

Enhanced Recovery Program

Annual Report FY20



BACK TO | HOME • FAMILY • THERAPY • WORK • LIFE • SELF

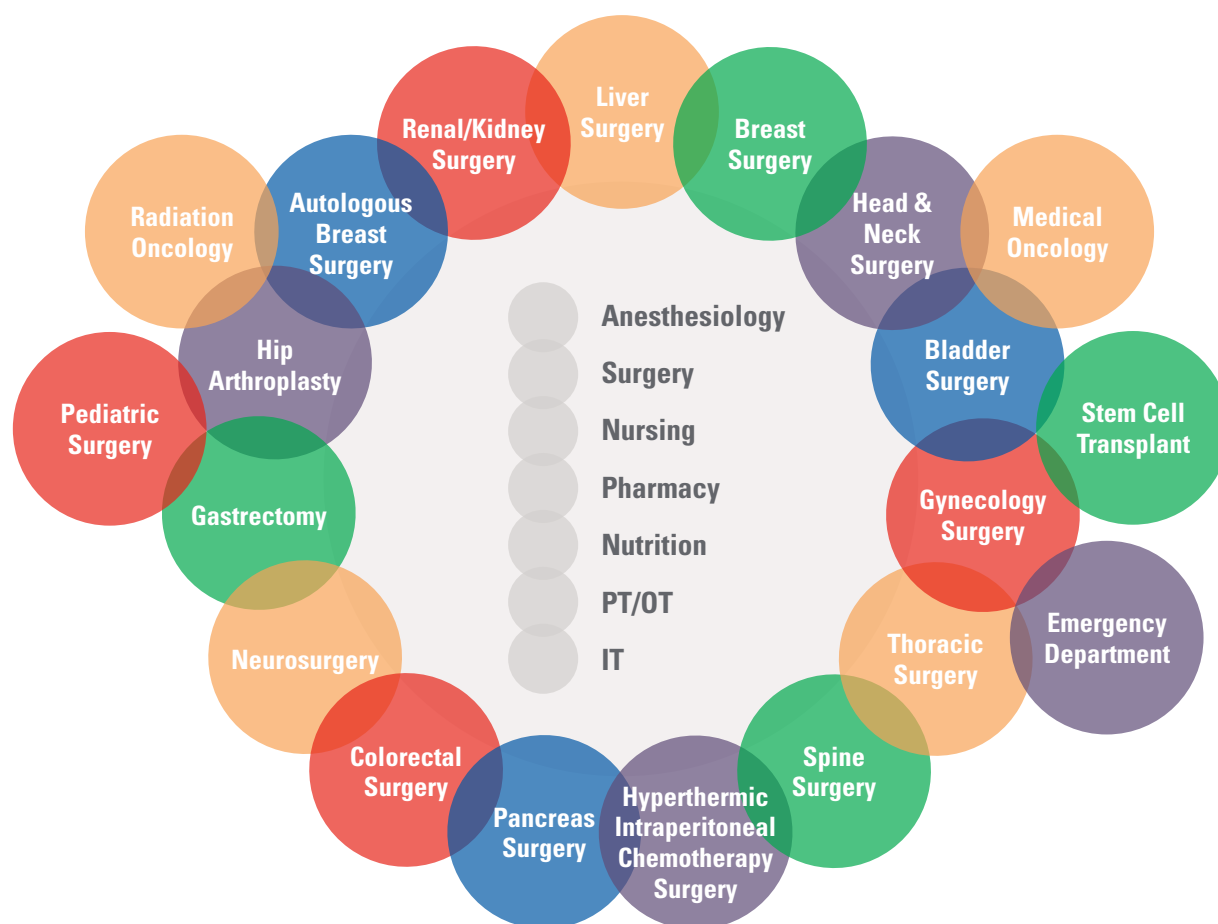
THE UNIVERSITY OF TEXAS
MD Anderson
Cancer Center
Making Cancer History®

Enhanced Recovery Program

MD Anderson Cancer Center's institution-wide Enhanced Recovery Program (ERP) is a collaborative, patient-centric, recovery-focused, care transformation initiative led by our multidisciplinary team members actively engaging caregivers and patients in their treatment planning and care delivery. Since inception in 2012, the MD Anderson ERP has quickly become one of the largest for oncology care in the world. The mission for our ERP teams is "implementation of proven and emerging innovations in cancer therapies to deliver safe, effective, and value-based cancer care programs

for an increasing number of patients." The program's vision is to minimize treatment-related complications by rapid rescue interventions, reduce patients' symptom burden, and enhance patients' experience and functional recovery, thereby facilitating timely return to adjuvant oncologic therapies when indicated and improving cancer outcomes. Collectively, MD Anderson ERP team members remain engaged and dedicated to ensure the best for our patients' care, experiences and outcomes.

MD Anderson ERP Teams 2012–2020



Special acknowledgment to all Enhanced Recovery Program members who contributed time and effort to making the FY20 annual report possible.

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On the cover

The preservation of outdoor spaces contributes to the healing environment at MD Anderson. Each new building or campus expansion has introduced green spaces to offer respite for our patients, visitors and employees.



We're all
in this
Together

Inspiring chalk art for front-line workers was created by the MD Anderson Children's Art Project team.

Together we are stronger

In writing these remarks, we reflect on the unprecedented challenges our world has faced with the COVID-19 pandemic. This past year has been unlike anything we have experienced before, and we are proud that The University of Texas MD Anderson Cancer Center Enhanced Recovery Program (MD Anderson ERP) has faced these times of uncertainty head-on and with a plan. Our team members have leaned on and supported each other, partnered with our patients, and remained diligent in providing high-quality, recovery-focused, patient-centric care during the pandemic. We have continued to make progress with our ERP. We as a team have demonstrated that impactful and enduring progress in our clinical programs can be achieved when we work together.

We dedicate this year's annual report to our multidisciplinary team members as a thank you for their commitment to advancing valuable care initiatives.

Teamwork has been the foundation of the MD Anderson ERP for the past decade and will remain the main driver of success for the program in the years to come.

Even in the midst of the COVID-19 pandemic, the MD Anderson ERP never wavered in helping our patients achieve their goals of returning back to home, back to family, back to therapy, back to work, back to life, and back to self. We thank our patients for inspiring us every day with their courage, strength and optimism, and for allowing us to be part of their cancer journey.

We couldn't be more proud of our ERP team's collective efforts as we watched our group come together like never before to advance patient recovery, experience, and outcomes. We are inspired by our team's dedication and accomplishments, and remain devoted to continuing the great work of the program across the institution, partner sites, and The University of Texas System.

We are Making Cancer History® and together we are stronger.



Thomas Aloia, M.D., M.H.C.M., F.A.C.S.
Chief Quality Officer
Head, Institute for Cancer Care Innovation
Professor, Department of Surgical Oncology



Vijaya Gottumukkala, M.D., M.B.B.S., F.R.C.A.
Associate Head, Institute for Cancer Care Innovation
Professor & Deputy Chair, Anesthesiology & Perioperative Medicine
Director, Program for Advancement of Perioperative Cancer Care

FY20 by the numbers



3,700
ERP patients in FY20

To date over
15,000 ERP patients



41
publications in FY20

To date over
100 publications



57
presentations in FY20

To date over
150 presentations



To date 9 awards received



2
ERP teams added in FY20

To date
20 ERP teams

Hear from our leaders



The Enhanced Recovery Program (ERP) at MD Anderson Cancer Center is a model of our patient-centered, recovery-focused, value-based care delivery paradigm. Engaging and partnering with our patients, our ERP multidisciplinary teams are focused to return patients efficiently, 'back to home, family, therapy, work, life and self.'

I am proud of our multidisciplinary ERP team's dedication and commitment to deliver the highest quality care adhering to our core values of Caring, Integrity and Discovery.

Peter WT Pisters, M.D.

President, MD Anderson Cancer Center

Enhanced recovery has revolutionized the way we care for our surgery patients at MD Anderson.

Reduced pain has led to shorter hospital stays and lowered the need for narcotics.

Our patients are now able to leave the hospital sooner and return to their families, jobs and everyday lives.

The Enhanced Recovery Program is a process that we are immensely proud to have joined with other divisions at MD Anderson to contribute collectively to improved patient outcomes.

Stephen Swisher, M.D., F.A.C.S.

Head, Division of Surgery

Professor, Department of Thoracic and Cardiovascular Surgery

The MD Anderson Enhanced Recovery Program supports the connection of multidisciplinary clinicians across the spectrum of patient care as one team focused on providing excellent care for our patients.

Nurses throughout the institution collaborate with multidisciplinary care teams to ensure a safe, caring and coordinated experience for both our patients and their families, resulting in improved patient outcomes.

Incorporating evidence-based practices ensures improved safety, quality of care and enhanced recovery.

Carol Porter, DNP, RN, FAAN

Head, Division of Nursing

Chief Nursing Officer

Senior Vice President

The MD Anderson Enhanced Recovery Program (ERP) has positively changed the way we practice by advancing patient care and increasing the interconnectedness of our multidisciplinary teams. Anesthesiology, critical care and pain medicine providers play a critical role in the treatment and recovery of cancer patients and we are proud of the improvements in outcomes. The MD Anderson ERP serves as a leader in delivering high-quality, value-based care.

Carin Hagberg, M.D., F.A.S.A.

Chief Academic Officer

Division Head, Division of Anesthesiology, Critical Care & Pain Medicine





“

Trust your team and ask questions when you are uncertain. Remember, you are the most important person on the planning team.

”

Uniqua Smith, Ph.D., MBA, RN
Associate Director of Innovation & Performance Improvement for Nursing Programs

The patient experience with Uniqua Smith, Ph.D.

Tell us about yourself and who you are.

My name is Uniqua Smith and I have been a registered nurse for 16 years. I am currently the associate director of Innovation & Performance Improvement for Nursing Programs and have been in this role for five years. My clinical background consists of working as a clinical nurse in the Post Anesthesia Care Unit (PACU) for six years and then moving on to manage the Anesthesia Assessment Center, Pain Management Center and Acute Pain Services for five years. I also have five years of experience as an adjunct faculty for the University of Phoenix, teaching a Health Administration Capstone course for undergraduate students.

What do you enjoy doing? How much time do you get to spend on your hobbies?

My top three favorite things are baking, roller skating and reading biographies or historical books. Since my breast cancer diagnosis, I haven't been able to bake as much, but I am slowly making my way back into the kitchen. I have not been roller skating since the diagnosis, but look forward to getting back on the rink soon. I was able to catch up on a lot of reading during treatment and while home recovering from surgery.

Why did you choose MD Anderson for your care?

I chose MD Anderson for my care because they are simply the best! My first encounter with MD Anderson was in 1996 as a caregiver for my aunt. Once a decision was made to transition her into hospice care, MD Anderson provided classes to prepare me for the management of her home care. Once she passed away, members of her primary care team called us to check on us and I thought that was phenomenal. I was so impressed with the care that was provided for my aunt that I changed my major from accounting to nursing. I started my nursing career at MD Anderson, and I was able to see firsthand all of the innovative and patient-centered treatment plans provided to oncology patients. My first impression was how each type of cancer had a unique service line to focus on that specialty. Additionally, each specialty worked closely together, when needed, to provide a comprehensive care plan for patients that blended service lines. Once I was diagnosed, it was a very easy decision to make since I had the perspective of a caregiver and a nurse. What I saw as a caregiver and what I saw as a nurse mirrored one another. Simply put, MD Anderson “walks the talk.” That provided me hope and faith that my team would do their best to end my cancer.

What were your expectations of surgery before learning about the Enhanced Recovery Program?

Being an employee here, I was familiar with the Enhanced Recovery Program, but it was just beginning as I was transitioning from my role as a recovery nurse to the ambulatory setting. My recovery expectations were based on my experiences in the PACU. Those experiences included longer stays in the hospital, potentially having a PCA pump for pain management, clear liquid diet and bed rest on the first day, and progressing to a full liquid diet and ambulation as my hospital stay extended. Essentially, the traditional recovery plan.

Who informed you about the Enhanced Recovery Program? Tell us about how you felt upon learning this program was available during your care.

My assigned anesthesiologist, Dr. Ifey Ifeanyi-Pillette, emailed me a few days prior to my surgery to discuss Enhanced Recovery After Surgery (ERAS). She provided instructions on what I should eat and drink on the days prior to the surgery, and the impact it would have on my recovery. Dr. Ifeanyi-Pillette also discussed what my recovery would look like with ERAS. I was extremely grateful for the time she took out of her busy schedule to make sure I was prepared for the most uneventful recovery possible. Although I had been a PACU nurse, I wasn't aware of the steps that I should take to enhance my recovery, since the program wasn't in place during my years of working in recovery. I am glad that my anesthesiologist didn't make that assumption based on my experience, and reached out to me to make sure I was aware of and prepared for the program.

Can you share some of your experiences while in the Enhanced Recovery Program?

I was able to participate in the Enhanced Recovery Program a total of three times within four months. Given that I had so many surgeries within a small timeframe, I credit the program with helping me to progress without difficulty. The most impressive experience was being able to go home so quickly after surgery. To have a total mastectomy and be discharged within 24 hours is amazing! This is helpful on so many levels, such as decreasing costs for hospital stays, decreasing risks for hospital acquired infections and pressure injuries, and allowing patients to recover in the comfort of their own homes, where family and friends can easily assist with care. The other impressive experience was the decreased need for pain medicine and antiemetics. The expectation for all three surgeries was that there would be a somewhat painful recovery, but there was a minimal need for any medications. Having a decreased need for pain medications and

antiemetics really helps patients to ambulate faster and get back to their baseline activity level.

How did it feel being a part of your care team?

I felt empowered to be a part of the process of planning my care. It was a great feeling to know that I played a part in the success of my recovery by following the guidelines for pre-surgery preparation. As a cancer patient, you can feel very helpless as you have no control over your disease. Having an opportunity to feel like you are contributing to the efforts of eliminating the very disease you can't control gives you a sense of accomplishment and being helpful to the team.

What was your goal after surgery?

My goal after surgery was to return to work as quickly as possible. Keeping my routine as normal as possible helped me navigate this cancer journey without losing hope. Being able to still come into the office was huge for me, as so much in my life had changed. There were so many things beyond my control, such as losing my sense of taste, losing my hair, having my nails detach from my nail beds, constant fatigue and hot flashes. I had no ability to control any of these issues that occurred as a result of my treatment, so having a few things that could provide some sense of normalcy really helped me cope with this unexpected life change. Routine is important to me, so being able to make the long drive from my home in Spring and be in my office helped me maintain a bit of that routine. On the days that I had to remain home due to chemotherapy or surgery, I felt a disconnect from my normal life, because being on the campus of MD Anderson has been a huge part of my life. The one great thing is that all of my treatment was done at the campus where I work, so I was still in a very familiar environment, but on the other side as a patient.

What is your advice to other enhanced recovery patients at MD Anderson?

My advice to other patients is to follow the plan that is put in place. It will have a tremendous impact on your surgery outcomes and your recovery. You will also be part of the care team and participating in your care plan. Additionally, you will be engaged in an innovative program, and your participation will help future patients by providing useful data for adjustments deemed needed by the team. You will be "paying it forward" by paving the way. Trust your team and ask questions when you are uncertain. Remember, you are the most important person on the planning team.



“
Enhanced recovery is orchestrated
teamwork for the common goal of
getting our patients back to their lives.

”

Carol Lewis, M.D., M.P.H., F.A.C.S.
*Associate Professor of Head and Neck Surgery and
Associate Chief Patient Experience Officer*

Teamwork to drive change with Carol Lewis, M.D.

What is your role in the ERP?

I lead our department's efforts to develop and implement our ERP.

Enhanced recovery in the head and neck surgical population is still very new. Tell us about how you became involved in the ERP and why you chose to implement this protocol.

Our department was relatively late to the ERP game compared to other surgical departments at MD Anderson, but we are ahead of the national curve for the field of head and neck surgery. Having seen our MD Anderson colleagues' results, it was impossible not to want to improve things for our patients. We chose to target patients who undergo combined head and neck-plastic surgery procedures because these are our highest acuity, most resource-intensive cases, and we thought we would see the biggest benefit in these patients.

Tell us about your work in the ERP.

Putting together this program meant coordinating head and neck surgeons, plastic surgeons, anesthesiologists, nurses and advanced practice providers from all phases of perioperative care. Once we agreed on the components of the program, the hardest part was implementation. The program is running smoothly, and we are focusing on evaluating and publishing outcomes.

What is the most important outcome from your work?

We know that our patients have seen big benefits in reduced need for narcotic pain medications and reduced

overall complications post-operatively. The biggest benefit has been validating the importance of every person involved in our program and engaging all levels of care across all phases of perioperative care.

What is your favorite memory from working with your ERP team?

We were brainstorming how to identify enhanced recovery inpatients in medical records. There were limited options for how we could tag patients' rooms or doors because of HIPAA, and we were generally just feeling stuck. Our clinical nurse leaders went back to the floor nurses for more ideas and one of our floor nurses asked why we couldn't just name the order sets 'Enhanced Recovery' — every time the nurses opened the orders, this would headline on the medical record. It was such a simple solution. I love how this exemplifies how engaged everyone is in problem-solving for the program.

Do you predict the ERP will become the standard of care in the future? Why?

Yes, and I hope that it evolves into our new normal because of the benefits our patients reap and the teamwork it fosters.

What do you tell other providers interested in implementing enhanced recovery in their area?

Team engagement is one of the biggest hurdles. The way we overcame that is to create a steering committee with representation from all levels and phases of care, giving everyone a voice and accountability.



Embarking on a collaborative journey with Carla Johnson

What is your role in the ERP?

My role in the ERP is that of a collaborator/facilitator. I work to ensure nursing is active in partnering with the interprofessional team on the implementation and continuous process improvement of the ERP.

Nurses are essential to the success and sustainability of enhanced recovery programs. Tell us about how you became involved in the ERP and why you chose to help implement this protocol.

A major role for nurses is to advocate for evidence-based patient care delivery models that promote safe, timely, effective, efficient, equitable and patient-centered care. I chose to help implement the ERP because this framework achieves those goals. My involvement includes ensuring front-line nurses have the resources and support needed for success.

Tell us more about the valuable role of nurses as part of the ERP multidisciplinary team.

Nurses who are part of ERP multidisciplinary teams are essential for providing education and ensuring pathways are followed correctly. The proper planning and education of patients, their family members, and health care team members can yield dramatic improvements in patient and financial outcomes.

What is the most important outcome from your work?

The most important outcome is the positive impact of nursing's contribution to the overall patient experience with ERPs. Nursing is currently involved in an interprofessional collaborative quantitative/qualitative research study to explore the sleep experience of gastrointestinal cancer patients hospitalized following surgery. This important work stemmed from the ERP and will provide valuable information to help improve our patients' experience.

What do you tell other nurses interested in implementing enhanced recovery in their area?

I tell them that this is a great opportunity to influence the patient experience before and after surgery and advocate for evidence-based protocols to improve outcomes.

“Enhanced recovery means delivering health care that improves the patient experience and the health of the patients we serve, reduces costs, and brings joy to the workforce.”

Carla Johnson, DNP, RN, NEA-BC, CCRN-K, CNL
Director of Clinical Nursing for
Nursing Administration



Paving the way for the future of ERPs with Gabriel Mena, M.D.

What is your role in the ERP?

I serve as the anesthesiology lead for the Thoracic, Breast and Autologous Breast (Plastics) ERP initiatives and as co-lead anesthesiologist for the Gynecologic Oncologic ERP initiative.

What makes the MD Anderson ERP special?

We at MD Anderson place our patients at the center of the universe throughout their hospital journey. The cornerstone of our program is delivering the highest quality of care through the prioritization of patient safety, experience, functional recovery and oncologic outcomes.

What is the most important outcome from your work?

The most outstanding outcome is to have contributed and collaborated nationally and internationally toward implementing the principle of ERPs. At our institution, our contributions allow us to see the impact of our interventions in a number of surgical disciplines. Through this multidisciplinary collaboration, we have integrated the clinical benefits of this quality improvement initiative to benefit numerous patients who undergo surgery at MD Anderson. In addition, we have dramatically reduced opioid consumption, length of stay, complication rates, and have maintained similarly low rates of readmission and reoperations. MD Anderson is the tip of the spear when it comes to oncologic ERP's in the national and international arena. To see the improvement in outcomes

and the impact of what we do translated to excellent functional recovery outcomes in our patients is incredibly satisfying.

Do you predict ERPs will become the standard of care in the future? Why?

Absolutely. Enhanced recovery is not a principle for future implementation. It is "the present" in our institution. We now consider this initiative part of our standard of care. I foresee that ERPs will become the standard of care in many institutions across the country and globally. There is a wealth of scientific evidence that supports the fact that no matter the institution or the country where they are implemented, ERPs are always associated with better patient outcomes, fewer complications, lower costs and a decrease in length of stay. We have demonstrated across multiple surgical subspecialties a significant reduction in perioperative opioid consumption and discharge/prescribed opioids. This is of immense value as we strive to find tangible solutions that allow us to continue tackling the current opioid epidemic affecting our nation.

“

Imagine the positive psychosocial impact of being able to return to your normal life with loved ones and/or back to work much sooner and to continue to be productive in society.

”

Gabriel Mena, M.D.

Professor, Anesthesiology and Perioperative Medicine



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The tree sculpture is located at Mays Clinic.

Developing a standardized framework for assessing value in health care

By Casey Allen, M.D., Thomas Aloia, M.D., Brittany Kruse, D.B.H., Vijaya Gottumukkala, M.D., and Matthew Katz, M.D.

The United States is transitioning to a value-incentivized health care system. At MD Anderson, we have favored a definition that integrates the outcomes component of the value framework with traditional quality, safety and patient experience measures, and also expands the definition to include the costs to both payors and patients. Historically, it has been difficult to effectively visualize and communicate all of the value framework's outcomes and cost components. It has also been difficult to summarize value using metrics across multiple dimensions.

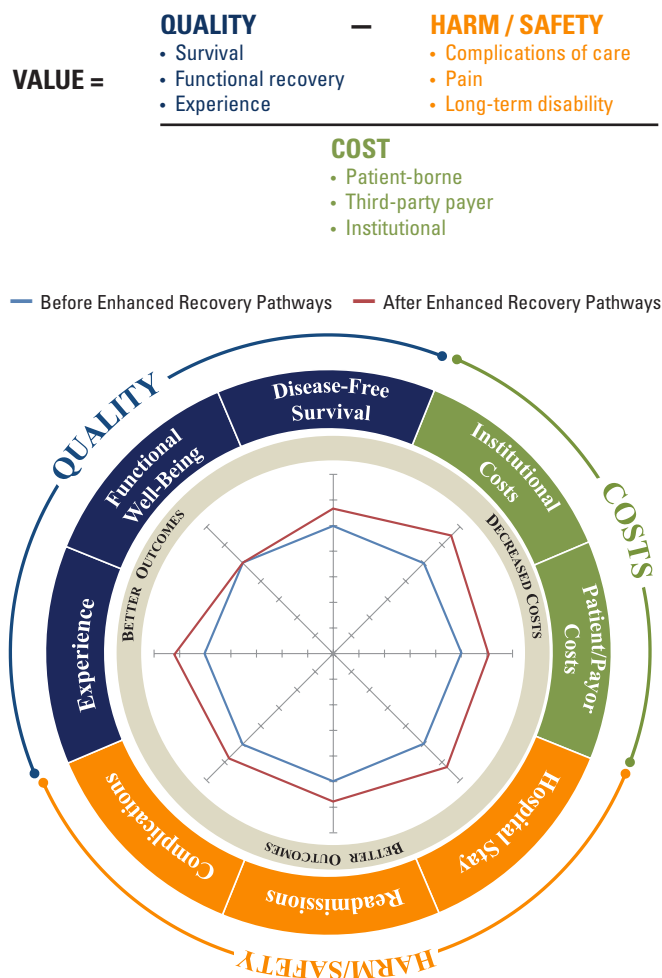
Recently, a set of enhanced clinical care pathways for patients undergoing pancreatectomy was implemented. This initiative provided an ideal opportunity to demonstrate the utility of a framework to simultaneously visualize and communicate a wide range of outcomes and cost metrics.

A radar chart, a graphical method of displaying data in which quantitative variables are represented on multiple axes that originate from the same point, was constructed to simultaneously present each value metric. More favorable outcomes are plotted farther from the center on each axis; metrics for which a negative change is favorable (i.e. costs, complications, length of stay) are plotted inversely. The figure reflects the change in value that occurred following implementation of the care pathways.

This tool enables us to visualize and communicate how the pathway implementation provides an overall value advantage by improving several metrics. We thus demonstrated the use of a novel analytic framework in which multiple domains of health care value are simultaneously quantified and communicated.

The simple radar chart is a practical tool with which to improve dialogue between stakeholders as it provides clinicians, patients, administrators and policymakers with a readily understandable snapshot that can facilitate value assessment. They may have particular utility in the context of shared decision-making between patient and provider, as they can reflect both costs that may be incurred and outcomes that may be achieved across two or more treatment possibilities.

Institutions may also find this framework useful as they develop and prioritize specific workflows, pathways and algorithms, or to support value-based reimbursement



models. Although this case study illustrates the potential utility of a novel framework, it also exposes limitations to our current abilities to measure value. For example, many domains can be measured using data readily available in electronic medical records, data registries and/or financial systems. Other metrics, however, especially patient-reported outcomes such as pain measures, functional outcomes, quality of life and measures of financial toxicity, may not be routinely available. Future work may help to guide not only the selection of metrics used by different stakeholders, but also how stakeholders' preferences may be reflected into more aggregate indexes of value.

As we develop better data, our ability to effectively communicate value will facilitate shared decision-making among all stakeholders involved in value-based health care.

Patient education: Success through teamwork

Providing patients with complete and current information is one way to help manage the stress of their care experience while also offering an opportunity to become partners in their recovery journey. Patient education is a key part of MD Anderson's Enhanced Recovery Program (ERP), driving patient engagement and empowerment. The Patient Education department partnered with members of the MD Anderson ERP to form a Patient Education Subcommittee that included both clinical and non-clinical experts.

Although each enhanced recovery specialty had its specific focus, the subcommittee shared one goal: develop clear educational materials using plain language that engages patients to be active in their care before, during and after surgery.

Committee efforts focused on developing and improving enhanced recovery patient education materials for the program. The subcommittee worked closely with senior health education specialist, Desiree Phillips. "Having this dedicated team of experts was a win-win for patients and this program," Phillips said.

The group met regularly to develop standardized content that related to many clinical areas.

The partnership with Patient Education was important because it made sure that materials followed health literacy guidelines and adult learning, as well as the process for medical updates, approval and information sharing.

"Health literacy is an important part of what we do. We make sure materials are written in clear, plain language below the eighth grade reading level, which follows our health literacy policy for patient education," Phillips said.

By working together with the team's experts and using a patient-centric approach, the subcommittee reduced the 20-plus patient education information sheets to four general patient education documents, including Enhanced Recovery Program Overview, Enhanced Recovery after Surgery, Nutrition: Enhanced Recovery after Surgery, and Prehabilitation.

In addition to the printed materials, the team created a video titled "Enhanced Recovery Program at MD Anderson: Bringing providers, patients and their caregivers together as active partners." It first showed at the Global Enhanced Recovery Symposium in February 2020, and was a highlight of the conference. The video is available across MD Anderson and on public web-based platforms, as well.

A special thank you to Desiree Phillips, Glenn Challenger, Lauren Lea, Mike Giannaccio, and Jordan Pietz for their dedication and hard work to create this video.

The MD Anderson ERP serves as an exceptional example of the power of teamwork. Using plain-language patient education materials to support a patient's experience is impactful to quality and value-based care.



The video was first presented during The University of Texas MD Anderson Global Enhanced Recovery Symposium in February 2020.

Using the power of data visualization to enhance decision-making

By Reena Ramachandran, M.S.



Data visualization can be a powerful tool to measure, track and showcase performance. Visual reports allow users to quickly skim through layers of data to efficiently process meaningful information.

With the MD Anderson Enhanced Recovery Program (ERP) quickly expanding to 17 surgical and three nonsurgical service lines, the Institute for Cancer Care Innovation (ICCI), in collaboration with the Electronic Health Record (EHR) Analytics and Reporting team, has worked to leverage the power of data analytics and visualization to monitor the success of the enhanced recovery pathways and to identify opportunities for improvement across service lines.

MD Anderson's ERP is an interdisciplinary care approach that uses patient education and engagement, nutritional optimization, multimodal opioid-sparing analgesia, symptom management, and rational fluid and blood management with the goal of improving patient outcomes. Monitoring the ERP process and outcome measures is integral to evaluating the enhanced recovery foundational elements, practices and pathways.

Goals of this collaboration between ICCI and the EHR Analytics and Reporting team include creating standard automated ERP reports and building dashboards within the EHR for institutional and service-line reporting.

As the ERP continued to expand, a growing need emerged to standardize data collection and reporting across the institution. This led to the creation of a custom Enhanced Recovery Program Universe within our EHR in early 2019, where ERP data variables were consolidated from five different data warehouses into a single warehouse.

In order to support the program's data-driven approach to improvement and monitor its effectiveness, a second phase was initiated to develop visualizations directly into the institutional EHR. These were designed to provide institutional leaders and stakeholders with insights into

compliance metrics and patient outcomes. The purpose was to create easy, accessible, interactive visualizations to allow ERP stakeholders to not only review overall trends but also provide opportunities to examine detailed data at service-line, provider and patient levels.

To understand the needs and scope of the visualizations, regular meetings with clinical stakeholders were conducted throughout the design phase.

Although the ERP Universe was created to serve as a one-stop shop for all the ERP-related data needs, many of the data elements that were necessary to develop the ERP visualizations were mapped from other data warehouses. We therefore had to learn how data is captured in the institutional EHR and how those fields can be extracted directly from the Universe program.

Another challenge was to learn the build/mapping of the data warehouses and use available data elements to build the visualizations in the ERP Universe without disrupting the current workflow or adding additional data entry fields. Dashboards were developed focusing on key outcome measures of the ERP, such as length of stay, 30-day readmission rate, 30-day Interventional Radiology interventions for fluid drainage, and fluid (blood products, colloids and crystalloids) management in the operating room.

This creative project eliminates the need for manual data extraction from chart reviews for several of the ERP-related data elements and speeds the process of metrics reporting. The dashboards standardize the process of reporting and allow for overall trends to be compared across service lines so that important trends and opportunities can be identified across the institution to support the work of the MD Anderson ERP. Just like any good visualization project, this is an iterative process and with more usage of this tool, there will be an opportunity to mature the tool with ongoing input from end users.

Leveraging mobile application technology to facilitate provider education

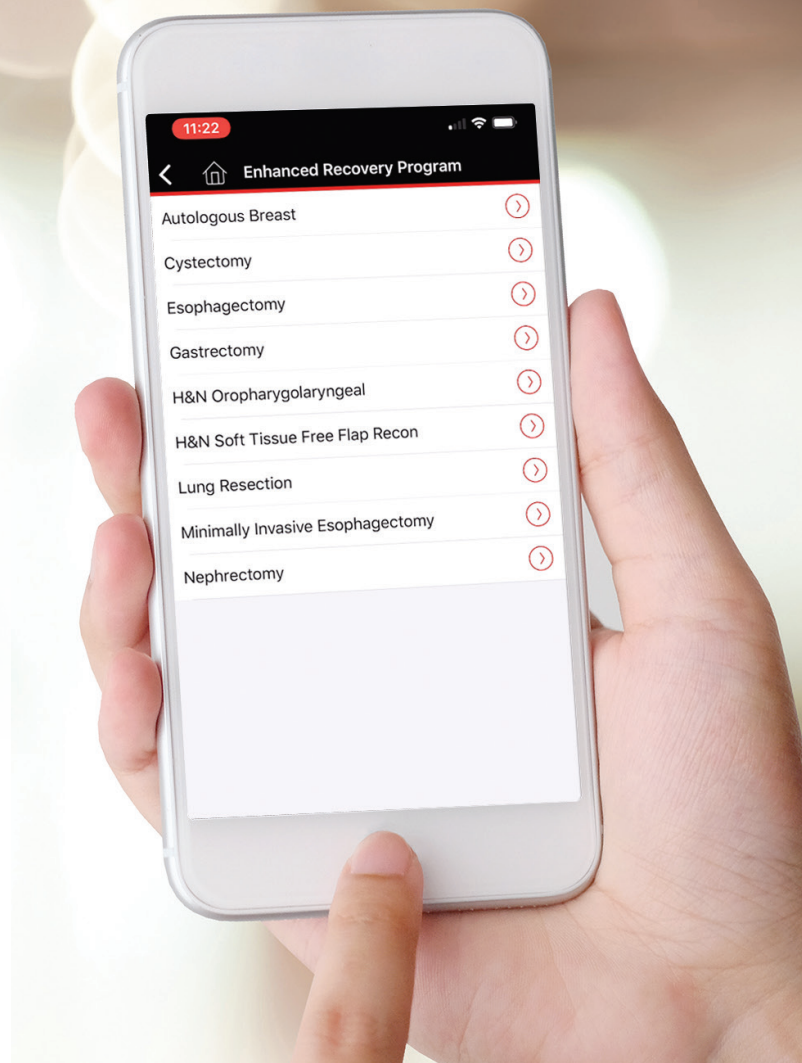
Enhanced recovery has revolutionized the management of patients to improve outcomes. As optimization of the protocols continues, the foundational element of provider education has emerged as essential to successfully build enhanced recovery into the fabric of care at MD Anderson.

In 2016, our colleagues in the bladder cancer enhanced recovery program, led by Neema Navai, M.D., and Jay Shah, M.D., identified challenges in sharing the traditional enhanced recovery pathway across all levels of the care providers. To overcome this barrier to adoption, they developed a reference pamphlet with the purpose of distributing the agreed-upon standard pathway to their multidisciplinary team. Over time, this pamphlet was transformed into a “pocket guide” small enough to fit in a lab coat pocket. The pocket guide outlined the continual steps of the pathway from all phases of care, pre-operative through patient discharge from the hospital.

The pocket guide was distributed to all providers in Urology. This guide provided a quick reference to the specific orders designated for each step in the patient’s journey, including information on medications, ambulation, diet, symptom management and more.

Recently, other MD Anderson enhanced recovery teams became interested in using this pocket guide method to educate providers on maintaining compliance to the pathways. However, it was also observed that keeping track of the pocket guide was a challenge. The guide was easy to lose, difficult to update, and lacked distribution feasibility.

With increased reliability of technology and rapid delivery of information, it was identified that the MD Anderson Enhanced Recovery Program (ERP) needed to adapt the pocket guide to a virtual platform via smartphone application.



The Enhanced Recovery Program mobile app was created to serve as a centralized reference for all MD Anderson ERP pathways, containing content applicable to all members of the care teams, including physicians, advanced practice providers, nurses, dietitians, pharmacists and others. The advantages of this tool include ease of use, eco-friendliness due to decreased paper utilization, increased feasibility for content updates, and more accessibility to end users across the institution.

With the assistance and guidance of ERP leadership, a collaborative effort was established with the MD Anderson Enterprise Development and Integration team, and the ERP mobile application was rolled out in July 2020. This innovative approach is helping streamline provider education and enhance compliance with the Enhanced Recovery pathways. A special thank you to Innocent Rukundo, Vijaya Gottumukkala, M.D., Brittany Kruse, Darren Skeete, Lenis Perez, David Holmes, and Bhuvan Shukla for their dedication and hard work to create this application.

Global Enhanced Recovery Symposium

The University of Texas MD Anderson Global Enhanced Recovery Symposium was hosted by the Institute for Cancer Care Innovation from February 20–22, 2020. It was our honor and privilege to host this inaugural global enhanced recovery meeting. Listening and learning from our patient panel was inspiring and motivated us to do better and to continue with our enhanced recovery and value-based care journey.

Over 200 registrants from nine countries attended. Participants learned about change management, care pathways and core elements, controversies in enhanced recovery elements, implementation and scaling best

practices, data management and analytics, innovative initiatives with enhanced recovery programs, and value-based frameworks. The feedback from everybody who attended the meeting has been uniformly encouraging and positive.

We are excited to work with our partners in advancing our mission of patient-centered, recovery-focused, outcome-based, value-driven care both nationally and globally.

We are appreciative of the engagement and support from our institutional and UT System leadership.



Team leads

Autologous Breast

Rene Largo, M.D.
Jesse Selber, M.D.
Gabriel Mena, M.D.

Bladder Surgery

Neema Navai, M.D.
Wendell Williams III, M.D.

Breast Surgery

Sarah DeSnyder, M.D.
Gabriel Mena, M.D.

Colorectal Surgery

Brian Bednarski, M.D.
Barbara Bryce Speer, D.O.

Emergency Center

Adriana Wechsler, M.D.

Gastrectomy

Brian Badgwell, M.D.
Ravish Kapoor, M.D.

Gynecologic Surgery

Pedro Ramirez, M.D.
Larissa Meyer, M.D.
Javier Lasala, M.D.

Head/Neck Surgery

Carol Lewis, M.D.
Zheng Gang, M.D.

Hip/Knee Arthroplasty

Spencer Frink, M.D.
Thomas McHugh, M.D.

HIPEC Surgery

Keith Fournier, M.D.
Pascal Owusu-Agyemang, M.D.

Liver Surgery

Thomas Aloia, M.D.
Vijaya Gottumukkala, M.D.

Medical Oncology

Marina George, M.D.

Neurosurgery

David Ferson, M.D.
Shaan Raza, M.D.

Pancreatic Surgery

Matthew Katz, M.D.
Jose Soliz, M.D.

Pediatric Surgery

Mary Austin, M.D.
Ravish Kapoor, M.D.
Valerae Lewis, M.D.

Radiation Oncology

Ann Klopp, M.D., Ph.D.
Shane Mesko, M.D.

Renal Surgery

Christopher Wood, M.D.
Jose Karam, M.D.
Surena Matin, M.D.
Timothy Jackson, M.D., Ph.D.

Thoracic Surgery

David Rice, M.D.
Gabriel Mena, M.D.

Spine Surgery

Claudio Tatsui, M.D.
Keyuri Popat, M.D.

Stem Cell Transplantation

Uday Popat, M.D.



Meet the ICCI team

The Institute for Cancer Care Innovation (ICCI) focuses on the principles of value-based health care delivery by implementing outcome measurement, calculating the cost of cancer care and enabling programs that increase the value of care delivery.



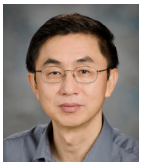
Thomas Aloia, M.D.
Head, Institute for Cancer Care Innovation
Chief Quality Officer



Vijaya Gottumukkala, M.D.
Associate Head



John Frenzel, M.D.
Director, Learning Health Systems



Lee Cheng
Principal Statistical Analyst



Jarrod Eska
Informatics Analyst



Wendi Martinez
Director, Quality Assessment & Performance
Improvement (QAPI)



Reena Ramachandran
Data Analyst



Ronald Walters, M.D.
Associate Head



Falana Adams
Senior Administrative Assistant



Utpala Daftary
Project Consultant



Brittany Kruse
Program Manager



Minh-Hue Mosley
Administrative Director



Iris Recinos
Clinical Value Improvement Coordinator



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ICCI Scholar
Surgical Oncology
Fellow



Ryan Huey, M.D.
Assistant Professor,
GI Medical Oncology



Shane Mesko, M.D.
ICCI Scholar
Resident, Radiation
Oncology

Program highlights

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Program highlights

Publications

- Allen, C. J., Thaker, N. G., Prakash, L., Kruse, B.C., Feeley, T. W., Kaplan, R. S., . . . Katz, M. H. (2020). Communicating Value: Use of a Novel Framework in the Assessment of an Enhanced Recovery Initiative. *Annals of Surgery, Publish Ahead of Print*. doi:10.1097/sla.0000000000004050
- Beattie, W. S., Lalu, M., Bocock, M., Feng, S., Wijesundera, D. N., Nagele, P., . . . Johnson, M. (2020). Systematic review and consensus definitions for the Standardized Endpoints in Perioperative Medicine (StEP) initiative: Cardiovascular outcomes. *British Journal of Anaesthesia*. doi:10.1016/j.bja.2020.09.023
- Cata, J. P., Gorur, A., Yuan, X., Berg, N. K., Sood, A. K., & Eltzschig, H. K. (2020). Role of Micro-RNA for Pain After Surgery. *Anesthesia & Analgesia*, 130(6), 1638-1652. doi:10.1213/ane.0000000000004767
- Cata, J. P., Patino, M., Gorur, A., Du, K. N., Uhelski, M. L., Myers, J., . . . Owusu-Agyemang, P. (2019). Persistent and Chronic Postoperative Opioid Use in a Cohort of Patients with Oral Tongue Squamous Cell Carcinoma. *Pain Medicine*, 21(5), 1061-1067. doi:10.1093/pm/pnz242
- Cata, J. P., Ramirez, M. F., & Perez-Gonzalez, O. (2019). Local Anesthetics: Hunting for the Holy Grail of Onco-anesthesia. *Pain Medicine*, 21(2), 219-220. doi:10.1093/pm/pnz327
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- Hagan, K., Raju, G., Carlson, R., & Gottumukkala, V. (2020). A response to: Determining Urgent/Emergent status of Gastrointestinal (GI) Endoscopic Procedures in an Ambulatory Care Setting during the Coronavirus Disease of 2019 (COVID-19). *Anesth Analg*.
- Harrison, R., Iniesta, M. D., Pitcher, B., Ramirez, P. T., Cain, K., Siverand, A. M., . . . Meyer, L. A. (2020). Enhanced recovery for obese patients undergoing gynecologic cancer surgery. *International Journal of Gynecologic Cancer*, 30(10), 1595-1602. doi:10.1136/ijgc-2020-001663
- Iniesta, M. D., Lasala, J., Mena, G., Rodriguez-Restrepo, A., Salvo, G., Pitcher, B., . . . Ramirez, P. T. (2019). Impact of compliance with an enhanced recovery after surgery pathway on patient outcomes in open gynecologic surgery. *International Journal of Gynecologic Cancer*, 29(9), 1417-1424. doi:10.1136/ijgc-2019-000622
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- Lillemoe, H. A., Newhook, T. E., Aloia, T. A., Grubbs, E. G., Chang, G. J., Katz, M. H., . . . Tzeng, C. D. (2020). Perceptions of opioid use and prescribing habits in oncologic surgery: A survey of the society of surgical oncology membership. *Journal of Surgical Oncology*, 122(6), 1066-1073. doi:10.1002/jso.26106
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Program highlights

Publications

- Merikli, A. F., McHugh, T., Kruse, B., Desnyder, S. M., Rebello, E., & Offodile, A. C. (2020). Time-Driven Activity-Based Costing to Model Cost Utility of Enhanced Recovery after Surgery Pathways in Microvascular Breast Reconstruction. *Journal of the American College of Surgeons*, 230(5). doi:10.1016/j.jamcollsurg.2020.01.035
- Meyer, L. A., Corzo, C., Iniesta, M. D., Munsell, M., Shi, Q., Pitcher, B., . . . Ramirez, P. T. (2020). A prospective randomized trial comparing liposomal bupivacaine vs standard bupivacaine wound infiltration in open gynecologic surgery on an enhanced recovery pathway. *American Journal of Obstetrics and Gynecology*. doi:10.1016/j.ajog.2020.07.017
- Meyer, L., & Ramirez, P. (2020). Functional Recovery at Home and After Discharge. In *Enhanced Recovery After Surgery (ERAS)* (p. 0-654). Basel, Switzerland: Springer International Publishing. doi:10.1007/978-3-030-33443-7
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- Owusu-Agyemang, P., Cata, J. P., Kapoor, R., Speer, B. B., Bellard, B., Feng, L., & Gottumukkala, V. (2019). Patterns and predictors of outpatient opioid use after cytoreductive surgery with hyperthermic intraperitoneal chemotherapy. *International Journal of Hyperthermia*, 36(1), 1057-1063. doi:10.1080/02656736.2019.1675912
- Owusu-Agyemang, P., Cata, J. P., Kapoor, R., Speer, B. B., Bellard, B., Feng, L., & Gottumukkala, V. (2019). Patterns and predictors of outpatient opioid use after cytoreductive surgery with hyperthermic intraperitoneal chemotherapy. *International Journal of Hyperthermia*, 36(1), 1057-1063. doi:10.1080/02656736.2019.1675912
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- Sammour, T., Malakorn, S., Thampy, R., Kaur, H., Bednarski, B. K., Messick, C. A., . . . You, Y. N. (2019). Selective central vascular ligation (D3 lymphadenectomy) in patients undergoing minimally invasive complete mesocolic excision for colon cancer: Optimizing the risk-benefit equation. *Colorectal Disease*, 22(1), 53-61. doi:10.1111/codi.14794
- Selber, J. C. (2020). The Robotic DIEP Flap. *Plastic and Reconstructive Surgery*, 145(2), 340-343. doi:10.1097/prs.0000000000006529
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- Vicente, D., Patino, M., Marcus, R., Lillemoe, H., Limani, P., Newhook, T., . . . Cata, J. P. (2019). Correction: Impact of epidural analgesia on the systemic biomarker response after hepatic resection. *Oncotarget*, 10(59), 6397-6397. doi:10.18632/oncotarget.27295

Program highlights

Publications

- Vu, C. N., Lewis, C. M., Bailard, N. S., Kapoor, R., Rubin, M. L., & Zheng, G. (2020). Association Between Multimodal Analgesia Administration and Perioperative Opioid Requirements in Patients Undergoing Head and Neck Surgery With Free Flap Reconstruction. *JAMA Otolaryngology–Head & Neck Surgery*, 146(8), 708. doi:10.1001/jamaoto.2020.1170
- Williams, W. H., Cata, J. P., Lasala, J. D., Navai, N., Feng, L., & Gottumukkala, V. (2020). Effect of reversal of deep neuromuscular block with sugammadex or moderate block by neostigmine on shoulder pain in elderly patients undergoing robotic prostatectomy. *British Journal of Anaesthesia*, 124(2), 164-172. doi:10.1016/j.bja.2019.09.043
- Williams, W. H., Cata, J. P., Lasala, J. D., Navai, N., Feng, L., & Gottumukkala, V. (2020). Effect of reversal of deep neuromuscular block with sugammadex or moderate block by neostigmine on shoulder pain in elderly patients undergoing robotic prostatectomy. *British Journal of Anaesthesia*, 124(2), 164-172. doi:10.1016/j.bja.2019.09.043
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- Zhang, H., Yang, L., Zhu, X., Zhu, M., Sun, Z., Cata, J. P., . . . Miao, C. (2020). Association between intraoperative intravenous lidocaine infusion and survival in patients undergoing pancreatectomy for pancreatic cancer: A retrospective study. *British Journal of Anaesthesia*, 125(2), 141-148. doi:10.1016/j.bja.2020.03.034

Presentations

- Gottumukkala, V. (2019, September 13). *TIVA vs. volatile anesthetics: Effects of anesthetics on metastatic disease* [Conference presentation]. Interventional Cancer Pain Symposium, New York, New York.
- Tatum, T. (2019, September 24). *The super team-Developing nursing partnership in enhanced recovery* [Meeting presentation]. MD Anderson Cancer Center, Virtual.
- Gottumukkala, V. (2019, October). *Enhanced recovery programs in cancer care: Can we make a difference?* [Meeting presentation]. American Society of Enhanced Recovery, Orlando, Florida.
- Gottumukkala, V. (2019, October). *Paravertebral blocks for breast cancer surgery: A score to settle* [Meeting presentation]. American Society of Anesthesiologists, Orlando, Florida.
- Gottumukkala, V. (2019, October). *Perioperative care of the cancer patient: A multidisciplinary perspective* [Meeting presentation]. American Society of Anesthesiologists, Orlando, Florida.
- Gottumukkala, V. (2019, October). *Thoracic epidural analgesia for major abdominal surgery: In the context of enhanced recovery programs* [Meeting presentation]. American Society of Anesthesiologists, Orlando, Florida.
- Gottumukkala, V. (2019, October) *Workup of the cancer patient: How different?* [Meeting presentation]. Society of Onco-Anaesthesiology & Perioperative Care, Hyderabad, India.
- Koetting, J., Coleman, T., & Gale, H. (2019, October 22). *Building nutrition into your program* [Meeting presentation]. MD Anderson Cancer Center, Virtual.
- Siebel C. (2019, October). *Optimizing nutritional status prior to surgery* [Conference presentation]. 8th Annual Society of Critical Care Medicine Texas Chapter Symposium, Houston, Texas.

Program highlights

Presentations

- Gottumukkala, V. (2019, November). *Enhanced surgical recovery programs and improved oncological outcomes: Can we make a difference?* [Meeting presentation]. Chinese Society of Anesthesiology, Hangzhou, China.
- Rukundo, I. (2019, November 19). *The role of the advanced practice provider* [Meeting presentation]. MD Anderson Cancer Center, Virtual.
- Gottumukkala, V. (2019, December). *Global impact of cancer* [Conference presentation]. Post Graduate Assembly in Anesthesiology, New York City, New York.
- Gottumukkala, V. (2020, January). *Anesthetics and cancer recurrence: What is the evidence?* [Conference presentation]. Leigh Valley Health Network's Department of Anesthesiology Seventh Annual Winter Retreat Conference, Macungie, Pennsylvania.
- Gottumukkala, V. (2020, January). *Beyond enhanced recovery: Improving brain health* [Conference presentation]. Leigh Valley Health Network's Department of Anesthesiology Seventh Annual Winter Retreat Conference, Macungie, Pennsylvania.
- Meyer, L. (2020, January 21). *Enhanced recovery and patient reported outcomes* [Meeting presentation]. MD Anderson Cancer Center, Virtual.
- Allen C., Thaker N., Prakash L., Kruse B., Feeley T., Kaplan R., Huey R., Frank S., Aloia T., Gottumukkala V., Katz M. (2020, February 20-22). *Communicating value in health care: A pilot study for quantifying value through assessment of risk-stratified clinical pathways following pancreatectomy* [Poster session]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Aloia, T. (2020, February 20-22). *Burning platform to burning ambition to burning desire to true north* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Aloia, T. (2020, February 20-22). *ERP as a model for value-based care* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Aloia, T. (2020, February 20-22). *How to engage your C-Suite? What do they want to know?* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Badgwell, B., and Kapoor, R. (2020, February 20-22). *Enhanced recovery can be applied to complex cancer surgery* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Botz, G. (2020, February 20-22). *Early warning systems/rapid response* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Cain, K. (2020, February 20-22). *Analyze-optimize cycles of CQI* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Cata, J. (2020, February 20-22). *Database and registry focused studies versus RCTs* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Cata, J. (2020, February 20-22). *Can we create an animal model for enhanced recovery after surgery?* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Chang, G. (2020, February 20-22). *Multicenter pragmatic trials in ERP: OPTISurg Cluster RCT* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.

Program highlights

Presentations

- Frenzel, J. (2020, February 20-22). *Debunking databases, registries and universes* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Gottumukkala, V. (2020, February 20-22). *Beyond enhanced recovery: Improving brain health* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Gottumukkala, V. (2020, February 20-22). *Pathway Development* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Heir, J.S. & Tzeng, C.D. (2020, February 20-22). *Fluid debate: Goal directed fluid therapy vs. zero balance* [Conference presentation]. [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Hofstetter, W. & Tsai, J. (2020, February 20-22). *Blood transfusion debate: Restricted vs. rational blood management* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Iniesta, M. (2020, February 20-22). *Overcoming barriers for data collection* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Katz, M. (2020, February 20-22). *Carbohydrate loading and immune-nutrition: Clinical experience* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Koetting, J. (2020, February 20-22). *Carbohydrate loading and immune-nutrition: What is the rationale?* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Kruse, B. (2020, February 20-22). *Making it all happen: Project management 101* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Le-Short, C. (2020, February 20-22). *Opioid sparing in chronic pain patients: What is the goal? And how?* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Meyer, L. (2020, February 20-22). *Developing the team* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Meyer, L. (2020, February 20-22). *What is recovery and how do we define recovery?* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Narayan, V. (2020, February 20-22). *Multicenter pragmatic trials in ERP: Multicenter RCTs in bladder ERP* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Ngo-Huang, A. (2020, February 20-22). *Prehabilitation & rehabilitation should be part of the cancer care journey* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Phillips, D. (2020, February 20-22). *Patient education: An essential element of an enhanced recovery program* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Rukundo, I. (2020, February 20-22). *Go live: Tips for success* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Sahai, S. (2020, February 20-22). *Incorporating internists, hospitalists and geriatricians into ERP* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.

Program highlights

Presentations

- Salas, M. (2020, February 20-22). *Planning a new program? What do I need to know as an administrator?* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Seif, M. (2020, February 20-22). *Prospective collection of data: Core metrics, baseline data and disease specific metrics* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Thomas, L. (2020, February 20-22). *Integrating nursing workflow & documentation into EHR (IFEED/DREAMS)* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Walter, R. (2020, February 20-22). *Payer perspective: What value are the payers looking for in a program?* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Wang, X. (2020, February 20-22). *Integrating PROs into routine clinical care* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Wilks, J., and Messick, C. (2020, February 20-22). *Pain management debate: TEA is gold standard versus truncal blocks or wound infiltration* [Conference presentation]. MD Anderson Cancer Center Global Enhanced Recovery Symposium, Houston, Texas.
- Gottumukkala, V. (2020, April 10-12). *Cancer: An emerging epidemic: Economic and social implications in developing countries* [Conference presentation]. 8th Global Conference on Peri-Operative Care of Cancer Patients, New Delhi, India.
- Gottumukkala, V. (2020, April). *Impact of ERAS on short and long term oncologic outcomes* [Conference presentation]. Annual Congress of the American Society for Enhanced Recovery (ASER), Baltimore, Maryland.
- Gottumukkala, V. (2020, April). *Making the case: The business and finances of enhanced recovery programs* [Conference presentation]. Annual Congress of the American Society for Enhanced Recovery (ASER), Baltimore, Maryland.
- Gottumukkala, V. (2020, April 10-12). *Pre-assessment for cancer patients: Special considerations* [Conference presentation]. 8th Global Conference on Peri-Operative Care of Cancer Patients, New Delhi, India.
- Gottumukkala, V. (2020, April). *Thoracic epidural or intrathecal opioids in ERAS: Which one for which patient?* [Conference presentation]. Annual Congress of the American Society for Enhanced Recovery (ASER), Baltimore, Maryland.
- Allen C., Thaker N., Prakash L., Kruse B., Feeley T., Kaplan R., Huey R., Frank S., Aloia T., Gottumukkala V., & Katz M. (2020, July 24-27). *Communicating value: Use of a novel framework in the assessment of an enhanced recovery initiative* [Conference presentation]. 2020 ACS Quality and Safety Conference, Virtual.
- Allen C., Eska J., Thaker N., Feeley T., Kaplan R., Huey R., Frank S., Aloia T., Gottumukkala V., & Katz M. (2020, July 24-27). *Developing a novel value framework: Utilizing national hospital administrative claims data in the assessment of an enhanced clinical care initiative* [Conference presentation]. 2020 ACS Quality and Safety Conference, Virtual.
- Gottumukkala, V. (Summer 2020). *Beyond the curve* [Podcast]. <http://www.aosrapm.org/webinar3.php>.
- Bednarski, B. (2020, August 31). *Our ERUT Journey: The University of Texas MD Anderson Cancer Center* [Meeting presentation]. MD Anderson Cancer Center, Virtual.

