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I. Executive Summary

For AY21-22, the DOM Quality & Patient Safety Team has continued its work as a campus leader in the domains of safety, quality, value and education. Through our monthly Systems Improvement Conference, we provide a team-based review and analysis of clinical events and implement system-oriented solutions with our health-systems partners. We were pleased to have our conference certified as a Collaborative Case Review by the UCH Quality Department, at which residents and fellows can participate and gain credit towards the GME Quality & Safety Incentive Partnership. We also created the DOM Quality Council with quality representatives from each Division to address the UCH/CUSOM Quality & Safety Performance Metrics for AY21-22. The DOM met all gateway metric thresholds and we helped each of our Divisions stand up their own certified collaborative case reviews. Finally, the second class of fellows graduated from the Leaders in Informatics, Quality and Systems (LInQS) Fellowship. These fellows not only accomplished impressive outcomes in their fellowship projects, but many transitioned into quality and informatics leadership roles at UCH and outside academic institutions.

II. Introduction

VISION

Accelerate the delivery of high value care to our patients and enhance the careers of our faculty and trainees.

MISSION

The mission of the DOM QPS Program is to promote a culture of patient safety, quality improvement and systems innovation among DOM faculty, trainees and staff, through data-driven support and patient-centered high value care. To achieve this mission, the DOM QPS Program has designated five overarching goals:

- Foster a community of safety and quality across the University of Colorado Anschutz Medical Campus (AMC) Community.
- Advancing our data analytics programing to support a learning health system.
- Build partnerships among DOM faculty, trainees and staff, SOM Departments and our health system partners to improve patient outcomes.
- Engage faculty and trainees in leading quality and process improvement activities.
- Educate faculty and trainees in quality improvement, patient safety, health systems improvement and clinical informatics.
DOM QUALITY & PATIENT SAFETY TEAM

DOM QUALITY & PATIENT SAFETY (QPS) TEAM

- **P. Michael Ho, MD, PhD**
  DOM Vice Chair for Quality

- **Tyler Anstett, DO, SFHM**
  DOM Assoc. Vice Chair for Quality

- **Anunta Virapongse, MD, MPH**
  DOM Assoc. Vice Chair for Quality

- **Heather Hallman, MSHS, MHA**
  Program Manager

- **Homer Atanacio, BS**
  Project Manager

- **Nicholas Olsen**
  Analytics Developer

DOM QPS DIVISIONAL LEADERSHIP TEAM (quality leaders representing their academic affiliate clinical sites)

- **Emily Gottenborg, MD**
  (UCH - Hospital Medicine)

- **Elena Lebduska, MD**
  (Lowry - Internal Medicine)

- **Katie Raffel, MD**
  (Denver Health - Hospital Medicine)

- **Tyler Miller, MD, FACP**
  (Veteran Affairs - Hospital Medicine)

- **Karen Ream, PA-C, MBA**
  (UCH - Cardiology)

- **Arun Kannappan, MD**
  (UCH - Pulmonary Science & Critical Care)
III. Making Patient Care Safer

DOM SYSTEMS IMPROVEMENT CONFERENCE

The mission of the DOM Systems Improvement (formerly Morbidity & Mortality) Conference is to establish a safe venue to identify areas for improvement in patient care, while promoting professionalism, integrity, and transparency. This conference has long been a step above the traditional M&M model, which focused on error identification without the lens of Just Culture to address opportunities for system changes, rather than individual failures. The UCH Quality Department recognized the need for systems-based case reviews and prioritized Collaborative Case Reviews (CCR) as a metric for the new UCH/CUSOM Quality & Safety Performance Metrics for AY21-22. The conference name was changed from the DOM M&M Conference to the DOM Systems Improvement Conference and was certified as a CCR. As a new CCR, this conference was a model to DOM Divisions and other SOM Departments setting up their own case review conferences and applying for CCR certification.

Table 1. AY21-22 DOM Systems Improvement Conferences

<table>
<thead>
<tr>
<th>Date</th>
<th>Systems Improvement Conference</th>
<th>DOM Division</th>
<th>Case Presenter(s)</th>
<th>Case Outcome(s)</th>
</tr>
</thead>
</table>
| July 2021     | Coordination of Complex Vascular Access in Renal Transplant Patient                              | Infectious Disease                       | • David Fraulino, MD  
• Tyler Anstett, DO, SFHM  
• Brian Montague, DO, MPH, MS         | Overhaul of discharge order set  
New orders include device-based care instructions + provider assignment + nursing directives |
| August 2021   | Managing Acute Agitation in Patient with Advanced Dementia                                      | Hospital Medicine & Internal Medicine    | • Christopher Caruso, MD  
• Elena Lebduska, MD                | Reached out to UCH to implement cumulative sedation notification |
| September 2021| Perioperative Anticoagulation Prophylaxis in the Setting of Thrombocytopenia                   | Pulmonary Science and Critical Care & Orthopedic Surgery | • Jason John, MD  
• Katie Raffel, MD                 | VTE prophylaxis order set & reminders  
Increased visibility for policy on patient refusal of medications |
| October 2021  | Shunted to Psych: An Opportunity for Diagnostic Process Evaluation                             | Hospital Medicine & Denver Health        | • Katie Raffel, MD  
• Julie Knoeckel, MD                | Discussed trigger to repeat H&P after initial admission, but unclear if that would be effective |
| November 2021 | Stop, Collaborate and Listen: Complex Communication and Role Clarity in a CODE BLUE           | Cardiology                               | • Laura Peters, DNP  
• Tyler Anstett, DO, SFHM           | Working with UCH on re-evaluation of push medication policy and expanding nursing roles |
| December 2021 | The Case of Duplicate Charts: Jane Doe x 2                                                   | Internal Medicine & Emergency Department  | • Jennifer Barrett, RN  
• Emily Gottenborg, MD              | LInQS fellow project to address duplicate chart creation and optimize duplicate charge mergers |
<table>
<thead>
<tr>
<th>Month</th>
<th>TIPS About Statins in Cirrhosis</th>
<th>Gastroenterology &amp; Hepatology</th>
<th>Eric Swei, MD</th>
<th>Timothy Yen, MD</th>
<th>Standardized note template for post-TIPS procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2022</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>February 2022</td>
<td>Why are you so confused? Special Challenges to Anuric AKI</td>
<td>Renal Diseases &amp; Hypertension</td>
<td>Katherine Rizzolo, MD</td>
<td>Laura Macke, MD</td>
<td>BPA notification to avoid cefepime in AKI/iHD</td>
</tr>
<tr>
<td>March 2022</td>
<td>Coordinating Multi-Disciplinary Care for Elder Abuse</td>
<td>Geriatric Medicine</td>
<td>Sarah Tietz, MD</td>
<td>Tyler Anstett, DO, SFHM</td>
<td>GME orientation on mandatory reporting Adding VESPA to amion &amp; FNE consult request</td>
</tr>
<tr>
<td>April 2022</td>
<td>Providing Culturally Competent Care in a Patient with Non-Resolving Pneumonia</td>
<td>Hospital Medicine</td>
<td>Paul Cannon, PA-C</td>
<td>Lorna Allen, MSN, FNP-C</td>
<td>BPA notification to consider tuberculosis isolation protocol when order quantiferon gold test</td>
</tr>
</tbody>
</table>

**AY21-22 Featured DOM M&M Case: Case of Hyponatremia & Coordination of Care, July 2021 [David Fraulino, MD (left); Brian Montague, DO, MPH, MS (right)]**

In this case, we examined a 37-year-old female with a complex history, including renal transplant, who was discharged home with a tunneled line. There was a lack of designated provider to manage line care and no clear instructions for Home-Health providers or line removal instructions. Through our discussion of this case, we discovered this was not an isolated incident and that we needed a better way to communicate post-acute care guidelines for patients discharging with a line. In response, a complete overhaul of the discharge order set was made to include new orders for device-based care instructions, assignment of the responsible provider after admission and nursing directives.

For the DOM Systems Improvement Conference to be certified as a CCR by the UCH Quality Department, there are three tiers of reviews that were established:

- **Tier 1** – Review of cases based on triggers (e.g., referrals, Division cases, RL submissions).
- **Tier 2** – CCR committee comprised of provider(s), nursing and administrative personnel meeting monthly to review identified cases.
- **Tier 3** – Full review of case at DOM Systems Improvement Conference with identified action items.

The DOM Systems Improvement Conference CCR co-chairs include Dr. Tyler Anstett, Dr. Anunta Virapongse, Kim Marshall, RN and Heather Hallman, MSHS, MHA. Together this team identifies the cases for review, holds discussions on identified issues with key stakeholders and those involved in the case, prepares the case for review and organizes the monthly conference for the Department. As one of the first conferences to be certified as a CCR, the DOM Systems Improvement Conference has been a leader across the CU School of Medicine and an example model for the other 40 certified CCRs.
Above are some data highlights from the CUSOM Graduate Medical Education Office. Additionally, with the increased attendance at the DOM Systems Improvement Conference, our case analyses and solution-generation discussions have been more robust and include multiple perspectives from those outside of the DOM. Below are highlights of data collected from the DOM Systems Improvement Conference Feedback surveys. We saw a significant increase in survey responses from the prior year and an overall improvement in conference impressions and increase in participants gaining new knowledge relevant to their clinical practice.

**Figure 1. AY21-22 DOM Systems Improvement Conference Feedback Data (N=95)**

What was your overall impression of this conference?

- Excellent: 44
- Good: 20
- Average: 0
- Fair: 0
- Poor: 0
DOM QUALITY COUNCIL

In AY21-22, the DOM Quality Improvement, Morbidity & Mortality Steering (QIMMS) Committee rebranded itself as the DOM Quality Council. The change was made as we welcomed our new DOM Chair of Medicine, Dr. Vineet Chopra, who wanted to create a group of designated representatives from each of the 13 clinical DOM Divisions responsible for DOM- and Division-based outcomes. This was done to achieve goals set in the UCH/CUSOM Quality & Safety Performance Metrics for AY21-22.

The new focus of the DOM Quality Council is to meet and exceed the gateway measures for the UCH/CUSOM Quality & Safety Performance Metrics for AY21-22, engage with UCH on hospital-wide improvement efforts and to improve outcomes tracking and performance with use of the Division-based actionable dashboards (developed by the UCH Analytics Team). The continued focus of this group is to participate in the review of DOM Systems Improvement Conference CCR reviews, discuss Department-wide quality issues and serve as quality leaders for the DOM and AMC. The UCH/CUSOM Quality & Safety Performance Gateway Metrics (see Figure 2) included 1) 90% clinical
documentation integrity (CDI) query responses within two days; 2) full Department/Division participation in the Consult Optimization Project (Q1/Q2) and full Department/Division use of the consult workflow (Q3/Q4); and 3) 95% compliance of faculty Ongoing Professional Practice Evaluation (OPPE) completions. The DOM met all gateway metrics for AY21-22, developed a process for timely CDI query response rates and exceeded the performance metrics for CCR certification and fellow/resident CCR participation. All 13 DOM clinical Divisions have certified CCRs and approximately 95% of fellowship programs showed fellow attendance at two or more CCR conferences.

Figure 2. AY21-22 UCH/CUSOM Quality & Safety Performance Dashboard

For the upcoming academic year, the DOM Quality Council will focus on identifying Division-specific quality metrics aligned with institutional metrics. This will be accomplished by designing Division-level projects addressing a gap in quality performance, with quarterly updates on progress to the Council. Additionally, we plan to utilize mortality and morbidity review processes to inform CCRs and improve the mortality notifications for IP and OP providers. The DOM Quality Council will also develop a Department Quality Plan as part of the UCH/CUSOM Quality & Safety Performance Metrics for AY22-23.
IV. Improving Quality of Care

DOM RESEARCH DAY

In an effort to increase the local opportunities for faculty/staff to share their quality outcomes and increase scholarly output, the DOM QPS team partnered with the DOM Research Day organizers to include Quality, Process Improvement & Patient Safety as a new category for AY21-22. The Quality, Process Improvement & Patient Safety poster category received 14 submissions, which was the highest number of submissions for all six categories. We saw submissions from residents, fellows, medical students and junior faculty representing 8 different DOM Divisions. The main poster themes included:

- Covid-19 Vaccine Disparities
- Clinical Decision Support
- Transitions of Care
- Post-discharge Follow-up
- Advanced Care Planning

The virtual session was moderated by the DOM QPS team and had many dynamic discussions on quality and safety issues within the DOM and UCH. With this success of the 2022 DOM Research Day, we plan to make Quality, Process Improvement & Patient Safety a recurring category for the 2023 DOM Research Day and will hopefully have this become a permanent new poster category.

QPS DATA SUPPORT

For AY21-22, the QPS team provided assistance to seven Divisions with projects addressing a wide range of priorities and quality initiatives. The DOM QPS team supported projects from the LInQS Fellowship as well as the Clinical Effectiveness and Patient Safety (CEPS) Small Grants Program. These projects include topics on transitions of care, quality metric registries and medication reconciliation.

*AY21-22 Featured DOM QPS Data Project: Retention and Linkage to Care for HIV Inpatients, Sarah Mann, MD (Infectious Disease)*

Dr. Mann was interested in improving retention and linkage to care for HIV patients. HIV patients are in a high-risk population and lower retention rates correlate with worsened outcomes and increased transmission of HIV. UCH does not have a formal inpatient linkage to care program, so Dr. Mann established a protocol for HIV patient discharge follow-up including Epic patient list tracking, outreach from retention specialists and new discharge workflows. The QPS team was able to extract data on hospitalizations, follow-up visits and linkage to care notes for patients with HIV. Dr. Mann used these data to track providers’ progress towards increased follow-up visits and completing the linkage to care visit notes. They have since hired a new Linkage to Care Coordinator who manages post-discharge communications, contacts discharging patients to set up follow-up care and works with patients to ensure they receive the appropriate care after admissions. They plan to collect post-intervention data in 4-6 months to compare with their baseline metrics, highlighted below.
V. Pursuing High Value Care

ANNUAL SHARK TANK COMPETITION

For the sixth year, the DOM QPS team hosted the annual Shark Tank Competition in May 2022. The goal of the Shark Tank Competition is to identify quality improvement projects, led by DOM faculty, that promote high value care (HVC). High value care is evidence-based, value enhancing practices that improve outcomes and the quality of healthcare. The winning project receives DOM QPS support including Six Sigma coaching, data support and analysis and increased visibility in the DOM and UCH. The sharks represented an impressive panel of leaders from across the SOM and hospital systems including:

- Vineet Chopra, MD, MSc (DOM Chair of Medicine)
- Geoffrey Connors, MD (Internal Medicine Residency Program Director)
- Anne Fuhlbrigge, MD (Sr. Assoc. Dean of Clinical Affairs, CU Medicine Chief Medical Officer)
- Jeffrey Glasheen, MD (Assoc. Dean of Clinical Affairs - Quality, IHQSE Director)
- CT Lin, MD (UCH Chief Medical Informatics Officer)
- Tom MacKenzie, MD (Denver Health Chief Quality Officer)
- Jennifer Wiler, MD, MBA (UCHealth Metro Chief Quality Officer)
2021-2022 Shark Tank Finalists

1. CHRISTOPHER KING, MD
   Homeward Bound: Improving System Flow and Patient Satisfaction Through Expanded Take Back Agreements

2. ANNIE CHEN, MD
   iAMCKD: Improving Anemia Management in Chronic Kidney Disease Patients

3. MEGAN CALZIA, MD
   ALANA FREIFELD, MD
   ANITA MOUDGAL, MD
   Where is the PFT? Improving Pulmonary Function Testing Rates Among Adults Presumed to Have Asthma in the Primary Care Setting

4. PAUL CANNON, PA-C
   JONATHAN TREEM, MD
   Remote Patient Monitoring (RPM) & Electronic Patient Reported Outcomes (ePRO) of Oncology Patients to Reduce Preventable Acute Care Utilizations

5. JOSE HENAO-CORDERO, MD
   LIZ MATTHEWS, MD
   Vaccination Optimization for Patients on or Starting Immunosuppressive Therapies

The Shark Tank finalists developed impressive HVC projects with novel interventions to improve healthcare quality and patient safety. The sharks were impressed with each team’s project goals and methodologies, to the extent that all five were chosen to receive DOM QPS support. Dr. Liz Matthews and Dr. Jose Henao-Cordero’s winning project is described below. These Shark Tank projects will have significant impacts in improving care and driving value at UCH.

2022-2023 Shark Tank Winner: Vaccine Optimization for Patients on or Starting Immunosuppressive Therapies: A Multi-Department Collaboration

Jose Henao-Cordero, MD (Infectious Disease Fellow) and Elizabeth Matthews, MD (Neurology Fellow) are the 6th Annual DOM Shark Tank winners for their project, Vaccination for Patients on or Starting Immunosuppressive Therapy: Increasing Compliance through Standardized Guidelines and Improved Access. Their project aim is to improve vaccination compliance for patients on immunosuppressive therapies and to improve vaccine access for patients. This project could impact over 20,000 patients in the UCHealth system. The team has already begun developing evidence-based vaccination guidelines for a variety of immunosuppressing conditions and are collecting baseline data to scope the patient population and target areas for pilot interventions. They will begin with patients initiating new immunosuppressive therapies and will later expand to patients on existing therapies. They hope to build an AglieMD pathway to guide providers in determining the appropriate vaccines for their patients before initiating immunosuppressive therapies.
2021-2022 Shark Tank Winner Update: VECTORS: Vancomycin Errors Corrected Through Optimizing OPAT Medication Reconciliation and After Visit Summary Standardization

Lorna Allen, FNP-C, Assistant Professor in Infectious Disease, is the winner of the 5th Annual Shark Tank Competition. The goal of this project is to standardize Outpatient Parenteral Antimicrobial Therapy (OPAT) monitoring of IV antibiotics, specifically vancomycin, for discharging patients. OPAT orders are frequently absent from both the discharge medication list (48%) and the after-visit summary (AVS) (46%). This adversely impacts continuity of care, adds frustration for patients/providers and increases the potential for adverse drug errors. The current discharge process includes five separate providers/staff and the OPAT orders must by copy/pasted into the AVS. The team developed an AgileMD pathway to guide primary teams in identifying and treating OPAT patients. Additionally, they developed an OPAT Navigator for Infectious Disease providers to enter OPAT orders. This is a major process change considering OPAT orders were previously entered by the primary team services. The OPAT Navigator and AgileMD pathway go live in August 2022.

VI. Educating Future Leaders

LEADERS IN INFORMATICS, QUALITY & SYSTEMS FELLOWSHIP

In 2019, the DOM QPS team introduced the Leaders in Informatics, Quality & Systems (LInQS) Fellowship Program. The objective of the LInQS Fellowship Program is to develop fellows and junior faculty into future leaders with successful academic careers in the areas of quality improvement, clinical system design, clinical informatics, and/or patient safety. This is a two-year program that combines didactics, longitudinal mentorship and hands-on training from faculty mentors with diverse expertise to support trainees and junior faculty.

This year our second class of fellows graduated with many impressive outcomes. Four LInQS fellows have submitted manuscripts for publications and several have presented their work at local and national conferences. Tim Yen, MD (Gastroenterology & Hepatology Fellow) has accepted a new position as Assistant Professor for Loma Linda University Medical Center in an informatics leadership role. Laura Macke, MD, along with LInQS fellow from Cohort 1 Blake Jones, MD, have both accepted positions as Division Quality Lead for the DOM Quality Council. Additionally, Dr. Macke has taken on a 25% FTE informatics role as she works towards her board certification in clinical informatics. Lastly, Laura Peters, DNP, has joined the Office of Advanced Practice to coach DNP students on system-level quality improvement initiatives, as well as helping NP providers advance to DNP students. Below is a highlight of the outcomes our fellows were able to achieve in their two-year fellowship projects.
For AY22-23, we welcome eight new fellows into the LInQS Fellowship Program who have already begun working on projects that address vital system issues. These projects focus on transitions of care, steroid stewardship, cancer screening, care continuity, total cost of care related to Medicare/Medicaid reimbursements, duplicate chart optimization, penicillin delabeling, and outpatient pre-visit planning. A new feature for this cohort is the collaboration with the Institute for Healthcare Quality, Safety & Efficiency (IHQSE) and their Foundations in Healthcare Leadership workshop. The LInQS fellows will participate in a 12-month program that blends practical in-person training, application to real world challenges, and longitudinal executive coaching. The goal is to help our fellows gain the skills necessary to become high-performing leaders in healthcare.

**LInQS Fellowship Program – Cohort 4**

**NANCY FANG, MD, MS**  
(ASSISTANT PROFESSOR, OBSTETRICS & GYNECOLOGY - FAMILY PLANNING)

**KRISTY GAMA, MSN, ANP-BC**  
(SENIOR INSTRUCTOR, MEDICINE - CARDIOLOGY)

**ANJELI KALRA, MD**  
(ASSISTANT PROFESSOR, MEDICINE - ALLERGY & CLINICAL IMMUNOLOGY)

**HILLARY LANDAU, MD, MBA**  
(INSTRUCTOR, MEDICINE - HOSPITAL MEDICINE)
HEALTH INNOVATIONS SCHOLAR PROGRAM

The Health Innovations Scholar Program (HISP) is an intensive training program for medical students who seek to lead innovative transformation of US healthcare. Medical schools typically do not provide the knowledge or skills necessary to drive reinvention of healthcare systems. The HISP is a mechanism to engage medical students early in their careers towards process/quality improvement and innovation. The students who have participated in HISP from 2013 - 2022 have engaged in experiential work across multiple clinical settings.

For AY20-21, the HISP hosted eight first year students all from the University of Colorado. These students worked on inpatient discharge transitions of care with a specific focus on interacting with patient portals. This resulted in a poster presentation at the Society of Hospital Medicine National Conference in Nashville, TN in April 2022.

IX. Future Plans

Looking ahead to the next academic year, we are enthusiastic to continue to expand and innovate through our current programs, diversify faculty and trainee participation in DOM QPS efforts and to increase the visibility of our programs to the DOM Divisions. We will continue to collaborate with the DOM Divisions and UCH leadership to provide data support, education and collaborate to address the quality and safety needs of our faculty. We will focus on addressing the AY22-23 CUSOM/UCH Quality & Safety Performance metrics and ensure each DOM Division achieves their individual performance goals. Our goal is to support the DOM in meeting and exceeding metric thresholds and continue to be a leader in quality performance for the campus and health system.