



NEONATOLOGY  
Vascular access

**expert** umbilical catheter

The only antimicrobial  
umbilical catheter

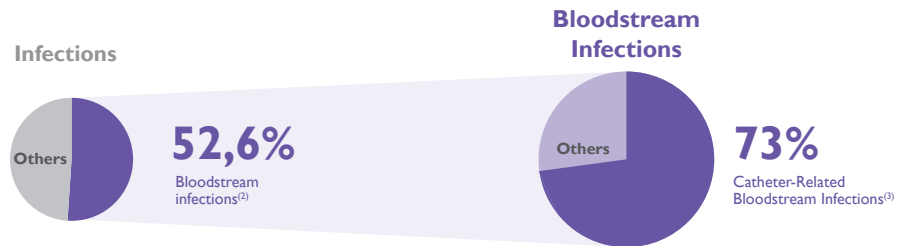


Value Life

# Catheter-Related Bloodstream Infections (CRBSI), a global challenge

## • Incidence

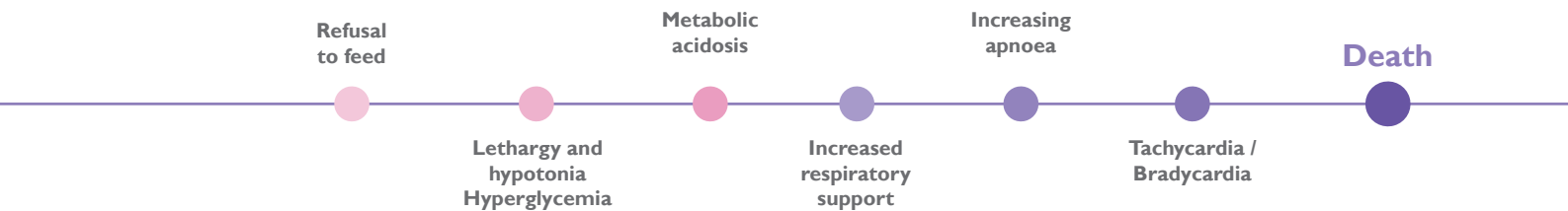
“ More than one million neonatal deaths every year in the world are attributable to infection. In Neonatal Intensive Care Units (NICUs) the reported [infection] incidence is 7-24.5%, and up to 40% in newborns with birth weight less than 1000 g or gestational age at birth <28 weeks<sup>(1)</sup>. ”



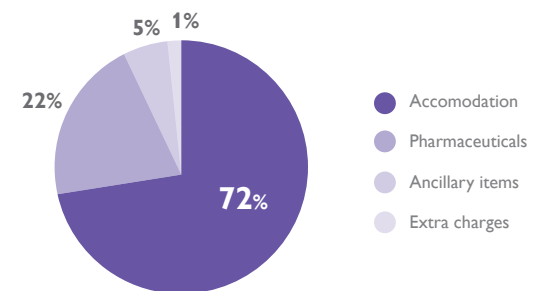
The incidence per 1000 device days is around 10.5 for umbilical catheter associated BSI<sup>(4)</sup>

Risk factors <sup>(5)</sup>		
Low birth weight	TPN	Dwell time

## • Consequences<sup>(3, 6, 7, 8)</sup>



The mean additional length of hospital stay in neonates with HAI is **24 days**.  
The mean extra charges for patients with a HAI is **11 750 €**<sup>(9)</sup>.



Repartition of additional costs due to BSI in NICU

# Recommendations<sup>(10)</sup>

“ II. Special approaches for preventing CLABSI [...] 4. Use silver zeolite - impregnated umbilical catheters in preterm infants (in countries where it is approved for use in children) ” **Society for Healthcare Epidemiology of America - 2014**

## expert umbilical catheter

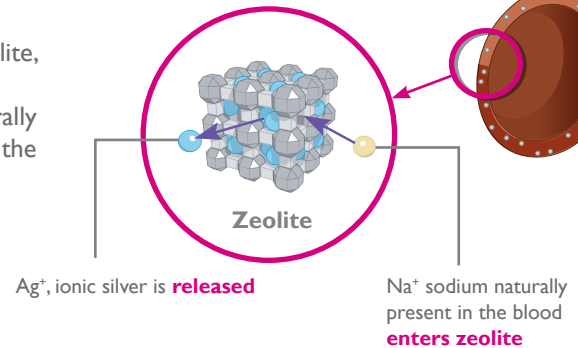
The **expert** umbilical catheter is the only umbilical catheter with an integrated antimicrobial technology, the AgION™ technology, to fight against CRBSI in NICUs.

The AgION™ technology is made of ionic silver bound into zeolite, a bio-inert ceramic integrated in the catheter material<sup>(11)</sup>. When the catheter comes in contact with blood the zeolite naturally releases the Ag<sup>+</sup> ions and replace them by Na<sup>+</sup> ions present in the blood. It is a pure ionic exchange.

Ionic silver is a highly efficient antimicrobial technology with<sup>(11)</sup>:

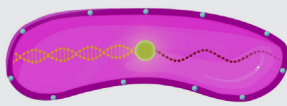
- a broad spectrum of action on gram<sup>+</sup>, gram<sup>-</sup> and fungi
- a low toxicity
- a tri-modal action

### The AgION™ technology

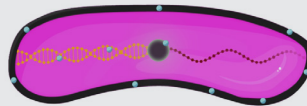


### Tri-modal efficacy

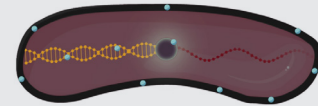
Ionic silver is a **bacteriostatic that inhibits the cell reproduction in three steps.**



**1. Damages of cell wall, Cessation of breathing**



**2. Inhibition of cell division**



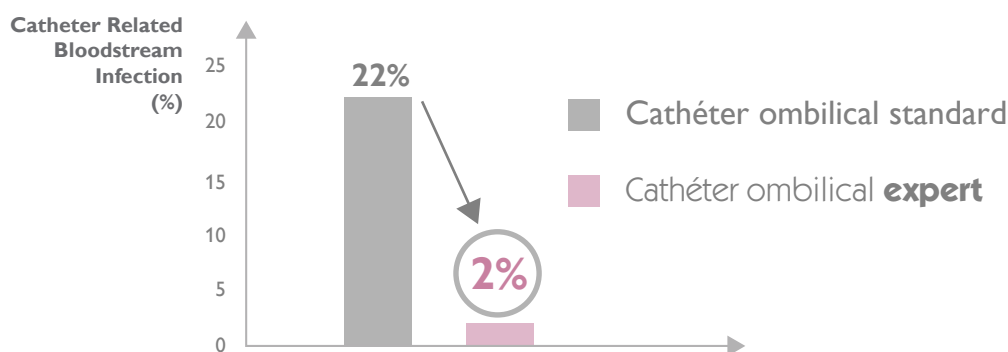
**3. Disruption of cell metabolism**

## Clinical study<sup>(12)</sup>

### • Objective & Settings

To determine the efficacy of the AgION™ antimicrobial system in reducing catheter-related bloodstream infections in preterm infants. A three year, single-site, randomised study at the Careggi University Hospital of Florence. 86 preterm infants: 45 with umbilical expert and 41 with a standard umbilical catheter.

### • Results

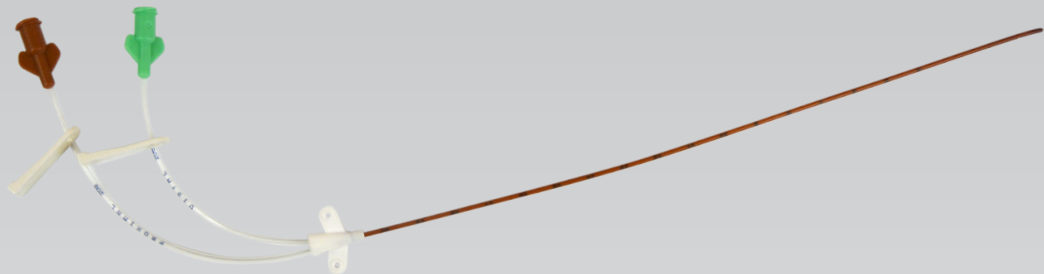


“ Preterms with expert UVC had shorter hospital stay and lower case fatality rate. ”

## Technical features

Single-lumen	Code	Fr	Length cm	Ext. Ø mm	Int. Ø mm	Flow rate ml/min	Prim. vol. ml
	8270.230	2.5	30	0.8	0.5	2.2	0.1
	8270.340	3.5	40	1.2	0.8	12	0.3
	8270.440	4	40	1.5	0.8	12	0.3
	8270.540	5	40	1.7	1.0	27	0.4
	8270.840	8	40	2.5	1.5	109	0.8

Double-lumen	Code	Fr	Length cm	Ext. Ø mm	Int. Ø mm	Flow rate ml/min	Prim. vol. ml
	8272.420	4	20	1.5	0.5	13.8 (x2)	0.3 (x2)
	8272.440	4	40	1.5	0.5	8.1 (x2)	0.4 (x2)
	8272.540	5	40	1.7	0.7	6.4 (x2)	0.3 (x2)



## Bibliography

1. Stronati et al. Neonatal sepsis: new preventive strategies. *Minerva Pediatr.* 2013 Feb;65(1):103-10.
2. Sohn AH et al. Prevalence of nosocomial infections in neonatal intensive care unit patients: results from the first national pointprevalence survey - *The Journal of pediatrics.* 2001/12; 139(6) : 821-827.
3. C. Geffers et al. Incidence of healthcare-associated infections in high-risk neonates: results from the German surveillance system for very-low- birthweight infants. *Journal Hosp Infect.* 2008 Mar;68(3):214-21.
4. Neonatal rates and risk factors of device-associated bloodstream infection in a tertiary care center in Saudi Arabia. *Balkhy HH1, Alsaif S, El-Saed A, Khawajah M, Dichinee R, Memish ZA.*
5. *Infect Control Hosp Epidemiol.* 2011 Jan;32(1):42-9. Epub 2010 Dec 1. Individualized catheter surveillance among neonates: a prospective, 8-year, single-center experience. Zingg W, Posfay-Barbe KM, Pfister RE, Touveneau S, Pittet D. University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland
6. Kanti Mallicki. A Prospective Study of Nosocomial Infection in a Neonatal ICU (NICU). *Pediatrics.* 2015 Feb;135 Suppl 1:S8-9. doi: 10.1542/ peds.2014-3330N.
7. W McGuire et al. Infection in the preterm infant. *BMJ.* 2004 Nov 27; 329(7477): 1277-1280.
8. Stoll BJ et al. Late-onset sepsis in very low birth weight neonates: the experience of the NICHD Neonatal Research Network. *Pediatrics.* 2002 Aug;110(2 Pt 1):285-91
9. Additional hospital stay and charges due to hospital-acquired infections in a neonatal intensive care unit. *J Hosp Infect.* 2001 Mar;47(3):223-9. Mahieu LM1, Buitenweg N, Beutels P, De Dooy JJ
10. Strategies to Prevent Central Line-Associated Bloodstream Infections in Acute Care Hospitals 2014 – SHEA Society for Healthcare Epidemiology of America
11. The use of silver for the control of medical devices *Infection – Specific analysis of Vygon AgION catheters*
12. Bertini G. et al. Reduction of catheter-related bloodstream infections in preterm infants by the use of catheters with the AgION anti-microbial system. *Early Hum Dev.* 2013 Jan;89(1):21-5

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