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IV Connectors Studied for Preventing Bacterial Growth

Nursing Research Compares Different Kinds of IV Connectors

WASHINGTON, D.C. – Two IV [needleless connectors](#) made by RyMed Technologies outperformed other connectors in suppressing bacteria known to cause [catheter-related bloodstream infections](#) (CRBSI), according to a poster presentation at the 2010 State of the Science Congress on Nursing Research.

The poster also summarized research showing that RyMed's [InVision-Plus®](#) reduced occlusions 20%-to-84% in clinical settings with cancer patients. Occlusions have been shown by research to lead to CRBSI, the poster notes.

The biennial congress is the premier event of the [Council for the Advancement of Nursing Science](#) (CANS). The poster was selected for inclusion in the meeting in part because it summarizes new research of importance to nurses.

“The research reported in this poster suggests several important conclusions,” said [Cynthia Chernecky](#), Ph.D., RN, AOCN, FAAN, the poster's lead author. “First, [IV connector design](#) matters in preventing CRBSI and occlusions. Only one manufacturer's devices were effective in this regard based on our study.”

“Second, clinicians shouldn't assume that anti-bacterial coatings are automatically more effective. The best non-anti-bacterial connector we tested far outperformed a silver-coated connector. Third, no connector should be used in a clinical setting unless its effectiveness is evident by our clinical research. That research should include a blood component because blood reflux is a major factor in CRBSI.”

The poster had three coauthors: Jennifer Waller, Ph.D., Denise Macklin, BSN, RNC, and Brenda Caillouet, MPH, BSN, RN, CRNI.

The [in vitro](#) study that utilized a blood component took place in two stages. In the first stage, five different connectors were compared for their ability to suppress the growth of various bacteria that cause CRBSI. The researchers found InVision-Plus to be the most effective of those connectors. The device exhibited no consistent [colony-forming units](#) (CFUs) of bacteria during the four test days for any of the four bacteria tested.

The connectors that proved to be less effective than InVision-Plus were MaxPlus® Clear (CareFusion/Medegen), MicroClave® (ICU Medical), Q-Syte™ (BD), and TKO™/Clave® (Hospira/Lifeshield™).

In the study's second stage, InVision-Plus – as the most effective connector from Stage 1 – was compared to two connectors impregnated with anti-bacterial agents. The two anti-bacterial connectors were [InVision-Plus® CS™ with Chlorhexidine-Silver Ion Engineering](#) (RyMed Technologies) and the silver coated V-Link™ (Baxter Healthcare).

Both InVision-Plus connectors performed well, producing no consistent CFUs. In contrast, V-Link produced up to 200 times more bacteria than either the non-antibacterial InVision-Plus or InVision-Plus CS (anti-bacterial).

The non-anti-bacterial connectors in the study's first stage encompassed several widely used designs. InVision-Plus is a neutral/zero fluid displacement connector (also called an intraluminal protection connector). MaxPlus® Clear is a positive displacement (or positive-pressure) connector. MicroClave® and TKO™/Clave® are negative displacement (or negative pressure) connectors. Q-Syte™ is an earlier form of negative displacement connector sometimes known as a “split septum” connector.

The FDA recently issued an [alert](#) requiring all manufacturers of positive displacement connectors to prove that their devices do not increase CRBSI risk. This is because numerous studies already associate positive displacement connectors with higher rates of CRBSI. Studies also associate negative displacement connectors with higher CRBSI rates, due to higher rates of occlusion.

Notably, the positive and negative displacement connectors in the current research were not able to control bacterial growth, which is consistent with those earlier studies. The ineffectiveness may be due in part to the bacteria-nurturing effect of blood residue in the connectors. The residue is caused by blood reflux. InVision-Plus connectors are not subject to blood reflux, which may help explain their effectiveness in the current study.

The poster's data on occlusions is based on research by co-author Brenda Caillouet at a nationally prominent cancer center in Houston, Tex. InVision-Plus was implemented at the center because center's cancer patients are severely ill with compromised immune systems, making them unusually vulnerable to infections.

CRBSI are one of the leading hospital-acquired infections and one of the nation's leading killers overall. They are fatal in up to 25% of cases and cost an estimated \$34,000 to \$56,000 per incident to treat, according to the [Institute for Healthcare Improvement](#).

“It's an honor to be selected for presentation at the CANS congress because only studies that are considered to advance nursing science are chosen,” said Dr. Chernecky, “But what's most important here is the recognition that choosing the safest, evidence-based IV connector plays a vital role in preventing occlusions and potentially fatal infections.”

The CANS congress was held Sept. 27-29 in Washington, D.C.

About RyMed Technologies, Inc.

Founded in 1994, RyMed Technologies specializes in the development and marketing of innovative safety products in the field of intravenous catheter care management. The company's products are designed to help reduce catheter-related infections associated with vascular access. More than 10 years of research and development have gone into InVision-Plus.

The company is headquartered in Franklin, Tenn. For more information, call (615) 790-8093 or access www.rymedtech.com.

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