CHI Health

better you

IMAGINE THAT.

Better than blood thinners!

Watchman™ for AFib patients

World's first:

One-of-a-kind heart procedure

Heart concerns?

Where you go matters

April 2020
CHIhealth.com

Heart Attack Experts:

Delivering Care When Every Minute Matters

Having a heart attack? Where you go matters! Not all hospitals are equipped to take care of complex heart cases.

Take this number: 90 minutes. That's the national guideline* for time to get treatment started on STEMI heart attacks - the most serious kind where your arteries are completely blocked. At CHI Health, we've cut that time to an average of 57 minutes – and in some cases as quickly as 13 minutes.

"The reason these numbers matter is because time is heart muscle," said Erich Fruehling, MD, CHI Health interventional cardiologist. "We're working against the clock to limit damage to your heart and increase your chances of living longer."

When you are suffering a heart attack, the time it takes from your arrival to getting your blood flowing again – that 57 minute average – is called "door-to-balloon" time.

Throughout CHI Health, 14 interventional cardiologists performed more than 2,000 angioplasties for blocked arteries last year. "During angioplasty, we use a catheter to insert a deflated balloon into the blocked artery. The balloon is then inflated restoring circulation," said Dr. Fruehling.

So, what happens if you live 150 miles from the closest "door?" **Outside the Omaha/Council Bluffs area**, only five Nebraska communities are designated to provide this level of care at what's called "primary percutaneous coronary intervention (PCI) facilities." CHI Health has hospitals with PCI facilities in three: Lincoln, Kearney, Grand Island, and a heart team in the fourth – North Platte.

CHI Health actively works with local paramedics/EMS to get you to the right place at the right time for the right care. So if you have a heart attack in a small town or rural Nebraska, rather than driving to the nearest ER only to then be transferred to a larger hospital, local paramedics/EMS are connected in real time with the CHI Health heart team – so they know exactly where you should go.

"From wherever you are, results will be communicated in real time back to our heart team. They'll quickly diagnose, make a course of action and begin prepping. Saving precious time," said Anub John, MBBS, CHI Health interventional cardiologist. "We can further reduce time and heart muscle damage by sending our AirCare helicopter to bring some patients in."

Erich Fruehling, MD
Interventional Cardiologist

Anub John, MBBS
Interventional Cardiologist

You can bypass the hospital "door" and be wheeled straight to a specially designed "cath lab" where life-saving care continues.

CHI Health's vast network of providers and hospitals ensures quick, quality, life-saving care for our entire state. "Where and when our patients need it – we have them covered," said Dr. Fruehling. "And with options like AirCare and door-to-balloon times 33 minutes faster than the national goal, we're committed to also providing the best outcomes."

**American Heart Association guideline.*

ALWAYS CALL 9-1-1 if you are experiencing chest pain.

Heart Care by the Numbers

If you have heart issues, you probably want care that's close to home. But you also want to go where the experts have the advanced training and experience to handle the heart's unexpected emergencies.

As the region's largest provider of cardiac and vascular services, CHI Health is both.
Just consider our numbers for 2019:

59
heart specialists with 500+ years of combined experience

81,000
patients from 1,250 communities *(as far as Puerto Rico and Hawaii)*

24,945
diagnostic procedures

16,625
people treated in ERs for heart problems

5,105
cardiac rehabilitation patients

With 14 hospitals and more than 150 clinics in Nebraska and southwest Iowa, CHI Health heart experts are closer than you think, whether you need help controlling high blood pressure, an advanced procedure like a TAVR (valve repair without open heart surgery) or a Watchman™ (implant for reducing stroke risk for atrial fibrillation). **We do more of these procedures than anyone in the region.**

Can't Come to Us? We'll Come to You *Mobile Diagnostic Units Reach 48 Communities*

You've probably seen our mobile diagnostic unit on the highways and byways of Nebraska, southwest Iowa and northern Kansas. Along with clinic visits, CHI Health proudly provides diagnostic testing to more than 48 communities. This team-based approach, supporting our patients and the communities where they live, is not only our passion, but our mission. Providing quality care, close to home, it's at the heart of what we do.

First in Nebraska:

Valve Replacement Without Open Heart Surgery

Open heart surgery or small incision? CHI Health cardiologists lead the way in innovative valve replacement.

"This is something that none of us would have imagined we'd be doing two decades ago," said Anuradha Tunuguntla, MBBS, known as "Dr. Anu."

For four years, she's worked as an interventional and structural cardiologist with CHI Health and has helped transform the care of patients with a common heart valve disease called aortic valve stenosis.

"Aortic valve stenosis is a condition where the main outflow valve of the heart gets calcified and thickened to the point where the valve doesn't open well and the heart isn't able to pump blood effectively to the rest of the body," Dr. Anu said.

The onset of symptoms leads to very poor prognosis and up to 50 percent of patients experiencing symptoms will die if the disease is left untreated. Symptoms to look for include shortness of breath, chest pain, fainting and fatigue.

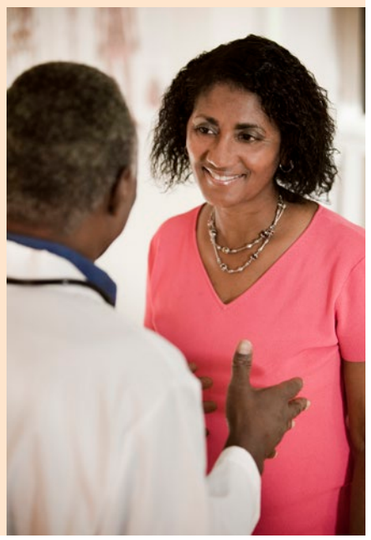
Treatment requires a valve replacement, which historically required open heart surgery. **But in 2011, CHI Health became one of the first health systems in the country and the very first in Nebraska to offer aortic valve replacement via catheter – called transcatheter aortic valve replacement or TAVR.** In most cases, a new valve is inserted through a small incision in the groin and guided through your blood vessels to your heart and into your aortic valve.

"We position the new valve inside the old valve. Once it's released, it starts functioning immediately," Dr. Anu said.

The patient is under conscious sedation (twilight sleep) for the minimally invasive procedure. Most patients go home within a day and experience a faster recovery, less bleeding, reduced stroke rates and fewer hospital readmissions.

"It truly is remarkable in terms of being able to replace a valve just from a small incision in the groin and then to be discharged the next day – and have outcomes similar or in certain respects better than open heart valve replacement," Dr. Anu said.

Together, CHI Health Nebraska Heart and CHI Health Creighton University Medical Center-Bergan Mercy have completed more than 700 of these life-saving procedures – more than any other health system in the state.



Anuradha Tunuguntla, MBBS
Interventional Cardiologist

Saving More Lives: TAVR Approved for Low-Risk Patients

Last summer, low-risk patients were approved for catheter-based aortic valve replacement by the FDA. That means more people can now have the minimally invasive procedure. Before this change, 80 percent of those living with this disease were considered too healthy to qualify.

CHI Health had a hand in bringing this procedure to low-risk patients by serving as a clinical trial site for intermediate and low-risk patients. Now, the majority of people living with aortic valve stenosis can bypass open heart surgery and opt for a catheter-based valve replacement instead.

"Really this has changed the landscape for the treatment of aortic valve stenosis," Dr. Anu said. "It's no more a question of who is a candidate. The question is who is not a candidate."

Questions? Start with your local cardiology clinic. They can connect you with the CHI Health heart team, if needed.

Leaky Mitral Valve?

MitraClip™ Fixes It Without Surgery

One in 10 people over age 75 has a common ailment called mitral regurgitation (leaky mitral/heart valve). Symptoms include shortness of breath, fatigue and swelling in the legs.

Today there's an alternative to invasive open heart mitral valve surgery.

Interventional cardiologists can use a MitraClip™ device for patients who have severe mitral valve regurgitation. This happens when the mitral valve of the heart does not close completely, causing blood to flow backward and leak into the heart's left atrium.

"Mitral regurgitation makes the pressures inside the heart and the lungs go up and causes heart failure symptoms," said CHI Health Interventional Cardiologist Arun Kanmanthareddy, MBBS. "Over time this causes the heart function to weaken and the heart chambers to enlarge. Once this happens, the heart function may not return back to normal even after repair or replacement. The mortality rates go up dramatically."

When performing the procedure, surgeons use a MitraClip™ device to "clip together" flaps of the valve. This procedure is performed through the big vein in the leg similar to a heart catheterization procedure. Recovery takes about 24 to 48 hours.

Arun Kanmanthareddy, MBBS
Interventional Cardiologist

"Patients can expect to see improvement in their heart failure symptoms such as leg swelling, ability to breathe better, improved sleep and more energy to do things," said Dr. Kanmanthareddy. "Over time patients can expect improvement in their heart function and quality of life with results similar to surgery."

CHI Health performs the most MitraClip™ procedures of any health system in the state.

Breathing Easy: TAVR Gets Columbus Man Back to Active in Days

Bob Parker is busy. The 74-year-old still works – doing inventory and pricing for a fertilizer company in Columbus, Nebraska. When he's not there, he's fishing, golfing or going on junk jaunts with his wife.

Within the last couple of years, though, those hobbies became tiresome.

"If I was doing any kind of activity, I would have to stop and catch my breath," Parker said. "I thought at one time, I was having a heart attack."

Fortunately he wasn't, but after seeing an interventional cardiologist at CHI Health, Parker learned he was living with a life-threatening disease, aortic valve stenosis, and would need a valve replacement.

"That's when they told me my aortic valve was closing up," Parker said.

Luckily for Parker, time was on his side. The FDA had recently approved catheter-based valve replacements for low-risk, generally healthy patients like Parker. This meant he could avoid open heart surgery and undergo the minimally invasive procedure.

The CHI Health heart team successfully replaced Parker's aortic valve in December 2019. Within hours, Parker noticed a change.

"I was surprised a little bit," Parker said. "I did feel some difference right off. It just felt better. My breathing was better and I felt overall relief."

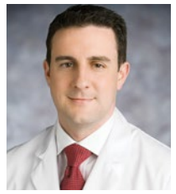
Doctors kept Parker for observation overnight. Within six days, he was back on the job.

He continues cardiac rehab and enjoys biking and walking with ease – welcome changes that came with his new aortic valve.

"The CHI Health heart team does a great job, that's for certain," Parker said. "I would recommend them to anyone. If you're going to have heart procedures done, go check with them."

Taking on Triglycerides:

Research Medication Lowers Fatal Fat



Joseph Thibodeau, MD
Cardiologist

Sherri Goff survived a heart attack but still had high levels of triglycerides, a type of fat, in her blood.

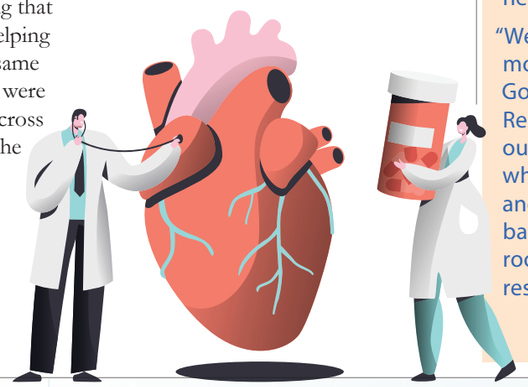
The elevated numbers worried her because the fat in her blood could lead to hardening of the arteries or a thickening of the artery wall. That could mean a higher risk of stroke or another heart attack.

But because she enrolled in a CHI Health clinical trial, she now has lower levels of the dangerous fat – and the satisfaction of knowing that in the coming months, she's helping thousands of others with the same problem. CHI Health patients were among hundreds of patients across the country who took part in the five-year-long clinical trial.

The drug she took – now known as Vascepa – proved to dramatically reduce the risk of cardiovascular "events" by lowering very high levels of triglycerides by 33 percent.

"It is definitely accurate to call Vascepa a lifesaver," said Sherri's cardiologist, Joseph Thibodeau, MD. "Vascepa helps reduce the risk of MI (myocardial infarction or heart attack), stroke and cardiovascular death in the study population of patients."

Dr. Thibodeau said he encounters patients every day who are at risk for a heart attack or stroke. "Many of these patients are willing to do whatever it takes to minimize their cardiovascular risk. It is gratifying to have one more piece to the puzzle and provide one more strategy to reduce their risk for a serious cardiovascular event."



Breakthrough Science: National Research at CHI Health

When the diabetes medication dapagliflozin was found to help heart failure patients, it was big news for cardiologists worldwide. Participating CHI Health physicians, research staff and patients helped make this breakthrough finding possible.

"National clinical research studies like these are available to CHI Health patients across our organization. We screen patients at all of our cardiology outpatient locations," said Kayleen Joyce, MS, CCRC, ACRP-PM, CHI Health Research Director.

More than 500 patients are currently involved in 40 active heart studies at CHI Health.

"We have been doing research for more than 25 years," said Corey Godfrey, MSPE, CCRC, CHI Health Research Manager. "It's part of our mission. It helps us define what is considered best practice and is the basis of evidence-based medicine because it's rooted in sound, scientific research."

Breakthrough Patients: Study Participation in Your Hometown

You don't have to live in a big city to participate in national clinical research.

In Hastings, Nebraska, Tom Singkofer's cardiologist told him about the "REDUCE-IT" study examining a particular type of fish oil.

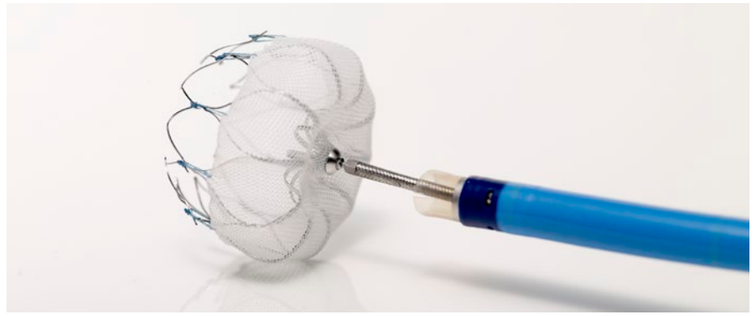
"I decided, why not?" said Singkofer, who'd undergone bypass surgery.

He then met Melissa Kelley, RN, CCRC, a CHI Health research coordinator who enrolls patients in studies. Over the next five years, she checked on Tom during office visits and by phone. "I really get a chance to know the patient," Kelley said.

When the study was over, they found out Singkofer received the placebo, not the medication, and the results: the fish oil was beneficial for heart patients.

"It was a good experience," said Singkofer. "And it didn't cost me anything."

Questions? Start with your local cardiology clinic. They can connect you with the CHI Health heart team, if needed.



Better Than Blood Thinners:

Watchman™ Device Reduces Stroke Risk in AFib Patients

Do you have atrial fibrillation (AFib)? Not a good candidate for blood thinners? Talk to your doctor about Watchman™. It's a life-changing device that can significantly reduce your risk of stroke.

Stephen Ackerman, MD
Cardiac Electrophysiologist

"Blood thinners can be difficult to regulate," said CHI Health Cardiac Electrophysiologist Stephen Ackerman, MD. "Sometimes people don't feel good when they take them. They can have side effects from the drugs, bruise easily or bleed easily, which is particularly problematic for patients with high-risk professions or hobbies like construction workers or motorcyclists."

Millions of people in the U.S. live with AFib and take blood thinners to decrease their chance of a stroke. For five years, Dr. Ackerman and the CHI Health heart team have been implanting the Watchman™ device in patients with AFib, who are at an increased risk of stroke due to clotting in the left atrial appendage, which is a small chamber in the top part of your heart.

"The appendage is an outpouching off of the top chamber of the heart, much like an outpouching off of a river," said Dr. Ackerman. "The flow slows down in that area and blood will clot there when it slows. Once the Watchman™ is inserted into the appendage, then the body heals over it and closes the appendage off, preventing clots from forming," Dr. Ackerman said.

This procedure is minimally invasive and takes about an hour under general anesthesia. Most patients go home the next day and if the healing process is on track, can stop taking blood thinners in six weeks.

CHI Health was one of the first hospital systems to offer the Watchman™ procedure and helped initiate its FDA approval by participating in clinical trials as early as 2005. To date, CHI Health Nebraska Heart and CHI Health Creighton University Medical Center-Bergan Mercy have implanted 400 of these devices – more than any other hospital system in the state.

"The more procedures you do, the better you are," Dr. Ackerman said. "Your success rate is higher and complications are lower."

Clinical Trial Studies Watchman™ for High-Risk Patients

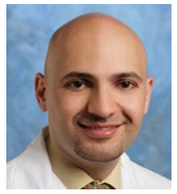
Starting in January 2020, CHI Health began a new clinical research trial designed to determine if the Watchman™ device is a reasonable alternative for high-risk patients with AFib who are on blood thinners and have undergone ablation.

The results could benefit many more people living with atrial fibrillation in the future.

"I think it's huge," Dr. Ackerman said. "Just not having to take blood thinners, would mean so much to so many! A lot of these people live in fear that they could almost bleed to death with blood thinners, so it's a really big deal for them."

For more, go to CHIhealth.com/WatchmanVideo

Himanshu Agarwal, MD
Interventional Cardiologist



Hussam Abuissa, MD
Electrophysiologist
Cardiologist

World's First:

One-of-a-Kind Heart Procedure Took Weeks of Prep

Imagine performing a complex surgery on a man's heart – in reverse.

This isn't the latest episode of "Grey's Anatomy" or "Chicago Med." It's a real procedure performed by CHI Health cardiologists and it's the first time this type of surgery has been done anywhere in the world.

The 82-year-old patient had a condition known as "dextrocardia with situs inversus." It's a rare heart condition where the heart and other internal organs are reversed. In Anthony Miloni's case, his heart, liver and other organs were flipped from where they are ordinarily.

"It was like a mirror image of his heart," said Interventional Cardiologist Himanshu Agarwal, MD. "Instead of being on the left, it was on the right."

Things really became complicated when Miloni needed an operation for atrial fibrillation (AFib), which affected his heart's ability to pump blood normally.

The procedure's called the Watchman™ and the device is the only one approved by the FDA for reducing the risk of stroke in people with AFib. Hundreds of thousands of the devices have been implanted successfully worldwide.

But not on an older patient with a heart that's on the right – rather, the wrong – side of his body.

"Approaching the heart from the liver on the left side, while the heart is on the right side, was totally opposite from what we typically do during such cases," said Cardiac Electrophysiologist Hussam Abuissa, MD. The team was forced to go through the liver – further complicating the procedure – because the patient was missing the vein that drains blood from the lower half of the body. "On top of that, the patient had multiple pacemaker wires which were in the way."

Preparations took weeks.

"I researched if anyone else anywhere in the world had done this procedure before," Dr. Agarwal explained.

"We had a 3D model printed from his scans and we 'shadow practiced' the entire procedure with the help of catheters. I also used a mirror to help retrain my muscle memory and brain, as this patient's heart was a true mirror image of a normal person's heart."

Operating room equipment "was not designed for anatomical deviations" such as Miloni's, Dr. Abuissa said. "I had to make sure we had all appropriate imaging (CT scans) and access equipment for the procedure."

Their meticulous planning paid off. The procedure was a success.

"It felt extremely gratifying!" said Dr. Abuissa. "This just speaks to our great team which has been able to achieve what hasn't been even *tried* at other institutions."

"What a great sense of accomplishment," said Dr. Agarwal. "That such a tough case could be pulled off without any problems!"

Questions? Start with your local cardiology clinic.
They can connect you with the CHI Health heart team, if needed.

Grateful for Surgeons' "Whatever It Takes" Approach

Anthony Miloni was on blood thinners to treat his atrial fibrillation, a condition that interferes with the heart's ability to pump blood normally.

But since blood thinners change the way your blood clots, he worried that a bad fall could be serious, even deadly.

The Watchman™ procedure was perfect for a patient like Tony. Except for one complication – his heart was located on the right side of his body rather than the left.

He wasn't sure any cardiologist would take on his tough case – until he met the team with the "whatever it takes" mentality.

After weeks of preparation, Himanshu Agarwal, MD, and Hussam Abuissa, MD, performed the Watchman™ procedure.

"Now my heart is working fine," Miloni said. "Everything is fine. I'll live until I'm 105."

Then he corrected himself.

"Make that 108!"

Chest Pain Demystified:

3D Heart Mapping Pioneered at CHI Health

Omar Nass, MD
Cardiologist

Is it a heart attack? That's the number one question for patients with chest pain. A definitive answer often requires a coronary angiogram that looks inside the heart.

The answer is no for more than half (55 percent) of chest pain patients who come to the emergency room. That's good news. The downside is having to undergo a procedure in which a catheter is inserted into your wrist or groin and threaded all the way to your heart – only to find no significant blockage.

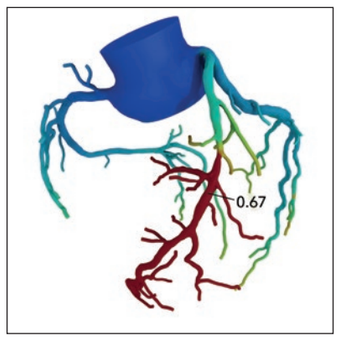
What if you could get the answers without the needle, catheter and recovery?

Now, you can. New technology called HeartFlow FFRct Analysis – creates a color-coded 3D map of your heart without having to undergo a coronary angiogram. The noninvasive test approaches a 90 percent accuracy rate when compared to 50 to 70 percent for angiography – which is an invasive procedure.

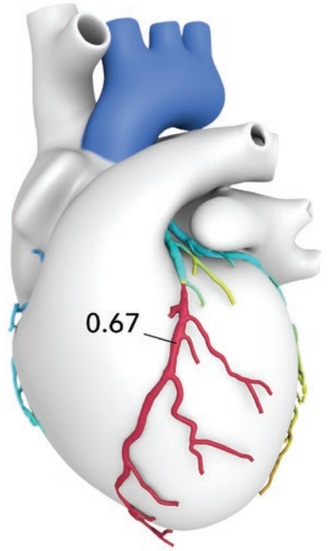
The new technology was pioneered in 2018 at CHI Health hospitals.

"This technology provides a major leap forward in our ability to detect blockages without having the patient undergo an invasive procedure," said CHI Health Cardiologist Omar Nass, MD.

HeartFlow uses CT data and advanced computer algorithms to create the personalized digital 3D models of coronary arteries and blood flow. "Because the system uses artificial intelligence, it gets smarter and faster with each new set of data," said Dr. Nass.



Above: HeartFlow's color-coded map of coronary arteries shows the extent of narrowing (.67 indicates severe blockage).



Right: HeartFlow's 3D technology maps a patient's unique coronary anatomy (shown here over a model not representative of actual product).

Heart at Risk? Take the Quiz

More than 600,000 people die of heart disease every year. Learn about your heart health risk and your heart's *real* age by taking our online quiz today.

- Customized Heart Risk Report
- Free Phone Consultation to Review Your Risk (available for those at high risk)

Go to CHIhealth.com/HeartRisk

For more, go to CHIhealth.com/HeartStressors

Questions? Start with your local cardiology clinic. They can connect you with the CHI Health heart team, if needed.

Tiniest Pacemaker Calls Heart Home

The world's smallest pacemaker is here, and it's changing the future of cardiac pacing.

Wireless and the size of a large vitamin, the Micra™ is 93 percent smaller than conventional pacemakers. It is implanted directly into the heart via a catheter – rather than being surgically placed in the chest.

The Micra™ has tiny hooks that attach to muscular fibers in the right ventricle. "It's less than 1 percent of the space of that chamber, so the heart doesn't even know it's there," said Joseph Thibodeau, MD, CHI Health cardiologist.

The pacemaker is placed in the heart via a leg vein and recovery takes a fraction of the time required for traditional pacemakers. "There's a lower risk of complications and infections, and battery life is longer at 13 years," said Dr. Thibodeau.

The Micra™ is for patients who have permanent atrial fibrillation and need a single-chamber pacemaker. A newer version called the Micra™ AV is now available for patients who need a conventional dual-chamber pacemaker.

"Now that the new device is available, the numbers will quadruple as more people will be candidates," Dr. Thibodeau said.

Rhythm Experts:

EP Labs Use Latest Precision Tools

When hearts skip a beat, the solution is often to destroy a tiny section of heart tissue which is causing rapid or irregular rhythms.

The procedure, called ablation, requires the ultimate in precision.

"At CHI Health, we perform the most ablations in the region and our outcomes are comparable to the highest institutions in the country," said Hussam Abuissa, MD, CHI Health Cardiac Electrophysiologist.

Those outcomes are made possible by the latest tools used at CHI Health electrophysiology labs for ablation techniques which correct heart arrhythmias.

For example, imagine the tip of a crayon. That's about the diameter of an advanced ultrasound catheter. "It's a 2 to 3 mm thick wire, and we use it to visualize the whole heart. This allows us to decrease the amount of radiation for patients and our staff," said Dr. Abuissa.

Now envision tiny magnetic dots, like those used to create computer animations. Similar technology is used to create real-time 3D models of the heart. "It's much like animation but we have the added fourth dimension of time. We can see how quickly the signals are moving in 3D space," Dr. Abuissa said.

CHI Health cardiac electrophysiologists also specialize in the placement of devices such as traditional and advanced pacemakers, defibrillators and the Watchman™ implant.

"In addition, our Device Clinic provides remote monitoring for around 4,000 patients," Dr. Abuissa said. "We serve patients in Iowa, Nebraska, South Dakota and Missouri."

Electrophysiology, or heart rhythm management, treats abnormalities or arrhythmias, such as atrial fibrillation, atrial flutter and ventricular tachycardia.

CHI Health

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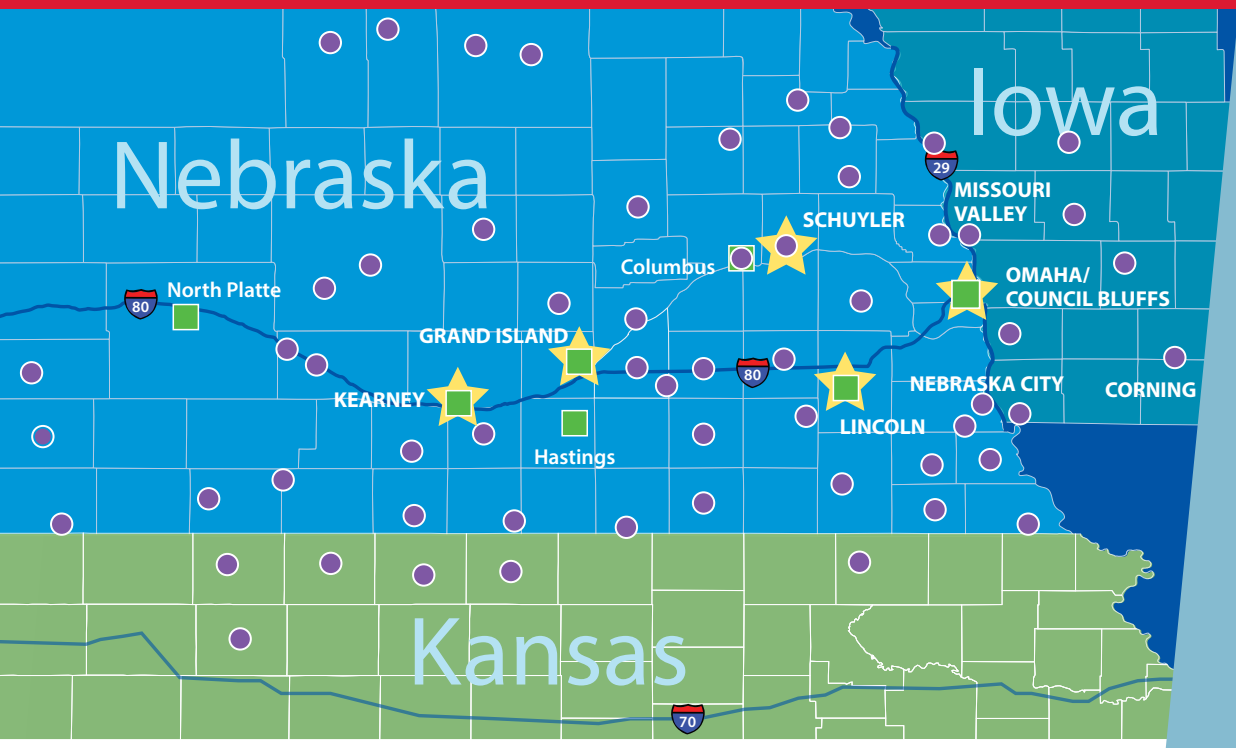
TRUST THE EXPERTS AT HEART



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(308) 946-7343

CHIhealth.com

CHI Health Hospitals with Heart Care | **Cardiovascular Clinics** | **Outreach Sites**

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CHI Health St. Elizabeth
CHI Health Nebraska Heart

Nebraska City
CHI Health St. Mary's

Omaha
CHI Health Creighton University Medical Center - Bergan Mercy
CHI Health Immanuel
CHI Health Lakeside
CHI Health Midlands

Plainview
CHI Health Plainview

Schuyler
CHI Health Schuyler

IOWA

Corning
CHI Health Mercy Corning

Council Bluffs
CHI Health Mercy Council Bluffs

Missouri Valley
CHI Health Missouri Valley