



NEUROMEDEX - NEURO



VENTRIGUARD®

antimicrobial catheter for temporary ventricular drainage



Long-term antimicrobial effect

- proved under practice-equivalent test conditions
- Prevents bacterial <u>and</u> mycotic infections
- by addition of ionized silver instead of antibiotic surface coating
- also effective against antibiotic-resistant bacteria like MRSA and VRE
- Biocompatible

NEUROMEDEX

- proved by comprehensive laboratory studies
- Precise catheter positioning
- by numbered length markers in 1 cm steps

VENTRIGUARD[®]—Technology Quadruple antimicrobial effect

Silver ions impair the functional and structural proteins of the bacteria cell. Result: Cellular integrity and cell proliferation decrease.



NEUROMEDEX

Silver ions induce structural changes of the bacteria cell wall. Result: Integrity and functionality of the cell wall are reduced, the cell loses its protection. 37

16

While silver ions attack the cell membrane, ions such as potassium and sodium are released. Result: An electrolytic imbalance is created, the cell dies off.

NEUROMEDEX

NEUROMEDEX

NEUROMEDEX

- NEUROMEDEX

- NEUROMEDEX

www.neuromedex.com/en/ventriguard-ventricular-catheter

- NEUROMEDEX

- NEUROMEDEX - NEUROMEDEX

VENTRIGUARD® ANTIMICROBIAL VENTRICULAR CATHETER

The VentriGuard ventricular catheter meets all neurosurgical requirements for temporary CSF drainage while offering a maximum of infection prophylaxis.

The innovative VentriGuard technology utilizes smallest amounts of ionized silver, which are completely incorporated in a non-metallic porous molecular structure. This unique interaction of material and active ingredient guarantees antimicrobial protection without toxic strain for the patient. Unlike catheters being only coated with antibiotics, VentriGuard products are affecting gram-positive as well as gram-negative bacteria.

As a further key benefit catheter placement with utmost precision is permitted by length markings in intervals of 1 cm and by a mandrin that reaches all the way to the closed tip of the catheter. Catheter dislocation is prevented by a specific connector which is fixed directly onto the scalp.

Ventricular catheter for external drainage with mandrin, catheter connector, spare butterfly and trocar

Ref. No.	Description	I.D. / A.D.	Length	Packaging Unit
60-0200	VentriGuard - Antimicrobial catheter 8.5 F, standard perforation	1.6 x 2.8 mm	30 cm	1 ea/box
60-0214	VentriGuard - Antimicrobial catheter 8.5 F, large perforation	1.6 x 2.8 mm	10 cm	1 ea/box
60-0010	VentriGuard - Antimicrobial catheter 10 F, large perforation	1.8 x 3.3 mm	30 cm	1 ea/box

VentriGuard - Antimicrobial EVD-set

Ref. No.	Description	Packaging Unit
50-0870	VentriGuard - Antimicrobial EVD-system (50-0000) with VentriGuard ventricular catheter 8.5 F (60-0200)	1 ea/box
50-1070	VentriGuard - Antimicrobial EVD-system (50-0000) with VentriGuard ventricular catheter 10 F (60-0010)	1 ea/box

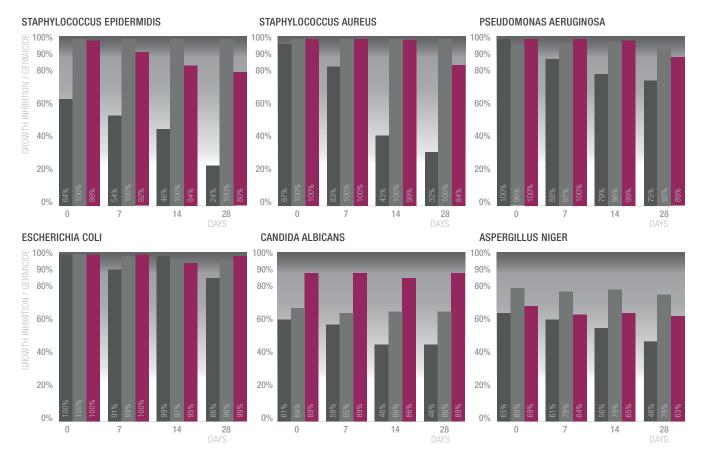
All mentioned products are sterile, double packed and latex free.





RESULTS

Overview of the results of the comparative tests* between the Neuromedex VentriGuard ventricular catheter, the conventional silver ionbased ventricular catheter and the impregnated ventricular catheter (smooth transition from growth inhibition to germicide depending on the specific conditions in relation to protein concentration and fluid exchange during application, growth inhibition already sufficient in the event of long-term application (calculated here for a contact time of 6h) due to cumulative aspects).



*The diagram shows the results of a comparative application-based examination of the anti-microbial effectiveness which was conducted as a blind study for this trial by an laboratory accredited aeruginosa, Escherichia coli, Candida albicans, and Aspergillus niger, an initial bacterial load of approx. 1 x 103 KBE/sample in a test medium containing serum, a contact period of 6 h at

NEUROMEDEX

NEUROMEDEX

- NEUROMEDEX NEUROMEDEX VENTRIGUARD® ventricular catheter

- NEUROMEDEX

NEUROMEDEX

- NEUROMEDEX

Conventional silver ion-based ventricular catheter Impregnated ventricular catheter

NEUROMEDEX - NEUROMEDEX

NEUROMEDEX - NEUROMEDEX



VENTRIGUARD® ANTIMICROBIAL EVD THERAPY WITH LONG-TERM PROTECTION

VentriGuard is a new and exceptionally effective product concept for temporary ventricular drainage. It is based on a patented technology for the targeted release of silver ions. In contrast to other application areas, high protein concentrations in liquor put particular demands on a sufficient and primarily long-term release of silver ions in order to effectively prevent the material from being colonised by micro-organisms. VentriGuard presents a dependable and durable means of achieving this.

Perfectly balanced

VentriGuard's active substance formula is specifically adjusted to the ventricular space and guarantees optimal antimicrobial properties over the entire duration of application without approaching the toxic threshold values and without significantly affecting biological compatibility.

Superior, safe technology

VentriGuard also offers effective protection from antibiotic resistant germs and fungi - in contrast to antibiotic-coated ventricular catheters. VentriGuard Technology deliberately avoids the use of nano-scale substances, because their long-term toxicological effects have not been sufficiently researched.

Proven effect

The long-term antimicrobial effect of VentriGuard (with simultaneous biological compatibility) has been verified in comprehensive laboratory tests under conditions equivalent to those of application.

VentriGuard - innovation from the specialist

VentriGuard is developed and manufactured by the Swiss medical engineering company NEUROMEDEX, a specialist in application-oriented single-use products for neurosurgery and pain treatment.

You can find more information here:

www.neuromedex.com/en/ventriguard-ventricular-catheter

Advantages of VentriGuard technology over antibiotic catheters

- The risk of resistance formation is greatly reduced
- Not only a good effect against gram-positive and gram-negative bacteria, but also against yeasts and fungi
- Spectrum of efficacy against MRSA and other antibiotic-resistant germs
- Long shelf life in sterile packaging (3 years)
- Proven effectiveness against fungi and yeasts
- Refrigerated storage is not necessary



NEUROMEDEX - NEUROMEDEX

Neuromedex GmbH • Guggerstrasse 32 • CH-8702 Zollikon/Zürich phone +41 (0)44 390 38 00 • fax +41 (0)44 390 17 14