

Perfusionists and their Heart-Stopping Work



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Courtesy of Saskatoon Health Region

Twice every day, they stop someone's heart.

Perfusionists are a rare breed in the health care world. There aren't many of them, and their patients rarely remember them as part of their health care team. Yet their work is heart-stopping, in both the literal and figurative sense.



Saskatoon Health Region's team of perfusionists spend their time with the most critically ill and injured patients.

From left: Marnie Olson PhD, CPC; Mark Rosin MPS, CPC, CCP; Victor Uppal BSc, CPC, CCP; Jennifer Bezaire, BScN, RN, CCP, CCN(C), CNCC(C); Jo-Anne Marcoux MSc, CPC, CCP. Missing: Erick McNair PhD, CCP

A major part of a perfusionist's job is cardiopulmonary bypass (CPB), which involves operation of the heart-lung machine. During grafting or other repairs to the heart, it is stopped, isolated from the rest of the circulatory system. The heart-lung machine keeps the patient alive while surgeons do their work, and perfusionists are the ones operating that machine.

"We do about 400 heart surgeries a year here in Saskatoon," said Mark Rosin, one of five full-time and one casual perfusionists who work in Saskatoon Health Region. "About twice a day, we stop someone's heart."

The work of perfusionists is extremely specialized, and they largely work in the critical care units. They do cell saving or autotransfusion – which is basically harvesting the blood of a bleeding patient, washing it, and giving it back to them – over 600 times a year at all three hospitals in Saskatoon. This mitigates the number of transfusions needed using blood from the blood bank.

They're also in charge of thromboelastography (TEG), a blood test that tells caregivers how a patient's blood clots, and other factors. They're the only ones in the hospital who do this lab-related work. They conduct TEGs between 1,400 and 1,800 times every year.

"TEG tells us how a patient breaks down their own clot, or if a drug is having an effect on their coagulation. It's useful for post-operative heart patients especially," Rosin noted.

These six people are also the ones who do arterial blood gasses in the operating room, helping with the analysis of a patient's blood and decisions about transfusions. And they help install IABP or Intraaortic Balloon Pumps, which puts a balloon in the aorta of patients whose hearts cannot support their own cardiac output. These pumps inflate and deflate inside the aorta in accordance with a patient's own cardiac cycle in order to increase blood flow and decrease the work the heart has to pump against. These happen between 60 and 80 times per year.

They also fly to Edmonton to help with the transport of the heart transplant patients once or twice a year, working with Air Ambulance.

Occasionally, perfusionists get called down to the emergency department at Royal University Hospital to help with massive transfusion protocols, such as when a person has been shot in the chest and needs blood rapidly. Perfusionists work with anesthesiologists in the operating room, helping them decide how to implement the blood transfusion resources, and use them efficiently.

ECMO or Extra Corporeal Membrane Oxygenation is also in the hands of our perfusionists. ECMO machines are used to support either the heart and lungs or just the lungs when they are not working well enough to oxygenate the blood, even with drugs and a ventilator. Some patients suffering from the H1N1 version of influenza A this spring needed help from ECMO to stay alive.

Monitoring a patient on ECMO is a round-the-clock, bedside affair for perfusionists.

“It’s all hands on deck when someone is on ECMO,” Rosin noted. “Everyone is working, and everyone is on call, and one perfusionist is at the patient’s bedside at all times.”

Typically, a patient placed on ECMO is on for 10 days to two weeks, until their lungs are strong enough. Then they are incrementally returned to their own support.

Saskatoon perfusionists do great work, and the statistics support that. The Saskatoon open heart program, of which they form a part, is among the top three in the country for mortality and morbidity rates, and stroke prevention.

And they’re not only dedicated to their work, they also devote much of their time to research. They are among the most published unit of perfusionists in Canada, publishing both alone and as a group, and they present a lot in Canada and the United States. Their average level of education is a Master’s degree.

It takes a special personality to literally have someone’s life in your hands at least twice a day, every day. It’s not a job for the timid. You need confidence in your clinical and academic skills to be a perfusionist. They bring a lot to the table when they’re involved, but perfusionists only deal with patients among the most sick, the most unstable, and the most challenging patients in the hospital.

“Everyone in our group has similar personalities, Type A,” Rosin said. “We challenge one another, and everyone brings different ideas to the mix, different ways to solve problems, because most of us come from different educational programs.”

Not many understand what perfusionists do. There are only 250 in Canada in 22 open heart units. And the patients they treat are often too sick to remember them. But that’s okay with them. They know their work has impact. They know it saves lives. The huge responsibility is what attracted most of them to this profession in the first place.