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Meeting a critical need: U-M launches new center aimed at transforming critical care through research

Michigan Center for Integrative Research in Critical Care will unite efforts of scientists, doctors & engineers to help patients with any acute illness or injury

ANN ARBOR, Mich. — America's emergency, trauma and intensive care teams provide some of the world's most advanced care, bringing patients back from the brink of death on a regular basis.



But even today's care can't save the lives, limbs or health of all patients who suffer severe injuries, massive burns, cardiac arrests, strokes, sudden organ failure and sepsis. And scientists have only recently begun to understand that these very different "critical" conditions affect the body's cells and tissues in similar ways.

Now, the [University of Michigan Medical School \(http://www.med.umich.edu/medschool\)](http://www.med.umich.edu/medschool) has launched a new center focused on finding new ways to treat patients with these conditions, and other acute illnesses and injuries, through cross-disciplinary research and entrepreneurial activity.

Called the [Michigan Center for Integrative Research in Critical Care, or M-CIRCC \(http://www.micircc.org\)](http://www.micircc.org), the center brings together scientists, physicians and engineers in a broad range

of specialties, from emergency medicine, surgery, internal medicine, nursing and pediatrics to biomedical engineering, pharmacy, epidemiology and bioinformatics.



U-M is already a powerhouse in research on a broad range of topics related to critical care, with more than \$50 million in existing research funding grants held by dozens of faculty members across many U-M schools, colleges and institutes.

More than 50 U-M faculty members have joined M-CIRCC, and more are expected to take part as the center takes shape. M-CIRCC will give these research teams a new way

to work together, serving as the scientific home and platform for new partnerships. M-CIRCC will also provide shared research resources to reduce the barriers to innovation.

“We have a strong history of making advances in critical care at the Medical School, including the development of advanced life support technology and important basic discoveries in inflammation and infection at the cellular level,” says Medical School dean James O. Woolliscroft, M.D. “M-CIRCC will allow our faculty to work in concert with faculty from other top-ranked schools within U-M, to enhance understanding and improve care.”

“The challenges of providing life-saving care to our most critically injured patients with the goal of returning them to their pre-injury state will require solutions that seem almost science fiction,” says M-CIRCC’s first director, Kevin Ward, M.D., professor of emergency medicine. “The only way to do this is to develop the scientific teams of the future, and this requires engaging experts in many diverse fields.”

Even in the months leading up to its launch, M-CIRCC has already begun to bring researchers together in new ways, spurring ideas to improve the diagnosis, treatment and prevention of a broad range of critical medical conditions. Teams have begun submitting proposals for new funding from public and private sources. The center will also seek funding from private donors who have seen first-hand what any kind of acute illness and injury can do to a patient – and a family.

Just as treatments developed to treat soldiers injured in combat are now being used to save the lives and limbs of civilians, the new discoveries and technologies that M-CIRCC members will generate hold the potential to apply to multiple patient types – from the smallest premature infant to the frail elderly patient.

M-CIRCC will enhance options for treating critical illness and injury, and its aftermath, across all locations of care.

“From the operating room to the intensive care unit, surgeons and their teams rely on skill, experience and technology to give each critically ill patient the best odds of survival and recovery. But too often, it’s not enough,” says Michael Mulholland, M.D., chair of the U-M Department of Surgery, which includes many M-CIRCC participating faculty. “M-CIRCC will allow us to improve those odds through research

that moves our understanding of critical illness forward, working with partners from many medical, scientific and engineering disciplines.”

Robert Neumar, M.D., Ph.D., chair of the [U-M Department of Emergency Medicine \(http://medicine.umich.edu/dept/emergency-medicine\)](http://medicine.umich.edu/dept/emergency-medicine), notes that research on critical care holds the potential to affect every step of treatment for millions of patients each year, from pre-hospital care to the emergency department, then into the operating room or a hospital bed, and then to long-term care or back to home.

“At U-M, we are making a commitment from laboratory bench to patient bedside, to develop and deliver the right care at the right time based on scientific knowledge at all levels,” he says. “In our own emergency care setting, we are preparing to expand our capacity to begin intensive care from the time a patient arrives. But we need better monitoring technologies to tell us in real time what effect our efforts are having, and to guide therapy. M-CIRCC, and the combined resources of the University of Michigan, will help us get there.”

“M-CIRCC puts in place at the University of Michigan a new center that has the vision and direction to address and study critical care "emergency" issues that often threatens life in a very rapid fashion, to saving lives through modern research and education,” says John Carethers, M.D., chair of the Department of Internal Medicine. “The multidisciplinary team approach with investigators working together in a coordinated fashion should on a continuous basis prevent premature death due to trauma or rapid medical decompensation. The Department of Internal Medicine and interested faculty are proud to be a component of this important endeavor for the University and the people of the State of Michigan.”

U-M engineers will also be involved in M-CIRCC. “It’s hard to overstate the key role of engineering in addressing the needs of critical care clinicians, and the engineering challenges that only research can overcome,” says Alec Gallimore, Ph.D., associate dean for research and graduate education at the U-M College of Engineering and Thurnau Professor. “The engineering faculty and students who will partner with others in M-CIRCC projects will have the potential to innovate on a new level, and spur entrepreneurial activity that could benefit patients worldwide.”

Says Valerie Castle, M.D., chair of the Department of Pediatrics and Communicable Diseases, “Our pediatric specialists and investigators at the U-M C.S. Mott Children’s Hospital are recognized leaders in the care of children and young adults with critical illness. We are extremely excited about the investment that we are making in M-CIRCC that will establish research cores and infrastructure to support our investigators in their research work to improve our understanding and care of patients with life threatening injury and illness.”

M-CIRCC is based at the [U-M North Campus Research Complex \(http://www.ncrc.umich.edu\)](http://www.ncrc.umich.edu), where Ward, Neumar and M-CIRCC core faculty member John Younger, M.D., have their laboratories.

For more about M-CIRCC, please visit [www.micircc.org \(http://www.micircc.org\)](http://www.micircc.org).

To donate to M-CIRCC, email anderbob@umich.edu (<mailto:anderbob@umich.edu>).

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