Center for Experiential and Applied Learning

Annual Report & Program Review

January 1 – December 31, 2021
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Executive Summary

JaNae Joyner, PhD, MHA - The Center for Experiential and Applied Learning (CEAL) celebrated our fourth birthday this year having been formed July 1, 2017 to serve the collective Atrium Health Wake Forest Baptist (academic enterprise + clinical enterprise + community).

This year continued to look different as we navigated the COVID-19 pandemic. While many of our training events returned to campus under masking and social distancing guidelines, we also explored hybrid teaching modalities and worked with our event champions to meet departmental needs.

CEAL had several major milestone accomplishments, including being accredited for the first time by the Society for Simulation in Healthcare (SSH) and by the American College of Surgeons (ACS) as an Accredited Education Institute (AEI). Troy McMillan, RN was also named the first certified healthcare simulation educator (CHSE) and certified healthcare simulation operations specialist (CHSOS) and at Wake Forest.

In late 2020, Wake Forest Baptist Health formed a strategic partnership with Atrium Health to become Atrium Health Wake Forest Baptist. As a result, in January, 2021, CEAL joined Carolinas Simulation Center (CSC) in building an enterprise simulation strategy as part of the educational plan of excellence that would support the strategically combined entity. This includes strategy around the new medical school opening in Charlotte, NC in 2024 and increased opportunities in experiential learning for all.
Other accomplishments in 2021 included:

- Continuation of our return on learning (ROL) initiative by formalizing a standardized evaluation tool and implementing that tool for relevant clinical enterprise events. We collected over 1,500 evaluations between January 1 and December 31, 2021.
- Continuation of one of our flagship programs, Ultrasound Guided IV, targeted at nurses at the Winston Salem, Davie, High Point, and Wilkes locations.
- Support of a Brooks Scholarship application by piloting an external Canvas license for pre-learn activities followed by ultrasound simulations often using the Vimedix for internal medicine residents.
- Reevaluation of our external ultrasound programs for people around the nation/world to include virtual, hybrid, and in-person offerings. This resulted in live ultrasound demonstration, ultrasound video production, altered schedules, mastering technology, and the establishment of an ultrasound video studio.
- Training of two CEAL Ultrasound mini-fellows from the departments of Internal Medicine and Pediatrics/Neonatology.
- Expansion of our American College of Obstetricians and Gynecologist (ACOG) Emergencies in Clinical Obstetrics (ECO) course to ensure simulation training every two (2) years for Birth Center healthcare professionals.
- Facilitated interviews, qualitative data analysis and preparation of a publication surrounding the 2019 opening of the Atrium Health Wake Forest Baptist Medical Birth Center.
- Hosting virtual live pipeline activities to encourage students to pursue healthcare careers.
- Establishment of process documents in the areas of ultrasound and anatomical resources.
- The development of professional development materials in a program that will launch in 2022 called CEAL Path

CEAL had 39,841 earner encounters and served 42 departments. CEAL’s portfolio was 65% clinical enterprise, 32% academic enterprise, and 3% other which included K-12 education. CEAL hosted 1574 events based upon staff tracking and > 12,000 teaching/event hours.
Our Vision

To Train One, Train Many. To Help One, Help Many.

Our Mission

The Center for Experiential and Applied Learning (CEAL) exists to serve Wake Forest School of Medicine, Atrium Health Wake Forest Baptist, and the healthcare community by promoting and sustaining the delivery of superior patient care, using experiential and applied learning that is grounded in educational theory and scientific discovery.

Our Values

We seek to advance the delivery of health care by providing hands-on immersive learning for current and future clinical professionals. We are guided by a responsibility to the patients who will be treated by the health care practitioners we support. For that reason, our primary mission is to improve the care and safety of the patients who will fall under the care of the students we train.

“Davie Medical Center just wants to give every one of you a huge THANK YOU for the education you provided our ED staff. We had a successful delivery here because of the time and effort each of you put in to helping us navigate the labor and delivery/infant world. We could not have done this without you and wanted you to know you helped make a difference for the mom, baby, and our staff who were able to help her.” Marlee McConnell, RN, Clinical Education
Faculty Leadership

The faculty leadership serve as clinical and content experts and have CEAL associated job descriptions. Current faculty leadership is shown below. Dr. Clancy Clark previously served in the role of Surgical Education and Innovation, which transitioned to Dr. Lauren McCormack in July. We would like to thank Dr. Clark for his service to CEAL over the past four years.

- JaNae Joyner, PhD, MHA – Associate Vice President & Assistant Dean
- Casey Glass, MD – Director of Ultrasound
- Jim Johnson, PhD – Director of Industry Relations and Professional Education
- Frederick Kremkau, PhD - Professor of Radiologic Sciences
- Lauren McCormack, MD - Director of Surgical Education and Innovation
- Tom Perrault, PhD – Director of Human Tissue Services/Human Body Donation Program
- Justin Traunero, MD – Director of Simulation – Hawthorne Hill campus

“I want to thank you for all that you have done, the hard tireless work, and thoughtful unification of all WFBH simulation activities. It was an honor to help lead WFBH through this process of CEAL becoming a hub for learning for the entire health system. I would also like to thank everyone involved in the ACS and SSH accreditation processes successfully completed despite the challenges of COVID-19.”

Clancy Clark, MD
CEAL Team Updates

Baby Shower to Celebrate Bridget Francis and Josie Claire

Carty Beaston - CEAL staff joyfully gathered in-person to celebrate Bridget Francis’, Experiential Learning and Ultrasound Supervisor, journey to motherhood. Collectively, staff enjoyed lunch, played games, wrote well-wishes, and showered Bridget with gifts. On June 11, 2021, a healthy baby girl, Josie Claire, safely made her arrival weighing 6 pounds, 9 ounces. Mother and baby settled comfortably at home shortly after birth. Amidst a difficult year surrounding the COVID-19 pandemic, celebrating CEAL’s newest addition remained a top highlight of our year. CEAL sends our warmest congratulations to the new family!
Dr. Fred Kremkau Receives the AIUM Distinguished Service Award

JaNae Joyner, PhD, MHA - In April, 2021, Frederick W. Kremkau, PhD, FACP, FAIMBE, FAIUM, FASA, was awarded the Carmine M. Valente Distinguished Service Award given by the American Institute of Ultrasound in Medicine (AIUM). The AIUM’s Board of Governors established the Carmine M. Valente Distinguished Service Award to memorialize and recognize an AIUM member whose long-standing contributions in the furtherance of the AIUM’s mission reflect Dr. Valente’s focus on collaboration. This award is given annually by the AIUM staff. AIUM has membership of over 9,000, mostly MDs with about 50 PhDs.

Dr. Kremkau received his BS in electrical engineering from Cornell University in 1963 and subsequently received his MS and PhD degrees in electrical engineering from the University of Rochester. He served as an officer in the U.S. Navy from 1963-1967. During his master's studies in electrical engineering at Rochester, Dr. Kremkau initiated his work in the medical applications of ultrasound. He began his academic career at Wake Forest School of Medicine, as Assistant Professor of Internal Medicine. After serving as Associate Professor of Diagnostic Radiology at Yale University, he returned to Wake Forest as Professor and Director of the Center for Medical Ultrasound. Dr. Kremkau continues to serve Wake Forest School of Medicine as an ultrasound educator in the Center for Experiential and Applied Learning (CEAL) continuing to help us drive the vision and direction of ultrasound education.

Dr. Kremkau is the author of 36 book chapters, 161 journal articles, and several books, including Sonography: Principles and Instruments, the first textbook in the field to reach its 10th edition. Dr. Kremkau was recipient of the AIUM's Presidential Recognition Award in 1981, the Joseph H. Holmes Basic Science Pioneer Award in 1994 and the William J. Fry Award in 2003. He has served as associate editor of the Journal of Ultrasound in Medicine and as secretary, vice president and president of the AIUM, chaired 12 committees of the AIUM, and served on the Executive Committee for 11 years and on the Board of Governors for 19 years.

We congratulate Dr. Kremkau on this great honor!
Troyanne McMillan Becomes First at Wake Forest to Receive CHSOS and CHSE Certifications

Maria Crawford – We would like to congratulate Troyanne McMillan, RN, for becoming the first person at Wake Forest School of Medicine to achieve Certified Healthcare Simulation Operations Specialist (CHSOS) and Certified Healthcare Simulation Educator (CHSE) as designated by the Society for Simulation in Healthcare (SSH).

As Nurse Simulation Educator for the Center for Experiential & Applied Learning (CEAL), Ms. McMillan supports the academic and clinical enterprises by operating a variety of simulation technologies ranging from anatomic models and task trainers to full-body patient simulators. She proctors Fundamentals of Laparoscopic Surgery (FLS) exams for the Surgical Academy and is an instrumental simulationist for the American Heart Failure Advanced Life Support (AHFALS) course. As a simulation educator, Ms. McMillan is focused on cross-functional labor and delivery simulation activities. She is the lead facilitator for the American College of Obstetricians and Gynecologists (ACOG) Emergencies in Clinical Obstetrics (ECO) course, and is co-author to many abstracts on the subject presented at National meetings. Ms. McMillan is a registered nurse and has worked in a number of nursing capacities including ICU, ophthalmology, surgical, and hospice care. When asked about her thoughts on this achievement, she stated “I am excited to be CHSOS and CHSE certified. My teammates, manager, and BioMed team helped me prepare, and the knowledge gained in the process is helping me perform my job more efficiently.” Dawn Swiderski, who leads the simulation educational initiatives at Atrium Health’s Carolinas Simulation Center, provided tutoring sessions as part of our continued better together partnership.

“All of the instructors were very informative, helpful, and non-judgmental!”
“Thanks! This was an excellent course which is great for me as well as seasoned nurses.”

Evaluation Feedback,
ACOG Emergencies in Clinical Obstetrics Training
CEAL Team Members Celebrate Milestone Service Anniversaries

JaNae Joyner - In 2021, five CEAL team members celebrated significant work anniversaries, accounting for 140 years of collective service. Congratulations to the following teammates:

Louise Nixon - 40 years
Ian Saunders – 30 years
Joel Ferris – 30 years
Cheryl Conner – 20 years
Chris York – 20 years

Additionally, this marks the 50th year since Fred Kremkau signed his first faculty contract with Wake Forest. Fred was with another institution for 4 years during his career marking year 46 in total at Wake Forest.

We are so blessed to work with this great team!

“Congratulations! Amazing to think about how many learners you have impacted over those years and played a large role in developing them into the professionals they have become (myself included)! Thanks for all that you do!”

Justin Traunero, MD
Assistant Professor, Anesthesiology
JaNae Joyner’s Leadership Role Expansion Announced in July

Terri Yates - As we are growing our education programs and expanding into Charlotte, I have restructured the administration and operational areas to leverage synergies of operations for efficiencies but to bring teams together to more effectively plan and create better approaches. With the reorganization, JaNae Joyner’s responsibilities and duties have expanded. Promoted to Associate Vice President/Assistant Dean for Curriculum Support, JaNae will continue her leadership role with CEAL and will also have responsibility and leadership with Coy Carpenter Library, CERTL and the Instructional Design team. JaNae will continue to work with the Carolinas Simulation Center leadership for planning and integration of simulation centers as well as be a key member in the planning and development of simulation needs for the medical students in Charlotte. There are multiple areas of innovation that are underway for the support of all our programs through simulation, virtual and online learning, and library resource needs.

“Congratulations to our fearless leader, JaNae Joyner, for her well-deserved promotion and expanded responsibilities within Wake Forest School of Medicine. Your new responsibilities are a tribute to your tireless work ethic and diverse skill set, as well as acknowledgement of the institution’s faith in your leadership.”

CEAL Team Members
CEAL Fleet Gains new Vehicles

Heather Chansen - CEAL fleet vehicles increased by two in 2021, to a total of three. The most recent acquisition is a box truck, pictured here without the branding that will follow development of new organizational logo(s).

The diversity of vehicles in the CEAL fleet allows for greater flexibility in scheduling and staffing events. Various configurations in the vehicles also allow for more specific uses to be targeted, which leads to more flexibility with regard to parking and navigating at the event site.

Where all mobile events previously required deployment of the ambulance, CEAL can now reach events that require smaller equipment or different staffing with the SUV, which is easier to park, seats more passengers, and uses considerably less fuel.

CEAL is grateful to have an array of available tools to suit the needs for our growing community of learners as they become better prepared healthcare professionals.

“I just wanted to send a huge thank you to you for coming to High Point on Friday and reviewing/simulation training for some of our more common OB emergencies. I think the group enjoyed the training and it is always good to have ‘practice’ in less stressful situations as preparation for ‘live’ emergencies. I appreciate all your support. I know it is a huge amount of work on your end.”

Michele Thorp BSN, RNC-OB, Clinical Educator
Operation Joy

Carty Beaston - The holiday season is often a time of rest, reflection, gatherings, and joy - not only within your own family but for others, too. After speaking with the Winston-Salem Ronald McDonald House, CEAL staff learned the organization needed toddler toys. As a result, several CEAL staff members gathered to buy and build five bikes for the Ronald McDonald House to gift and disburse to their families. CEAL staff enjoyed pizza, sharing Christmas memories, and team building before delivering the bikes to the Ronald McDonald House. This team-build encouraged CEAL staff camaraderie and communication while working towards the common goal of positively impacting families staying at the Ronald McDonald House. Spreading hope and good cheer was a highlight of our year and a friendly reminder of the reason for this season.
The Center for Experiential and Applied Learning (CEAL) Receives Two International Accreditations – News Release

Wake Forest School of Medicine’s Center for Experiential and Applied Learning (CEAL), received full accreditation for our institutional simulation center from the Society for Simulation in Healthcare (SSH) with recognition in the areas of teaching and learning. CEAL also received accreditation from the American College of Surgeons (ACS) as a comprehensive accredited education institute (AEI).

CEAL has physical locations on the 4th floor of Bowman Gray Center for Medical Education (BGCME) in Innovation Quarter and at Atrium Health Wake Forest Baptist Medical Center on various floors in Reynolds Tower, Janeway Tower, Ambulatory Care, and Gray buildings. CEAL also conducts simulation, ultrasound, standardized patient, and anatomical resource programming in-situ within the Atrium Health Wake Forest Baptist network, including community hospitals.

CEAL is led by Associate Vice President and Assistant Dean, JaNae Joyner, PhD, MHA and includes a team of both clinical faculty and staff by which these accreditations would not have been possible including Justin Traunero, MD and Clancy Clark, MD.

Established in 2004, the SSH is the largest international simulation accreditation organization and seeks to improve performance and reduce errors in patient care through the use of simulation.

The ACS is a scientific and educational organization of surgeons that was founded in 1913 to raise the standards of surgical practice and to improve the quality of care for surgical patients. The College is dedicated to the ethical and competent practice of surgery. Established by the American College of Surgeons’ Division of Education, with approval from the Board of Regents, the AEI Consortium accredited its first institutes in 2006. Today the Consortium is a network of 88 Comprehensive and 10 Focused ACS-AEIs. The AEI program offers unique opportunities for collaborative research.
Simulation Program

CEAL Utilizes ACOG ECO Course to Train Birth Center Staff

Maria Crawford - As we approach the two year anniversary of the opening of the Birth Center at Atrium Health Wake Forest Baptist Medical Center, our institution remains dedicated to maintaining the highest level of patient care through their commitment to the expansion of training for emergencies in clinical obstetrics. Partnering with the Center for Experiential and Applied Learning (CEAL), the Birth Center operations group established a 24 month rotational certification program for all physicians, nurses, and nurse midwives responsible for obstetric care within the birthing centers throughout our network of hospitals. The American College of Obstetricians and Gynecologists (ACOG) Emergencies in Clinical Obstetrics (ECO) training covers pre-learn videos, lectures, and simulation for shoulder dystocia, breech vaginal birth, umbilical cord prolapse, postpartum hemorrhage, hypertensive emergency, and maternal cardiac arrest. Teamwork and communication strategies are a key component to the training. Successful completion of the course includes passing an assessment exam with a score of 80% or higher upon which also awards participants with CME credit.

In preparation for the Birth Center opening in 2019, CEAL used simulation to prepare newly hired labor and delivery nurses as well as multidisciplinary providers in obstetric emergencies, using the ACOG ECO method. Simulation exercises, reinforcing skills through referencing clinical checklists and role-play were performed using birthing simulators to gauge proficiencies in dealing with emergencies presented during and after childbirth. After the completion of the classes leading up to the Birth Center opening, nurses and multidisciplinary groups self-reported a higher confidence level in their abilities to handle obstetric emergencies versus prior to training.

Ongoing in-situ simulations led by CEAL and departmental champions continue to reinforce the ACOG ECO protocols followed at the institution. In addition to the Birth Center, network emergency departments as well as air care/paramedic teams participated in ACOG ECO in 2019 and 2020. This year, CEAL plans to deliver training to all OB care providers that have not previously taken the ACOG ECO course and will incorporate this curriculum into the residency onboarding plan.
Dr. Josh Nitsche Teaches First Year Residents Emergencies in Clinical Obstetrics Course

“Very good course, loved the hands on experience.”
“I thought every part of the course was well put together, timely fashioned and very helpful. I would recommend this program to all OB providers. I truly learned a lot.”

Evaluation Feedback, ACOG Emergencies in Clinical Obstetrics Training
Crisis Resource Management in FY21

Justin Traunero, MD, FASA - For FY2021, CEAL continued to produce and conduct monthly Multidisciplinary Crisis Resource Management (CRM) activities. We have continued to mature and refine our CRM events in the perioperative and Birth Center clinical settings.

Our perioperative CRM program is the longest-running component of our overall CRM activity portfolio, and we have continued to support, refine, and mature this event. The perioperative CRM program allows us to target our discussions to relevant issues that have touched patients and staff in our institution. Additionally, the targeted use of cadaveric tissue for some of these simulations provides a level of realism and seriousness that is uniquely provided by the resources available to CEAL. The rich discussions amongst all the members of the multidisciplinary monthly CRM teams continues to provide ever-novel and evolving learning opportunities for all participants. The monthly engaging, highly collegial participation by anesthesiology, surgery, and OR nursing teams in these educational events continues to be a source of pride for Wake Forest and is a collaboration that is rare amongst both academic and non-academic medical institutions.

Additionally, the unit-based in-situ multidisciplinary CRM simulation curriculum for Atrium Health Wake Forest Baptist Birth Center is now entering its second year. This program continues to evolve and mature in support of refining care processes and patient safety issues that are unique to the complex medical care provided on a busy perinatal unit. This monthly high-fidelity multidisciplinary CRM simulation program focuses on both common crises situations that arise in the care of low and high risk perinatal patients, as well as simulation of patient care events that have occurred in the Birth Center at Wake Forest. The Birth Center CRM program continues to be beneficial in practicing and continual evolution of effective care processes on the unit, useful for identifying areas for improvement, and for heightening the level of effective communication between providers and staff across the numerous medical disciplines that are instrumental in the care of low and high risk obstetric patients.
Birth Center CRM Events Expand to Include Multiple Shifts

Maria Crawford – In 2021, the monthly unit-based in-situ multidisciplinary CRM simulation events in the Birth Center were expanded to include the night staff, performing the same scenarios as their day shift counterparts. These events include unique scenarios designed and facilitated by event champions - Joshua Nitsche, MD, PhD (Maternal Fetal Medicine), Jennifer Ingle, DNP, RN-BC (Nursing), and Laura Dean, MD (Anesthesiology). CEAL and event champions have adjusted this multi-shift event opportunity as needed for improved teaching and learning outcome.

CEAL has also used the two groups as a testing opportunity for post-event survey collection. The evaluation forms are completed on paper for one shift, and electronic for the other. The purpose is to measure response rate/survey completion, when asked to scan a code and complete it electronically vs. having someone handing out paper evaluation forms and asking for immediate completion. 2021 results indicate that 90% of event participants complete paper surveys vs. a 30% completion rate electronically. In 2022, CEAL will work toward increasing electronic survey responses through enhanced technology and simplifying the process for participants.

“Love the Hands on! I think it would be a good thing for new grads to have simulation more often in order to get more comfortable during emergencies.”

Evaluation Feedback,
ACOG Emergencies in Clinical Obstetrics Training
Forsyth County Emergency Medical Services Event

Ross Neugeboren – The continued training of Emergency Medical Services personnel, who must maintain a broad knowledge of medical conditions and address the unique needs of each patient, is challenging. In helping to fulfill the Atrium Health Wake Forest Baptist commitment to bring the Best Care for All, CEAL hosted a series of training sessions for Forsyth County Emergency Medical Services (FCEMS.) Utilizing the Bowman Gray Center for Medical Education, FCEMS personnel worked their way up from the ground floor of the 5-story building, completing a challenge on each floor. In the process, the Emergency Medical Technicians and Paramedics refreshed and grew their ability to manage sports injuries, trauma, and childbirth. Darrell Nelson, MD, FACEP, FAEMS, Associate Professor, Department of Emergency Medicine, Medical Director – FCEMS, facilitated the sessions. In evaluations asking participants to rate their confidence in managing conditions before and after the training, impressive gains were noted in the providers’ post-training confidence to care for obstetrical emergencies.
Project East Partners with CEAL for Space Planning

Maria Crawford - A new care tower is in the planning stages at Atrium Health Wake Forest Baptist Medical Center, and is one of the significant investments the Atrium Health – Wake Forest strategic combination is making in the Triad.

The care tower will be a new, world-class, $450 million facility with an upgraded emergency department, state-of-the-art operating rooms and enhanced adult intensive care units. Internally, we refer to the care tower project as Project EAST. The acronym stands for Emergency, Acute Care, Surgical Tower.

Planning Design and Construction worked with the CEAL Simulation team to mock up the Emergency Department before construction begins.

The exercise was deemed a success and the project is expected to be completed in 2026.
FLS/FES Exam Proctor Updates

Vernon Williams/Troy McMillan – Fundamentals of Laparoscopic Surgery (FLS) and Fundamental of Endoscopic Surgery (FES) exams are two-part assessments that consist of online multiple choice test and a skills assessment. The online assessment for both exams cover cognitive skills, clinical judgement, and fundamental knowledge. FLS has a manual skills assessment that evaluates efficiency and precision that must be documented. The FES skill assessment uses a GI simulator that tests technical and psychomotor skills that is documented online from the simulator. Both exams must be completed to apply for ABS certification.

Our Atrium Health Wake Forest Baptist FES/FLS testing center was the first in the state to re-open following the required pandemic shut-down, and performed 31 FES exams and 33 FLS exams in 2021.

We continue to work with our surgical academy to insure our residents are scheduled for exams and have ample opportunities for practice.
Joint Trauma Simulation Adaptation during COVID-19

Vernon Williams - Joint Trauma Simulation was impacted from the high volume of patients and pandemic changes over the past year in the Emergency Department. Our teams did a great job adapting and moving the training to the Patient Simulation Suite. We also expanded these events to include the Critical Care ICU nurses, who provided a location on the unit to do different multi-disciplinary trainings. The simulation team alternates each month working with the ER and CCU nurses.

Emergency Medicine took many precautions, following COVID-19 protocols and social distancing. They requested for Serology testing for all tissue used for training to ensure the safety of all event participants and staff. Our program already had an established dual screening process in place - ruling out donors who tested positive for Covid, and performing blood tests. Simulation helped accommodate staff by setting up trainers in our ultrasound department and emergency medicine conference rooms. All staff was provided personal protective equipment (PPE), such as gloves, masks, and gowns, then given appropriate space to meet social distance requirements.

“Excellent simulation with real life application”
“This was a great team building activity”
“Fantastic course”
“The reps and instructors were so helpful. Thanks!”

Evaluation Feedback, Simulation Participants
Ultrasound Program

Wake Forest School of Medicine PA Studies and Ultrasound

Carty Beaston - Wake Forest School of Medicine PA Studies integrates basic ultrasonography into the first year curriculum. This curriculum takes place on each of its (2) campuses including 66 students located in Innovation Quarter and 24 students located on the Appalachian State University-Boone campus. Students engage in laboratory experience to learn the musculoskeletal system, the nervous system, the cardiovascular system, the pulmonary system, the digestive system, and the urogenital system. CEAL resources including our Registered Diagnostic Medical Sonographer, ultrasound machines, and task trainers are used to enhance these trainings. This equips PA students with basic point of care ultrasound skills upon entering the clinical year.

“I feel a great sense of gratitude and humility that you all went through as much trouble as you did to put on outstanding [Simulation & Anatomy] sessions for us students...you have transformed these couple of days into an incredible opportunity and growth process for us...I want to reiterate how appreciative and humbled we are to be a part of a program who cares so much about their students.”

PA Student
Spotlight on Dr. Aarti Sarwal

Maria Crawford - Aarti Sarwal, MD, FNCS, FAAN, FCCM, RPNI, is a Professor of Neurology at the Wake Forest School of Medicine. She is the Section Chief for Neurocritical Care and the Medical Director of the Neurocritical Care Unit at Atrium Health Wake Forest Baptist Medical Center.

She directs the hospital’s Neurocritical Care Fellowship program, which is accredited by the United Council of Neurological Subspecialties. She serves in the role of Social Media Editor for Critical Care Medicine. Her research interests include point-of-care applications of ultrasound in the Intensive Care Unit, sonographic assessment of cerebral physiology and hemodynamics, and ventilator induced muscle dysfunction in the neurocritical care population.

Dr. Sarwal has been a champion for advancement in CEAL’s Ultrasound programs, serving as course director for all Neurovascular Ultrasound courses offered at Wake Forest School of Medicine.

Dr. Sarwal was recently featured at a WINFOCUS webinar titled “POCUS in 2021: Looking back, looking forward. 4 experts in 3 continents discuss advances that have changed their practice and the road ahead.” In this webinar, she was one of four internationally recognized intensivists who discussed the advances of 2021 that have changed their practice, from airway management to hemodynamic monitoring, and beyond.

In 2021, she was a contributing author for only critical care echocardiography board review book. In addition, she co-authored an article published in Springer, a leading global scientific, technical and medical portfolio, titled “Basic ultrasound head-to-toe skills for intensivists in the general and neuro intensive care unit population: consensus and expert recommendations of the European Society of Intensive Care Medicine”.

https://doi.org/10.1007/s00134-021-06486-z

“I just wanted to say thank you for a very informative and highly engaging week! I have learned so much about CUS and the various uses of TCDs. We are extremely privileged to be able to attend the course as residents at Wake!”

Ashish Gulati, DO
Neurology, Atrium Health Wake Forest Baptist
Ultrasound Mini-Fellowship

Carty Beaston - Two faculty members completed the Ultrasound Mini-Fellowship in 2020-2021, Dr. Megan Ringle, Pediatrics/Neonatology and Dr. Chris Kelly, Internal Medicine. Dr. Ringle will be implementing the first year of a structured point-of-care-ultrasound (POCUS) curriculum for neonatology fellows and staff, in 2021-2022. Dr. Kelly, a Brooks Scholar, continued advancing the Internal Medicine residency ultrasound curriculum by holding a total of (6) four hour workshops, in CEAL, including Intern POCUS Boot Camps and Upper Level POCUS Workshops. He successfully trained 115 Internal Medicine residents and preliminary residents in POCUS exams of the heart, lung, and IVC, along with ultrasound-guided procedures. Dr. Kelly also developed the POCUS Champion training pathway within the Internal Medicine residency program, in which selected upper level residents undergo more rigorous POCUS training using a multimodal educational approach that includes an online remote learning curriculum, structured small group sessions on the Vimedix simulated ultrasound, supervised scanning of hospitalized patients, and encouraged use of POCUS in the clinical setting. CEAL congratulates both faculty members on their respective accomplishments.
Point-of-Care Ultrasound (POCUS) Curriculum

Chris Kelly - Bedside ultrasound is emerging as a necessary skill in modern medicine. Our Internal Medicine residents receive ultrasound training to prepare them for success in their future careers. Point-of-care ultrasound (POCUS) is embedded within the educational curriculum throughout Internal Medicine residency training at Wake Forest School of Medicine. Our residents develop skills to perform and interpret bedside ultrasound exams and learn to incorporate POCUS findings into their clinical reasoning.

Residents receive ultrasound training through a multimodal educational approach involving hands-on workshops, lectures, POCUS Focus Noon Report case conferences, educational gel rounds on hospitalized patients, and encouraged use of POCUS in the clinical setting. New interns go through an Intern POCUS Boot Camp within the first two months of starting residency, where they learn fundamental ultrasound concepts and scanning technique. The supportive nature of the program fosters a mentorship-like mentality that enables residents to enhance their ultrasound skills while simultaneously taking excellent care of their patients. At the end of each academic year, interested residents can apply to become a POCUS Champion. Our upper-level POCUS Champions undergo additional, more rigorous ultrasound training to become POCUS instructors for interns and medical students during workshops, on the wards, and in clinic.

We have top-of-the-line ultrasound equipment located throughout our clinical workspaces, including both handheld and cart-based machines. Additionally, our residency program has a strong partnership with the Center for Experiential and Applied Learning (CEAL), which gives us access to a Vimedix ultrasound simulator on which residents can fine-tune their POCUS skills and learn to recognize pathology in a stress-free educational environment.

“Thank you so much for the support CEAL has provided to the Internal Medicine Residency program in regards to our Point of Care Ultrasound (POCUS) curriculum. This is a huge accomplishment, and we could not have done it without the incredible partnership we have with CEAL. Thanks to each and every one of you for your hard work and support!”

Chris Kelly, MD
Ultrasound-Guided IV

Carty Beaston - CEAL’s ultrasound-guided IV (USGIV) training educates Atrium Health Wake Forest Baptist staff safe, secure, and efficient IV insertion. Each class includes online pre-learning modules followed by 2 hours of in-person, hands-on lab experience led by CEAL’s Registered Diagnostic Medical Sonographer and an Emergency Medicine physician. Staff learn ultrasound machine basics and knobology, medical supplies needed for completing USGIV, and in-plane and out-of-plane techniques needed to place IV’s using a task trainer that mimics human vessels. CEAL’s USGIV class offering and participation continues to increase yearly. In 2021, CEAL held 80 in-person training sessions across the Winston-Salem, High Point, and Davie Medical Center hospital campuses and trained 250 clinicians in USGIV placement. CEAL also provided department specific USGIV training to Radiology, Nurse Anesthesia, AirCare, Pisgah Urgent Care, and Nursing Education. Post-course survey results remain positive. USGIV fulfills CEAL’s mission of using simulation in enhancing a patient care procedural skill leading to safer and more efficient care.

As stated by an ICU nurse after completing the training, “This class helped me to get the technique of how to place ultrasound guided IV’s. I feel more comfortable following my needle and making sure I’m in the vessel. I am now confident in my ability to differentiate veins from artery. Bridget gave me helpful tips like look up stream and flash to solidify you are in the vessel. She did a great job and this class must be continued and should be required for ICU nurses. This is such a valuable skill to have. Thank you!”

“I loved this class! Most useful class I’ve had!”
“Amazing class and instructor.”
“Bridget was great - professional, fun, and informative. I can’t wait to use what I’ve learned on our patients to minimize pain and harm.”
“Great course. Very valuable information and knowledge for use as RNs.”

Evaluation Feedback, Ultrasound Guided IV Training
CEAL Sponsored Neurology Ultrasound Course Shifts to Virtual/Hybrid Modality - Addresses Pandemic Concerns and Increases Participation

JaNae Joyner, PhD, MHA/Maria Crawford - Wake Forest School of Medicine has a 40+ year history offering ultrasound courses with associated continuing medical education (CME) to the region, nation, and world. Currently, this CME ultrasound portfolio is housed within the Center for Experiential and Applied Learning (CEAL). As a result of the COVID-19 pandemic, CEAL, partnering with faculty champions in various departments like Neurology, worked to pivot training sessions from an in-person format to virtual/hybrid approaches such that training could continue despite institutional, state, and federal pandemic guidelines. In October, 2020 CEAL offered the Neurovascular Ultrasound Course as a hybrid approach moving from the traditional didactic in-classroom lectures with hands on scanning opportunities to novel didactic WebEx sessions and scanning demos, affording a small group of participants to join at the medical school in Winston-Salem while a larger group joined online. In March, 2021, CEAL offered this same course solely in the virtual format due to COVID-19 spikes occurring across the nation. CEAL executed another Neurovascular Ultrasound course with a hybrid approach in September, 2021, (www.wakehealth.edu/ultrasound) bringing back hands-on scanning sessions that are loved by participants for a limited class size while providing a virtual option to a larger audience. During the COVID-19 pandemic, our courses were well-received through the evaluations, noting thanks for our willingness to pivot, and brought about a 40% higher participant number than our traditional exclusively in-person courses (48 participants = October, 2020; 35 participants = March, 2021 CEAL presented an accepted “works in progress” abstract at our Wake Forest Health Professions Education Institute (HPEI) in May, 2021 entitled “Evaluation of a Change in Teaching Modality to the Virtual Environment on the Neurovascular Ultrasound CME Course due to the COVID-19 Pandemic” as a result of this ongoing work.

“Thanks to everyone for putting this learning experience together under such challenging conditions. This team effort to deliver state-of-the-art medical education is a testament to your dedication. Thank you very much!!”

Cedric Lefebvre, MD, Emergency Medicine
Demo Days

Bridget Francis - Always looking to expand our inventory, this year we invited Simbionix and Humimic Medical to demo ultrasound and simulation equipment. Simbionix highlighted a female model that has OB/GYN scanning capabilities. One can scan normal anatomy and load cases with pathology and ultrasound images for teaching. Humimic Medical specializes in task trainers for ultrasound and simulation. The company manufactures several different ballistic gel densities to correspond to those found in the body. They make several different USGIV models, a knee phantom to practice aspirations, custom models, and more. Humimic gifted 2 USGIV trainers, a knee phantom, and several gel samples to add to our ultrasound inventory.
Anatomical Resources

Virtual Anatomy Lab for Graduate Students

Chris York - COVID-19 continued to create challenges in spring 2021. The Wake Forest Graduate School leadership decided to go virtual for the semester. That’s a tough spot to be in especially when one teaches a hands-on class like anatomy lab. Our CEAL lead anatomy specialist filed for, and was granted, an exemption to be able to bring some students into the lab if the students wanted that experience. We had approximately 30 students that still wanted some aspect of the hands-on lab component. Since the class enrollment was around 52, we filmed each lab and uploaded them to the Canvas site in order not to penalize those students who wanted a completely virtual experience. This was in addition to having to prerecord all lectures and upload them as well. All course testing also took place online. It was quite a project to find human anatomic images that were good enough for online testing purposes. However, all educators were put into the same boat last year so our situation was not unique to all, just unique to us. We managed to make it through the term fairly well. The student scores were very close to normal, non-pandemic, ranges. The student reviews were complementary as they communicated that they understood the difficulty of teaching this type of class virtually. Overall, the course was taught successfully, but hope that spring 2022 will look more like spring 2019!

“I have received exclusively positive feedback about each session with rave reviews for Tom Perrault and his crew’s work in the anatomy lab! Thanks, as always, to the staff making the magic happen (and there was a lot of magic!) and to each of you for your ongoing dedication to tirelessly educating the rising leaders of our profession.”

Caroline Sisson, PA-C, PA Studies
Standardized Patient Program

SP Recruiting Efforts

Tonya Mock - The SP program is continuing to onboard/recruit new Standardized Patients with various marketing strategies. We have created brochures and shared with different educational programs. Elevator posters also have been created to be displayed throughout the medical center elevators and other Atrium/Wake Forest Baptist Health outlying facilities, starting January, 2022. We have focused on diversifying our program to include more African American and Asian SPs to be more reflective of the population.

We are currently partnering with the Boone PA Program in their recruitment efforts to attain their own dedicated SP’s, as they hold several competing events during the year with the PA program @ 525 Vine. We have added a Boone option on our website to the application process so that we can keep everything centralized.

Meetings are held on a monthly basis with the Clinical Skills group to better understand their needs and develop new processes that are needed and the Year 3 SP Educator, Kimberly McDonough, to improve the SP/student experience with debriefings after CPX testing events. This has proven to be effective with developing SPs and empowering them with feedback.

As the program continues to grow, we have created a strategic plan for 2022, which includes a more robust onboarding process, focused on training for new and repeat SPs, and creating a process for SPs to achieve advanced status.

“Very patient and informative staff”  
“This was fantastic!”  
“Great learning experience”  
“Please let’s do more of these!”

Evaluation Feedback, Multidisciplinary Simulation Event Participants
CeAL Surgical Updates

Dr. Andrew Nunn Receives National Acclaim for Innovative Surgical Critical Care Education

Ross Neugeboren - In the operating room, Acute Care Surgery fellows must employ a comprehensive set of techniques to efficiently expose and repair traumatic injuries. From initial exam and diagnosis through surgery and subsequent intensive care, their practiced application of skill and knowledge is vital to a patient’s positive clinical outcome.

The development and maintenance of these skills, especially those that are complex but performed relatively infrequently, is logistically challenging. To address this, Andrew Nunn, MD, FACS, Assistant Professor, Department of Surgery, set out to develop a year-long “Trauma Exposures and Techniques” or “TET” curriculum, in 2017.

For his work, Dr. Nunn was named the 2021 winner of the Surgical Critical Care Program Directors’ Society (SCCPDS) Innovation in Education award. He called upon the support and resources of the Center for Experiential and Applied Learning (CEAL) at Atrium Health Wake Forest Baptist and industry professionals to create and sustain the lab with minimal annual budget.

As one facet of a broad continuous quality improvement program, the curriculum is guided by data from patient cases and feedback from members across the continuum of care. In effect, real-world experiences create the lessons. Each monthly lab covers specific objectives pertaining to a single body region or overall topic. After review and discussion of key points, participants perform approximately two hours of hands-on surgical exposure and procedural technique. The lab integrates ultrasound exams on standardized patient models, honing the physicians’ skills in diagnosis and assessment. The procedural sessions utilize donated human cadavers, along with a live porcine lab. Through the combination of these modalities, Dr. Nunn and fellow instructors build the trainees’ confidence and proficiency in their skill performance. Over 90% of fellows who completed the course believe the lab improved their ability to care for traumatically injured patients.

The SCCPDS award is the latest acknowledgement of Dr. Nunn’s continued commitment to excellence in teaching and the advancement of the Surgical Critical Care/Acute Care Surgery specialty. With the addition of this honor, he has been recognized six times for his instructional efforts. Dr. Nunn has presented extensively at national conferences and co-authored numerous peer-reviewed journal publications. Congratulations to Dr. Andrew Nunn for these accomplishments and all those involved in the development and operation of the nationally recognized “Trauma Exposures and Techniques” lab.
Administrative Team

Birth Center Publication Underway

Carty Beaston - In July 2021, the Atrium Health Wake Forest Baptist Medical Center Birth Center celebrated their two-year anniversary. CEAL partnered with medical education qualitative researcher, Dr. Stacy Schmauss, to write a “lessons learned” publication on the labor and delivery service line expansion. Data collection included quantitative and qualitative surveys from front line to the c-suite staff and semi-structured interviews with institutional and Birth Center-associated management/leadership. Results indicated interpersonal skills, such as communication, hiring, onboarding, and leadership style largely contributed to the planning and timely opening of the Atrium Health Wake Forest Baptist Medical Center Birth Center. CEAL is submitting findings to medical journals for potential publication, and remains encouraged that their “lessons learned” will positively impact other organizations managing complex projects.

“Thanks for all your work to help us all become better equipped to handle emergency situations!”

Evaluation Feedback, Simulation Participant, Labor & Deliver Crisis Recourse Management Event
Reaching a Broader Audience with Social Media Platforms

@UltrasoundWake   @CEALUltrasound

Carty Beaston - In 2021, CEAL grew our social media presence by creating Facebook and Twitter pages. The social media platforms are used to increase awareness of CEAL’s ultrasound services, resources, and continuing medical education offerings to health care students and professionals. Project Coordinator, Carty Beaston, manages the pages for real-time interactions and information sharing of CEAL’s internal and external ultrasound events. As of December 2021, CEAL’s Twitter page gained 144 followers and over 6,500 profile views, along with a Facebook following of 31 and 24 page likes. Follow us for up-to-date information on ultrasound courses and medical simulation training tools.
Ultrasound Video Studio Capabilities

Ross Neugeboren – As an experiential learning center, the ability to engage and create impactful experiences for distance learners became a top priority amid the pandemic. CEAL purchased additional equipment and broadened our ability to produce high-quality content for our portfolio of ultrasound continuing education courses and institutional initiatives. Noting an absence of resources on the Atrium Health Wake Forest Baptist Medical Center campus to meet this need, we envision the creation of a dedicated studio space in our ultrasound suite. Work is ongoing to utilize existing space and equipment and combine those with new technology and processes. When completed, the studio will allow the intuitive creation of content by staff and faculty without extensive background or training. Over the past year, the content created with this equipment/space included:

- A demonstration of Transcranial Color-Coded Duplex (TCCD) scanning for use during our remote Neurovascular Ultrasound course
- A guided demonstration of neuromuscular scanning by Dr. Michael Cartwright, Professor, Department of Neurology for presentation at the International Conference and Course on Neuromuscular Imaging
- A protocol training video for the multi-site POINTER-NV study, for distribution to participating research sites across the country
- Most recently, content from the TCCD portion of the Neurovascular Ultrasound course was submitted for use in guideline writing by the European Society of Intensive Care Medicine
CEAL Creates Interactive Virtual Tour for Incoming Residents

Ross Neugeboren – Shortly after the new year, CEAL received a request from Kinchit Shah, MD, Assistant Professor, Department of Internal Medicine and Site Director, Internal Medicine residency. In preparation to welcome internal/hospital medicine residents to High Point Medical Center, the coronavirus pandemic highlighted a need for a digital orientation. Specifically, a video was requested to take the place of an in-person tour Dr. Shah would give to help new residents find their way to key clinical and educational spaces. Ideas included an interactive virtual tour combining 360-degree images, video elements, with navigation by map and click-through hotspots, was envisioned. After the initial meeting, in consultation with our colleagues on the Instructional Design team, a plan was formed to create the tour. After purchasing new camera equipment and working through technical difficulties, image capture began mid-May. To minimize cost, the Creative Media and Marketing team allowed us use of the institutional license to SeekBeak, an online tour creation and sharing platform. Nearly 40 high-resolution panoramic images, three videos created by Dr. Shah, and countless navigation “hotspots” were joined to create the tour experience. On June 20th, the finished virtual tour was released to the incoming residents and faculty supporting the residency education. “I have constantly received positive feedback for this tour of our High Point campus,” said Shah. “Learners felt that they have already been to campus after reviewing the tour before beginning their actual rotation. It helped reduce first day rotation anxiety tremendously.” The tour can be accessed quickly by mobile device or computer and experienced asynchronously by the users, making it an enduring resource. Recognizing the value of interactive tours as part of the learner experience, CEAL is working to offer use of equipment and consultation to help departments create these experiences.

HPMC Internal Medicine Residency Tour

[Image of the virtual tour interface]
Building Our Brand

Louise Nixon – In a continued effort to create further awareness of the formerly named Center for Applied Learning (CAL) now being Center for Experiential and Applied Learning (CEAL), existing signage at the Medical Center campus was replaced to clearly identify each of CEAL’s learning areas in both Janeway and Reynolds Towers.

“Many thanks to each of you for making the “paramedic trooper day” a rousing success. The comments made on paper paled to the many thanks/wows/unbelievable type comments that I got the rest of the week. These folks sincerely appreciate the physician level education you provide. Many of the paramedics realize this was a capstone event in their career.”

Jeff Hinshaw, PA-C, Emergency Medicine
Spotlight on Wake Forest School of Medicine

Carty Beaston - Wake Forest School of Medicine (WFSOM) has an established history of educating and producing skilled health care professionals. As one of the most competitive medical training programs in the nation, WFSOM offers MD, PA, CRNA, DNP and biomedical graduate programs. The Bowman Gray Center for Medical Education encompasses advanced medical school teaching facilities, including the Center for Experiential and Applied Learning (CEAL). CEAL offers shared learning laboratories, instructional equipment, high-fidelity pediatric and adult manikins, task trainers, ultrasound machines, a standardized patient-program, and curriculum development services.

CEAL’s space and resources improves clinical education for WFSOM students and providers. Practical learning opportunities include anatomy labs, human patient simulation labs with low fidelity task trainers and high fidelity manikins, and multi-disciplinary training. CEAL’s ultrasound resources are also instrumental in the WFSOM curriculum providing students and clinicians opportunities to advance their vascular, muscular, cardiac, musculoskeletal, OB/GYN, abdominal, and point of care scanning skills while learning human pathology. Furthermore, CEAL’s standardized patient-program provides hands-on experience for students to practice doctor-patient encounters, history taking, physical examinations, and clinical documentation with actors skilled in representing live patient simulation.

CEAL supports the WFSOM education and Atrium Health Wake Forest Baptist by working to advance clinical care and improve patient care outcomes. The WFSOM educational activities are linked to the mission and goals of CEAL, in addition to the institutional vision and mission of Atrium Health Wake Forest Baptist. Visit our website www.wakehealth.edu/ceal to learn more about our programs, services, and resources.

“Thank you for your willingness to spur on the upcoming student population. It definitely creates a pipeline for education and interest for our Health Care hires of the future.”

Cheryl Phibbs, Contingent Workforce Manager
Second Look Weekend

Ross Neugebore – For medical school applicants, an invitation to Second Look weekend is worthy of celebration. This event allows potential students to experience the curriculum, atmosphere, and educational resources of the program and program to assist with their decision on potentially attending. For prospective members of the Class of 2025, amid the COVID-19 pandemic, a traditional visit was not feasible.

Alongside the admissions office, CEAL identified a cross-section of curriculum activities to represent the program. CEAL staff from the Simulation, Ultrasound, and Administrative functional areas worked together to create two short videos. One film highlighted the value of high-fidelity simulation in the Anesthesia clerkship curriculum through the student interviews and scenario footage. The standout integration of ultrasound into the medical school curriculum was showcased through an upbeat montage of the annual “Ultrasound Games.” During the day-long games, preclinical students complete ultrasound exams to score points and secure victory for their team. However, another adaptation to operations during the pandemic, the format change brought the experience in a new form.

“Recently, after our joint venture with the Atrium program, one of the students said they were going to choose Obstetrics as a career after all the amazing things the Cea1 team shared. That is a DEFINATE WIN!”

Cheryl Phibbs, Contingent Workforce Manager
Tracking Update

Louise Nixon – Moving from manual tracking to query based reporting is a few steps closer to reality. Progress was made in building a query within the Event Management System (EMS) and running tests to ensure resource costs are calculated accurately for demonstrating value. This process remains in the testing stages and will be reviewed with the institution’s EMS administrators as the next phase.

New Equipment

Louise Nixon – CEAL was very fortunate to be able to enhance available resources with the following equipment purchases:

- **April 2021**
  - 2nd Generation PICC with IV and Arterial Line Ultrasound Training Models (4)
  - Insta360 Camera
- **May 2021**
  - Ultrasound Scrotal Phantom (2)
- **June 2021**
  - Airway Trainers (2)
  - Super OB Susie Childbirth Trainer
- **September 2021**
  - Components to create Video Recording/Streaming System
- **November 2021**
  - Lumbar Puncture Blocks/Replacement Skins
  - Breast Examination Pathologies/Lymph Node Pads
- **December 2021**
  - Realistic IV Arm and Wound Accessories
  - Cases for Mobile Task Trainers and Ultrasound Systems

“This class was very informative and engaging. The hands on practice was great and really helped to reinforce the proper technique.”

“Three people per class was perfect for the instructor to identify each participants needs and help them individually.”

“Great class! Absolutely loved it! Bridget is great!”

“Wish I had taken it a long time ago - keep up the good work!”

**Evaluation Feedback, Ultrasound Guided IV Training**
CEAL Team Publications/Grants

Abstracts:


Bell, Cameron C. and James E. Johnson (2021) Utilizing Simulation Based Training to Teach Wound Management Strategies When Caring for Burns Treated with Autologous Skin Cell Suspension. Journal of Burn Care & Research: the official publication of the American Burn Association 42(Supplement 1):S173-S173

Journal Articles:


Textbooks:

**Book Chapters:**


**Grants:**