

2020-0185

**Centro:** Md Anderson  
**Servicio:** FARMACIA

PROPUESTA INCLUSION

BRAUN MEDICAL	
Coste	
Caja	Unidad

SAP	Descripcion	Ref	Prest
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CREAR	FILTRO P/CITOSTATICO MINI-SPIKE2 CHEMO	4550592	50
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162,50 €	3,25 €
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Impuesto Aplicable(21% IVA)

**GRUPO:** AF  
**CLASE:** AF06  
**CARACTERISTICA:** AF0604


*Handwritten signature in blue ink.*

El Centro Hospitalario se responsabilizará que dicho material sea facturado al paciente y/o Entidad Aseguradora Pública o Privada, con especial atención a pacientes de Entidades Aseguradoras las cuales requieran consentimiento y autorización previa antes de su uso o aplicación.

Si el paciente es asegurado de entidades quienes tienen acuerdos con proveedores, previamente la Dirección o Administración del Hospital deberá verificar las marcas y/o proveedores homologados por la Entidad.

En caso que el paciente pertenezca a Entidades Aseguradora Públicas o Privadas con quienes tengamos Tarifa de Prestación Cerrada, antes de dar conformidad la Dirección del hospital deberá analizar el coste del material junto con la tarifa de prestación.

Gestion Realizada por  
Victor Rodríguez

Fdo.....  


**Centro:** Md Anderson  
**Servicio:** FARMACIA

MATERIAL USO ACTUAL

SAP	Descripcion	Ref	Prest
828726	FILTRO VENTEO-MINI SPIKE PLUS	4550340	50

BRAUN MEDICAL	
Coste	
Caja	Unidad

165,28 €	3,31 €
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PROPUESTA INCLUSION

SAP	Descripcion	Ref	Prest
	FILTRO P/CITOSTATICO MINI-SPIKE2 CHEMO	4550592	50

BRAUN MEDICAL	
Coste	
Caja	Unidad

162,50 €	3,25 €
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**MODELO 1. ADMISIÓN DE NUEVOS MATERIALES  
PROPUESTA DE NUEVO MATERIAL HOSPITALARIO PARA SU INCLUSIÓN EN LA GUÍA  
HOSPITALARIA DE HOSPITEN**

1. Nombre y referencia material: MINI-SPIKE2 CHEMO
2. Nombre comercial: REF. 4550592
3. Laboratorio: BRAUN MEDICAL S.A.
4. Presentación: UNA CAJA 50 UNIDADES

5. Aplicación: FILTRAR AEROSOL

6. Descripción del producto: FILTRO

7. Reseñese la acción diagnóstica/terapéutica principal y el uso terapéutico del material que justifique su inclusión:  

8. Materiales de uso actual en Hospiten código SAP: 828726

9. Razones clínicas por las cuales este material es superior a los citados anteriormente: MAYOR SEGURIDAD EN LA MANIPULACION DE AEROSOL Y MEJORA ECONOMICA

10. ¿Qué materiales considera usted podrían retirarse de la Guía reseñados anteriormente? 828726

A rellenar por el centro. Marcar con una x si el MATERIAL SANITARIO es NO facturable.

	Adeslas	DKV	Sanitas			
Amb	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hosp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FECHA:  

DR./SERVICIO SOLICITANTE    
Fdo.: Dr. Nuria González

Director Gerente    
Fdo.: Nuria González

VºBº Director Médico    
Fdo.:Dr. Nuria González

**Víctor Rodríguez González**

---

**De:** Jose Manuel Jorge Pérez  
**Enviado el:** martes, 24 de marzo de 2020 20:42  
**Para:** Fernando Cerezo; Víctor Rodríguez González  
**Asunto:** RV: Crear material  
**Datos adjuntos:** CREAR MINI-SPIKE2.pdf


Buenas tardes,

Víctor, por favor pongámonos con esta solicitud en cuanto puedas.

Gracias.

**Saludos Cordiales**  
Responsable Fungibles y Prótesis.

**Jose Manuel Jorge Pérez**  
Dpto. Gestión y Adjudicación de Compras / Purchasing Department

 Antes de imprimir este mensaje, asegúrese de que es necesario.

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**De:** Fernando Cerezo <[fcerezo@mdanderson.es](mailto:fcerezo@mdanderson.es)>

**Enviado:** viernes, 6 de marzo de 2020 11:27


**Para:** Jose Manuel Jorge Pérez <[josemanuel.jorge@hospiten.com](mailto:josemanuel.jorge@hospiten.com)>

**Asunto:** Crear material

Envío documentación firmada para la creación de material si procede.

Gracias y un saludo

**Fernando Cerezo**  
RESPONSABLE DE COMPRAS

 Antes de imprimir este mensaje, asegúrese de que es necesario.





OFERTA  
03/2020/1773

B. Braun Medical SA  
Carretera de Terrassa, 121  
Dirección Postal: Apartado 6  
E-08191 Rubí (Barcelona)  
Tel.: 935866200\*  
Fax: 935881096

Su referencia:

Haga referencia en sus comunicaciones:

Referencia: 03/2020/1773  
Fecha oferta: 03/03/2020  
Válida hasta: 01/06/2020  
Su contacto: Narcisca Elena Cabrera  
Farmia (02)  
0

ATN. Jose Manuel Jorge Pérez

HOSPITAL RAMBLASLU  
(Farmacia)  
Rb General Franco, 115  
38001 Santa Cruz de Tenerife  
STA. CRUZ TENERIFE

Cod. Prod	Denominación Producto	Presentación	Caja/ Ud	Precio
4550592	MINI-SPIKE 2 CHEMO Codigo GTIN: 4046964197796	ca/50	Unidad	3,250000

Aplica a toda la oferta:

Impuestos NO Incluidos

Vigencia: desde 02/03/2020 hasta 31/03/2021



# Mini-Spike® 2 Chemo

PREPARACIÓN Y MEZCLA DE CITOSTÁTICOS CON SEGURIDAD

Especificaciones de producto	
Volumen de purga	0,705 ml
Volumen residual	0,06 ml
Tasa de flujo	> 300 ml/min
Comportamiento del sellado de la válvula	2 bar de presión

No contiene PVC - DEHP ni látex

Mini-Spike® 2 Chemo PureSite



4550592	4551100
C/50	C/100

<sup>1</sup> Instituto Nacional de Seguridad e Higiene en el Trabajo (INSHT). NTP 740: Exposición laboral a citostáticos en el ámbito sanitario. INSHT, 2006. Disponible en: [http://www.insht.es/InshtWeb/Contenidos/Documentacion/FichasTecnicas/NTP/Ficheros/701a750/ntp\\_740.pdf](http://www.insht.es/InshtWeb/Contenidos/Documentacion/FichasTecnicas/NTP/Ficheros/701a750/ntp_740.pdf)

<sup>2</sup> CONNOR et al. (ISOPP STANDARDS COMMITTEE) (2007). ISOPP Standards of Practice. Safe Handling of Cytotoxics. J Oncol Pharm Practice Supp. 13: 1-81

<sup>3</sup> Boletín Oficial del Estado. Real Decreto 665/1997, de 12 de mayo, sobre la protección de los trabajadores contra los riesgos relacionados con la exposición a agentes cancerígenos durante el trabajo. BOE núm. 124 de 24/05/1997.

<sup>4</sup> NIOSH Alert: Preventing occupational exposures to antineoplastic and other hazardous drugs in health care settings. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) 2004. Publication No. 2004-165.

<sup>5</sup> Jürgen Gebel & Col. Evaluation of the microbial tightness of CSTDs. University of Bonn Hospital, Institute for Hygiene and Public Health, Germany. Pharmacy Practice, Issue 77, spring 2015. [www.hospitalpharmacyeurope.com](http://www.hospitalpharmacyeurope.com)

<sup>6</sup> Roth JV. How to enter a medication vial without coring. Anesth Analg 2007; 104(6): 1615

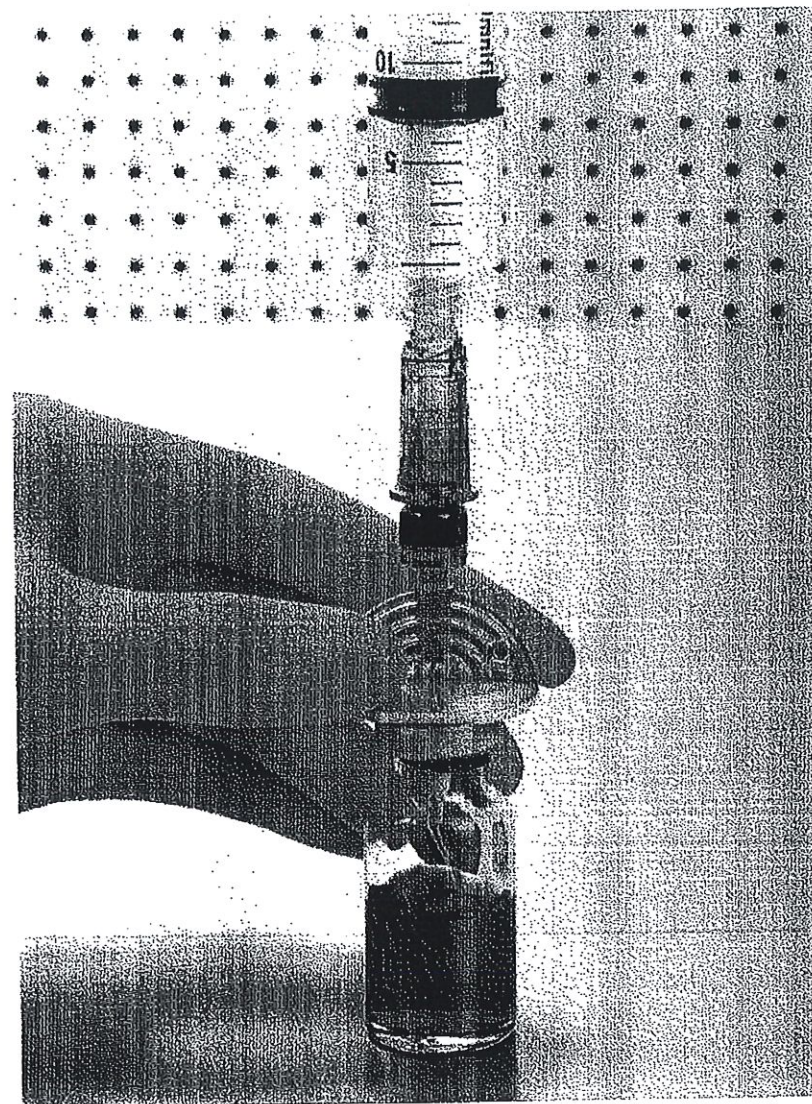
<sup>7</sup> Walpot H, Franke RP, Burchard WG, Agterkamp C, Muller FG, Mittermayer C, Kal G. The filter effectiveness of common 15-micron filters (DIN 58362). II: Scanning electron microscopy and roentgen analysis. Infusionstherapie 1989; 16(3): 133-9

<sup>8</sup> Durgin JM, Hanan ZI. Thomson Delmar Learning's Pharmacy Practice for Technicians 2004; 227

<sup>9</sup> Yébenes J et al., „Resistance to the migration of microorganisms of a needle-free disinfectant connector“; AJIC 26, vol. 31, no. 8 (2003): 462

B. Braun Medical S.A. | División Basic Care | Hospital Care | Ctra. de Terrassa, 121 | 08191 Rubí (Barcelona)  
Tel. 93 586 62 00\* | Fax 93 588 10 96 | [www.bbraun.es](http://www.bbraun.es)

608041  
09/16



FILTRO DE SISTEMA CERRADO

**Mini-Spike® 2 Chemo**  
RECONSTITUCIÓN Y MEZCLA DE CITOSTÁTICOS CON SEGURIDAD



# Mini-Spike® 2 Chemo

FILTRO DE SISTEMA CERRADO PARA LA RECONSTITUCIÓN DE CITOSTÁTICOS

De todos es conocido los riesgos que implica la manipulación de los fármacos citostáticos.

Por eso, muchas Instituciones, Asociaciones y Expertos, redactan protocolos y Normas de buena utilización.<sup>1,2,3</sup>

Entre otras, se relacionan:

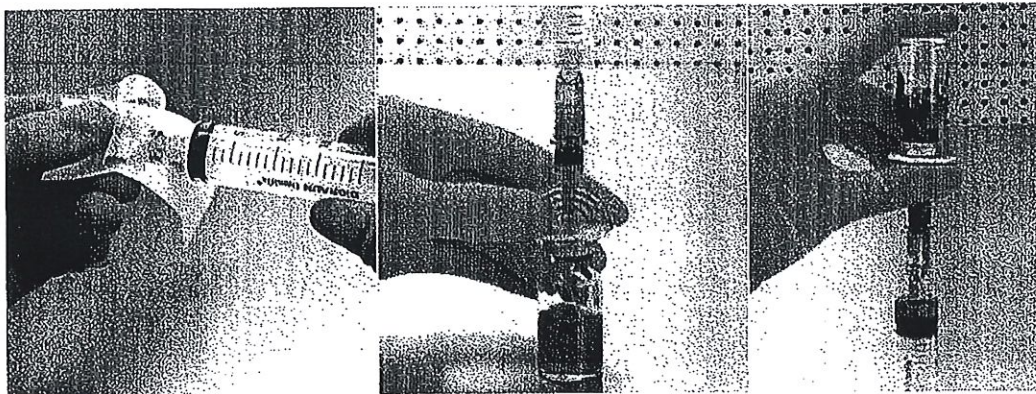
- Utilizar instalaciones adecuadas
- Equipos de protección individual
- Trabajar en CSB
- Evitar la utilización de agujas y envases de cristal
- Utilizar productos de sistema cerrado y conexiones Luer-Lock



Para evitar el riesgo en el proceso manual de la reconstitución de fármacos citostáticos, B. Braun presenta Mini-Spike® 2 Chemo. Un dispositivo provisto de dos filtros: uno de 0,2 micras para los aerosoles y otro adicional de 5 micras en el canal del flujo, para evitar partículas.

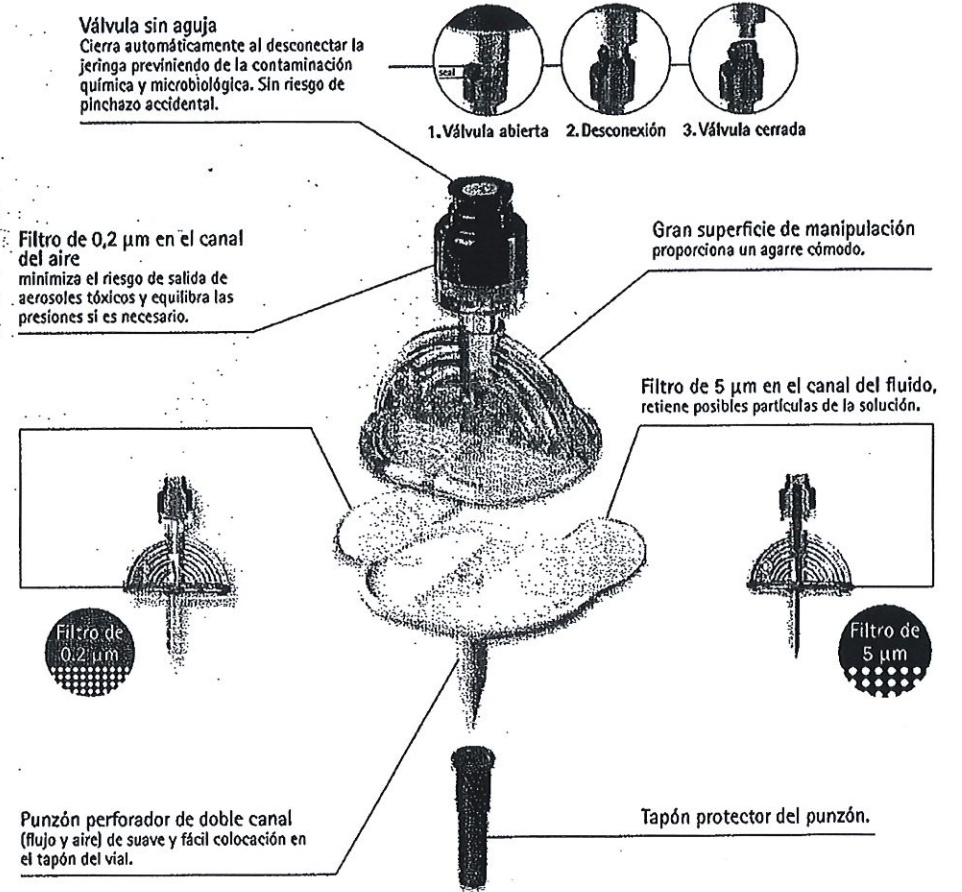
Pruebas en laboratorios externos han confirmado y demostrado que Mini-Spike® 2 Chemo y PureSite cumplen con la definición de la NIOSH para los dispositivos de Sistema Cerrado<sup>4</sup>:

**"Un dispositivo que no intercambia aire no filtrado o contaminantes con el medio adyacente"**



# Mini-Spike® 2 Chemo

UN ÚNICO PRODUCTO APTO PARA TODAS LAS MEDIDAS DE VIAL



Mini-Spike® 2 Chemo y PureSite contribuyen a la reducción de los riesgos, aumentando no sólo la seguridad del profesional, sino también de los pacientes y el medio ambiente. 1-6-7-8-A

# B | BRAUN

B. Braun Melsungen AG  
Division Hospital Care  
34209 Melsungen  
Germany

Contact: Gudrun Henke

Fon: 05661 71-2712

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Internet: <http://www.bbraun.de>

Date: May 04, 2016

To whom it may concern

## Confirmation

We herewith confirm that the air filter of our medical devices

Article number	Product name
4550340	Mini-Spike® Chemo
4550587	Mini-Spike® Chemo V
4550536	Mini-Spike® Chemo Micro-tip
4550592	Mini-Spike® 2 Chemo

has been subject to and passed testing regarding aerosol retention of 99,999 %.

For and on behalf of

B. Braun Melsungen AG

i. A.



Andreas Katerkamp

Head of Development Center IV-Setz / Drug Admixture

i. M.



Gudrun Henke  
Senior Manager Regulatory Affairs CoE IV-Systems

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Prof. Dr. h.c. Ludwig Georg Braun

Executive Board:  
Prof. Dr. Helmut-Walter Goble  
(Chairman)  
Dr. Annette Bellier  
Anna Maria Braun  
(Deputy Board Member)

Olaf Philipp Braun  
Prof. Dr. Hans-Peter Kraschel  
Dr. Manfred Lugin  
Cornel H. Reubner, LL.M.  
Markus Stossmann

Corporate Office: Melsungen  
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# B | BRAUN

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Contact: Dr. Stefan Seidel

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Fax: 05661 75-26 08

Email: stefan.seidel@bbraun.com

Internet: <http://www.bbraun.de>

Date: October 28, 2015

To whom it may concern

## CONFIRMATION

This is to confirm that the integrated SafeFlow luer access of our medical devices of the product group

### Mini-Spike® 2 Chemo

is closed systems referring to NIOSH 2004 definition, as it prevents the escape of hazardous contaminants into the adjacent environment. Corresponded tests were conducted by external laboratories.

For and on behalf of

B. Braun Melsungen AG

i. V.



Dr. Stefan Seidel

Head of Regulatory Affairs CoE IV-Systems

i. A.



Andreas Katerkamp

Head of Development Centre IV-Sets / Drug Administration

Chairman of Supervisory Board:  
Prof. Dr. h.c. Ludwig Georg Braun

Executive Board:  
Prof. Dr. Heinz-Walter Grob  
(Chairman)  
Dr. Annette Boller  
Otto Philipp Braun

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HRB 11 000  
WEEF-Reg.-No. DE 4289900

Address:  
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Germany

# Evaluation of the microbial tightness of CSTDs

Currently, only few studies are available regarding the tightness of closed system transfer devices (CSTDs). The presented study deals with the evaluation of microbial tightness of CSTDs using airborne and touch contamination

Jürgen Gebel  
Sapuna Kurlokose  
Barbara Grtler  
Martin Exner  
University of Bonn Hospital, Institute for  
Hygiene and Public Health, Germany

**Nosocomial infections pose a major problem to healthcare system as they contribute to increased morbidity and mortality in hospitalised patients. According to the EPIC study, the most common bacterial pathogens for hospital acquired infections are *Staphylococcus aureus* (S. aureus), *Pseudomonas aeruginosa* and coagulase-negative staphylococci.<sup>1</sup> Moreover, viruses, parasites and fungi are isolated from patients suffering from nosocomial infections.**

A patient can acquire an infection in three different ways:

- The permanent or transient flora of the patient can cause an endogenous infection.
- Another type of nosocomial infection is the exogenous cross-infection. According to the World Health Organization, in this case, microorganisms are transferred between patients through direct contact, aerosols and objects contaminated by patient's flora and via medical staff.
- Furthermore, the flora from the healthcare environment can cause an endemic or epidemic exogenous environmental infection. The latter type is caused by microorganisms which have well adapted to the hospital environment.<sup>2</sup>

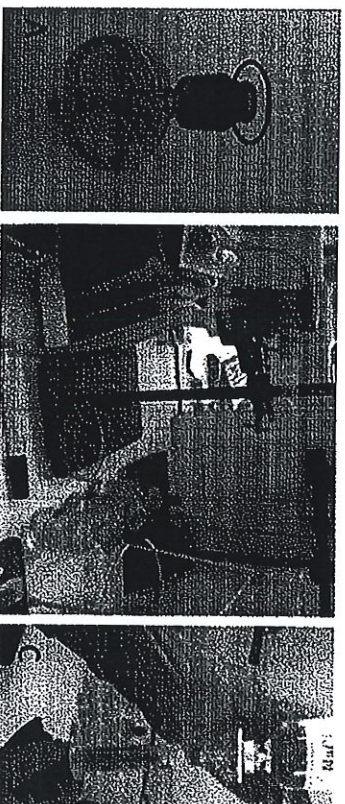


Figure 1: (A): Safeflow valve (os indicated) integrated in B Braun Mini-Spike® 2 Chemo V. (B): Experimental setup in the exposure chamber. (C): Withdrawal of NaCl after nebulisation

Hospital-acquired infections are often associated with the use of medical devices. Open infusion systems and open drug transfer devices increase the risk for the entry of microorganisms which can lead to infections. To minimise such infections, the National Institute for Occupational Safety and Health (NIOSH) requests the use of a closed system transfer device which is defined as follows:

“A drug transfer device that mechanically prohibits the transfer of environmental contaminants into the system and the escape of hazardous drug or vapour concentrations outside the system”.

Therefore, in order to prevent nosocomial infections, it is necessary in addition to other hygiene measures to verify the microbial tightness of CSTDs.

## Aims of the study

The first objective of this study was to evaluate the microbial tightness of a Safeflow valve integrated into a B Braun

Mini-Spike® 2 Chemo V using airborne contamination. Mini-Spike® 2 Chemo V is a vented dispensing pin which is used for reconstruction and drug admixture. The second objective was to examine the microbial tightness after touch contamination. For this analysis, the Safeflow valve was used as a stand-alone medical device.

## Safeflow valve airborne contamination analysis

The airborne contamination analysis was carried out with *Bacillus subtilis* (*B. subtilis*) spores, which were prepared and purified according to the laboratory standard method SOP 112 Bonn described in the doctoral thesis of Gebel in 1998.<sup>4</sup> A B Braun Mini-Spike® 2 Chemo V was inserted into a vial containing 50ml of 0.9% sodium chloride solution. The spiked vial was placed together with five tomI Luer Lock syringes, five Sofra® Cloth CHX 2% wipes and five Combi-Stoppers in an exposure chamber. A nebuliser containing a suspension of



4.8 x 10<sup>5</sup> cfu spores of *B. subtilis* per ml was used to generate an aerosol for one minute. The volume of *B. subtilis* suspension nebulised per minute is 0.278ml. This corresponds to 1.34 x 10<sup>3</sup> aerosolised spores of *B. subtilis* in the exposure chamber, which has a volume of 0.24 m<sup>3</sup> (on average: 5.6 x 10<sup>5</sup> cfu/m<sup>3</sup>).

For an equal distribution of spores, the following procedure was carried out after two minutes. The Safeflow valve was disinfected with a Sofra® Cloth CHX 2% wipe and left to air-dry for 15 seconds. Then a 10ml Luer Lock syringe was filled with 8ml of sodium chloride solution and closed with a Combi-Stopper. Thirty minutes later, *B. subtilis* suspension was nebulised once again but only for half a minute. The whole procedure starting from disinfection of the valve was repeated with the remaining four syringes. The 0.9% sodium chloride solution from all syringes and the remaining fluid of 10ml in the vial was each filtered through a 0.45µm filter, which were incubated on tryptic soy agar at 37°C for 48 hours. Results were documented as cfu per 8ml and 10ml, respectively. The whole experiment was carried out three times. Three Mini-Spike® 2 Chemo V were tested per experiment.

**Results**  
Table 1 shows that none of the tested Mini-Spike® 2 Chemo V showed transmission of *B. subtilis* spores through the valve after contamination of the chamber with 1.34 x 10<sup>5</sup> cfu of *B. subtilis* spores which corresponds to 5.6 x 10<sup>5</sup> cfu/m<sup>3</sup> on average (95% confidence interval for microbial tightness: 66.4–100%).

**Safeflow valve touch contamination analysis**

The touch contamination analysis of the Safeflow valve was carried out with *S. aureus*.

*S. aureus* was prepared and purified according to EN 12353. A B Braun Intrafix® SafeSet administration set was inserted into a B Braun Ecoflac® plus IV solutions container with 500ml of 0.9% sodium chloride solution and the line was filled. An extension line (type “Heidelberg”) was connected to a single Safeflow valve and the end of the line was lead into a sterile graduated cylinder.

A suspension of 10<sup>7</sup> cfu/ml of *S. aureus* was used to contaminate the Safeflow valve. The volume of *S. aureus* suspension applied per valve was 10µl.

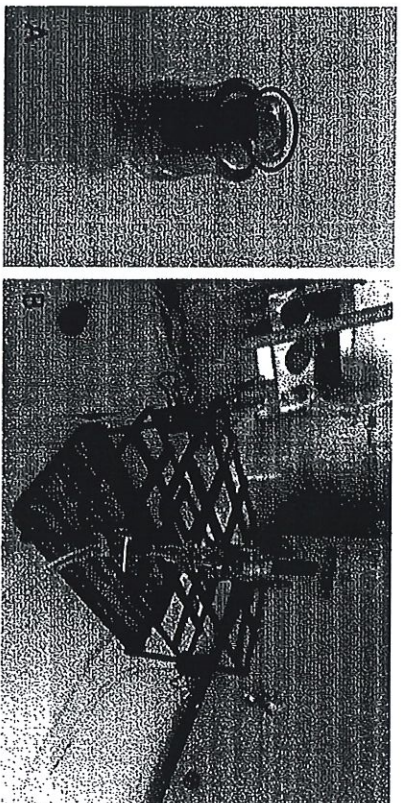


Figure 2: (A): B Braun Safeflow valve (as indicated). (B): Experimental setup.

**Table 1: Results of the evaluation of the microbial barrier of B Braun Mini-Spike® 2 Chemo V**

Date	Safeflow valve	Contamination cfu/8ml and cfu/10ml of 0.9% NaCl					Residual
		Syringe					
		I	II	III	IV	V	
07.04.2014	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
08.04.2014	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
14.04.2014	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0

This corresponds to 10<sup>5</sup> cfu of *S. aureus* on each valve. After a drying period of one hour the membrane of the Safeflow valve was disinfected with Sofra® Cloth CHX 2% wipes and let to air-dry for 15 seconds. Following it was connected to the Luer lock of an Intrafix® SafeSet administration set. The roller clamp of Intrafix® was opened and 80ml of the sodium chloride solution were transferred from Ecoflac® plus into the sterile glass. This procedure starting with the contamination of the valve was repeated four times. The collected infusate was filtered incubated (see experimental procedure for Mini-Spike® 2 Chemo V).

**Results**

As demonstrated in Table 2, all nine tested Safeflow systems did not show a contamination (95% confidence interval for microbial tightness: 66.4–100%).

**B Braun Cyto-Set® and B Braun Cyto-Set® Mix airborne contamination analysis**  
The third objective of this study was to

evaluate the microbial tightness of the connection of B Braun Cyto-Set® and B Braun Cyto-Set® Mix through airborne contamination with spores of *B. subtilis*. The Cyto-Set® closed system is utilised for the preparation and application of cytostatic drugs.

Four B Braun Ecoflac® Plus IV solutions containers with 100ml of 0.9% sodium chloride solution and one B Braun Ecoflac® Plus IV solutions container with 500ml 0.9% sodium chloride solution were hung up in the exposure chamber. All four 100ml containers were spliced with Cyto-Set® Mix, the 500ml container was spliced with the main line Cyto-Set®. The end of the main line was drained out of the chamber into a sterile Erlenmeyer flask and all existing air vent-filters and clamps were closed. The nebulisation procedure was done as described for the testing of the Safeflow valve of the B Braun Mini-Spike® 2 Chemo V.

Two minutes after nebulisation, the first Cyto-Set® Mix was connected with the main line of Cyto-Set®. Then the clamp of this Cyto-Set® Mix was opened



and the infusate was collected with a drip rate of 180 drops/min in a sterile Erlenmeyer flask. In the next step, the clamp of the main line was opened to rinse the system with 50ml 0.9% sodium chloride solution. The remaining three Cyto-Set® Mix were emptied in the same way.

Finally, the Erlenmeyer flask with the collected infusate of 600ml NaCl was emptied and examined for microbial contamination as explained above. One Cyto-Set® in combination with four Cyto-Set® Mix was tested per experiment.

#### Results

None of the tests with B Braun Cyto-Set® and B Braun Cyto-Set® Mix showed transmission of *B. subtilis* spores after contamination of the chamber with  $1.17 \times 10^8$  cfu of *B. subtilis* spores which corresponds to  $5.6 \times 10^2$  cfu/m<sup>3</sup> on average (see Table 3).

#### Discussion and conclusions

The presented methods are suitable for evaluating the microbial tightness of the CSTDs as they simulate worst-case scenarios. The bioburden in ambient air of operating theatres and intensive care units ranges from  $10^1$  cfu/m<sup>3</sup> to  $10^2$  cfu/m<sup>3</sup> of air.<sup>7</sup> The current study was carried out under exposure of 100-times higher concentrations of *B. subtilis* spores (on average:  $5.6 \times 10^3$  cfu/m<sup>3</sup>).

The microbial concentration used for the touch contamination with *S. aureus* was 10<sup>5</sup>-times higher than found on the fingertips of physician's dominant hands, which carries on average 18.7 cfu/cm<sup>2</sup> of aerobic bacteria.<sup>8</sup> According to Pittet et al,<sup>9</sup> intact areas of some patients' skin can carry 100–10<sup>6</sup> cfu/cm<sup>2</sup>, which can serve as a source for microbial transmission onto the healthcare worker's hands. That is why we decided to choose such a high concentration for the contamination of the Safeflow valve.

By means of these test methods, the microbial tightness of various medical devices such as container closure systems, air vent and prime stop filters in infusion sets and septums of intravenous catheters were also tested. These tested products showed, despite exposure to excessive air or surface contamination, good microbial tightness, providing they are applied according to instruction. Details of these examinations are intended for publication. In some cases, further investigations with greater numbers of samples are under consideration. ●

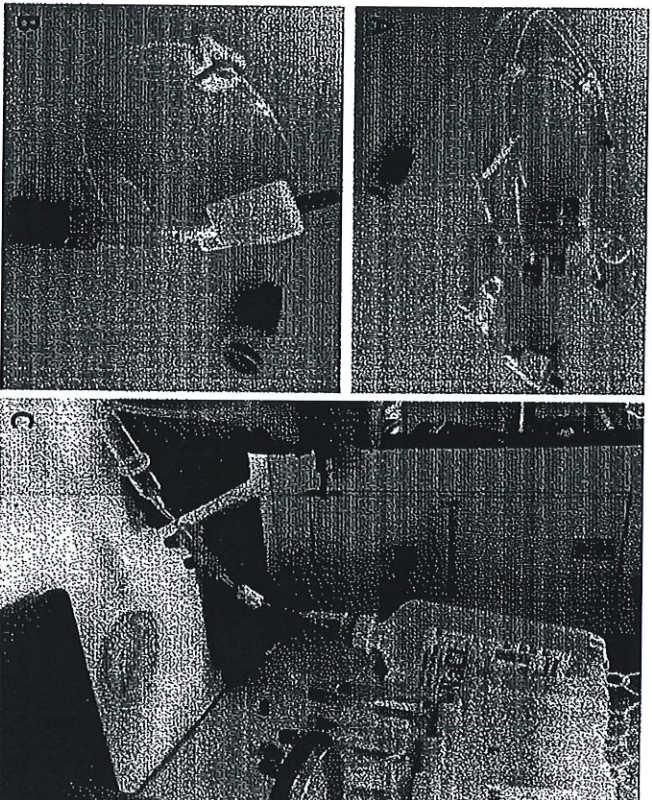


Figure 3: (A): B Braun Cyto-Set® NEW (B): B Braun Cyto-Set® Mix NEW. (C): Experimental setup.

Table 2: Results of the evaluation of the microbial barrier performance of the Safeflow valve

Date	Contamination cfu/400ml of 0.9% sodium chloride solution	0	0
16.06.2014	0	0	0
23.06.2014	0	0	0
22.07.2014	0	0	0

Table 3: Results of the evaluation of the microbial barrier performance of Cyto-Set®

Date	Contamination cfu/600ml 0.9% sodium chloride solution	0	0
25.08.2014	0	0	0
25.08.2014	0	0	0
26.08.2014	0	0	0

The content of this editorial was presented at the 35th International Symposium on Intensive Care and Emergency Medicine 2015 in Brussels.

#### Conflict of interest

The experiments were carried out on behalf of B Braun Melsungen. The company did not have any influence on the evaluation of the results.

#### References

1. Vincent JL et al. The prevalence of nosocomial infection in intensive care units Europe. The results of the EPIC study. JAMA 1995;274:639–44.
2. World Health Organization. Prevention of hospital-acquired infections. WHO/CDS/CSR/EPI/2002.12; 2002.
3. NIOSH Alert: DHHS (NIOSH) Pub No. 2004-165; September 2004.
4. Gebel J. Standardisierung der mikrobiologischen Dosimetrie im Rahmen der Desinfektion von Trinkwasser mit UV-Strahlen. Mathematisch-Naturwissenschaftliche Fakultät. Bonn, Rheinische Friedrich-Wilhelm-Universität; 161;1998.
5. Gaudesat K. Assessment of airborne pathogens in healthcare settings. AJMR 2009;3(2):66–76.
6. Li CS, Hou PA. Bioerosion characteristics in hospital clean rooms. Sci Total Environ 2003;305(1–3):169–76.
7. Augustowska M, Dukiewicz J. Variability of airborne microflora in a hospital ward within a period of one year. Ann Agric Environ Med 2006;13(1):99–106.
8. Longtin Y et al. Contamination of stethoscopes and physicians' hands after a physical examination. Mayo Clin Proc 2014;89(3):291–9.
9. Pittet D et al. Evidence-based model for hand transmission during patient care and the role of improved practices. Lancet Infect Dis 2006;6:641–52.



Doc.compr.	Cl.	Soc.	Proveedor	Nombre 1	OrgC	GCp	Fecha doc.	InPerVal	FinPerVal	CPag												
Pos.	Material	Texto breve			N° material proveedor			Ctd.	prev.	UMP	Prc.neto Mon.		Cnt.	UMA	UMB	Prc.net.Al Mon.		Grupo ar	Acreeedor	Nombre 1	Soc.	C
460000010	WK	H005	10029	B. BRAUN MEDICAL, S.A.			OCC	FAR	20.02.2002	20.02.2002	31.12.9999	ZP18										
2110	921093	FILTRO INYECTOR 0,2 STERIFIX.			4099206		1	CA		71,03	EUR	50	UN		1,42	EUR	C04	10029	B. BRAUN MEDICAL, S.A.		H005	
3490	941440	FILTRO MINI SPIKE FP C/ VALVULA 4550579			4550579		1	CA		66,11	EUR	50	UN		1,32	EUR	C03	10029	B. BRAUN MEDICAL, S.A.		H005	
3500	941450	FILTRO CHEMO MINISPIKE ONCOLOGIA			412014		1	CA		112,50	EUR	50	UN		2,25	EUR	C03	10029	B. BRAUN MEDICAL, S.A.		H005	
3930	821414	FILTRO P/CITOSTATICO MINI-SPIKE CHEMO V			4550587		1	CA		162,50	EUR	50	UN		3,25	EUR	RE	10029	B. BRAUN MEDICAL, S.A.		H005	
4600000565	WK	H005	10029	B. BRAUN MEDICAL, S.A.			OC3	FAR	06.05.2005	06.05.2005	31.12.9999	ZP18										
1240	921093	FILTRO INYECTOR 0,2 STERIFIX.			4099206		1	CA		71,03	EUR	50	UN		1,42	EUR	RE	10029	B. BRAUN MEDICAL, S.A.		H005	
1250	821414	FILTRO P/CITOSTATICO MINI-SPIKE CHEMO V			4550587		1	CA		162,50	EUR	50	UN		3,25	EUR	RE	10029	B. BRAUN MEDICAL, S.A.		H005	
4600001450	WK	H027	10029	B. BRAUN MEDICAL, S.A.			OC5	FAR	17.03.2011	17.03.2011	31.12.9999	ZP18										
310	828726	FILTRO VENITEO-MINI SPIKE PLUS			4550340		1	CA		165,28	EUR	50	UN		3,31	EUR	C04	10029	B. BRAUN MEDICAL, S.A.		H027	