



procirca™

Leaders in Perfusion • Mechanical Circulatory Support • Neuromonitoring

Inaugural Report



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“Procirca is uniquely positioned to help hospitals in and out of the UPMC system exceed their goals, and prepare for any shifts in the health care market.”

— Stephen Winowich, President, Procirca

Procirca’s unique spectrum of services is relied upon and valued by some of the top hospitals and medical device industry leaders across the world for our clinical expertise, and ability to deliver unrivaled quality care in a cost-effective manner. And of course, the results of our efforts can be seen in the lives of the tens of thousands of adult and pediatric patients that we care for every year.

Perfected in one of the most demanding, and renowned integrated delivery and financing systems in the world at UPMC, Procirca’s services have been put to the test, awarded for quality, and have set the industry standards in perfusion, blood management, mechanical circulatory support (MCS), and intraoperative neuromonitoring (IONM).

With continued support from UPMC, Procirca has also committed even more resources to fulfill our core academic medical center values to not only ensure we are prepared for the future in health care, but that we as an organization bring about changes that augment patient care. This is demonstrated in a variety of initiatives including: sponsorship of our own educational programs in Perfusion, Extra-corporeal Membrane Oxygenation, IONM, and MCS, authoring multiple peer-reviewed publications, and leading research projects that include Procirca’s participation in a National Heart, Lung, and Blood Institute (NHLBI) sponsored trial for pediatric MCS technologies.

As we reflect on the past year, Procirca has experienced increases in:

- Clinical volumes
- Hospitals supported
- Coverage area served
- Clinical and academic faculty
- New product service lines to meet the needs of a dynamic market

Furthermore, we realized our goal to constructively impact health care delivery models. From doubling the size of our accredited School of Perfusion, launching our very own simulation training center, and preserving Procirca’s steadfast academic collaborations with the University of Pittsburgh and top institutions across the country, to hosting clinical internships and providing high school, undergraduate, and post-graduate students opportunities to explore the dynamic clinical setting.

Procirca’s relationship with the University of Pittsburgh is unique and vital to our success and will remain so in the future. Our cutting-edge services require top talent, and the pipeline of novel ideas and resources from the University is a tremendous resource for us.

I believe our greatest contribution to the health care field is our expert staff of clinicians, technicians, and domain experts. The Procirca team is committed to the common goal of delivering best-in-class, compassionate patient care. We will continue to shape this organization to rapidly address market demands while never losing focus on maintaining our unparalleled clinical skills.

Procirca is uniquely positioned to help hospitals exceed their goals and prepare for fluctuations in the health care market. We value our clinical partnerships and are extremely proud of our accomplishments this past year. We look forward to providing exceptional care to the patients we are privileged to serve, and redefining the future of advanced care.



Stephen Winowich

President, Procirca



Heart Surgery. Brain Surgery. Organ Transplantation. Mechanical Circulatory Support.

Each of these complicated procedures calls for exceptional skills, precision and teamwork. Now hospitals can do more to ensure patient safety, efficiency, and compliance — with the help of Procirca.

For nearly 30 years, Procirca has led the way in providing hospitals with cardiovascular and neurologic support services. Today, we have 110 highly trained employees assisting nearly 70 hospitals across the globe. Our expertise, combined with the clinical and academic capabilities of UPMC, one of the nation's leading integrated health care systems, positions us as uniquely qualified support specialists in the clinical care environment.

Three Areas of Expertise

PERFUSION

MECHANICAL CIRCULATORY SUPPORT

INTRAOPERATIVE NEUROMONITORING

The Tools and Talent that are part of the Procirca Suite of Services

Our unmatched expertise and technological support enhance patient safety and help physicians monitor and trouble shoot during complex procedures. As a wholly owned subsidiary of UPMC, we offer important advantages, including world-class doctors, on-going training, and the ability to continually innovate and educate the other professionals with whom we work.

- Cardiopulmonary bypass expertise that keeps a patient's heart and lungs functioning during open-heart surgeries
- Technology that allows the use of a patient's own blood during transfusions, minimizing the risks associated with allogeneic blood
- Assist with the implantation and long-term management of devices that support the cardiovascular system in the heart failure population
- Monitoring the brain and spinal cord during surgeries that could affect the nervous system and alerting the surgeon if problems arise

Simply put, Procirca can promote quality, safety and cost-effectiveness during the most serious surgeries.

“We have access to 3,000 UPMC physicians. We live the hospital life. And we know the challenges. It's our people, training, and experience that allows us to bring the cutting edge of health care to any hospital we support.”

— **Stephen Winowich**, President, Procirca

Perfusion & Blood Management

The Most Advanced Support for Cardiac Surgeries

What keeps a patient's heart and lungs pumping during open-heart surgery? We do, using the latest technologies to assist the surgical team. And we can help any hospital develop and maintain a world-class perfusion program that extends from pediatrics to adults. Procirca's unmatched perfusion services cover the most comprehensive and diverse scope of practice in the world.

Perfusion

- Certified and licensed perfusionists to manage cardiopulmonary bypass, extracorporeal membrane oxygenation (ECMO), and other novel procedures like organ preservation, regeneration, and transplantation
- Meticulously engineered equipment and disposable supplies
- Quality assurance and performance management
- Program assessments
- Educating and credentialing hospital staff in perfusion
- MedEvac air and ground transport
- Chemoperfusion services

Nearly
70 hospitals
and
17,000 patients

throughout the world benefit
from our expertise each year

We wrote the book on Perfusion

Education and proper training are so important to our mission. That's why we created the Procirca Perfusion Simulation and Education Center at UPMC Shadyside in Pittsburgh, Pennsylvania. Here participants gain a greater understanding of modern cardiopulmonary bypass, ECMO and ventricular assist devices (VADs) through demonstrations, hands-on learning, high-fidelity simulations, and experienced professionals. They can learn without the risk of patient harm, and develop best practices for both routine and crisis scenarios. Our faculty of American Board of Cardiovascular Perfusionists, led by renowned cardiac surgery physicians, has a combined 110 years of clinical experience. Our center is also recognized by the American Board of Cardiovascular Perfusion (ABCP).



At our unique Perfusion Simulation and Education Center, we:

- Train physicians, nurses, and other clinical staff
- Offer comprehensive courses and boot camps
- Provide ABCP recertification credits

More than 4,000 cardiac procedures supported each year

Procirca has actively participated in use of lung regeneration and preservation technologies which have led to successful lung transplantation for seven patients who likely would not have survived the wait for a donor organ.

Managing a cost-effective and high-quality perfusion program is a complex undertaking, encompassing staffing and personnel management, equipment and disposable management, quality assurance and improvement, compliance concerns, and program design. Procirca integrates these components into a perfusion services program customized to meet each hospital's needs.

- Adult and pediatric cardiopulmonary bypass
- Cardiopulmonary support
- Intra-aortic balloon pump
- Extracorporeal membrane oxygenation (ECMO)
- Transplant support
- Congestive heart failure fluid removal
- Chemoperfusion
- Patient transport
- STS data management
- Program assessment
- Long and short term locum tenens coverage
- Perfusion and ECMO education

ECMO highlights

- Application of bedside electronic database to assure real time documentation, enhancing quality management while improving patient outcomes
- Maintained the prestigious Extracorporeal Life Support Organization Gold certification
- Highest volume of work in one year, treating 201 patients and delivering over 37,000 hours of ECMO support

School of Perfusion Growth

- Advanced from Baccalaureate to Master's Degree program
- Increased student enrollment by 100%
- Increased clinical rotation sites by 30%
- Enhanced the clinical curriculum to include >100 hours of high fidelity simulation
- Relocated the school to a larger facility with state-of-the-art teaching tools

Blood Management

Using the Patient's Own Blood for Healthier Results —
and Healthier Bottom Lines

More than 7,000
patients per year

benefit from
our blood management

15% average
cost savings

realized by participants in our
Total Blood Management Program

In any surgery that requires transfusion, patients benefit from receiving their own blood and avoiding the risks associated with allogeneic blood. That's the goal of our blood management program at Procirca. Trained in best practices developed by health care pioneers at UPMC, our certified technologists are proud to meet American Association of Blood Bank (AABB) standards.

- Blood recovery — Our technologists take every opportunity to salvage a patient's own blood using a device called a cell saver
- Biologics — Post surgery, we specialize in a therapy that uses the patient's own stem cells and platelets to improve wound healing
- State-of-the-art equipment and disposable supplies
- Quality assurance and performance management
- Program assessments
- Training of clinicians and administrators

“Our clients benefit from significant quality improvement and reductions in the costs of purchasing, preparing, and delivering blood. The hospitals we support also realize a decrease in complications that can occur post-transfusion.”

— **Bob Dyga**, VP, Perfusion Operations

Blood management benefits for hospitals

- Standardized blood management practices leading to improved clinical outcomes
- Reduced risk of infection, transfusion reactions, and administration errors
- Meet needs of patients who because of religious or other reasons are not able to receive blood transfusions
- Reduced length of stay
- Cost savings opportunities



More than
\$1.25 million
savings

Versus using original equipment manufacturers (OEMs)

Procirca Total Blood Management Program is a turnkey approach that delivers personnel, equipment, and supplies. With our full-time medical director and UPMC association, hospitals will also have access to medical leadership for expert consultation, training, on-site mentorship, and simulation training. And our experts can provide a no cost, no obligation evaluation of a hospital's current blood management practice.

- Autologous component therapies, including platelet-rich and autologous conditioned plasma, fibrin glue and bone marrow aspirate concentrate
- Autotransfusion
- Cardiac post-op blood recovery
- Orthopedic post-op blood recovery
- Program assessment
- Program management
- Capital equipment
- Disposables
- Certified blood management staff
- Quality and data management
- Education and auditing
- Regulatory compliance

Clinical Engineering – Equipped to Help in Every Way

Clinical engineering is an important part of Procirca's Perfusion Services. Our certified technicians are available to operate, manage and maintain perfusion equipment on the spot. Our technicians assure 100% compliance with standards set by the Joint Commission, State guidelines, and AABB.

Procirca provides:

- Preventative maintenance
- Emergency equipment service
- Asset tracking
- Assessment of capital purchases and equipment servicing

2,000 pieces
of equipment

managed by
our certified technicians

“Procirca was instrumental in developing the most sophisticated patient blood management program in the country at UPMC. The experience and expertise gained from our patient blood management program is unparalleled. We've seen a decrease of over 100,000 transfusions annually resulting in more than \$15 million savings.”

— Jonathan Waters, MD, Medical Director, UPMC's Total Blood Management Program

Mechanical Circulatory Support (MCS)

Providing Real Help for Heart Assist Patients

Heart failure patients who are awaiting a transplant, or those whose hearts aren't functioning adequately, often need help from special devices to sustain their circulation, the most common being a ventricular assist device (VAD).

At Procirca, we provide hospitals with exceptional and comprehensive service offerings that extend from establishing or enhancing an MCS program to assisting with the direct care of the MCS population.

Unique Experience. Unique Approach.

Procirca's clinical and technical specialists are on the cutting edge of MCS technology for both adults and children. Our team of bioengineers can bring this expertise to hospitals with new or established MCS programs. Highly trained and experienced, they provide services throughout the MCS care continuum to help both staff and patients.

MCS Services

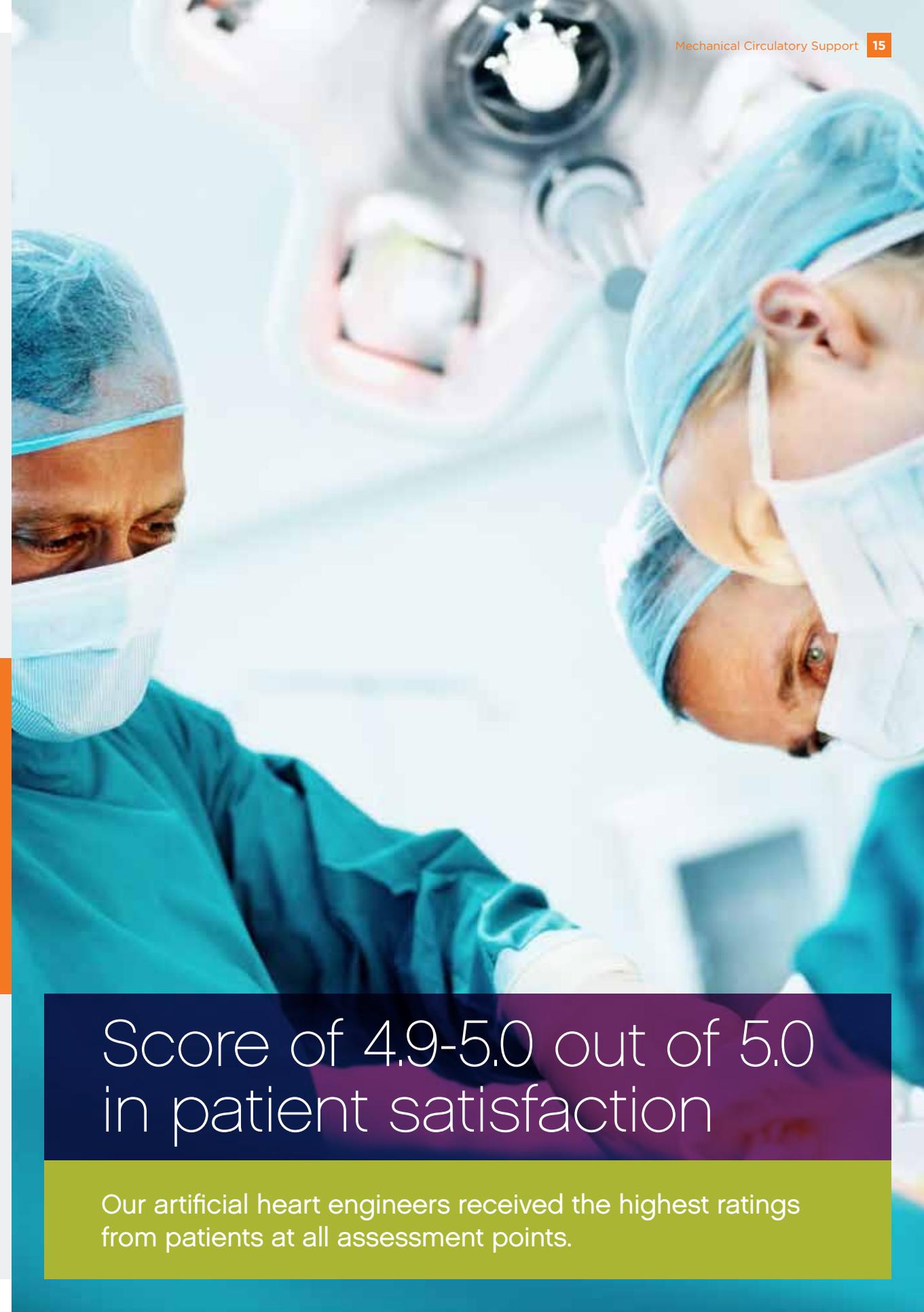
- In-house clinical and technical support of MCS patients
- Management of MCS equipment and inventory
- Training of staff, patients, and caregivers
- Remote, on-call technical support

“Procirca evolved from the artificial heart program at UPMC, which is recognized globally as a premier MCS program. Our goal is to make the expertise we developed at UPMC available around the world while maintaining the same high-quality of care.”

— **Richard Schaub**, Senior Director, Vital Engineering

Score of 4.9-5.0 out of 5.0
in patient satisfaction

Our artificial heart engineers received the highest ratings from patients at all assessment points.





MCS Accomplishments

- Provided clinical and technical support to more than 1,600 patients
- Delivered more than 750 years in MCS patient support days
- Expertise in more than 15 MCS technologies
- Provided MCS services in 23 states and 7 countries

Proven performance in MCS applications

During Surgery

Procirca is on-site to initiate, monitor and troubleshoot MCS device support and function as the surgeon performs the implantation, acting as a liaison between the device and the hospital's medical staff, and providing technical and physiological information that might not be apparent to others.

After Surgery

Our team is available to train patients and their families about living with MCS technology. We provide 24/7, on-call support to triage patient issues and work directly with the hospital's medical staff to address both technical and clinical concerns.

In Hospital

Procirca helps a hospital build its staff by training nurses, physicians, and clinical support personnel on the technical issues involved in MCS. We not only provide the people and training, but also consultation on developing the infrastructure required to build or maintain a successful MCS program. For example, our experience and methods for equipment tracking can help maximize patient safety as well as reimbursement.

In addition, our practices for training and inventory documentation can help hospitals be better prepared for regulatory audits and surveys. No other provider offers such comprehensive and innovative support services in the MCS field.

- On-site support for more than 100,000 patient days at external VAD centers
- Remote patient on-call technical support for more than 85,000 days at external MCS centers
- On-site technical and implant support for multiple VAD manufacturers (including three of the most commonly used devices)
- On-site technical and implant support for five MCS clinical trials
- Involved in trials for Ventracor, Novacor, Sunshine, Jarvik, and more

Intraoperative Neuromonitoring

When surgeries carry a risk of damage to the peripheral and/or central nervous system, hospitals can help predict and prevent injury through the use of Intraoperative Neuromonitoring (IONM).

Procirca has led the way in this life-changing field for more than 35 years. Our group has set the standards, and our program is recognized as one of the best in the world. By pioneering, innovating and standardizing IONM, Procirca has become an international model of clinical, IT, and administrative excellence.

More than
7,500 procedures
monitored annually

in 25 hospitals throughout
Pennsylvania and Ohio.
That also includes 500 pediatric
cases every year.

The Procirca Way of Delivering Neuromonitoring Expertise

Our team works with hospitals across a wide range of specialties, from neuro, ortho and ENT to vascular, cardiac, interventional radiology, general surgery, and pediatric surgery.

Our certified technologists work on-site to collect and transmit clinical data throughout the surgery. And our innovative networking solution allows procedures to be monitored — remotely, securely and in real-time — by one or more of our board-certified neurophysiologists, providing even more expertise at critical moments.

“Procirca was one of the first providers to deliver IONM services in the country. And now because of our leadership, technical expertise and world-class training program, IONM is the standard of care.”

— Ryan Quallich, Supervisor, Intraoperative Neuromonitoring

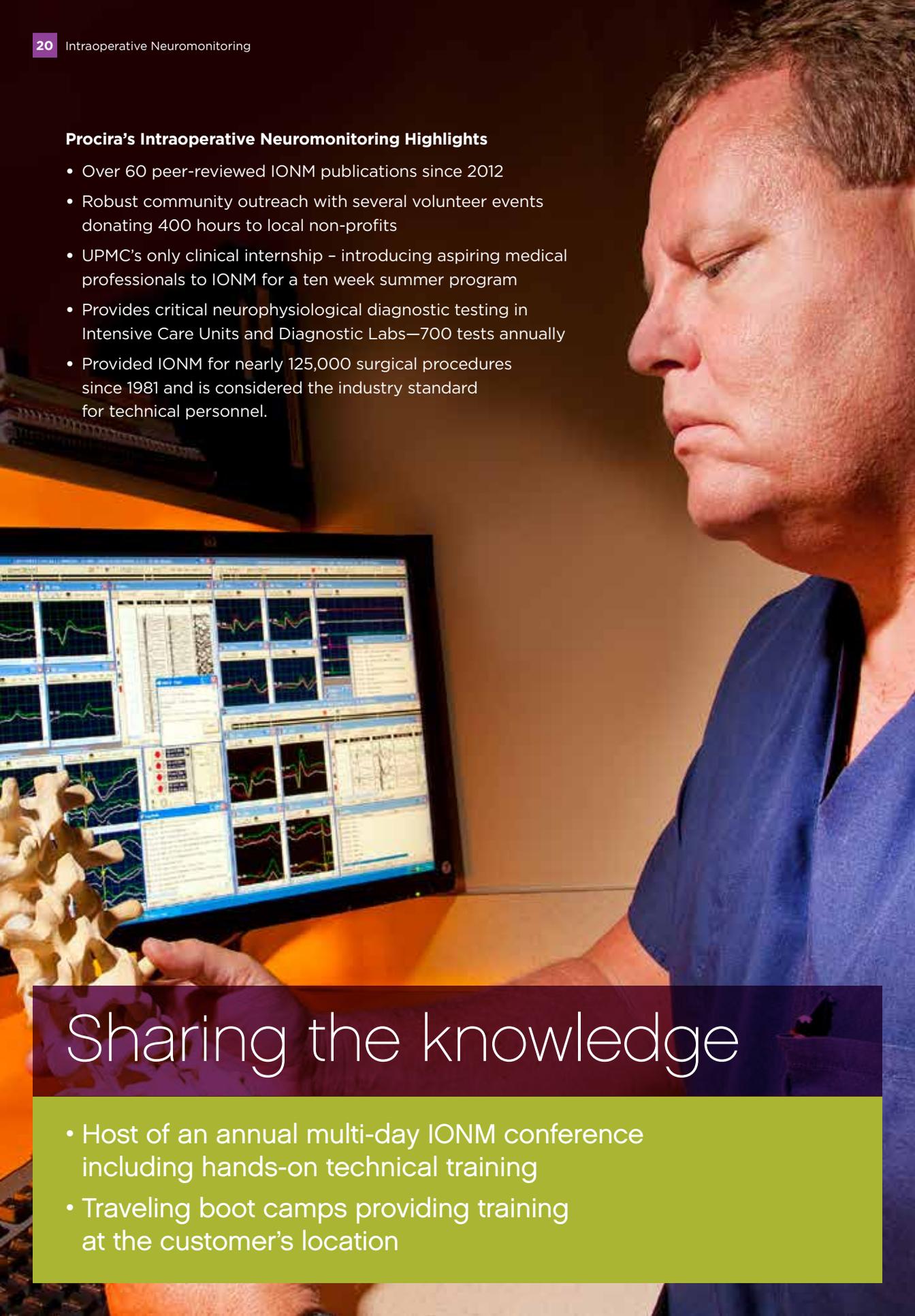


Exceptionally qualified staff

100% of our professionals have their Certification for Neurophysiological Monitoring—the industry-standard for technical personnel. Thirty of our technicians have earned this qualification. In addition, our four Neurophysiologists are all board-certified.

Procira's Intraoperative Neuromonitoring Highlights

- Over 60 peer-reviewed IONM publications since 2012
- Robust community outreach with several volunteer events donating 400 hours to local non-profits
- UPMC's only clinical internship - introducing aspiring medical professionals to IONM for a ten week summer program
- Provides critical neurophysiological diagnostic testing in Intensive Care Units and Diagnostic Labs—700 tests annually
- Provided IONM for nearly 125,000 surgical procedures since 1981 and is considered the industry standard for technical personnel.



Sharing the knowledge

- Host of an annual multi-day IONM conference including hands-on technical training
- Traveling boot camps providing training at the customer's location

Recognized Leadership

Procira actively develops simulation models to train technicians in IONM. We offer national and international training programs and workshops to educate others in the field.

Core services:

- Technical support in the OR
- Staff training and competencies
- Quality assurance metrics and risk avoidance
- Program assessment and enhancement

Our collaboration with the University of Pittsburgh Department of Neurosurgery allows us to bring our expertise to new procedures, such as our recent work with helping surgeons precisely place stimulators in the brains of Parkinson's patients to reduce or eliminate tremors.

IONM-Supported Procedures

There is a broad range of procedures where IONM helps to preserve nerve, spinal cord and brain function, including:

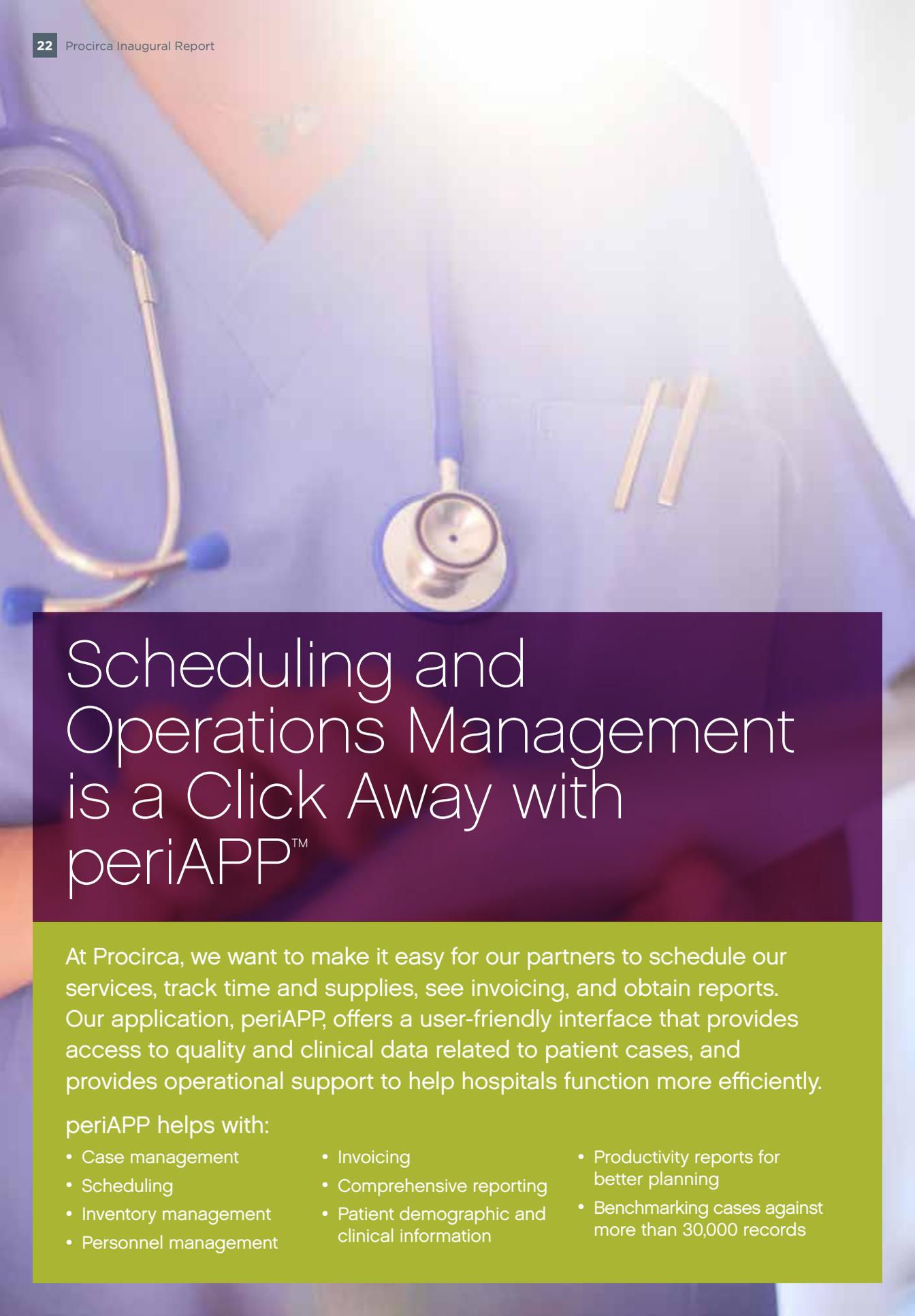
- Clipping of cerebral artery aneurysms
- Removal of brain tumors
- Thyroidectomies
- Scoliosis correction
- Lumbar fusion
- Anterior cervical discectomy
- Cardiac procedures including: abdominal aortic aneurysms, coronary artery bypass grafting, and aortic valve replacement
- Carotid endarterectomies
- Total hip replacement
- Deep brain stimulation for Parkinson's Disease
- Endovascular procedures (Neuro/Cardiac)

ABRET Accredited

In recognition of our dedication to quality training and service, Procira is one of only 26 centers nationally to earn American Board of Registration of Electroencephalographic and Evoked Potential Technologists (ABRET) accreditation, which is the highest neurodiagnostic accreditation an organization can achieve.

“Procirca's expert neurophysiologists provide the highest level of service with reliability and a depth of knowledge which, in my opinion, is unparalleled.”

— Dr. Raymond Sekula, Director of The Center for Cranial Nerve and Brainstem Disorders at the University of Pittsburgh



Scheduling and Operations Management is a Click Away with periAPP™

At Procirca, we want to make it easy for our partners to schedule our services, track time and supplies, see invoicing, and obtain reports. Our application, periAPP, offers a user-friendly interface that provides access to quality and clinical data related to patient cases, and provides operational support to help hospitals function more efficiently.

periAPP helps with:

- Case management
- Scheduling
- Inventory management
- Personnel management
- Invoicing
- Comprehensive reporting
- Patient demographic and clinical information
- Productivity reports for better planning
- Benchmarking cases against more than 30,000 records

The First Choice for Patient-Centered, Quality-Focused Support

Helping patients stay safe and healthy. Helping hospitals provide the best care possible. That's our goal at Procirca.

Our people make the difference with unmatched training, experience and skills. No one brings more expertise to the table or a greater dedication to quality. And no one offers more comprehensive solutions — and more ways to help hospitals save money.

While Procirca has a history of excellence, we also have a future of innovation. As a subsidiary of UPMC, we work with some of the finest medical minds, researchers, engineers, and educators in the world. We are constantly improving and expanding. And we look forward to collaborating with our partners to customize programs that fit their unique needs and allows them to provide the best care to their patients.

Working with Procirca:

- Increase efficiency
- Enhance patient care
- Lower costs
- Boost patient and staff satisfaction

“Procirca is committed to developing and implementing best practices in all of our clients’ facilities across all of our service offerings.”

— Stephen Winowich, President, Procirca

Leadership and Faculty



Stephen Winowich, BS
President
Senior Advisor, UPMC Artificial Heart Program



Brian Errigo, MBA, CNIM
Director, IONM



Robert Dyga, RN, CCP, LP
Vice President, Perfusion Services



Ryan Quallich, BS, CNIM
Supervisor, IONM



Richard Schaub, PhD
Senior Director, MCS
Senior Director, UPMC Artificial Heart Program
Adjunct Professor, Department of Bioengineering, University of Pittsburgh



■ Procirca's impact with services, support, and education around the world

Procirca Medical Faculty

Cardiac

- Thomas Gleason, MD
- Robert Kormos, MD
- Victor Morell, MD
- Christopher Sciortino, MD, MS, PhD
- Mahesh Sharma, MD
- Marc Simon, MD MS

IONM

- Katherine Anetakis, MD
- Jeffrey Balzer, PhD
- Donald Crammond, PhD
- Partha Thirumala, MD

Neurosurgery

- Robert Friedlander, MD, MA

ECMO - Cardiac

- Penny Sappington, MD

Blood Management

- Jonathan Waters, MD

Academic/McGowan Institute and Swanson School of Engineering

- Harvey Borovetz, PhD
- Sanjeev Shroff, PhD
- William Wagner, PhD



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