THE FUTURE OF SURGERY HAPPENS TODAY.

Department of Surgery 2020-21 Annual Report



Who we are



What we do

ON THE COVER: These are photos from two physician-modified endograft cases. Some aortic aneurysms involve the branches of the aorta as well and require either an open repair or a complex stent repair. In certain circumstances, we have the capability to construct stent-grafts that allow the aneurysm to be sealed off, but maintain flow to the organs with customized branches. These cases require many hours of planning, state-of-the-art hybrid endovascular operating rooms, and a skilled team.

Message from the chair

Dear colleagues,

I think we can all agree that the years 2020-21 were like no other. And perhaps nowhere is this truer than in the medical community. Yet, despite the immense challenges presented by a pandemic, we are pleased to say that our community persisted, making significant progress in our missions to provide world-class innovation, education and patient care.

This report serves not only as a highlight of those accomplishments but as a reminder for what we've overcome along the way, as we partner for improving care based on data. In the end, among the lessons that COVID-19 has reinforced is the fact that the only predictable event is the need for constant adaptation to change. This principle lies at the core of our focus, as we deliver the safest and most effective care possible.



Vigneshwar Kasirajan, M.D. Stuart McGuire Professor and chair, Department of Surgery

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Vigneshwar Kasirajan, M.D.



A year	like no	other

Message from the chair
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Innovation and Technology
(ORBIT)
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Key accomplishments

Enhanced Recovery After Surgery Hunter Holmes McGuire VA Medical Center Quality data	22 23 24
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Awards Back co	over



Adam Klausner, M.D. Associate chair for clinical and translational research, VCU Department of Surgery



Martin Mangino, Ph.D. Associate chair for basic science research, VCU Department of Surgery

Surgery awards
FY2017
\$5,263,388
FY2018
\$6,999,674
FY2019
\$9,283,718
FY2020
\$9,757,904
FY2021 (YTD)
\$8,237,738

Office of Research, Biomedicine, Innovation and Technology (ORBIT)

Thanks to the generosity of donors and grants, key improvements were made in the Office of Research, Biomedicine, Innovation and Technology (ORBIT) despite a challenging year. In the Department of Surgery, advancements were made in innovation, research and education. Meanwhile, the department saw increases in awards across several areas, including foundation, National Institutes of Health (NIH) and federal grants and partnerships in the areas of global surgery education, mentorship, research, skills training and clinical care. This infrastructure enables the recruitment of the top researchers in the field of surgery and ensures funding from federal and private resources.

Christine B. and David E. Cottrell Innovation Suite

A leadership gift from Christine B. and David E. Cottrell is set to improve surgical innovation, research and education. A donation of more than \$1 million was given to the Department of Surgery in order to advance the university's infrastructure. The gift marks the first investment in the Cottrell Surgical Innovation Suite, including plans for over \$5 million in construction over two phases.

The project will provide two surgery suites and rooms for small animal surgery, ICU/recovery and clinical chemistry/hematology, as well as a locker room, scrub area, instrument cleaning and sterile storage. Existing wet laboratories will be renovated to accommodate wet labs, a reanimation lab, procedure lab and cell culture.

Consolidating labs and missions

The Department of Surgery in the School of Medicine completed a 10-year planning and construction project that will consolidate core lab spaces into a newly renovated 9,000-square-foot multifunctional facility on the ninth floor of Sanger Hall. While research faculty and staff in the Department of Surgery occupy the new space, it will also be available to numerous VCU School of Medicine research collaborators, including those in the areas of pharmacy, health professions, engineering, arts and sciences. Industry partners and outside academic collaborators will also be found working throughout the space, solving complex problems in biology and medicine, advancing our mission to treat and cure human disease and suffering.



Nicholas Thomson Injury and Violence Prevention

In fiscal year 2020-21, Nicholas Thomson, Ph.D., was awarded several internal and external funding awards. As a forensic psychologist and assistant professor in the Department of Surgery, and director of research for the Injury and Violence Prevention Program (IVPP), Thomson oversees the research efforts and conducts program evaluation for IVPP. His research falls into two overlapping domains: injury and violence prevention and understanding the developmental pathways for psychopathology and violence.

In late 2020, Thomson received a \$1.9 million research project grant (R01) from the Centers for Disease Control and Prevention (CDC) to study firearm violence prevention in adult victims — one of few awards aimed at gun violence in over 20 years. The project brings together a team of multidisciplinary experts from VCU's departments of surgery, psychology and biostatistics, and the L. Douglas Wilder School of Government and Public Affairs. He also serves as co-investigator on a CDC study awarded to the Virginia Department of Health to improve the reporting of nonfatal firearm injury data from the emergency department.

This year, Thomson was awarded a five-year, \$2.5 million R01 by the National Institutes of Health's (NIH) National Institute of Mental Health to understand the biological mechanisms contributing to the development of callous-unemotional traits (behaviors that reflect a disregard for others) in youth with conduct disorder. As one of the largest federally funded longitudinal studies in this field, his research has the potential to improve treatment strategies for conduct disorder as well as provide greater sensitivity to early screening for callous-unemotional traits in youth.



INTERNAL GRANTS

- VCU Rapid Research award (to evaluate the mechanisms of intimate partner violence during the COVID-19 pandemic)
- Innovation Gateway Commercialization Fund award (to finalize the development of a virtual reality intervention for aggression and substance use in youth)
- School of Medicine Wellness in Action grant (to support partial development of a VR stress reduction intervention in health care staff during the pandemic)
- CCTR award (to develop an RDOC assessment of threat sensitivity)

Still moving Educational placement and outcomes amid virtual transitions

Residency and fellowship program efforts remained strong throughout the pandemic. We enriched our entirely online interview process, including adding virtual question sessions with current residents, a fourth interview date to make interview groups more intimate, virtual hospital tour and residency perspective videos and a diversity virtual happy hour for URM applicants. We continue to use the Yapp app to share information about our program. This year, we interviewed a total of 161 residents. Despite the challenges, the board pass rate for all 2019-20 residents was 100%.



Department chair Vigneshwar Kasirajan, M.D. (far right), with chief residents



Breaking bad news Learning to convey the toughest info — virtually

No job can be more critically sensitive than delivering bad news. And there's no question that this is best done in person. But today's medical care expands beyond examination rooms to include phone calls and video conferencing technologies. Amid the COVID-19 pandemic, these technologies have become critical, yet they also come with inherent challenges — especially when sensitive information needs to be disclosed to patients and their family members.

Funded by the American Medical Association as part of the Accelerating Change in Medical Education initiative, the Breaking Bad News program engages interns from VCU, Ohio State, the University of Cincinnati and Baylor University Medical Center across plastic surgery, general surgery and emergency medicine to practice video-mediated communication for emotionally laden conversations. Designed to help participants overcome the inherent challenges in video-based communication, three sessions focused on the delivery of bad news, goals of care discussions and disclosing medical error.

Ahead of the program, only 22% of participants had any prior training in telehealth communications. Nearly all labeled the activity as a valuable learning experience.

Among participants:

22% had previous formal training on telehealth communications

77% labeled the usefulness of telemedicine in health care as positive

86% agreed the activity was a valuable learning experience

Members from the Breaking Bad News team (left to right): David Park, project manager; Elizabeth Trent, CHSPS operations manager; Emily Rivet, M.D., colorectal surgeon; Susan Haynes, surgical stimulation administrator; Renee Cholyway, general surgery resident; and Stacie Hall, standardized patient program manager



Engagement

As we ensure that every member of our community feels respected and valued for who they are and what they bring to education, research and community engagement endeavors, never have these efforts been more important than amid COVID-19. Whether it's developing connections through inclusion or gathering staff over social activities and professional development, each of our departments has worked to overcome the social separation brought on by a pandemic.



Diversity, Inclusion, Racial Equity (DIRE) Committee

DIRE was established in 2020 to discuss diversity, inclusion and racial equality as they relate to employees, trainees and patients, as well as in the community. The committee developed recruitment and retention, community outreach and organizational systems for developing and implementing strategies for improving representation of underrepresented minorities, while creating an inclusive and equitable culture.

The DIRE Committee participated in a virtual event, Pathway to Discovery, where it hosted guest speakers to elevate the voices of Black, Indigenous, People of Color (BIPOC) in health care and provide insight into career opportunities and pathways for high school students in greater Richmond.

COVID-19 Surgery Sanity Series

In response to the pandemic, the department created a daily Zoom-based class targeted at physical, emotional and mental health, which we lovingly dubbed the Surgery Sanity Series. As part of these efforts, we hosted exercise classes, comedy hours, virtual board games, a cooking challenge and even had a fabulous cooking lesson from the Food Network's Rachael Ray.



Rachael Ray, hosting a virtual cooking class for our staff



Advanced Practice Providers Wellness Taskforce

Amid the pandemic, our staff remain as determined as ever to continue with career advancement. For this reason, we established the Advanced Practice Providers (APP) Wellness Taskforce. Comprised of departmental advanced practice providers (APPs) and chaired by Lesley Coots, FNP, the taskforce advocates for professional development activities among surgical APPs, including financial support for accepted poster and podium presentations, and designing quarterly procedural education in partnership with the Transition to Practice Program at VCU Health.

"It has been a great pleasure to chair the APP Wellness Taskforce. This taskforce also advocated for additional working space for surgical APPs. Many initiatives accomplished by this taskforce will ensure surgical APPs are able to provide effective, cutting-edge care to our patients at VCU Health, while also contributing to our medical community at large."

– Lesley Coots, FNP, chair of APP Wellness Taskforce



Lesley Coots, FNP



1. Ambulatory Care Center, Richmond, Va.



2. Adult Outpatient Pavilion, Richmond, Va.



3. Children's Hospital of Richmond,



4. Forest Avenue, Richmond, Va.



5. Massey Cancer Center, Richmond, Va.



6. Nelson Clinic, Richmond, Va



7. Stony Point, Richmond, Va.

Ensuring access

When it comes to access, our goals are to become the market leaders in all surgical specialties and to expand, improve and facilitate ambulatory clinic and procedural access for patients in need of surgical care. In 2020, the Department of Surgery saw patients from 45 states and more than 37,000 patients throughout Virginia at 19 inpatient and outpatient locations.

 Clinic visits

 2018
 76,622

 2019
 85,487

 2020
 76,162

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8. VCU Health Community Memorial Hospital, South Hill, Va.



9. Fredericksburg Multispecialty Center,







11. Short Pump Pavilion, Henrico, Va.



12. VCU Health Tappahannock Hospital,



13. VCU Health at William & Mary



14. VCU Health at Waterside Commons

24

last spring with a clinic in Fredericksburg, Virginia. VCU Health at The Park at Snowden is offering a variety of services, such as colon and rectal surgery, urology, transplant, oncology, cardiology, heart and vascular surgery. We are excited to expand into more communities as part of our

strategic goal to better care for the .

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Fredericksburg: The Department of Surgery expanded north

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Distinct count of patients

Proving our flexibility

The VCU Department of Surgery has been able to navigate the COVID-19 crisis because of the flexibility of our team. Because trauma and emergency surgery did not slow during the pandemic, coverage in those areas was essential. We took an inventory of our strengths and the expertise of each group in order to decide where people should be assigned.

With a phased approach, we consolidated 12 inpatient specialties services into two teams to limit exposure for our staff and providers, as well as ensure capacity for COVID-19 patients while managing volumes.

We also condensed multiple services into a flexible team to provide care to our patient population while preventing spread of the virus.





James Whelan, M.D.

Medical director, surgical ICUs

Acute Care Surgical Services

Amid a tough year, the Division of Acute Care Surgical Services upheld its commitment to quality and process-improvement initiatives. As a result, our trauma admission volumes remained stable, and we continue to be ranked in the top quartile for lowest mortality despite a pandemic.

KEY IMPROVEMENTS

- CT scanning and ED length of stay: Trauma led a multidisciplinary approach to revise CT trauma protocol for initial imaging, resulting in significant reductions in average turnaround time and earlier decisions for trauma care, lifesaving interventions, consults and disposition.
- DVT practice management guidelines: We revised our practice to reduce unnecessary screenings, resulting in decreased DVT and PE rates, while still being an outlier in TQIP benchmarking.
- Local PI leading to regional impact: We led a multicentered collaboration to develop regional prehospital trauma arrest protocol.

To accommodat

COVID-19 patients, we

e our

transformed several operating rooms into patient rooms during the pandemic.

Trauma Admissions and Adjusted Mortality: 2017-2020





Michel Aboutanos, M.D. Division chair, acute care surgical services

OR c	ases	
2017	2,199	
2018	2,374	
2019	2,667	
2020	2,036	

Trauma Admission Trends by Calendar Year



Strategic focus	Key performance indicator	rmance indicator Baseline FY19		Target
Quality	30-day readmission rate	8.7%	7.6%	7.4%
Quality	Mortality	0.88	0.87	0.81
Efficiency	ciency Length of stay in days (trauma)		7.52	6.85
	Length of stay in days (acute general)	8.25	8.48	6.85
Value	HCAHPS-(IP) communication with doctors	77%	76%	83.5%
value	HCAHPS-(IP) likelihood of recommending practice	77%	73%	83%



Guilherme Campos, M.D. Division chair, bariatric and GI surgery

OR cases			
2017	636		
2018	477		
2019	557		
2020	532		

Bariatric and Gastrointestinal Surgery

Our Division of Bariatric and Gastrointestinal Surgery has a decades-long tradition of excellence in clinical care, educational training and translational research. And that tradition continues amid tough years. Under the direction of Guilherme Campos, M.D., the division made key improvements, including the addition of endoscopic sleeve gastroplasty (ESG). In collaboration with ACC3 and 9109, in 2020 we also developed a protocol for post-operative ambulatory intravenous hydration and significantly reduced readmissions and ER visits for patients undergoing bariatric surgery.

Endoscopic sleeve gastroplasty (ESG)

For patients with a body mass index of 30 or more who have been failed by conventional weight loss, ESG is a safe option that's associated with significant weight loss. Large case series have documented a mean percentage of total body weight loss at 12 months at 15±7.7%, which is far superior to what is obtainable by standard diets.

Earlier this year, the VCU Health Bariatric Program started offering this minimally invasive endoscopic option. During ESG, a commercial endoscopic suturing device is attached to a therapeutic double-channel endoscope. Then, permanent full-thickness sutures of the stomach are placed to reduce the gastric cavity space.

While the weight loss associated with traditional laparoscopic bariatric techniques is superior to ESG, the risks with ESG are smaller than the risk of operative complications. ESG allows for a quicker return to daily activities.

> Guilherme Campos, M.D., performing a laparoscopic conversion of a prior LSG and lap band gastric bypass, hiatal hernia repair and pedicled omentoplasty

Dashboard	Strategic focus	Key performance indicator	Baseline FY19	YTD FY20	Target
	Quality	30-day readmission rate	7.6%	8.3%	9.7%
	Quality	Mortality	0	0	0.81
	Efficiency	Length of stay in days	3.74	2.91	3.72
	Valua	HCAHPS-(IP) communication with doctors	89%	82%	83.5%
	Value	HCAHPS-(IP) likelihood of recommending practice	79%	79%	83%

2020 Quality Metrics for Bypass and Sleeve Bariatric Surgeries





Cardiothoracic Surgery

The VCU Division of Cardiothoracic Surgery stays at the forefront of the evolution for cardiac surgery. That tradition continued in 2020-21, as the division became one of seven U.S. clinical trial sites for the world's most advanced artificial heart. Heart surgeon Vigneshwar Kasirajan, M.D., chair of the Department of Surgery, was named principal investigator of the CARMAT total artificial heart clinical trial program that began in fall 2021.

Testing the world's most advanced option

In the U.S., the number of patients who would benefit from a heart replacement is 50,000-60,000. Yet available donors are scarce. An off-the-shelf device that produces outcomes similar to heart transplantation is a game-changer. CARMAT (which is also the name of the company that makes the new total artificial heart) replaces both lower pumping chambers of the heart. Its pump is fully implantable and electrically driven.

A new clinical trial aims to prove that the CARMAT total artificial heart can meet FDA standards for performance and safety, while providing a good quality of life for patients with advanced heart disease. Thanks to Kasirajan's efforts, VCU now plays a key role in advancing this option.



STS CABG Only Volumes and Mortality O:E





Mohammed Quader, M.D. Interim division chair, cardiothoracic surgery

Card	iac	
OR ca	ases	
2017	832	
2018	743	
2019	830	
2020	783	
Thora	acic	
OR ca	ases	
2017	665	
2017 2018	665 659	
2017 2018 2019	665 659 632	

	Cases CY20	Deceased	Mortality	Mean LOS	Median LOS	Inpatient surgery	Returns
Esophagectomy	30	1	1	10.17	8.00	29/30	13%
Lobectomy	73	1	0	3.92	3.00	73/73	4%

Vigneshwar Kasirajan, M.D., department chair and cardiac surgeon, holding a total artificial heart

Dasilbuaru	Strategic focus	Key performance indicator Baseline FY19		YTD FY20	Target
	Quality 30-day readmission rate 11. Mortality 1.	30-day readmission rate	11.2%	11.5%	10.1%
		1.16	1.25	1.17	
	Efficiency Length of stay in days		9.78	9.13	9.59
	Value HCAH	HCAHPS-(IP) communication with doctors	85%	84%	83.5%
		HCAHPS-(IP) likelihood of recommending practice	84%	83%	83%



Jaime Bohl, M.D. Division chair, colon and rectal surgery

OR c	OR cases				
2017	419				
2018	631				
2019	731				
2020	596				

Colon and Rectal Surgery

VCU Medical Center is one of only several nationally to have a program in surgical palliative care that's based in the Division of Colon and Rectal Surgery (CRS). As such, the CRS division is recognized as a leader in developing care pathways for seriously ill patients, including those who prefer some limitation on life-sustaining treatment.

Setting limits

There is growing recognition for the importance of advance care planning and establishing care goals when it comes to decreased readmissions and length of stay, as well as for reducing non-beneficial invasive and high-intensity end-of-life care. Evidence shows that among the majority of elderly, high-risk patients planning for surgery, most prefer some limitation of life-sustaining treatment. For this reason, one of the main efforts in the CRS division includes operationalizing strategies for goal-congruent care.

When a patient was recently referred for advance care planning and her operating surgeon realized she lacked documentation of a health-care decision-maker, had marginal decision-making capacity and was considering a high-risk surgery for colon cancer, an ACP referral identified the patient's niece. That led to a meaningful discussion about her wishes for limitations of life-sustaining treatments under some circumstances and an overarching treatment goal that allowed her to continue playing bingo and checkers with her friends. The patient's rationale for surgery was to feel better and have a better quality of life; she was not concerned about life prolongation.

When the patient contracted COVID-19 at her assisted living facility prior to surgery, her niece was comforted by knowing that her aunt did not wish to receive support with intubation and mechanical ventilation. She was also able to use the discussions surrounding possible surgery to guide her medical decision-making. Ultimately, her aunt recovered and was optimized for surgery, undergoing an uneventful laparoscopic colon resection and experiencing an uncomplicated recovery.

Preop oral antibiotics	Multi-modal pain	Postop VTE	Postop	Postop intake	Foley
	management	prophylaxis	mobilization	of liquids	removal
61.54%	91.04%	92.54%	40.63%	86.57%	98.51%
Facility	Facility	Facility	Facility	Facility	Facility
performance	performance	performance	performance	performance	performance
62.45%	80.83%	83.67%	67.29%	82.35%	95.47%
ISCR performance	ISCR performance	ISCR performance	ISCR performance	ISCR performance	ISCR performance
30-day	30-day	30-day	30-day	Length of stay	Return of bowel
readmission	SSI	VTE	UTI	(days)	function (days)
13.43%	8.96%	1.49%	0.00%	7.01	1.55
Facility	Facility	Facility	Facility	Facility	Facility
performance	performance	performance	performance	performance	performance
9.71%	7.85%	1.48%	1.73%	6.32	2.04
ISCR performance	ISCR performance	ISCR performance	ISCR performance	ISCR performance	ISCR performance

	Strategic focus	Key performance indicator	Baseline FY19	YTD FY20	Target
Dashboard	Quality	30-day readmission rate	17%	11.6%	16.5%
		Mortality	0.34	0.29	0
	Efficiency	Length of stay in days	7.03	6.78	7.44
	Value	HCAHPS-(IP) communication with doctors	94%	88%	83.5%
		HCAHPS-(IP) likelihood of recommending practice	86%	77%	83%

Surgical Oncology

Faculty in the Department of Surgery's Division of Surgical Oncology are integral to the clinical care, education and training programs, as well as basic, translational and clinical research activities for VCU Massey Cancer Center. In 2020, not only did the department maintain its brisk schedule of surgeries, but it also made key improvements for patient care.



Louie Raphael, M.D.



Pancreatic resection - operating room



Tumor

Improving outcomes

To improve outcomes for surgical oncology patients, Louie Raphael, M.D., leads the Division of Surgical Oncology's efforts to establish a weekly morbidity and mortality conference, and a weekly preop conference focusing on optimizing and streamlining care. Both initiatives will help to keep focus on targeted efforts and tools for assessing patient risk in order to minimize unfavorable outcomes, such as excess length of stay, 30-day readmission and mortality. Raphael also focuses on research across clinical and academic departments, as well as with the greater community, while actively collaborating with Massey health disparities researchers to disseminate evidence-based interventions that improve care and reduce health disparities.

Personalizing the source for better results

In the quest to develop new interventions, poor predictive values from studies using established cancer cell lines represent major barriers. Our understanding of how cancer responds to certain therapies is further complicated by the marked molecular heterogeneity that exists among primary tumors from different patients and intra-patient tumor cell heterogeneity, neither of which can be captured with currently available commercial cell lines. Some of these barriers can be addressed through direct isolation and culture of patient-derived primary human cancer as organoids (PDOs) and patient-derived xeno-graft (PDX) models from viable surgical specimens. These methods allow us to improve the value of studies by providing samples that are morphologically similar to original cancers, retaining both interpatient and intrapatient heterogeneity.

In this way, our work provides a critical model for enhancing clinical relevance, by augmenting preclinical investigations and affording personalized therapeutic examinations.

	Strategic focus	Key performance indicator	YTD FY20	Target	
	Quality	30-day readmission rate	16.7%	15.2%	18.5%
Jar	Quality	Mortality	1.34	0.59	1.05
, dh	Efficiency	Length of stay in days	7.31	6.31	6.54
Das	Value	HCAHPS-(IP) communication with doctors	78%	81 %	83.5%
		HCAHPS-(IP) likelihood of recommending practice	80%	80%	83%



Jose Trevino, M.D. Division chair, surgical oncology

OR cases							
2017	1,243						
2018	1,361						
2019	1,498						
2020	1,433						



Omar Abubaker, D.M.D. Division chair, oral and maxillofacial surgery



Shravan Renapurkar, D.M.D.

Main OR cases	
2017 367	
2018 375	
2019 430	
2020 411	
ACC OR cases	
2017 89	
2018 96	j
2019 73	
2020 79	
Total cases (Main + ACC)	
2017 456	j
2018 471	
2019 503	
2020 490	

Oral and Maxillofacial Surgery

For more than 50 years, the Department of Oral and Maxillofacial Surgery has proven to be a world-class provider of patient care and specialist training, including more than 122 specialists in the field. More importantly, the department remains committed to providing quality, state-of-the-art patient care for those with diseases, injuries and defects — patients like Molly, a 20-year-old female who presented for evaluation of surgical correction of maxillofacial deformity.

Restoring health and daily life

Molly presented with complaints of an anterior open bite and uncomfortable mandible position affecting her ability to eat and chew, as well as jaw discomfort and snoring. Upon clinical and imaging evaluation, her condition was found to be secondary to severe bilateral mandibular condylar resorption, associated with severe maxillamandibular hypoplasia. She was also suspected to have obstructive sleep apnea, which was confirmed with a sleep study.

Given the cause of discrepancy in her jaws, Molly required surgical advancement of her maxilla and mandible, in coordination with her orthodontic treatment. Given multiple variables and the complexity of surgery, maintaining accuracy of the outcome was challenging. Virtual surgical planning and 3D printing were used for pre-planning surgical movement of her jaws, as well as fabrication of a custom-fit TMJ total joint prosthesis. Once the planning was completed and joints fabricated, she underwent surgery with Shravan Renapurkar, D.M.D., and his team. After recovering without any complications, she is now happy to have a stable bite, adequate jaw function and cure of her sleep apnea, along with esthetic changes.

"Before surgery, I had a multitude of unexplained issues that were affecting my daily life," Molly says. "I had no idea that everything regarding my physical health, lack of self-confidence, exhaustion and even mental health would boil down to one main problem that could be completely corrected. ... My quality of life has significantly increased, and I couldn't be happier with how things turned out. I haven't faced a food that I can't chew!"



Preoperative photos of Molly



Virtual surgical planning for positioning of the mandible and resection of the condyles/ coronoid processes. (From top: preoperative, intermediate and postoperative)



Planning and design of custom fit TMJ total joint prosthesis – DICOM data from virtual planning used

Pediatric Surgery

As the only Level I Pediatric Trauma Center in Central Virginia and an accredited Adolescent Bariatric Surgery Center, the Department of Pediatric Surgery remains dedicated to the ACS National Surgical Quality Improvement Pediatric Program (NSQIP). The center's Pediatric Solid Tumor Clinic involves a multidisciplinary team of oncologists, pathologists, surgeons, radiologists, child life specialists, psychologists and nurses. The department's nurses have been recognized for similar contributions to pediatrics nursing care, especially gastrostomy.

RECENT HIGHLIGHTS:

- Children's Hospital of Richmond at VCU received Level 1 Children's Surgery Center verification by the American College of Surgeons Children's Surgery Verification Quality Improvement Program (ACS CSV).
- The addition of an inaugural multidisciplinary anorectal malformation clinic for children with complicated medical conditions and anomalies



General Mortality, Morbidity, and SSI CY2020







After a four-hour surgery with pediatric surgeon Laura Boomer, M.D., and 24 rounds of chemotherapy at the Children's Hospital of Richmond, Andi beat children's kidney cancer. She fought cancer with grit, determination and pearls.

Dashboard

Strategic focus	Key performance indicator	Baseline FY19	YTD FY20	Target
	Mortality	1.24	0	0.82
Efficiency	Length of stay in days	4.08	3.45	3.69
Valua	HCAHPS-(IP) communication with doctors	s 80% 87% 8		83.5%
Value	HCAHPS-(IP) likelihood of recommending practice	80%	85%	83%



Charles Bagwell, M.D. Division chair, pediatric surgery

OR c	ases	
2017	1,641	
2018	1,627	
2019	1,604	
2020	1,331	



Tae Chong, M.D. **Division chair, plastics** and reconstructive surgery

	OR cases	S
201	7 1,52	3
201	8 1,82 7	1
201	9 1,91 1	
202	20 1,642	2

Plastics and Reconstructive Surgery

Breast cancer is the most common form of cancer for women in the U.S. As a result, breast reconstruction is also common, and rates of reconstruction continue to rise. But breast reconstruction is more painful than mastectomy alone. The Division of Plastics and Reconstructive Surgery's multimodal analgesia and enhanced recovery after surgery protocols include multiple interventions that have led to improved outcomes in implant-based and autologous breast reconstruction.

Enhanced recovery after surgery

A team from plastics and reconstructive surgery and the VCU School of Nursing, comprised of Lesley Coots, DNP, APRN-C; Shelly Smith, DNP, APRN-C; Deborah Shockey, DNP, APRN-C; Michael Feldman, M.D.; and Daniel Luppens, M.D., implemented an enhanced recovery after surgery (ERAS) protocol for adult women undergoing breast reconstruction after mastectomy.

The quality improvement project resulted in a statistically significant reduction in average reported pain scores, LOS (reducing costs and improving access), inpatient MME use, discharge prescription MME's and muscle relaxant prescription.

	Pre- implementation	Post-implementat ion
Number of patients	100	100
Average age	50.62	49.8
Average LOS	1.94	1.22*
Average pain score	4.02	3.36*
Inpatient MME use	193.27	75.31*
Discharge MME	289.16	95.15*
Number of discharge muscle relaxant prescriptions	55	4*

*p<0.01



Burn Volume and Mortality: CY 2017-2020



	Strategic focus	Key performance indicator	Baseline FY19	YTD FY20	Target	Providers operating on a burn patient	
	Quality	30-day readmission rate	5.6%	7.9 %	5.5%		ale.
hboard		Mortality	0	0.22	0.14		20
	Efficiency	Length of stay (inpatient plastics)	8.97	8.81	8.78		
Jas		Length of stay (burn surgery)	9.71	11.63			-1
	Valua	HCAHPS-(IP) communication with doctors	83%	79 %	83.5%		T
	value	HCAHPS-(IP) likelihood of recommending practice	86%	84%	83%	a set	

Transplant Surgery

As a leading authority in all aspects of solid organ transplantation, the Division of Transplant Surgery's mission includes providing the best in patient care, research and education. Last spring, that mission was extended when — for the first time ever — VCU Health Hume-Lee Transplant Center performed a liver transplant in which the donor's blood type was incompatible with the recipient's, a situation that normally rules out transplant.

Performing the impossible

For prospective recipients, living-donor liver transplants reduce the time and stress of being on the national transplant waiting list. The organ from a living donor is often healthier and so are the recipients, because they don't have to spend as much time waiting. The transplant center team performed the blood typeincompatible liver transplant using a living donor in this case, a son who offered a portion of his liver to his mother to make the transplant possible.

The multidisciplinary team of experts included David Bruno, M.D., surgical director of adult and pediatric liver transplantation; Seung Duk Lee, M.D., transplant surgeon; Kimberly Sanford, M.D., medical director of transfusion medicine; Idris Yakubu, Pharm.D., transplant pharmacist; Erin Schulz, living-donor transplant coordinator; and Vinay Kumaran, M.D., surgical director of living donor liver transplantation.



Median Months to Transplant



3 year Patient Survival



Brenton Luper offered a portion of his liver to his mother, Karen, to make her liver transplant possible.

Strategic focus	Key performance indicator	Baseline FY19	YTD FY20	Target
Quality	30-day readmission rate	25.9%	24.8%	22.2%
Quality	Mortality	0.27	0.68	0.23
Efficiency	Length of stay in days	6.30	6.25	6.28
Value	HCAHPS-(IP) communication with doctors	88%	84%	83.5%
value	HCAHPS-(IP) likelihood of recommending practice	85%	82%	83%



Marlon Levy, M.D. Division chair, transplant surgery



Vinay Kumaran, M.D. Surgical director, living donor transplantation

OR c	ases	
2017	1,013	
2018	1,011	
2019	1,101	
2020	1,343	

Urology



Lance Hampton, M.D. Division chair, urology



Tony Herndon, M.D. Co-surgeon in chief at CHoR and director of pediatric urology

OR case	S
adul	t
2017 1,19	0
2018 1,19	0
2019 1,30 4	4
2020 1,19	0
OR case	S
pediatri	C
2017 1,16	7
2018 1,22	4
2019 1,08	7

As one of Virginia's highest-performing urology programs, faculty from the VCU Division of Urology represent the best and brightest from multiple subspecialties. The Men's Infertility Program at VCU features technologically advanced, non- or minimally invasive treatment through a wide variety of services, such as vasectomy/reversal, intrauterine insemination, assisted reproductive technology and in-vitro fertilization. Adult and pediatric urology were ranked Nos. 46 and 29 by U.S. News & World Report, respectively.

Adapting to succeed

Amid a tough year, the Division of Urology adapted, posting several key accomplishments. Tony Herndon, M.D., co-surgeon in chief at CHoR and director of pediatric urology, is associate editor-in-chief for the Journal of Pediatric Urology. Additionally, the Division of Urology Diversity Scholars Program was founded to provide students from approved medical schools with exposure to urology through rotations at VCU. This will enable third-year medical students to train under faculty mentors, positioning them for success in urology match. The program will help diversify the urology program at VCU and beyond, as just 1% to 2% of faculty at our nation's medical schools are African Americans.

Amid the first wave of COVID-19, Sarah Krzastek, M.D., pioneered a virtual sub-internship program to improve program visibility, participation of off-site faculty, mentorship and networking during a rapid transition to virtual learning. The program allowed for virtual experiences, such as live surgery, interactive didactic sessions, hands-on activities such as clay modeling and suture workshops, and patient encounters via telehealth.



Luriel Smith-Harrison, M.D., performing a left percutaneous nephrolithonomy (PCNL)

	Strategic focus	Key performance indicator	Baseline FY19	YTD FY20	Target
	Quality	30-day readmission rate	11.4%	8.4%	12.2%
oar	Quanty	Mortality	0.49	0.48	0.45
qų	Efficiency	Length of stay in days	3.88	3.69	3.53
Das	Voluo	HCAHPS-(IP) communication with doctors	80%	91%	83.5%
	value	HCAHPS-(IP) likelihood of recommending practice	80%	81%	83%

Vascular Surgery

The Division of Vascular Surgery is committed to making patient care its top priority. Those goals haven't changed amid COVID-19. In addition to top-flight care, we continue to train the next generation of premier vascular surgeons, while conducting research brings about new vascular disorder treatments. In 2019, our comprehensive aortic program was established, bringing together expertise from nine divisions of VCU Health to care for patients with aortic diseases, including aneurysms and dissections.

Going further

The new comprehensive aortic program employs the latest technologies, such as 3D case planning software, 3D printing and advanced stent-grafts, to repair previously unrepairable pathology, preventing rupture and death. The program combines expertise across vascular surgery, cardiac surgery, cardiology, cardiac anesthesia, acute pain service, critical care anesthesia, genetics, neurology and radiology. The most advanced perioperative neuromonitoring and neuroprotection program in the region provides increased safety to patients undergoing both open and endovascular aortic repairs. The result is the highest quality care for patients having extremely complex, life-threatening problems.

KEY ACCOMPLISHMENTS:

- 128 complex aortic cases in FY20 (June 2019-July 2020)
- Two new industry-sponsored aortic device studies



Mark Levy, M.D. Division chair, vascular surgery

OR c	ases	
2017	809	
2018	904	
2019	877	
2020	885	

	Cases CY20	Mortality	Median LOS	Returns	DVT
Carotid endarterectomy	23	0	2.00	4.35%	0
EVAR (reflects emergent and elective)	30	3	2.00	0	0
Rib resection	16	0	0.00	0	0

Kate Klein, M.D., cardiac surgeon, and Daniel Newton, M.D., vascular surgeon, two collaborating surgeons of the comprehensive aortic program

A DESCRIPTION OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OW				
Strategic focus	Key performance indicator	Baseline FY19	YTD FY20	Target
Quality	30-day readmission rate	15.2%	16.0%	14.1%
focus Key performance indicator focus 30-day readmission rate Quality 30-day readmission rate Mortality 4 Efficiency Length of stay in days HCAHPS-(IP) communication with doctors	1.37	0.89	0.85	
Efficiency	Length of stay in days	6.34	8.32	6.70
Volue	HCAHPS-(IP) communication with doctors	84%	77%	83.5%
Value	HCAHPS-(IP) likelihood of recommending practice	77%	79%	83%



DEPARTMENT OF SURGERY ANNUAL REPORT



Jaime Bohl, M.D. Medical director, ERAS



Pranav Shah, M.D. ERAS lead, anesthesiology



Brenton French, M.D. Surgical ΩI research fellow

Enhanced Recovery After Surgery

Through our commitment for ensuring high-value, quality care, the Enhanced Recovery After Surgery (ERAS) program implemented a framework for improving outcomes while also reducing costs and ensuring the health and wellness of patients. Over the past two years, we implemented standard "care pathways" that encompass pre-surgical optimization, care during surgery and post-operative recovery.

Tangible improvements

ERAS incorporates a novel approach to patient care amid surgery with standardized anesthesia pathways. Since September 2019, we implemented these pathways within 10 surgical subspecialties, ensuring every patient receives the ideal, evidence-based approaches in anesthesia and surgery. At the same time, we're innovating new approaches for tracking results, including the development of an extensive perioperative data system, which we now use to track surgical outcomes on a near daily basis. With the implementation of new pathways, the results highlight reductions in mortality, infections and organ dysfunction. The same approach allows us to pinpoint areas for improvement.

Next, we will expand these approaches to urgent and emergent surgeries to continue our progress for evidence-based, quality care for every patient.



Jaime Bohl, M.D., and Pranav Shah, M.D., collaborating on the ERAS program to improve patient outcomes as the medical director and lead.

RECENT HIGHLIGHTS:

- New, novel intraoperative anesthesia pathways with 10 elective surgical subspecialities
- Reduced length of stay by 25% over the past three years, from a median length of stay of 2.8 to now 2.1 days
- Intraoperative goal-directed approach to therapy in colorectal surgery reduced postoperative acute kidney injury by 55% in major abdominal surgery cases
- Improved rates of postoperative mortality (inpatient has declined by more than 50% over four years in elective patients)



Partnership with Hunter Holmes McGuire VA Medical Center

The Chief Resident in Quality and Patient Safety (CRQS) is a national Veterans Affairs (VA) educational program that includes training in quality improvement, patient safety, and clinical and educational system redesign.

The Central Virginia VA Health Care System (CVHCS) in Richmond historically has been involved in this program via the departments of Internal Medicine and Anesthesiology. This marks the third year for the Department of Surgery for participation and the second general surgery gap resident. Residents learn about patient safety and quality from experts at the National Center for Patient Safety, as well as from local leaders at the CVHCS in Richmond. Furthermore, residents are able to focus their interests on whatever branch of surgery they eventually believe they will be training in.

There are significant collaborations among all surgical specialties in patient care, education and research that mutually benefit veterans and VCU Health.

Surgical Education, Research, and Innovation Top Priorities

With core programs in twelve surgical specialties and expanded surgery services, "Numerous surgical faculty have funded projects and are now able to support four VA-funded resident research positions each year," says Jeannine Rivers, M.D., chief of surgery for McGuire VAMC. Newer programs taking place at McGuire VAMC include bariatric surgery, women's health, colorectal surgery, thoracic surgery, transcatheter aortic valve replacement (TAVR), TeleICU and robotic general/oncologic surgery (including robotic esophageal, liver and pancreatic resections). To support these services, numerous construction projects are planned and underway, including two fully integrated operating rooms (ORs) that are set to open in 2022, one of which is hybrid. Three additional ORs are scheduled to arrive within the next five years, as phase one of our new third floor OR suite, bringing the total number of operating rooms to 14.

Additional improvements targeted for 2024 include private inpatient rooms, a new thirdfloor SICU, a cancer center, four new ORs and multispecialty surgery clinics in our new Spotsylvania Ambulatory Surgery Center.



Jeannine Rivers, M.D., Chief of Surgery (middle) at McGuire VAMC with two residents.

Core programs in surgical specialties include general/oncology, vascular, urology, transplant, cardiac, orthopedics, plastics, neurosurgery, ophthalmology, podiatry, gynecology and otolaryngology—all of which continue to flourish due to clinical referrals across the immediate region and from other states. The result is a busy and broad clinical practice for surgical trainees.



Mike Amendola, M.D. VA partnership, safety and quality



Wayne Tse, M.D., presents his paper at the Society for Clinical Vascular Surgery (SCVS) meeting. His presentation was written up in the journal Vascular Specialist and his research was submitted for publication.

quality improvement efforts across the department." – Robert Larson, M.D., associate chair for quality and patient safety

"The Department of Surgery at VCU is committed to providing the safest and most effective care possible. Our Quality and Safety Committee performs a critical analysis of safety, complication and mortality data on a monthly basis. Working in conjunction with surgical division guality teams, this oversight drives

1

Robert Larson, M.D.

	All cases	General	Vasc.	CRS	Cardiac	Plastics	Thoracic	Urology	GYN	NSG	Ortho	ENT
Mortality	1.32	1.16	1.28	0.96			0.99	0.80	1.56	0.91	1.19	
Morbidity	1.35	1.50	1.35	1.30	1.23	1.25	1.18	1.07	1.30	1.22	1.10	1.58
Cardiac	1.08	0.87	1.39	0.85	0.93		0.49	0.74	0.83	1.11	1.22	1.79
Pneumonia	1.23	1.15	1.29	0.95	1.48		1.29	1.26		0.96	0.78	
Unplanned intubation	1.37	1.17	1.69	1.24	0.98		1.12	1.01	1.46	0.94	1.29	
Ventilator > 48 hours	2.04	2.25	1.99	1.72	0.90		0.78	1.02	1.36	0.85	1.73	1.92
VTE	0.90	0.81	1.04	0.96		1.09	1.30	0.97		1.19	0.95	1.11
Renal failure	1.75	1.82	1.18	1.52	0.99	13.84	1.24	0.91				
UTI	1.12	0.89	0.76	1.37	1.10	0.88	0.64	1.02	1.62	1.25	1.02	0.88
SSI	1.33	1.59	1.04	1.23	0.84	1.24	1.23	1.37	0.84	1.39	0.95	1.08
Sepsis	1.32	1.17	1.17	1.19	1.28	2.21	1.14	1.77	1.18	0.73	1.10	1.24
C. diff colitis	0.44	0.73	0.86	0.77			0.64	0.82		0.88	0.77	
ROR	1.41	1.40	1.27	1.21	0.93	1.05	1.22	1.57	1.01	1.13	1.40	1.21
Readmission	0.95	1.03	0.84	0.98		1.04	0.95	1.09	0.88	0.98	0.99	1.15

January 2021 semi-annual report (odds ratios) Cases from July 2019 – June 2020

Quality

Dashboard FY2020	Strategic focus	Key performance	Baseline FY19	YTD FY20	Target		Strategic focus	Key performance indicator	Baseline FY20	YTD FY21	Target
		30-day					Quality	7-day readmission rate	5.1%	5.1%	4.70%
	Quality	readmission rate	12.3%	12.3%	Divisional	21		Mortality: 0:E	0.89	0.78	
		Mortality	0.91	0.89	Divisional	/20	Efficiency	Average CMI	3.00	3.02	
		Length of stay		[2.24,2.52]		Ę		IP length of stay in days	7.32	7.47	6 days
	Efficiency	in days	7.45	7.32	Divisional	00al		HCAHPS-(IP)			
		HCAHPS-(IP) communication with doctors	83%	82%	83.5%	Dash	Value	communication with doctors	83%	82%	83.5%
	Value	HCAHPS-(IP) likelihood of recommending practice	82%	80%	83%			HCAHPS-(IP) likelihood of recommending practice	82%	80%	83%

Administration team

The main goal of the Department of Surgery administration is to provide support and resources to team members across the department in their mission to provide excellent patient care, conduct innovative research, and train the next generation of surgeons. Each member of the administrative team provides unique resources and guidance as we work together to further the growth and mission of surgery at VCU.



Katie Golob, M.H.A. Department administrator



Jessica Carey HR administrator



Tina Cary, M.A. Associate administrator, plastics and urology



Biliana Ivanova, M.B.A. Operations administrator, OR scheduling and financial clearance, colon and rectal, surgical oncology



Amanda Jabri, M.B.A. Research manager



Angel Medina, R.N. Associate administrator, cardiothoracic and vascular



Abdul Nur, M.H.A. Associate administrator, acute care surgical services



Nicole Palat, M.H.A. Associate administrator, children's surgery



Wanda Peebles Financial reporting specialist



Doris Rice, CPA Financial manager

The Department of Surgery has a comprehensive two-year administrative internship program for Master of Health Administration (MHA) students to complement their coursework with hands-on experience in a dynamic health care setting. Interns contribute to departmental operations primarily through project-based learning and engagement in various initiatives and committees. This internship equips students with invaluable experience and skills needed to prepare them for a career as a health care leader.



Erin Fenton (left) and Davis Roche Department of surgery administrative interns



U.S. News & World Report 2021-22 Best Children's Hospital U.S.

Children's Hospital of Richmond at VCU was again named among the country's top 50 hospitals in caring for kids, earning rankings in four pediatric specialties, including pediatric urology.

Newsweek: World's Best Hospitals 2021, VCU Medical Center

Newsweek specifically recognized VCU Medical Center for performing above the national average in infection prevention. VCU Medical Center also ranked among the top three health care institutions in Virginia and No. 83 in the country.



U.S. News & World Report

No 1. "Best Hospital" in Richmond metro area (for 11 years in a row)

Lown Institute Hospitals Index

Top 50 Major Teaching Hospitals in America 2020

Becker's Healthcare 2020

One of the 100 Great Hospitals in America

Forbes

America's Best-in-State Employers (No. 15 in Virginia for 2020)



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