Infection alert in catheters could tackle hospital superbugs

Amsterdam (April 25, 2016) - A new infection alert system in catheters could prevent serious infections in millions of elderly people, according to researchers at the University of Bath, UK. The system, which uses a new material developed by scientists at the University of Bath, could help prevent urinary tract infections in hospital patients and in elderly people living in care homes.

A catheter drains urine from the bladder when a person can't release urine without help or is incontinent, including elderly people living in care homes. Over the years, bacteria can build a layer called a biofilm inside the catheter tubes that eventually blocks them. The urine then becomes acidic, promoting the growth of resistant bacteria that are difficult to treat.

The new system developed by Dr. Toby Jenkins and his colleagues provides a means of early detection, so the catheter can be changed and the infection treated before a person becomes unwell.

"Catheter-related infections are a serious problem, especially if the bacteria are resistant to antibiotics. We hope that with this simple to use sensor system we can ultimately make a real difference to patients' lives," said Dr. Jenkins.

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The new system is based on a material called a "smart coating" that can change color in response to the presence of bacteria. The coating contains a special dye that is released when acidic urine comes in contact with it. The dye turns the urine bright yellow, revealing the infection.

The coating is made up of two layers. The first reacts to changes in urine caused by the bacteria, the second layer releases the dye. When bacteria grow in the catheter, they produce a type of acid that dissolves the top layer of the coating, releasing the dye into the urine.

Dr. Jenkins' team used a glass bladder, artificial urine and bacteria from patient samples to test the system. It showed that the coating could detect infection before the catheter was blocked, preventing the need for emergency surgery to remove the catheter.

The authors also hope the catheter coating could be used to cut the cost of treating infection, estimated to be over $3 billion per year in the US alone. They plan to run clinical trials to show the system is safe and beneficial for patients.

The article is "An in-situ infection detection sensor coating for urinary catheters" by Scarlet Milo, Naing Tun, Thet, Jenkins T. (2016). It appears in Biosensors and Bioelectronics, Volume 81 (July 2016), published by Elsevier.

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