified and solved before they turned into accidents. This not only allayed the pilots who made the mistakes, but it allowed others to learn best practices to prevent future errors and promoted a culture of safety.

Dr. Byron Joyner and the HQSC recognize Captain Karsten Liljegren for helping UW trainees shape a better culture of safety at UW Medicine.

Boeing has prioritized safety from the top down, something they argue is necessary to change culture. Their executive leadership understand that safety initiatives and culture change are slow and will require long-term investment of resources prior to seeing benefit. According to Captain Liljegren, it takes about 5 years to change culture. So when they decided to move from the standard punitive or blame culture toward a "just" culture of safety reporting, they needed to address the real concerns from pilots. The flight safety team experienced a 500% increase in reporting during a 5-year period of culture shifting. Here's how they did it.

They created a de-identified reporting system, but still offered an anonymous means to report. They offered 4 different methods of error reporting to make it as easy as possible: iPad app, web app (which surprisingly looks very similar to a PSN form), in person, phone call, or the tried and true - hand written card in a box. Reports go directly to Captain Liljegren and his safety team of pilots for analysis, importantly bypassing mid-level managers and supervisors. The team analyzes the events surrounding the report, sometimes contacting the reporter or other involved parties to get additional information, then compiles de-identified safety reports that are disseminated to Boeing leadership and their pilot community. Flat screen monitors all around the office display report statistics from the past month. Concise educational newsletters are published bimonthly summarizing valuable incident reports, topics of concern, and prevention tips. As the icing on the cake, Captain Liljegren wears a second hat at Boeing as a Director of Operations, which allows him to directly initiate changes in policies and procedures based on areas of concern that arise. He and his team also go out to different departments, such as maintenance and ground crews, and collaborate on mutually beneficial safety campaigns.

In recent years, as a testament to how successful their culture shift has been, it's rare now that someone reports anonymously, showing

that the pilots at Boeing trust the de-identified and protected reporting commitment. When other pilots or mid-level managers ask the safety team: "Who made that error?" The answer is: "it's irrelevant." Their ultimate goal is to move towards reporting not only for self-protection, but for the sake of other pilots, the company, and aviation. In such a complex and high-risk environment, who better to look to for concerns or suggestions than the pilots and personnel on the front line? In the eyes of the Boeing company, safety is what people do when no one is watching.

To behaviorally reinforce reporting, Captain Liljegren or a member of his safety team will respond to every reporter within 30 days or sooner, informing them of the outcome or responses taken as a result of their submission. This demonstrates a crucial part of the culture – team members need to feel valued, and closing this loop provides the reward for their action to reinforce similar future behavior. In order to tackle uncertainty about what to report, Boeing's expectation is that all concerns are reported, and the burden of filtering is on the safety team.

Boeing also worked to incentivize reporting, offering protection from punitive action by the company and Federal Aviation Administration if pilots report within 24 hours of an event. In other words, if you make an honest mistake and report it promptly, Boeing will not take punitive action against you and the regulatory agency will not take your license away. Because of this incentive, more pilots are now reporting on themselves! This is not a get out of jail free card, however. Reporters are excluded from protection if an event involves criminal activity or blatant disregard for company policies - such as a pilot flying drunk or intentionally reckless.

Pilots are not the only ones involved with safety culture. Every employee at Boeing carries a card on their lanyard which displays company safety steps. The steps on the card review when to perform a risk assessment, what questions to ask, areas to consider in analysis, and how to evaluate if controls are effective and safety is assured.

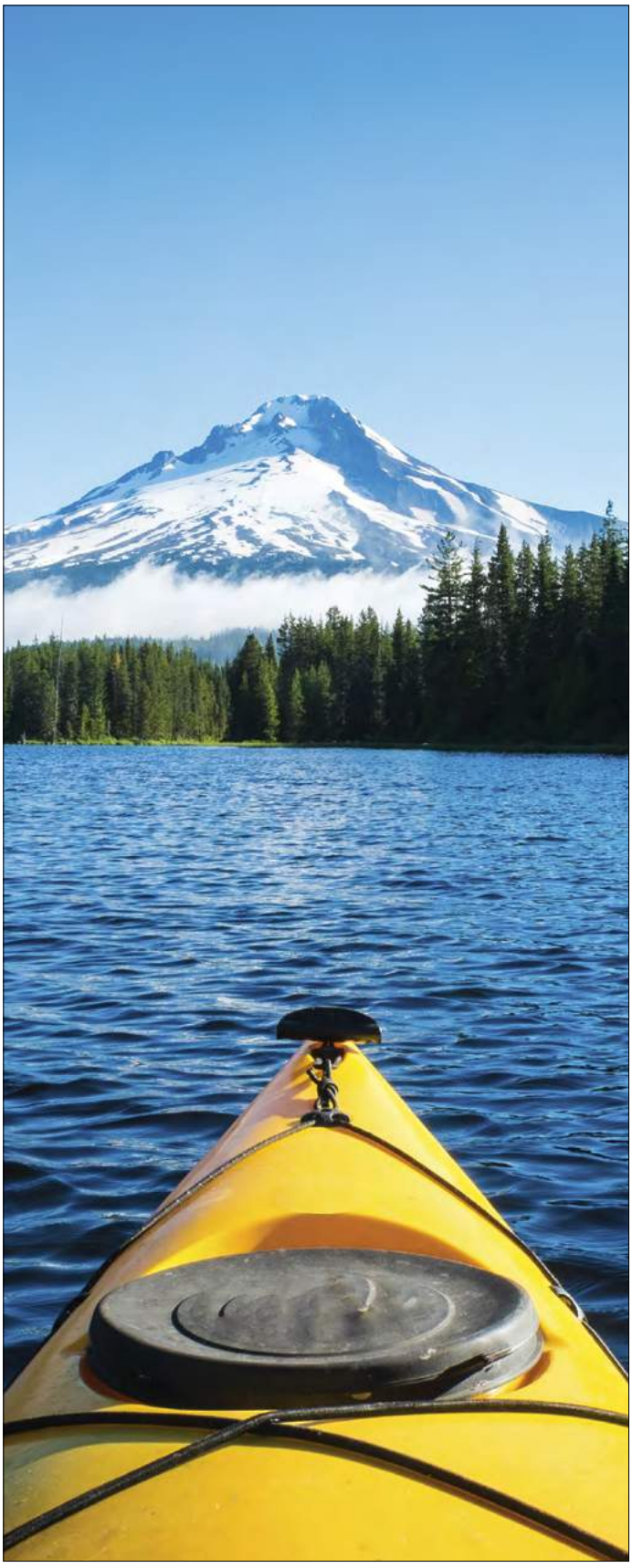
Dr. Byron Joyner and HQSC members visit Captain Karsten Liljegren at Boeing in Seattle.

Later in the morning, we had the privilege of boarding a 787 test plane and were able to see the so-called "guts" of the plane while still in pre-production testing. It was a flying laboratory with equipment and gear laid out along the entire cabin, providing space for engineers to test performance in flight. We couldn't have a visit without experiencing one of Boeing's flight simulators, mainly used by their own pilots and engineers and occasionally by airline pilots, to test new controls and configurations. The windows of the cockpit showed us a lifelike virtual representation, making the experience feel so real that it took a moment for our visual and vestibular systems to orient while we received contradictory sensory stimuli. Finally, we had another special privilege to see the famous and historic Boeing Transonic Wind Tunnel which has enabled the design and testing of many of the most important planes in history, including the B-47 bomber and the modern 737-MAX. Testing in the wind tunnel allows Boeing to save billions of dollars in design and research costs, as only airworthy designs make it to the factory floor.

What lessons can we bring back to UW Medicine? Perhaps the most important lesson is the importance of a just culture. Healthcare continues to face numerous challenges, particularly when trying to change culture. Punitive culture is still pervasive nationally in medicine and may be the one of the most significant barriers to quality and safety. Although healthcare is not the same as aviation, it can certainly borrow heavily from the lessons they've learned. We all know that surgeons adopted checklists with great success. The human body, though, is an ever-unique and dynamic test bed, and a fully controlled environment is unobtainable. The most important factor in medicine is us, humans. Although we have the ability to make errors, we also have the ability to mitigate the risk of error and improve safety.

We must learn from our colleagues within our community, to whom we also provide healthcare – and incentivize reporting practices with the backing of executive leadership. Consistent and timely closed-loop feedback with reporters, dissemination of lessons learned, specialty-specific safety advocates with protected time, increased discussion of near-miss and adverse events, and clearly outlined policies regarding de-identification and reporter protection are just some of the ways to accomplish this ambitious goal. Academic hospitals such as UW may reap the greatest benefit from such initiatives, due to the sheer volume of front line trainees that can report safety events from which to learn. Sometime in the near future, perhaps the state medical board could assure medical license protection to physicians who self-report safety concerns to their respective hospital systems.

Beyond specific processes, culture change is paramount. We will miss opportunities to drive changes in the system by pointing fingers at individuals. PSN reports should be rewarded and looked at positively, not used as threats or for personal vendettas. It's time we came together as a community, much like the aviation industry, and shift our perspective to viewing an error, not to seek an individual to blame, but to see an opportunity to explore and fix the processes, environmental factors, and policies that led the individual down the wrong path.



Questions

Jonathan Hourmozdi, MD, Internal Medicine, PGY-1

She just arrived from eastern Oregon. She's never been in a hospital like this; I've never been to Oregon. Everything is new, all of it confusing. She tries to understand. I stop in every morning, and she shares with me her family. Pictures adorn the walls. Visitors crowd the room, dressed in bright blue plastic wrap to keep her safe. She tells me her hopes, her needs – the promises she made to her children and husband. I exchange a joke, a laugh, a smile. Today she found out that we need to do a lumbar puncture. She hates needles. She is crying. Would it be okay if I give her a hug?

I have no answers to the questions that are of use to me.

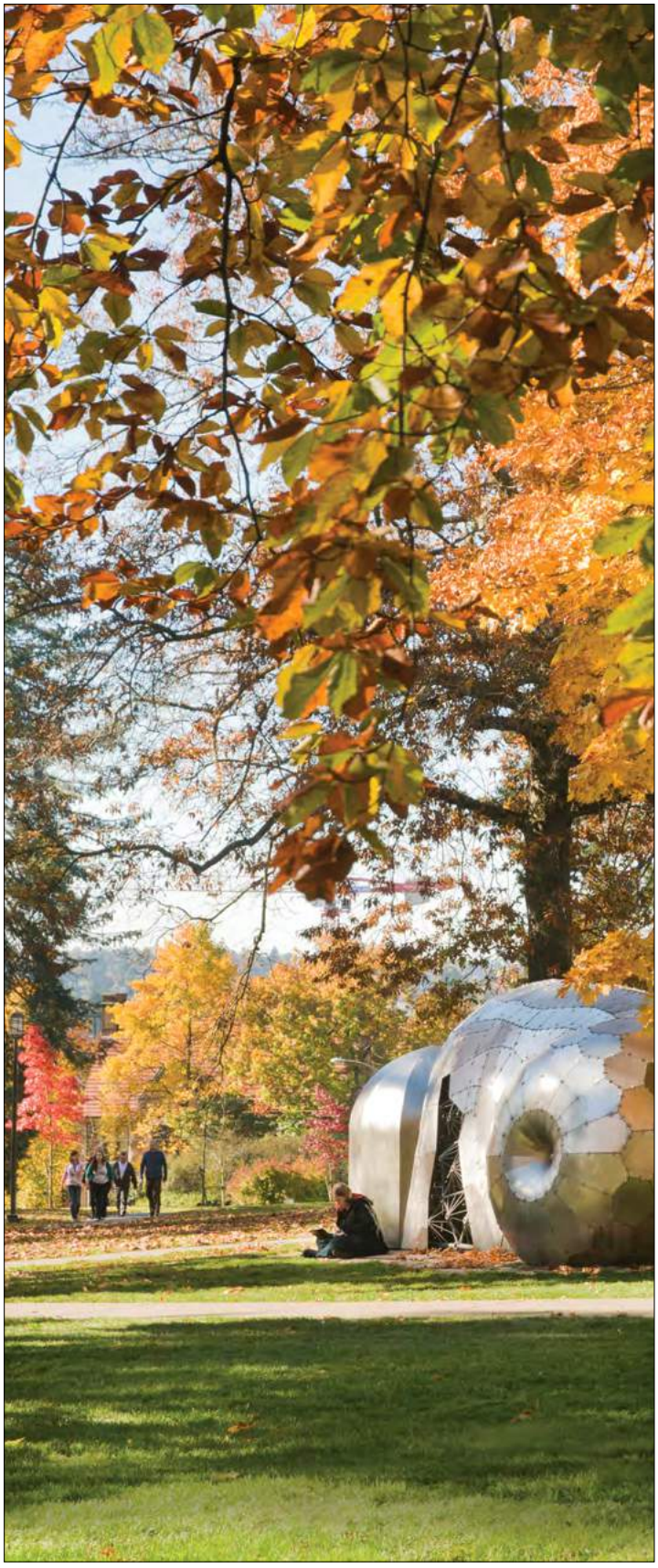
We have started therapy. She will be studied, watched, vigilantly monitored. The vampires come in every night to take her blood and whisk it away to the lab. The cancer cells are slowly disappearing from her blood. She is pale as we tell her the medications are working. She smiles.

It's two in the morning and she has a fever. She has no more white blood cells. Her children are sleeping soundly on the couch. She's wide awake and scared. I tell her this is common. We are going to start the medicines that will protect her from the sickness we've given her. She cries softly in the dark so as not to wake her children. I hold her hand in silence for a few minutes. I'm acutely aware of the germs on my white coat. Would it be okay if I give her a hug?

I have no answers to the questions that are of use to me.

Her fevers have gone away and cell counts are returning. We all cross our fingers that there is no cancer among them. My time on the service is ending, and she is readying for discharge. Her entire family is in the room. They are expressing their gratitude to our team for the care they have received. I can't imagine a more perfect ending to my rotation. In the back of my mind, I know there is a 50% chance they will have lost her in two years. She reaches out to hug me. Would I be okay if I give her a hug?

I have no answers to the questions that are of use to me.



Once upon a time

Monica Samelson, MD, Psychiatry PGY-2

In a stark room full of fluorescent light and a single rubber couch a butterfly sat and worried her wings. They were very big and very beautiful and she told me about all the things and people that had hurt her while her iridescent wing lost strips ripped off in her worrying fingers. When she sobbed great big tears formed and made her heavy and she said, "I never do this, I swear – I don't usually cry." She wanted to fly south for the rest of forever but she loved her family so she built them something grand to help them forget her by. What she had built for her family was beautiful and delicate, constructed so carefully by a soft person for the people she loved, and what I built for her wasn't like that at all. It was haphazard and rough, because I had spent the time we were talking just barricading that room full of fluorescent light, trying quickly to make a place for her to stay for a while where she could be safe, even if it meant she couldn't fly there.

In a stark room there was a lioness sitting on a rubber couch under the fluorescent light. She growled angrily every time we walked past, and stood back on her hind legs when she saw us and said, "Oh hey look, it's the shrink squad." She was sick, though, and wouldn't let us take her vitals, and one time I sat down in front of her and looked deep into her deep brown feline eyes and asked her please to let us take her temperature because I was worried about her health. "No!" she said. "You don't care about my health, you just care about covering your ass. If you really cared about my health, you'd hold my hand, you'd look in my eyes." I sat down in front of her then and I took her big paw in mine where the claws sat conspicuously in their sheaths and I held it and I looked in her eyes and I said, "Please let us take your temperature. I'm truly truly worried about your health." Her eyes were surprised and she let me nudge the cold thin rod of a thermometer under her tongue alongside her big teeth. The next day she said if we truly cared we'd bring her flowers, we'd bring her cake. We didn't do those things but she did stop calling us the shrink squad.

My Mistress

Megha Shankar, MD, Internal Medicine, PGY2

I have a confession to make: I have a mistress.

Life, I'm sorry to tell you this, but I have a mistress.

Her name is Death.

It's been a year since we became intimate.

I promise I love you and I see you in her, Life.

I see you in her when I allow myself to listen to your vessel;

The body and voice that tell me your stories and your pain and your glory.

Can't you see how I got confused? I mistook you for her,

That night I saw a man splayed across the floor, blood projecting from his mouth, smelling profusely of vomit.

That day I broke a woman's ribs trying to find you, witnessing her family drowning in their tears with hope on their breath.

Those days I spoke to a man in a coma every morning, asking how he was doing?

I forgot what you looked like.

I saw a chronically ill body and learned to ignore what was once critical.

That significantly elevated bicarb? It's her baseline.

I started to forget about the human condition when I got too busy to remember that you need silence,

Raw, unfiltered silence.

I forgot to pause,

and remember that silence was a part of our relationship,

and that whenever we fought, I had to also pull up a chair for silence to participate, too.

But you forgot about me too.

I was forced to witness your premature end,

And forced to witness your prolonging.

I'd like to speak again, Life.

Because I've seen you around.

I saw you in the family that was so grateful they witnessed that 60 minute code.

I saw you in the aspiration pneumonia we allowed by letting my 80 year old friend drink his chai.

I saw you in the stubbornness of a diabetic who lived on the streets and refused IV antibiotics.

I saw you in the rage of a psychotic woman who desperately needed that cardiac surgery.

I saw you in the alcoholic patient who said naltrexone worked but he stopped it because drinking was more fun.


ARTS & HEALING