



iEXCELSM Annual Report



July 2022–June 2023



iEXCELVision

Improving Human Performance
& Effectiveness in Health Care.

iEXCEL

Executive Summary

iEXCEL's 4th year of operations in the Davis Global Center can be described as another year of exponential growth for the program. Based on the vision *to improve human performance and effectiveness in health care* by advancing the adoption of simulation and visualization for experiential learning, iEXCEL is purposefully designed to meet three important UNMC missions: the academic, statewide & community outreach, and business missions. Over the past year, the staff has focused on refining the iEXCEL operational infrastructure by building upon key measures of success to ensure continued growth and innovation.

At the core of iEXCEL is *improving the safety and quality of patient care* through precision training. This involves developing a competency framework that supports the interprofessional, experiential model for performance-based training, as well as assessing the impact of simulation and visualization on the outcomes of learning and patient care. *Advancing Interprofessional (IPE) Education* is another important success measure, and 2023 has seen an increase in multi-disciplinary healthcare team training activities, ranging from cardiac surgery to emergency response scenarios.

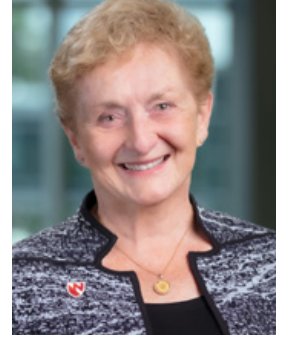
Providing transformational, experiential learning opportunities and tracking the adoption of simulation, by discipline and level of training is now routine in the Center as faculty, students and staff learn how to apply the wide variety of simulation and visualization technologies to their curriculum. We have seen growth in human simulation where real people, trained as standardized patients (SPs), ensure our students hone their communication and humanistic skills, while also responding to the growing need for more advanced ultrasound training.

Advancing the statewide and global mission for the University of Nebraska is a daily activity as the iEXCEL staff host national and global visitors from countries including South Korea, Uzbekistan, and Pakistan. Providing remote and distributed training opportunities is a high priority as we track statewide activities provided by mobile simulation units and interactive digital walls that connect across the state of Nebraska.

The fostering of *business & community engagement* activities has resulted in 33 contracts with industry collaborators who help support internal and external training workshops, as well as engage with UNMC faculty to develop new tools and procedures that benefit the safety and quality of patient care. Revenues from these activities support the iEXCEL Technology Refreshment Fund to keep the Davis Global Center up-to-date with cutting edge teaching technologies.

New research and development opportunities continue to arise through innovation and entrepreneurship, as iEXCEL creates 3D/VR and holographic productions that stimulate great interest in learning and discovery. This results in tremendous advancements in technology utilization and other breakthroughs, such as contracts with industry collaborators for the digital twinning of organs, equipment, and complex biological processes.

As iEXCEL continues its journey to build the future of health professions education, we feel deep appreciation for the community and state leaders, as well as the extraordinary philanthropic support that helps take iEXCEL from a vision to a reality.



Pamela Boyers, PhD
Associate Vice Chancellor
Clinical Simulation, iEXCEL

Pamela J. Boyers

iEXCEL Team



LEADERSHIP

Pamela Boyers, PhD

Associate Vice Chancellor, Clinical Simulation, iEXCEL

Benjamin Stobbe, RN, MBA

Assistant Vice Chancellor, Clinical Simulation, iEXCEL, UNMC

ADMINISTRATION

Frank Bogatz, BSBA

Associate Executive Director, Business & Data

Michael Hollins, MPA, MA

Associate Executive Director, Community & Business Strategy

Jenni Bouckhuys, BMS

Director, Simulation Operations

Elisabeth Barrett, MPA

Marketing & Production Coordinator

Kelly Bates

Customer Service Representative

Jesse Carlberg

Web/Database Administrator

Kiley Dinsmore, BS

Simulation Operations Associate

Armalita Dosseh

Program Coordinator, iEXCEL/Interprofessional Education (IPE)

Nicholas Madson, BS

Program Coordinator, Senior Administration

Amber Mekush-Harter, BS

Database Systems Administrator

Betsy Lay

Customer Service Representative

Priscila Rodrigues Armijo, MD

Educational Research Specialist

Mitchell Tillwick

Program Coordinator, iEXCEL Senior Administration

Laurel Ybarra, BA

Program Associate, Administration/Marketing

SIM-NE

Douglas Dekker, BS, NRP

Program Manager, SIM-NE

Meg Davis, BS

Assistant Manager – Administration, SIM-NE

Lori Cooley

Program Associate, SIM-NE

James Staab, Paramedic

Central Regional Coordinator Lead Instructor, SIM-NE

CJ Prewitt, NRP, EMS-I

Northeast Regional Coordinator Lead Instructor, SIM-NE

Robby Rhembrandt, NRP, EMS-I, FP-C, CCP

Western Regional Coordinator Lead Trainer, SIM-NE

Phillip Oelschlager, NRP, FP-C, EMS-I

Southeast Regional Coordinator Lead Field Trainer, SIM-NE



VISUALIZATION

Bill Glass, MS, BFA

Artistic Director, iEXCEL Visualization

Paul Dye, MEd, BFA

Manager, Educational Technology & Design

Brian Curtis, BA

3D Animation Visualization Specialist

Wesley Fisher

3D Generalist – Basic

Neil Humphrey

UX Designer

Anthony Lanza, BS

3D Generalist I

Dheeraj Varandani, BFA

3D Generalist I

Jer Weann Ang, MS

Medical Illustrator

Jeremiah Wilt

Computer Programming Specialist

ADVANCED SIMULATION

Sarah Kriss, BS

Manager, Advanced Human Simulation Program

Randi Peavy

Manager, Surgical Simulation Program

Samantha Rogers, MSA, CHSOS

Manager, Clinical Simulation Program

Anthony Brandner, RRT, MPH

Advanced Simulation Specialist

Teena Foster, MBA

Advanced Simulation Specialist

Wayne Howell III, RT(R), ARRT

Advanced Surgical Simulation Specialist I

Chad Lingel, BMS

Human Simulation Program Associate

Jamie Olsen

Advanced Surgical Simulation Specialist II

Andrew Oxtoby

Advanced Simulation Specialist

Jess Nolker, BS

Advanced Human Simulation Specialist II

Kylie Schnell

Surgical Simulation Support Technician

Jeff Whannell, EMT-P, CHSOS

Advanced Simulation Specialist

Terri Williamson

Advanced Simulation Specialist I

iEXCEL Oversight & Governance

The iEXCEL Advisory Board and Strategic Advisory Group provide critical insight and visionary leadership in bringing this transformational project to life.

ADVISORY BOARD meets quarterly; provides oversight and guidance of iEXCEL and the Davis Global Center with a focus on fundraising, sustainability, business development and community relations.

Anne Barnes

Vice Chancellor for Business, Finance and Business Development, UNMC

Mogens Bay

Executive Chairman, Valmont Industries, Inc.

Pamela Boyers, PhD

Associate Vice Chancellor, Clinical Simulation, iEXCEL, UNMC

Doug Ewald

Executive Associate Athletic Director & Chief Financial Officer, University of Nebraska System

Jeffrey P. Gold, MD

*Chancellor, UNMC
Executive Vice President & Provost,
University of Nebraska System*

Paul Hogan

Co-Founder & Chairman, Home Instead Senior Care

James Linder, MD

Chief Executive Officer, Nebraska Medicine

Susan Morris

President, Heritage Services

Connie Ryan

President, Streck, Inc.

David Scott

Founder, Tetrad

Benjamin Stobbe, RN, MBA

Assistant Vice Chancellor, Clinical Simulation, iEXCEL, UNMC

Amy Volk

Senior Vice President, University of Nebraska Foundation

Michael Yanney

Chairman Emeritus, The Burlington Capital Group, LLC

STRATEGIC ADVISORY GROUP meets quarterly; engages UNMC Vice Chancellors, Deans and leaders, including representation from the University of Nebraska Foundation and Nebraska Medicine. This group provides insight and strategic direction to ensure iEXCEL serves as a meaningful, interprofessional and experiential resource for faculty, staff and students.

Pamela Boyers, PhD

Associate Vice Chancellor, Clinical Simulation, iEXCEL, UNMC

H. Dele Davies, MD

Senior Vice Chancellor, Academic Affairs, UNMC

Brian Boerner, MD

Assistant Professor, Internal Medicine, College of Medicine, & Director, Interprofessional Academy of Educators, UNMC

Emily McElroy, MLIS

Dean, McGoogan Library of Medicine, College of Medicine, UNMC

Emily Glenn, MSLS

Dean, McGoogan Library of Medicine, College of Medicine, UNMC

Janet Guthmiller, DDS

Dean, College of Dentistry, UNMC

Jennifer Larsen, PhD

Vice Chancellor, Research, UNMC

Ken Bayles, PhD

Vice Chancellor, Research, UNMC

Keith Olsen, PharmD

Dean, College of Pharmacy, UNMC

Benjamin Stobbe, RN, MBA

Assistant Vice Chancellor, Clinical Simulation, iEXCEL, UNMC

Kyle Meyer, PhD

Dean, College of Allied Health Professions, UNMC

Karen Burbach, MA

Senior Associate Director, Public Relations, UNMC

Bradley Britigan, MD

Dean, College of Medicine, UNMC

Meg Johnson

Assistant Vice President of Development, University of Nebraska Foundation

Juliann Sebastian, PhD

Dean, College of Nursing, UNMC

Devin Nickol, MD

Associate Dean, Interprofessional Education; Associate professor College of Medicine, UNMC

Rodney Markin, MD, PhD

Director, UNeTech Institute & Associate Vice Chancellor for Business Development, UNMC

Carol Hasbrouck

iEXCEL Interprofessional Education Consultant

Chandrakanth Are, MD

Associate Dean, Graduate Medical Education

Beth Culross, PhD, RN, GCNS-BC

Assistant Professor, Director, LRC & IPAE, UNMC

Ali Khan, MD, MPH, MBA

Dean, College of Public Health

Jessica Janssen Wolford, MBA

Senior Director for Development, UNMC, University of Nebraska Foundation



3rd Annual iEXCEL Innovation Awards



iEXCEL Nebraska Medicine Partnership Award

Kalen Knight, RN for conducting clinical simulations and visualization sessions using interactive walls for the emergency department fellowship.



iEXCEL Clinical Award

Scott Sanderson, MPS, CCP, LP, Department of Medical Sciences for his incorporation of iEXCEL and simulation into the perfusion curriculum, helping grow the program's experiential learning opportunities.



iEXCEL Academic Award

Stacie Christensen, DPT, Department of Health & Rehabilitation Sciences for creating an educational model and training platform for benign paroxysmal positional vertigo (BPPV) cases.



iEXCEL Teaching Technologies

Robert Norgren, PhD, Department of Genetics, Cell Biology and Anatomy for conducting neuro block labs using multiple technologies within the Davis Global Center.



iEXCEL Collaboration Award

TJ Lockhart, MD, Department of Anesthesiology for revamping the course curriculum and simulation setup to allow medicine, pharmacy and nursing students to run mock code scenarios.



iEXCEL Student Award

College of Pharmacy Student Group – American Pharmacists Association Academy of Student Pharmacists. Pharmacy students hosted recurring simulations on Naloxone and student skills nights.

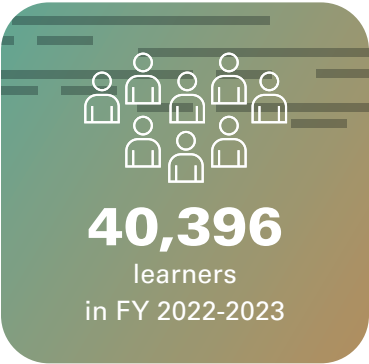
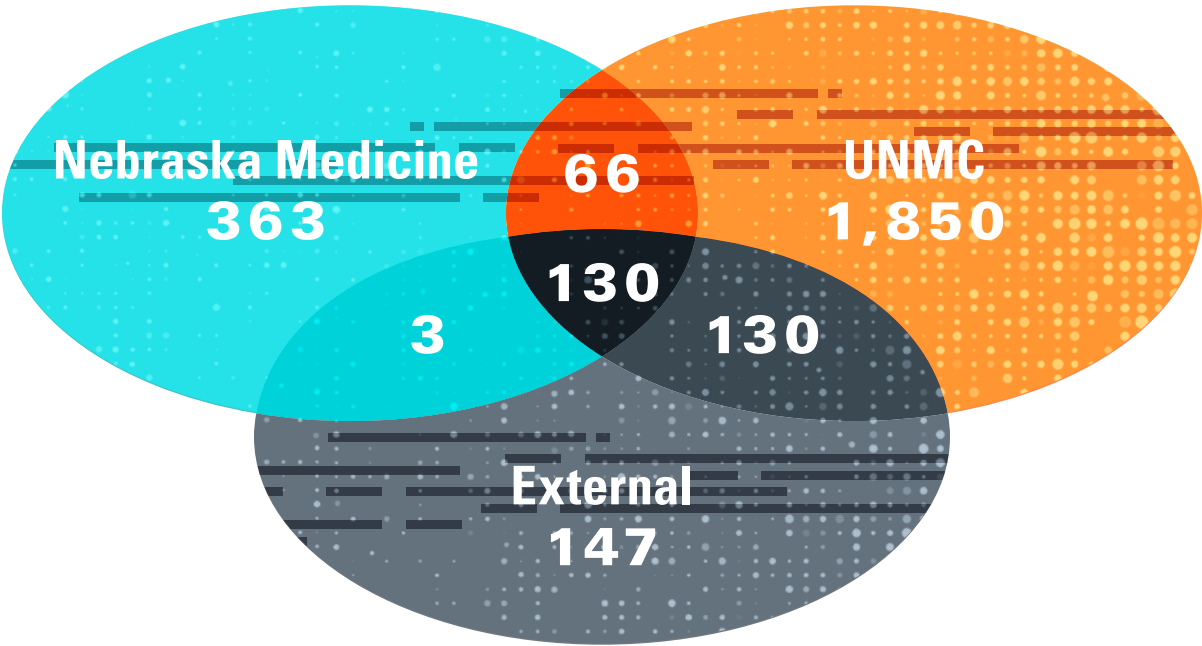


iEXCEL Impact Award









William Thorell, MD, Department of Neurosurgery for his love of teaching, neurosurgery and simulation that led him to be involved in many sessions with iEXCEL, including ear, nose and throat skull base, as well as American Heart Association stroke and neurosurgery training.

iEXCEL by the Numbers

INTERPROFESSIONAL SIMULATION PARTICIPANTS BY INSTITUTION



SIMULATION ACTIVITIES FROM JULY 1, 2022 – JUNE 30, 2023

	Events	Learners/ Attendees	Hours
 Medicine	456	15,881	1,433
 Allied Health	386	6,577	1,212
 Dentistry	5	86	12
 Nursing	84	1,686	352
 Public Health	11	309	24
 Pharmacy	49	1,253	138
 Graduate Medical Education	467	4,808	1,537
 Nebraska Medicine	363	5,532	1,345

iEXCEL Operations & Data Strategy

Integrated into the Davis Global Center is a robust, comprehensive data capture system that tracks, analyzes and distributes data. Through tracking center usage and training outcomes, real-time feedback can be given to students and faculty. This comprehensive data capture model allows for simulation enhancement, improved training outcomes and a maximized return on investment for all stakeholders.

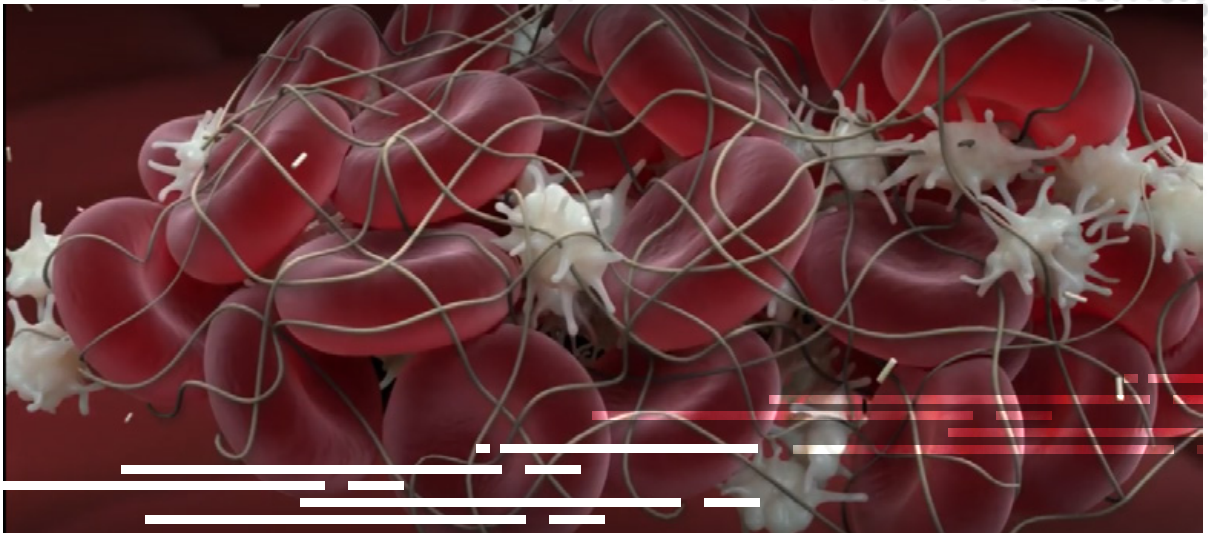
iEXCEL Visualization



Visualization Leads to Student-Driven Tools of Collaboration

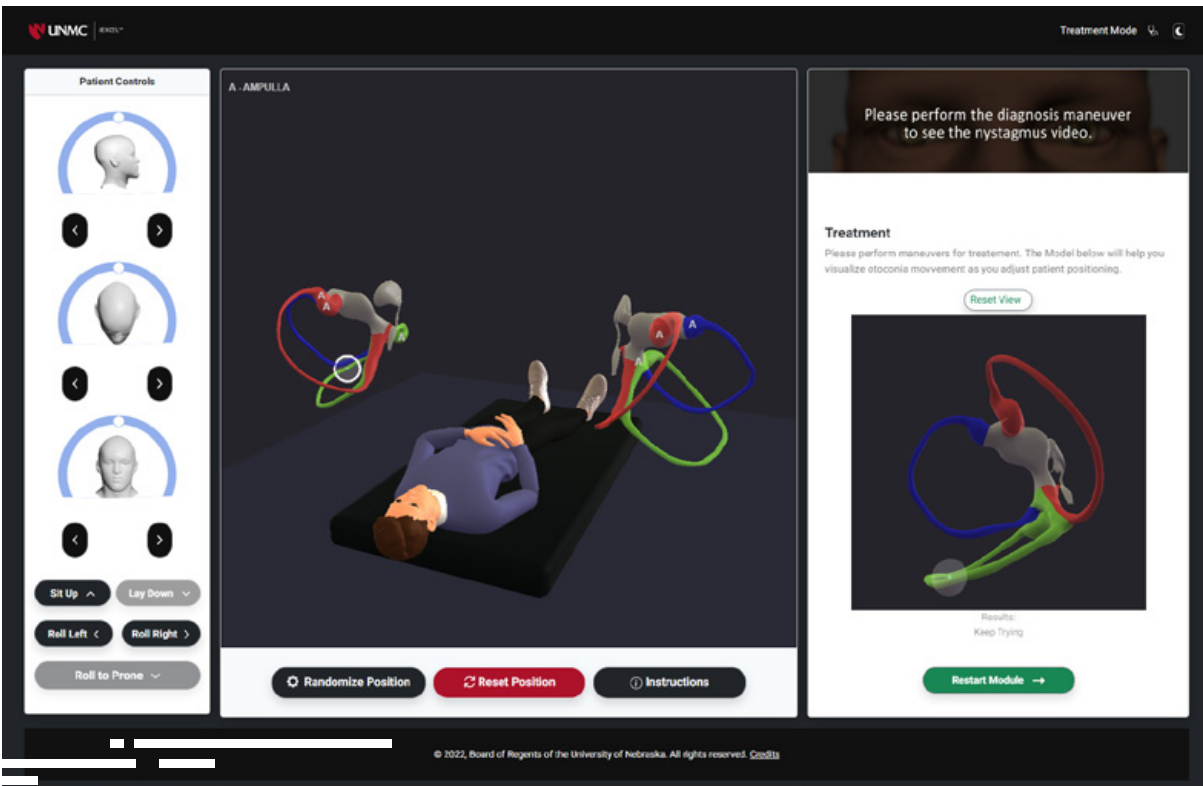
Graduate Student Association members led interprofessional workshops focused on oncology, neurology and HIV utilizing visualization technology.

Additionally, Graduate Medical Education students utilized the interactive walls to transform their traditional poster session into an interactive multimedia format.



Visualization Comes into the Classroom

Led by Dr. Scott Koepsell, College of Medicine first-year students studied blood clotting utilizing the iEXCEL created 3D animations to enhance comprehension of this complex sub-cellular process.



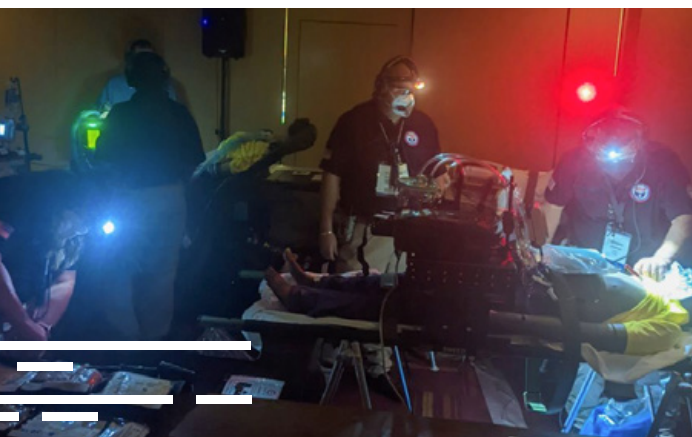
One-Of-A-Kind Interactive Learning Module

One of the leading causes of dizziness in adults is benign paroxysmal positional vertigo (BPPV). Due to the complex and abstract nature of both the diagnosis and intervention, iEXCEL worked with Dr. Stacie Christensen to create a first of its kind app to combine the didactic information of the fundamental concepts of BPPV with interactive visualization.



iEXCEL Simulation

ADVANCED CLINICAL SIMULATION



🌀 Is there a Doctor on Board?

Clinical Simulation team members worked with the NDMS Trauma Critical Care Teams and UNMC Emergency Medicine on simulations involving evacuating and transporting patients by aircraft. To mimic the challenges faced in a real air evacuation, simulation specialists created a realistic fuselage environment where participants managed multiple patients in the dark, using only radio headsets to communicate over the auxiliary aircraft noise.





🌀 Acute Care Block with Standardized Patients

In this month-long course, students practiced many skills, including clinic visit follow-up calls with a non-English speaking patient. In these scenarios, students work with a Standardized Patient and interpreter to review the appointment notes and address patient questions.



🌀 From “Clinic to Crime” Scenario

The Emergency Department Nursing Fellowship and Nebraska Medicine Forensic Examiner Program practiced a simulated clinical consultation on domestic violence. Learners then conducted a crime scene death investigation using the Davis Global Center home unit. This collaborative training event demonstrated the importance of nurses’ role in supporting and responding to victims and survivors.

HIGHLIGHTS



15,687
learners

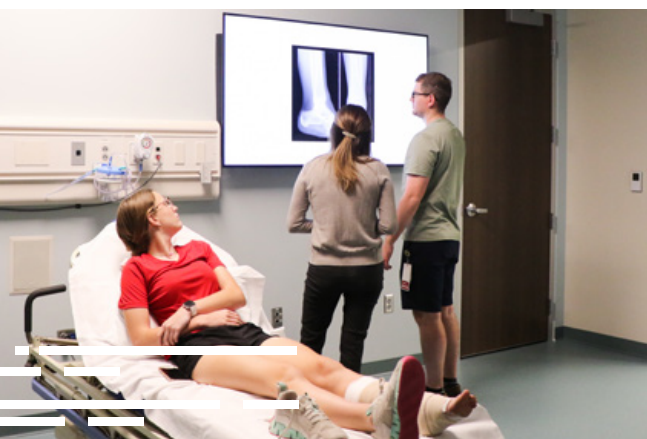


927
activities



iEXCEL Simulation

ADVANCED HUMAN SIMULATION



🌟 New Partnership: UNO Sports Medicine

In a new partnership with University of Nebraska at Omaha Sports Medicine program, professionals throughout the region practiced scenarios with standardized patients at conferences and in-situ simulations involving various settings in the field.



🌟 University of Nebraska-Lincoln (UNL) Clinical Psychology Diversity Class

The UNL Clinical Psychology Diversity Class simulated working with a diverse group of patients with an emphasis on discrimination stress, masculinity, anxiety, emotional masking, teenage motherhood, religiosity, and social support.

Standardized Patients involved in this simulation acted the roles of patients, providing UNL students with an opportunity to practice engaging via Zoom and in-person related to heavy and difficult topics.

HIGHLIGHTS

5 generations
of SP actors

549
virtual and in-person
sessions statewide

TELEHEALTH:
24 telehealth
simulations
for **559** learners

16 bilingual SPs
speaking:

- Cantonese
- West African dialects
- Portuguese
- Nepali
- Hindi
- Spanish
- French

90 scenarios
utilized
simulation capture system
for standardized grading
and video review



College of Dentistry & College of Nursing OSCE Practice

College of Dentistry collaborated with iEXCEL and College of Nursing to utilize Standardized Patients for this semester’s Objective Structured Clinical Exam (OSCE). Working with human patients helps students practice skills in unique ways, as learners were required to demonstrate competency in history-taking, physical examinations, clinical reasoning, as well as medical knowledge.



iEXCEL Simulation

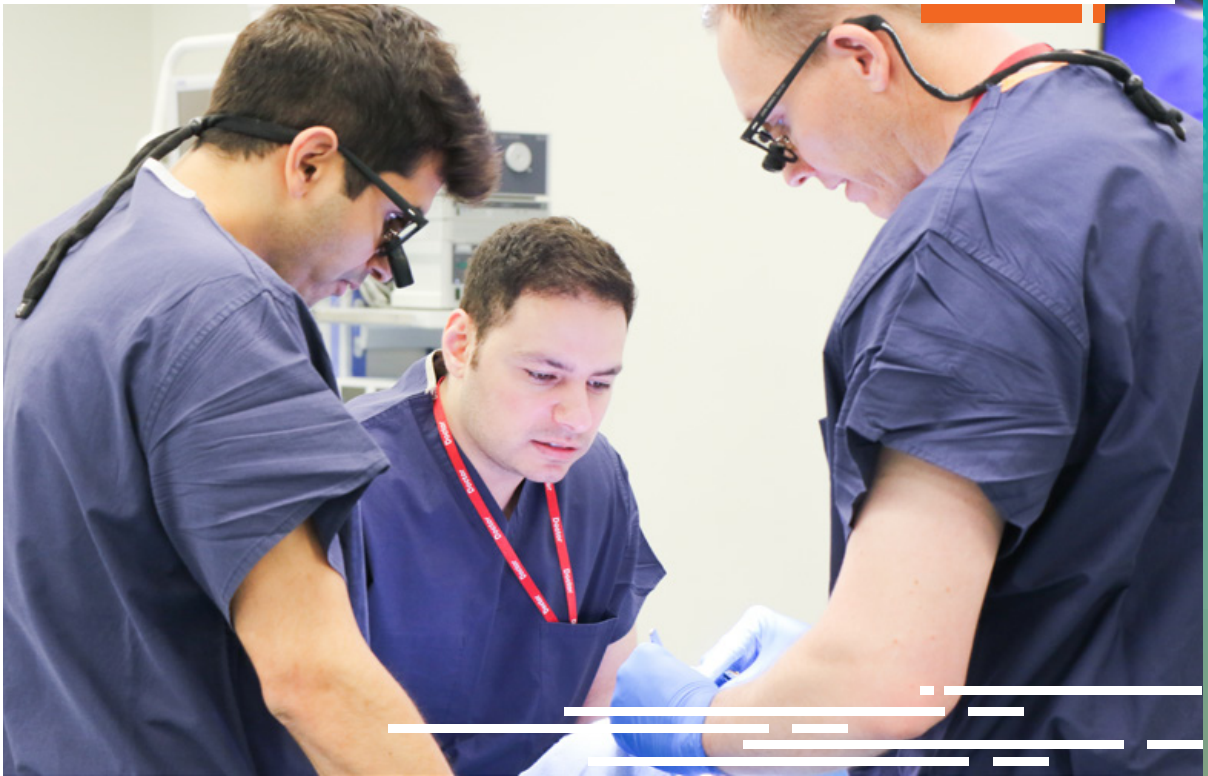
ADVANCED SURGICAL SIMULATION



Resident Courses Adopt Surgical Simulation

Utilizing simulated operating rooms as a part of the training, both the ASSET and BEST courses highlighted different surgical skills for trauma. While ASSET focused on critical failure of anatomical structures in emergencies, the BEST course involved endovascular techniques to stop bleeding in life-saving scenarios.





Multi-Disciplinary Simulation Sessions in Action

Cardiothoracic Surgery, Anesthesia, Perfusion, and Surgical Nursing practiced a variety of interprofessional simulation scenarios. Sessions included placing patients on and off bypass, accidental decannulation, pacing disconnects, and unexpected emergencies including being stuck in an elevator during power failure.



New Teamwork & Approach to Rhinoplasty

Plastics and Reconstructive Surgery faculty led their first interdepartmental session between the Plastic Surgery and Otolaryngology teams where learners from both programs practiced rhinoplasty procedures together.

HIGHLIGHTS



5,687
learners



465
activities



SIMULATION in Motion-Nebraska

Simulation in Motion – Nebraska (SIM-NE) seeks to enhance the quality and accessibility of emergency medical education to rural/frontier areas by delivering high-quality, technologically advanced simulation training to the Emergency Medical Care Providers in Critical Access Hospitals and ambulance services across the entire state.

10,000 & Counting!

On April 23, 2023 in Mullen, Nebraska, SIM-NE reached their 10,000th trainee! This milestone served as a celebration for the countless professionals the team has trained throughout Nebraska in efforts to improve health care outcomes for the entire state.



5 Years of SIM-NE

Over the past 5 years, SIM-NE has taken high-fidelity simulation training to the next level in communities throughout the state of Nebraska. The program reached countless critical access hospitals and rural emergency medical service providers before expanding into K-12 education, health and emergency response teams, Air and National Guard, and statewide law enforcement.



Every County Reached in Nebraska

On March 23, 2023, SIM-NE reached their goal of servicing every Nebraska County, when they reached county number 93! A session at Hayes County Rural Fire and EMS marked the momentous occasion where learners focused on pediatric multi-systems trauma and adult overdose patients.





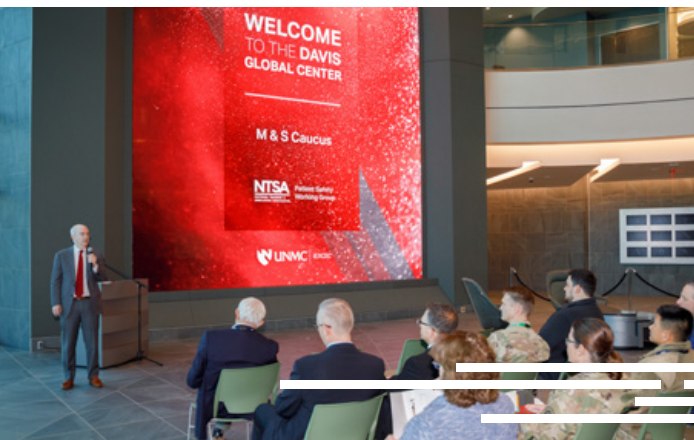
iEXCEL

Community & Business E



Student-Focused Enhanced Care Productions

The Student Interprofessional Society worked with iEXCEL Marketing and Production to create a Cultural Competency instructional video series. These videos are now the foundation for seminars engaging interprofessional peers in productive discourse and greater awareness of cultural biases in health care and are also being used via Nebraska Medicine training portals.



Government & Military Partners

In April 2023, iEXCEL hosted the Congressional Modeling & Simulation Caucus and National Training Simulation (NTSA) Patient Safety Working Group for a summit at the Davis Global Center including roundtable discussions related to potential for funding and infrastructure required for tele-simulation training for health care professionals.



engagement



Community Collaborations

iEXCEL collaborated with the American Heart Association (AHA) to create adaptive learning modules focused on stroke impact and recovery. This interactive online resource was part of a broader partnership that involved live virtual broadcasts and in-person simulations. Numerous UNMC subject matter experts participated, including Dr. William Thorell who highlighted anatomy and causes of strokes, while also demonstrating a craniotomy and recovery of stroke survivors on the advanced surgical skills floor.

HIGHLIGHTS



2,387
high-level visitors



278
tours & community
events

This year's many partners included AIM Institute, Bio Nebraska, Omaha STEM Ecosystem, Visit Omaha, UNMC High School Alliance, Rural Pathways, SHPEP, Omaha Chamber of Commerce, Girls, Inc., NorthStar, North High School, Central High School, Omaha Public Schools, Bryan High School, Buena Vista High School, Kiewit Luminarium, CUES Schools, University of Nebraska at Omaha Scott Scholars, and more!

iEXCEL Press & Media

- **Air Force officials tour UNMC as part of ongoing partnership**
UNMC Today, May 19, 2023
- **Pathway students tap into UNMC's simulation education**
UNMC Today, May 1, 2023
- **iEXCEL announces Holomedicine Association partnership**
UNMC Today, April 5, 2023
- **Nebraska Legislative League tours UNMC**
UNMC Today, April 5, 2023
- **Transforming How Health Care Professionals are Educated**
NU for NE, April 1, 2023
- **iEXCEL awards showcase new levels in health care simulation**
UNMC Today, February 23, 2023
- **Donation will support rural stroke care**
UNMC Today, February 13, 2023
- **Cutting-Edge Medical Training**
PCMA Convene, December 1, 2022
- **Aiming For 'Real and Accessible': EMS Simulations Give Rural Providers Hands-On Experience**
Rural Health Info Hub, November 30, 2022
- **November Health Matters: High-tech simulators let Nebraska health professionals hone their skills**
Omaha World Herald, November 13, 2022
- **Education and Research Through Technology**
Metro Magazine, November 6, 2022
- **Japanese delegation visits its 'role model' at UNMC**
UNMC Today, November 2, 2022
- **Undergrads in academic health pathways visit UNMC**
UNMC Today, October 12, 2022
- **High-tech UNMC facility generates benefits to state**
UNMC Today, October 10, 2022
- **UNMC hosts Ukrainian medical delegation**
UNMC Today, October 3, 2022
- **UNMC called nation's top biocontainment resource**
UNMC Today, September 12, 2022
- **Fire and rescue trains with SIM-NE**
Washington County Pilot-Tribute & Enterprise, September 3, 2022
- **SIM-NE marks 5 years bringing vital training to Nebraska**
UNMC Today, August 18, 2022
- **UNMC to host global health care simulation conference**
UNMC Today, August 8, 2022
- **SIM-Nebraska visits Bennet Rural Fire for important EMS training**
KOLN-TV, July 29, 2022
- **Native American youth participate in science camp**
UNMC Today, July 6, 2022

PUBLICATIONS

- Samant S, Bakhos JJ, Wu W, Zhao S, Kassab GS, Khan B, ... Chatzizisis YS. (2023). Artificial Intelligence, Computational Simulations, and Extended Reality in Cardiovascular Interventions. *JACC: Cardiovascular Interventions*, 16(20), 2479-2497.
- Siebler J, Bouckhuys J, Mormino, M. (2023). Orthopaedic Surgery First-Year Resident Surgical Skills Month Curriculum. *JBJS Open Access*, 8(2). doi: 10.2106/JBJS.OA.22.00058
- Kotcherlakota S, Beam E, Ricks B, Swanson R, Schuelke S, Rodrigues Armijo P, Glass B, Wilt J, Siu K. (2023). An interprofessional network approach to increase XR use in healthcare. In Cherner T, Fegely A. (Eds). *Bridging the XR Technology-to-Practice Gap: Methods and Strategies for Blending Extended Realities into Classroom Instruction, Volume 1* (pp.169-186). Association for the Advancement of Computing in Education (AACE).
- Zhang C, Wang S, Mansi A, Katzir M. (2022) In Situ Real-Time Dosimetric Studies for Spine Stereotactic Body Radiation Therapy in a Cadaver Implanted with Carbon-Fiber and Titanium Instrumentation. *World Neurosurgery*, 164, e749-e754. doi: 10.1016/j.wneu.2022.05.043.
- Zeigler BP, Redding M, Boyers PJ, Carter EL. (2022). Model-Based Systems-of-Systems Healthcare: Coordinating the Coordinators. In Recent Trends and Advances in Model Based Systems Engineering (pp. 515-527). *Springer, Cham*. doi: 10.1007/978-3-030-82083-1_44

PRESENTATIONS

- Rogers S. *Ultrasound Simulation: Creating a Complete Multi-Specialty Learning Pathway*. Presenter. Webinar at HealthySimulation.com. 04/2023. Virtual.
- Ang J, Glass B. *Enhancing Your Presentations with Visualizations*. Presenters. CHRI Pediatric Academic Workshop: Winter Writers Retreat. 03/2023. Omaha, NE.
- Boyers P. *The Future Face of Healthcare: Impact on Health Professions Training*. Keynote Speaker. 5G Telemedicine Security Summit. 03/2023. Austin, TX.
- Dye P, Glass B. *AR/VR Projects at iEXCEL*. Presenters. IAE IPE/ SIM Combined SIG Meeting. 03/2023. Omaha, NE.
- Stobbe B. *Innovations in Simulation-Based Education: Simulation Summit "Shark Tank."* Panelist. ACS Surgical Simulation Summit. 02/2023. Orlando, FL.
- Langenfeld J. *PPE – Increase Provider Confidence through Sim and Just-In-Time Training*. Presenter. IMSH. 01/2023. Orlando, FL.
- Dekker D. *Driving to Results: Addressing Critical Education Needs in Rural Settings with Medical Simulation*. Presenter. Webinar at HealthySimulation.com. 11/2022. Virtual.
- Hollins M. *How to Have Effective Partnerships*. Panelist. Nebraska Arts Council Virtual Statewide Conference. 08/2022. Virtual.





Thank you to all our supporters who have made
iXCEL and the Davis Global Center a reality.

