

December 11, 2016
startribune.com

StarTribune

25°  10°
Bitter temperatures in
the week's forecast. **B16**

SUNDAY, DECEMBER 11, 2016

StarTribune

STARTRIBUNE.COM/BUSINESS • SECTION D

BUSINESS

D6 • STAR TRIBUNE

BUSINESS

SUNDAY, DECEMBER 11, 2016

WHITEBOARD

WORLD OF GADGETS



OCULUS TOUCH \$200

Controllers make a difference with Rift

The Oculus Rift virtual-reality headset became available this year to much fanfare, but it was missing something that would have made playing around in the digital world even better: the ability to move your hands independently. Oculus has released a pair of new controllers, called Touch, which give you a controller to use with each hand.

It is hard to overstate how much of a difference this makes in terms of immersion. Everything feels different when your arm and hand movements are reflected into the digital world — pointing at objects, reaching for hand-holds and even pulling a trigger is much better with dual controllers. It's much easier to lose yourself in a world when you are using your own limbs.

Looking beyond games — something that is vital to the future of virtual reality — the addition of individual controllers for each hand is a big step. Some of the most compelling Touch experiences are not traditional games. Quill, Oculus' own drawing and painting program, lets users really get close to their art and shows just one way that virtual reality can move beyond gaming into other creative ventures.

Overall, the Touch controllers are not as good as the HTC Vive's, which come with that headset. This also doesn't change the recommendation that the top virtual-reality headset to fit most people's needs will be the PlayStation VR, if only because the people most likely to want a gaming headset are likely to have a PlayStation already (Rift requires a high-end computer and storage many don't have).

REALLY BAD CHESS FREE FOR IOS

Two queens? It might happen with this game

Really Bad Chess is an engaging and wacky version of the classic game, which assigns players a random set of chess pieces. The pieces move in the same way as in regular chess, but players could end up with three bishops, a couple of queens — you never know what you are going to get. The result is a controlled version of chaos on the chessboard, and it provides an interesting challenge for new and old chess players. The free version of the game (for iOS devices) pits players against the game's artificial intelligence in a few game modes that let you improve your rank among all of the game's players. You can also pay \$3 to unlock a pass-and-play mode, which has an ad-free mode.

WASHINGTON POST

INNOVATION MEDICAL TECHNOLOGY



JERRY HOLT • jerry.holt@startribune.com

Pursuit Vascular CEO Doug Killion said his company's work can cut roughly \$600 million in unnecessary spending from the health care industry.

Cleaning up the dialysis process

A 'simple' plastic cap made in Maple Grove could reduce the infection rate for patients

By JOE CARLSON • joe.carlson@startribune.com

They don't look like much — two plastic screw-caps, one red and one blue, each bearing a small dipstick with a slightly sticky invisible coating.

But these small caps may one day save hundreds of lives, and hundreds of millions of dollars in unneeded health care expenses. And they are made in Maple Grove.

For the past year, a start-up company there called Pursuit Vascular has been having its ClearGuard HD Antimicrobial Barrier Caps for hemodialysis catheters quietly tested on thousands of patients who visit dialysis clinics run by major competing chains, Fresenius Medical Care North America and DaVita.

The DaVita study is still ongoing, but Pursuit Vascular CEO Doug Killion said the industry that fights kidney failure is already excited about the strong results from the randomized study of Fresenius patients.

"You can reduce the infection rate by 69 percent, as we've shown in this study that was just published, which is a stunning number," Killion said. "People are ecstatic about a 69 percent reduction in these infections, with a product that is ... brilliantly simple."

The kidneys are supposed to remove harmful waste, toxins and excess fluid from the blood. Patients in kidney failure often undergo a life-saving treatment called hemodialysis, in which the patient's blood is slowly pumped out and run through a machine that removes the chemicals and fluids before pumping it back into the body clean.

Doctors have devised several ways to move that much blood in and out of the body several times per week. One of the more common solutions is a device called a chronic hemodialysis catheter, which is a surgically implanted set of tubes with one end sticking out of the patient's body and the

other end embedded in a major vein just outside the heart.

A simple clamp keeps material from moving into or out of the catheter when not in use.

Such catheters put patients at disproportionately high risk for developing serious bloodstream infections. Although the raw infection rate may appear relatively low — less than one positive blood test per 1,000 patient days with a chronic hemodialysis catheter in the Fresenius study — the rate is applied to a vast group of 15 million catheter-based dialysis procedures that are performed per year in the U.S.

The infection rates are so high that experts including the National Kidney Foundation recommend using a different long-term use vascular-access system, if possible. Many patients eventually switch to other methods, like a fistula or a graft implant, but most dialysis patients are discharged from acute care with an implanted hemodialysis catheter.

The Centers for Disease Control and Prevention estimates that 37,000 hemodialysis patients per year develop bloodstream infections. Killion estimated that Medicare pays about \$16,000 per episode of hemodialysis blood stream infection, which amounts to nearly \$600 million in spending.

"Medicare hates these because they have to pay for the infections, and the infections are very costly and very deadly," Killion said.

(Medicare is mainly a program for people aged 65 and older, but it covers hemodialysis patients of all ages through its \$31 billion end-stage renal disease care program.)

The caps made by Pursuit Vascular work by treating the catheter's external tip with a chemical called chlorhexidine, which kills bacteria and fungi.

The chemical is considered an antimicrobial, not an antibiotic, meaning it's far less likely to

breed antibiotic-resistant super germs while it's screwed onto a catheter access hub, Killion said. The chemical is clear and sticky like fruit cocktail juice left to dry.

The U.S. Food and Drug Administration cleared the prescription-only ClearGuard HD End Caps for use in 2013.

In the Fresenius study, which was funded by Pursuit Vascular but independently run by Fresenius researchers, 2,470 patients were treated at sites around the country that were randomized to either stick with existing disinfection protocols or switch to the ClearGuard caps.

The study found ClearGuard HD caps were associated with 43 percent fewer hospital admissions for serious bloodstream infections than the control group that used Fresenius' normal caps.

Looking at the broader measure of infections overall, the rate of patient blood cultures testing positive for infection was 69 percent lower in the ClearGuard group, with 0.22 positive blood tests per 1,000 treatment days with the ClearGuard cap vs. 0.72 positive tests per 1,000 days using Fresenius' standard equipment and protocol.

Killion said one of the key breakthroughs that led to the ClearGuard caps was the realization that infectious microbes infect the outside end of the catheter first, before colonizing the entire tube and forming a biofilm that can't easily be removed. The chlorhexidine in the caps doesn't remove such biofilm. ClearGuard inventor Bob Ziebol, co-founder and vice president of Pursuit Vascular, realized that a health care provider wouldn't have to deal with biofilm if it just kept the cap clean from the beginning.

"He knew through experimentation that the infection process always starts here at the hub. People don't know that," Killion said. "What they see is the patient with the blood stream infection. Their catheter is completely filled with biofilm from the tip all the way to the hub, and they think, 'Oh, we have to come up with a liquid that you can fill the whole catheter with.' And Bob said, maybe you don't."

Joe Carlson • 612-673-4779