Antimicrobial Arrowgard Blue Advance® Catheters
Protect from pathogens on the CDC’s “Severe Threats” List
What's the threat?

The invisible risk

According to the CDC, antibiotic resistance is one of the greatest global public health challenges of our time.\(^1\)
Antimicrobial Stewardship Programs

Hospital antimicrobial stewardship programs are implementing systematic programs and practices in order to limit the use of antibiotics that could result in increasing antibiotic resistance in dangerous bacteria.

How are providers responding?
What are your challenges?

Stopping the spread of antibiotic resistant pathogens

Catheters help treat patients, but can be pathways for germs (including antibiotic resistant bacteria) to enter the body.
How can Teleflex help?

With Arrowg+ard Blue Advance® Catheters
Arrowg+ard Blue Advance Catheters are the 3rd generation of chlorhexidine-based protective treatment from Teleflex.

Arrowg+ard Blue Advance Catheters have been shown to provide at least 99.99% reduction in catheter colonization by gram-positive and gram-negative bacteria and fungi for at least 30 days.²

99.99% Colonization Reduction³
Where's the proof?

The power of blue

In a controlled benchtop study, antimicrobial Arrowgard Blue Advance® Catheters demonstrated a 100% decrease in bioburden on the catheter surface of various CLABSI pathogens (6 of them antibiotic resistant and on the CDC Serious Threats), including:

- Methicillin Resistant *Staphylococcus aureus*
- Carbapenem Resistant *Enterobacter cloacae*
- Methicillin Resistant *Staphylococcus epidermidis*
- Carbapenem Resistant *Escherichia coli*
- Carbapenem Resistant *Klebsiella pneumoniae*
- Vancomycin Resistant *Enterococcus faecalis*

See page 9, *Comparing Antimicrobial Effectiveness*, for testing data.
Where's the proof?

In that same test, the Bard® PICC and the AngioDynamics Bioflo® PICC actually demonstrated an increase in bioburden in five out of six tested antibiotic resistant pathogens on the CDC Serious Threats List tested, including:

- Methicillin Resistant Staphylococcus aureus
- Carbapenem Resistant Enterobacter cloacae
- Carbapenem Resistant Escherichia coli
- Carbapenem Resistant Klebsiella pneumoniae
- Vancomycin Resistant Enterococcus faecalis

See page 9, Comparing Antimicrobial Effectiveness, for testing data.
Using a protected Arrowgard Blue Advance® Catheter can help you combat antibiotic resistant bacteria by:

• **Reducing catheter colonization** from major CLABSI causing pathogens including antibiotic resistant bacteria on

• **Protecting the catheter inside and out** with antimicrobial protection along the entire intra- and extraluminal fluid pathway, including the extension lines

Click here to see video of the antimicrobial Arrowgard Blue Advance Catheter in action
Comparing Antimicrobial Effectiveness

**Objective:** To evaluate and compare the antimicrobial effectiveness of three different types of commercially available Peripherally Inserted Central Catheters (PICCs) against six antibiotic-resistant bacteria (superbugs).

**Methodology:** Equal segments were cut from three groups of PICCs: Chlorhexidine-based (Group A), Fluorine-based (Group B), and untreated (Group C). The external surface of the cut segments was challenged with one of the six tested organisms for 24 hours. All six organisms were tested on each of the three groups. The concentration of the challenge inoculum for each organism was at 1.5 x10^5 Colony Forming Units per Milliliter (CFU/mL). Adherent microorganisms were recovered by sonication in Dey-Engley (D/E) neutralizing broth and subsequent quantitative plating on D/E agar. The Log_{10} reduction (LR) was determined by comparing the CFUs recovered from the segments to the initial inoculum concentration as well as to the positive control. Each test was done in triplicate. Percent increase/decrease in bioburden (adherent microorganisms) was calculated from Log_{10} reduction results.

**Results:**

<table>
<thead>
<tr>
<th>ORGANISM</th>
<th>ARROWG+ARD BLUE ADVANCE® PICC</th>
<th>BARD® PICC</th>
<th>ANGIODYNAMICS BIOFLO® PICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHALLENGE CONCENTRATION (CFU/ML)</td>
<td>RECOVERED CONCENTRATION (CFU/ML)</td>
<td>PERCENT DECREASE/INCREASE IN BIOMEDUR (%)</td>
<td>CHALLENGE CONCENTRATION (CFU/ML)</td>
</tr>
<tr>
<td>Methicillin Resistant Staphylococcus aureus ATCC 33591</td>
<td>150,000</td>
<td>0</td>
<td>100.00</td>
</tr>
<tr>
<td>Carbapenem Resistant Enterobacter cloacae BAA-2468</td>
<td>150,000</td>
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<td>100.00</td>
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<tr>
<td>Carbapenem Resistant Escherichia coli BAA-2469</td>
<td>150,000</td>
<td>0</td>
<td>100.00</td>
</tr>
<tr>
<td>Carbapenem Resistant Klebsiella pneumoniae BAA-2470</td>
<td>150,000</td>
<td>0</td>
<td>100.00</td>
</tr>
<tr>
<td>Methicillin Resistant Staphylococcus epidermidis ATCC 51625</td>
<td>150,000</td>
<td>0</td>
<td>100.00</td>
</tr>
<tr>
<td>Vancomycin Resistant Enterococcus faecalis ATCC 51299</td>
<td>150,000</td>
<td>0</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Disclosure Statement – Study was funded by and authors are employed by Teleflex LLC.
Rx only.

Contraindications: Clinical assessment of the patient must be completed to ensure no contraindications exist. Arrowg+ard Blue Advance® Catheters are contraindicated in the following areas:

• Patients with known hypersensitivity to chlorhexidine
• In presence of device related infections
• In presence of previous or current thrombosis in the intended vessel or along the catheterized vessel pathway.

No correlation between in vitro/in vivo testing methods and clinical outcomes have currently been ascertained.

References:
2. In vitro data on file 2010: AVER-004371 and AVER-004483. No correlation between in vitro / in vivo testing methods and clinical outcomes have currently been ascertained.
3. Gupta N, Giare-Patel K, et al. Are PICCs with eluting technology more effective against antibiotic resistant bacteria than non-eluting technology? Poster #T3. Disclosure Statement – Study was funded by and authors are employed by Teleflex LLC.

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