



## Correction to: Standardization and Chemical Characterization of Intravenous Therapy in Adult Patients: A Step Further in Medication Safety

Silvia Manrique-Rodríguez<sup>1,2,3</sup> · Irene Heras-Hidalgo<sup>1,2</sup> · M. Sagrario Pernia-López<sup>1,2,3</sup> · Ana Herranz-Alonso<sup>1,2,3</sup> · M. Camino del Río Pisabarro<sup>4,5</sup> · M. Belén Suárez-Mier<sup>4,6</sup> · M. Antonia Cubero-Pérez<sup>4,7</sup> · Verónica Viera-Rodríguez<sup>4,8</sup> · Noemí Cortés-Rey<sup>4,9</sup> · Elizabeth Lafuente-Cabrero<sup>4,10</sup> · M. Carmen Martínez-Ortega<sup>4,11</sup> · Esther Bermejo-López<sup>12,13</sup> · Cristina Díez-Sáenz<sup>14</sup> · Piedad López-Sánchez<sup>3,15</sup> · M. Luisa Gaspar-Carreño<sup>3,16</sup> · Rubén Achau-Muñoz<sup>3,16</sup> · Juan F. Márquez-Peiró<sup>3,17</sup> · Marta Valera-Rubio<sup>3,18</sup> · Esther Domingo-Chiva<sup>3,19</sup> · Irene Aquerreta-González<sup>3,20</sup> · Ignacio Pellín Ariño<sup>12,21</sup> · M. Cruz Martín-Delgado<sup>12,21</sup> · Manuel Herrera-Gutiérrez<sup>12,22</sup> · Federico Gordo-Vidal<sup>12,23</sup> · Pedro Rascado-Sedes<sup>12,24</sup> · Emilio García-Prieto<sup>12,25</sup> · Lucas J. Fernández-Sánchez<sup>26</sup> · Sara Fox-Carpentieri<sup>27</sup> · Carlos Lamela-Piteira<sup>3,28</sup> · Luis Guerra-Sánchez<sup>29</sup> · Miguel Jiménez-Aguado<sup>29</sup> · María Sanjurjo-Sáez<sup>1,2,3</sup>

Accepted: 12 April 2021 / Published online: 7 June 2021  
© The Author(s) 2021

**Correction to: Drugs in R&D (2021) 21:39–64**  
<https://doi.org/10.1007/s40268-020-00329-w>

In the original publication of this article, the units of potassium chloride in Table 2 are incorrect. Instead of 0.04 mEq/L, 0.06 mEq/L and 0.2 mEq/L, it should read as 0.04 mEq/mL, 0.06 mEq/mL and 0.2 mEq/mL.

Norepinephrine: It says 80 µg/mL (40 mg/50 mL) and it should read as 80 µg/mL (40 mg/500 mL).

The corrected Table 2 is given below.

The original article has been updated.

---

The original article can be found online at <https://doi.org/10.1007/s40268-020-00329-w>.

---

✉ Silvia Manrique-Rodríguez  
silvia.manrique@salud.madrid.org

Extended author information available on the last page of the article

**Table 2** Standard concentrations and physicochemical characterization

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
ACYCLOVIR (amp 25 mg/ml 10 ml) TEDEC-MEIJ FARMIA, S.A.	5 mg/mL (500 mg/100 mL)	D5W	287±0.58	1.043	300	10.46±0.02	YES
		NS	279±2.08	1.032	288	11.04±0.03	YES
ALBUMIN HUMAN (5% vial 250 mL, 20% ALBUNORM® vial 100 mL) OCTAPHARMA	5%	-	274±1.53	1.042	286	7.12±0.02	NO
	20%	-	274±0.58	1.059	290	7.04±0.01	NO
AMIKACIN (vial 500 mg/2 mL) B.BRAUN MEDICAL, S.A.	5 mg/mL (500 mg/100 mL)	D5W	308±1.00	1.047	322	4.42±0.01	NO
		NS	283±1.53	1.034	293	4.87±0.01	NO
	10 mg/ml	-	304±2.31	1.037	316	4.55±0.03	NO
AMIODARONE (TRANGOREX® amp 150 mg/3 mL) SANOFI-AVENTIS, S.A.	2.4 mg/mL (600 mg/250 mL)	D5W	298±1.53	1.020	304	3.84±0.01	YES
	3.6 mg/mL (900 mg/250 mL)	D5W	298±1.53	1.020	304	3.80±0.01	YES
AMOXICILLIN SODIUM- CLAVULANATE (vial 1 g) SANDOZ FARMACEUTICA, S.A.	10 mg/mL (500 mg/50 mL)	NS	350±1.53	1.036	363	8.91±0.01	NO
	20 mg/mL (2 g/100 mL)	NS	425±0.58	1.040	442	8.90±0.03	NO
AMPICILLIN (GOBEMICINA® vial 500 mg, vial 1 g) LABORATORIOS NORMON	10 mg/mL (1 g/100 mL)	NS	309±0.58	1.034	320	9.03±0.01	NO
	20 mg/mL (2 g/100 mL)	NS	347±2.08	1.038	360	9.04±0.03	NO
AMPHOTERICIN B (AMBISOME® vial 50 g) GILEAD SCIENCES S.L.	1 mg/mL (50 mg/50 mL)	D5W	298±1.53	1.024	305	5.64±0.01	NO
	2 mg/mL (100 mg/50 mL)	D5W	300±2.31	1.028	309	5.60±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>ANIDULAFUNGIN</b> (ECALTA® vial 100 mg) <b>PFIZER, S.L.U</b>	100 mg/130 mL (0.77 mg/mL)	D5W	258±1.53	1.042	269	4.57±0.02	NO
		NS	258±1.15	1.035	267	4.49±0.05	NO
<b>AZITHROMYCIN</b> (ZITROMAX® vial 500 mg) <b>PFIZER, S.L.U</b>	2 mg/mL (500 mg/250 mL)	D5W	320±1.53	1.022	327	7.21±0.01	NO
		NS	299±1.53	1.009	301	6.90±0.02	NO
<b>AZTREONAM</b> (AZACTAM® vial 1 g) <b>BRISTOL MYERS SQUIBB S.A.</b>	20 mg/mL (1 g/50 mL)	D5W	383±2.31	1.031	395	5.18±0.03	NO
		NS	361±2.52	1.020	369	5.05±0.01	NO
<b>CALCIUM CHLORIDE</b> (amp 10% 10 mL) <b>B.BRAUN MEDICAL, SA.</b>	2 mg/mL (1.000 mg/500 mL)	D5W	318±0.58	1.022	325	4.15±0.00	YES
		NS	296±1.00	1.008	298	5.60±0.01	YES
	10 mg/mL (1.000 mg/100 mL)	D5W	391±1.53	1.023	400	4.30±0.01	YES
		NS	357±2.31	1.009	361	4.55±0.05	YES
<b>CALCIUM FOLINATE</b> (vial 50 mg/5 mL) <b>TEVA PHARMA, S.L.U.</b>	0.2 mg/mL (50 mg/250 mL)	D5W	300±1.53	1.022	306	5.54±0.01	NO
		NS	285±2.00	1.012	288	5.99±0.04	NO
	0.5 mg/mL (50 mg/100 mL)	D5W	299±0.58	1.021	306	5.97±0.01	NO
		NS	286±1.53	1.008	289	6.31±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT	
<b>CALCIUM GLUCONATE</b> <b>(SUPLECAL® amp 4.6 mEq mg/10 mL)</b>  <b>B.BRAUN MEDICAL, SA.</b>	0.2 mg/mL (1 amp/500 mL)	D5W	300±0.58	1.021	307	5.65±0.01	YES	
		NS	281±1.00	1.008	283	6.40±0.01	YES	
	0.4 mg/mL (2 amp/500 mL)	D5W	305±1.00	1.022	312	5.84±0.01	YES	
		NS	284±1.00	1.009	287	6.39±0.02	YES	
	1 mg/mL (1 amp/100 mL)	D5W	308±1.53	1.024	316	6.16±0.01	YES	
		NS	295±1.00	1.010	298	6.28±0.01	YES	
	2 mg/mL (2 amp/100 mL)	D5W	319±1.53	1.027	327	6.20±0.02	YES	
		NS	312±1.00	1.017	317	6.69±0.01	YES	
	<b>CASPOFUNGIN</b> <b>(vial 50 mg/10 mL)</b>  <b>TEVA PHARMA, S.L.U.</b>	0.28 mg/mL (70 mg/250 mL)	NS	264±0.00	1.006	266	6.19±0.01	NO
		0.5 mg/mL (50 mg/100 mL)	NS	254±1.00	1.006	256	6.36±0.01	NO
	<b>CEFAZOLIN</b> <b>(vial 1 g)</b>  <b>LABORATORIO REIG JOFRE</b>	20 mg/mL (2 g/100 mL)	D5W	317±2.52	1.026	326	5.04±0.01	NO
			NS	309±1.15	1.017	315	4.94±0.03	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>CEFEPIME</b> (vial 2 g) <b>ACCORD HEALTHCARE, S.L.U.</b>	20 mg/mL (1 g/50 mL)	D5W	442±1.53	1.033	457	4.10±0.03	NO
		NS	415±1.53	1.018	422	4.26±0.01	NO
	40 mg/mL (2 g/50 mL)	D5W	558±2.08	1.041	581	4.11±0.04	NO
		NS	539±2.52	1.030	556	4.30±0.01	NO
		1/2S	387±0.58	1.022	396	4.30±0.01	NO
<b>CEFOTAXIME</b> (vial 2 g) <b>LABORATORIO REIG JOFRE</b>	20 mg/mL (1 g/50 mL)	D5W	353±1.53	1.027	363	5.41±0.25	NO
		NS	334±2.31	1.015	339	5.26±0.02	NO
	40 mg/mL (2 g/50 mL)	D5W	398±2.08	1.033	411	5.41±0.09	NO
		NS	383±1.00	1.023	392	5.33±0.01	NO
<b>CEFTAZIDIME</b> (vial 2 g) <b>FRESENIUS KABI ESPAÑA, S.A</b>	20 mg/mL (1 g/50 mL)	D5W	317±1.53	1.023	324	6.71±0.01	NO
		NS	307±0.58	1.015	311	6.95±0.01	NO
	40 mg/mL (2 g/50 mL)	D5W	332±1.73	1.028	341	6.61±0.01	NO
		NS	325±0.58	1.022	332	6.93±0.01	NO
<b>CEFTAZIDIME/AVIBACTAM</b> (ZAVICEFTA® vial 2 g/0.5 g) <b>PFIZER, S.L.U</b>	20 mg/mL (2 g/100 mL)	D5W	374±2.00	1.031	386	6.73±0.18	NO
		NS	356±1.15	1.017	362	6.66±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
CEFTOLOZANE/TAZOBACTAM (ZERBAXA® vial 1 g-0.5 g) MERCK SHARP & DOHME DE ESPAÑA, S.A.	10 mg/mL (1 g/100 mL)	D5W	504±1.53	1.032	520	5.98±0.01	NO
		NS	478±0.58	1.021	488	6.06±0.02	NO
		1/2S	374±1.00	1.016	380	5.93±0.01	NO
CEFTRIAOXONE (vial 1g, 2 g) LABORATORIO REIG JOFRE	20 mg/mL (1 g/50 mL)	D5W	392±1.73	1.031	404	6.57±0.03	NO
		NS	371±1.00	1.018	378	6.61±0.08	NO
	40 mg/mL (2 g/50 mL)	D5W	474±1.53	1.041	494	6.66±0.06	NO
		NS	454±1.00	1.028	467	6.72±0.02	NO
		1/2S	303±0.00	1.016	310	6.36±0.01	NO
CEFUROXIME (vial 750 mg) LABORATORIO REIG JOFRE	15 mg/mL (750 mg/50 mL)	D5W	329±1.00	1.027	338	6.04±0.03	NO
		NS	318±1.53	1.013	322	6.81±0.03	NO
	30 mg/mL (1.500 mg/50 mL)	D5W	355±1.73	1.028	365	6.41±0.03	NO
		NS	346±1.53	1.019	353	6.73±0.03	NO
CICLOSPORIN (SANDIMMUN® amp 250 mg/5 mL) NOVARTIS FARMACEUTICA SA	2.5 mg/mL (250 mg/100 mL)	D5W	593±1.00	1.020	605	6.61±0.01	NO
		NS	546±1.53	1.007	550	6.50±0.01	NO
		1/2S	430±1.53	1.007	433	5.09±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>CIPROFLOXACINE</b> (bag 200 mg/100 mL) <b>ALTAN PHARMACEUTICALS S.A.U.</b>	2 mg/ml	-	290±1.53	1.043	303	4.30±0.01	NO
<b>CISATRACURIUM</b> (NIMBEX FORTE® vial 150 mg/30 mL, amp 20 mg/10 mL) <b>ASPEN PHARMACARE ESPAÑA S.L.U. (vial)</b> <b>PFIZER, S.L.U (amp 20 mg)</b>	1.2 mg/mL (300 mg/250 mL)	D5W	226±0.58	1.016	230	3.79±0.01	NO
		NS	118±0.58	1.004	119	3.53±0.02	NO
	2 mg/mL (100 mg/50 mL)	-	2±0.58	1.002	2	3.33±0.01	NO
<b>CLARITHROMYCIN</b> (KLACID® vial 500 mg) <b>MYLAN PHARMACEUTICALS, S.L.</b>	2 mg/mL (500 mg/250 mL)	D5W	294±1.15	1.021	301	5.21±0.02	NO
		NS	273±1.53	1.008	275	5.36±0.04	NO
<b>CLINDAMYCIN</b> (vial 300 mg/2 ML, vial 600 mg/4 ml) <b>LABORATORIOS NORMON</b>	9 mg/mL (900 mg/100 mL)	D5W	329±2.08	1.024	337	6.43±0.01	NO
		NS	305±1.53	1.011	308	6.27±0.02	NO
	12 mg/mL (600 mg/50 mL)	D5W	341±1.00	1.025	350	6.81±0.01	NO
		NS	318±1.53	1.013	322	6.69±0.02	NO
<b>CLOXACILLIN</b> (vial 1 g) <b>LABORATORIOS NORMON</b>	20 mg/mL (1 g/50 mL)	D5W	266±2.08	1.020	271	4.91±0.03	NO
		NS	258±1.15	1.012	261	4.90±0.01	NO
<b>COLISTIMETHATE SODIUM</b> (vial 1.000.000 UI) <b>ALTAN PHARMACEUTICALS S.A.U.</b>	1.6 mg/mL (80 mg/50 mL)	D5W	304±1.15	1.020	310	8.26±0.02	NO
		NS	292±1.73	1.008	294	8.29±0.02	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>COTRIMOXAZOLE</b> <b>(SOLTRIM® vial 800 mg sulfamethoxazole/160 mg trimethoprim)</b> <b>ALMIRALL, S.A.</b>	3.2 mg/mL (800 mg/250 mL)	D5W	408±1.00	1.023	417	8.61±0.01	NO
		NS	388±2.00	1.011	392	8.73±0.02	NO
<b>DAPTOMYCIN</b> <b>(CUBICIN® vial 350 mg, 500 mg)</b> <b>MERCK SHARP &amp; DOHME DE ESPAÑA, S.A.</b>	7 mg/mL (350 mg/50 mL)	NS	289±1.53	1.008	292	4.53±0.01	NO
	10 mg/mL (500 mg/50 mL)	NS	295±1.15	1.008	297	4.50±0.01	NO
<b>DEXKETOPROFEN</b> <b>(ENANTYUM® amp 50 mg/2 mL)</b> <b>LABORATORIOS MENARINI</b>	1 mg/mL (50 mg/50 mL)	D5W	390±1.53	1.019	397	7.18±0.02	NO
		NS	373±0.58	1.009	376	7.31±0.02	NO
<b>DEXMEDETOMIDINE</b> <b>(DEXDOR® amp 200 µg/2 mL)</b> <b>ORION PHARMA, S.L.</b>	4 µg/mL (5 amp/250 mL)	D5W	298±1.73	1.017	303	4.18±0.01	NO
		NS	278±0.58	1.006	279	5.60±0.02	NO
	8 µg/mL (10 amp/250 mL)	D5W	300±2.08	1.018	306	4.20±0.01	NO
		NS	277±0.58	1.006	279	5.54±0.01	NO



Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>DIGOXIN</b> (amp 0.5 mg/2 mL) <b>KERN PHARMA, S.L.</b>	5 µg/mL (0.5 mg/100 mL)	D5W	446±0.58	1.019	455	6.03±0.03	YES
		NS	418±2.08	1.006	421	6.09±0.05	YES
	10 µg/mL (0.5 mg/50 mL)	D5W	608±2.00	1.019	620	6.25±0.02	YES
		NS	568±2.08	1.007	572	6.14±0.04	YES
		1/2S	458±1.73	1.004	460	6.12±0.01	YES
<b>DIPOTASSIUM PHOSPHATE</b> (amp 1 M 10 mL) <b>FRESENIUS KABI ESPAÑA, S.A</b>	1 amp/250 mL	D5W	378±1.53	1.026	387	9.28±0.01	YES
		NS	359±1.15	1.013	363	9.53±0.01	YES
	2 amp/250 mL	D5W	447±1.15	1.030	461	9.41±0.01	YES
		NS	434±0.58	1.020	443	9.63±0.01	YES
<b>DOBUTAMINE</b> (amp 250 mg/20 mL) <b>PFIZER, S.L.U</b>	1 mg/mL (250 mg/250 mL)	D5W	282±1.53	1.018	287	3.95±0.01	YES
		NS	266±1.73	1.007	268	4.55±0.01	YES
	2 mg/mL (500 mg/250 mL)	D5W	264±0.58	1.017	269	3.83±0.01	YES
		NS	250±0.58	1.007	251	4.17±0.01	YES
<b>DOPAMINE</b> (amp 200 mg/5 mL) <b>GRIFOLS MOVACO S.A.</b>	1.6 mg/mL (400 mg/250 mL)	D5W	312±1.73	1.020	318	4.30±0.01	YES
		NS	289±1.53	1.007	291	4.80±0.01	YES

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>EPINEPHRINE</b> (amp 1 mg/mL) <b>B.BRAUN MEDICAL, SA.</b>	40 µg/mL (10 mg/250 mL)	D5W	295±2.08	1.020	301	3.89±0.01	YES
		NS	276±0.58	1.008	279	3.91±0.01	YES
	100 µg/mL (10 mg/100 mL)	D5W	298±2.08	1.019	303	3.76±0.01	YES
		NS	277±0.58	1.008	280	3.72±0.01	YES
<b>EOPROSTENOL</b> (FLOLAL® vial 0.5 mg) <b>GLAXOSMITHKLINE, S.A.</b>	5 µg/mL (0.5 mg/100 mL)	NS	198±0.58	1.006	199	11.88±0.01	NO
	10 µg/mL (1 mg/100 mL)	NS	117±0.58	1.005	117	12.15±0.01	NO
<b>ERITROMYCIN</b> (PANTOMICINA® vial 1 g) <b>FERRER INTERNACIONAL, S.A.</b>	2 mg/mL (1 g/500 mL)	NS	284±0.58	1.008	287	6.98±0.01	NO
	2.5 mg/mL (250 mg/100 mL)	NS	284±0.00	1.008	286	7.09±0.02	NO
	5 mg/mL (500 mg/100 mL)	NS	283±0.58	1.010	286	7.30±0.01	NO
<b>ERTAPENEM</b> (INVANZ® vial 1 g) <b>MERCK SHARP &amp; DOHME DE ESPAÑA, S.A.</b>	20 mg/mL (1 g/50 mL)	NS	388±1.53	1.018	395	7.76±0.01	NO
<b>ESMOLOL</b> (BREVIBLOC® 10 mg/mL bag 250 mL) <b>BAXTER S.L.</b>	10 mg/ml	-	305±1.53	1.030	314	5.01±0.00	YES
<b>FENTANYL</b> (FENTANEST® amp 0.15 mg/3 mL) <b>KERN PHARMA, S.L.</b>	4.5 µg/mL (0.45 mg/100 mL)	D5W	296±1.00	1.019	302	4.23±0.01	NO
		NS	278±0.58	1.007	280	5.17±0.01	NO
	15 µg/mL (0.75 mg/50 mL)	D5W	294±1.53	1.019	299	4.31±0.02	NO
		NS	279±0.58	1.007	281	4.82±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>FLECAINIDE (TAMBOCOR® amp 150 mg/15 mL) MYLAN PHARMACEUTICALS, S.L.</b>	2 mg/mL (300 mg/150 mL)	D5W	295±0.58	1.018	300	5.79±0.01	NO
<b>FLUCONAZOLE (400 mg/200 mL bag) LABORATORIOS NORMON</b>	2 mg/ml	-	290±0.58	1.031	299	5.50±0.03	NO
<b>FLUMAZENIL (ANEXATE® amp 1 mg/10 mL) LABORATORIOS RUBIÓ S A</b>	0.04 mg/mL (2 mg/50 mL)	D5W	300±0.58	1.016	305	4.07±0.01	NO
		NS	289±1.15	1.008	292	4.13±0.01	NO
	0.1 mg/mL (5 mg/50 mL)	-	297±0.58	1.007	299	3.97±0.01	NO
<b>FOSCARNET (vial 6.000 mg/250 mL) CLINIGEN HEALTHCARE ltd</b>	12 mg/mL (6000 mg/500 mL)	D5W	294±0.58	1.019	299	7.57±0.00	NO
		NS	281±0.58	1.012	285	7.46±0.01	NO
	24 mg/mL (6000 mg/250 mL)	-	281±1.53	1.016	285	7.45±0.01	NO
<b>FOSPHOMYCIN (vial 1 g) LABORATORIOS ERN, S.A.</b>	20 mg/mL (1 g/50 mL)	D5W	559±1.15	1.035	579	7.79±0.01	NO
		NS	547±2.08	1.026	562	7.75±0.01	NO
		1/2S	455±1.53	1.022	465	7.64±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>FUROSEMIDE</b> (SEGURIL® 250 mg/25 mL) SANOFI-AVENTIS, S.A.	2 mg/mL (500 mg/250 mL)	D5W	299±1.00	1.017	304	8.85±0.01	NO
		NS	279±0.58	1.007	281	9.37±0.01	NO
	5 mg/mL (250 mg/50 mL)	D5W	291±1.73	1.019	297	8.44±0.02	NO
		NS	282±0.58	1.013	286	8.67±0.01	NO
	10 mg/mL (500 mg/50 mL)	-	284±1.00	1.019	289	8.94±0.01	NO
<b>GANCICLOVIR</b> (CYMEVENE® amp 500 mg) KERN PHARMA, S.L.	5 mg/mL (500 mg/100 mL)	D5W	302±1.53	1.023	309	10.52±0.01	NO
		NS	288±1.15	1.009	290	10.88±0.01	NO
<b>GENTAMICIN</b> (240 mg/80 mL) B.BRAUN MEDICAL, SA.	3 mg/ml	-	297±0.58	1.033	307	4.62±0.02	NO
<b>HALOPERIDOL</b> (amp 5 mg/mL) PENSA PHARMA, S.A.U.	0.05 mg/mL (2.5 mg/50 mL)	D5W	297±0.58	1.021	303	3.91±0.01	NO
	0.1 mg/mL (5 mg/50 mL)	D5W	297±0.58	1.021	303	3.80±0.02	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>HEPARIN SODIUM</b> (5% vial 5 mL) <b>LABORATORIO REIG JOFRE</b>	20 UI/mL (5.000/250 mL)	D5W	293±1.15	1.020	299	6.03±0.02	NO
		NS	276±0.58	1.005	277	5.88±0.01	NO
	40 UI/mL (10.000/250 mL)	D5W	292±1.00	1.020	298	6.35±0.01	NO
		NS	276±1.00	1.006	278	5.65±0.01	NO
	100 UI/mL (25.000/250 mL)	D5W	292±1.53	1.020	298	6.56±0.01	NO
		NS	276±1.53	1.006	278	5.79±0.01	NO
<b>HYDROCORTISONE</b> (ACTOCORTINA® vial 100 mg) <b>TAKEDA FARMACEUTICA</b> <b>ESPAÑA, S.A.</b>	2 mg/mL (100 mg/50 mL)	D5W	296±1.53	1.019	302	7.47±0.01	NO
		NS	274±0.58	1.006	276	7.60±0.01	NO
	4 mg/mL (200 mg/50 mL)	D5W	292±1.00	1.018	297	7.74±0.01	NO
		NS	268±1.00	1.006	270	7.83±0.01	NO
<b>IMIPENEM-CILASTATIN</b> (vial 500 mg/500 mg) <b>FRESENIUS KABI ESPAÑA, S.A</b>	5 mg/mL (500 mg/100 mL)	D5W	386±0.58	1.026	396	7.56±0.01	NO
		NS	358±1.53	1.015	364	7.43±0.02	NO
<b>INSULIN HUMAN REGULAR</b> (ACTRAPID® vial 100 UI/mL) <b>NOVO NORDISK PHARMA, S.A.</b>	1 UI/mL (100 UI/100 mL)	D5W	280±1.00	1.011	283	4.93±0.03	NO
		NS	280±0.58	1.006	282	5.82±0.02	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
ISOPRENALINE (ALEUDRINA® amp 0.2 mg/mL) LABORATORIO REIG JOFRE	4 µg/mL (1 mg/250 mL)	D5W	297±0.58	1.019	302	3.66±0.01	NO
		NS	278±0.58	1.007	280	4.47±0.01	NO
IRON SUCROSE (amp 100 mg/5 mL) VIFOR PHARMA ESPAÑA, S.L.	1 mg/mL (100 mg/100 mL)	NS	328±0.58	1.018	334	10.67±0.01	NO
	2 mg/mL (200 mg/100 mL)	NS	385±1.00	1.020	393	10.82±0.01	NO
KETAMINE (KETOLAR® vial 500 mg/10 mL) PFIZER, S.L.U	2 mg/mL (500 mg/250 mL)	D5W	299±0.58	1.019	305	4.23±0.01	NO
		NS	280±1.00	1.007	282	5.02±0.01	NO
	5 mg/mL (500 mg/100 mL)	D5W	307±1.15	1.019	312	4.23±0.01	NO
		NS	287±0.58	1.007	289	4.81±0.01	NO
LABETALOL (TRANDATE® amp 100 mg/20 mL) KERN PHARMA, S.L.	1 mg/mL (250 mg/250 mL)	D5W	245±1.00	1.016	249	3.93±0.01	NO
		NS	228±1.00	1.005	229	4.20±0.02	NO
	2 mg/mL (500 mg/250 mL)	D5W	190±1.00	1.015	193	3.77±0.01	NO
		NS	177±1.53	1.006	178	4.19±0.01	NO
LEVOFLOXACIN (bag 500 mg/100 mL) FRESENIUS KABI ESPAÑA, S.A	5 mg/ml	-	303±2.08	1.032	312	5.16±0.01	NO
LEVOSIMENDAN (SIMDAX® vial 12.5 mg/5 mL) ORION PHARMA, S.L.	25 µg/mL (12.5 mg/500 mL)	D5W	472±1.00	1.016	480	3.46±0.01	NO
	50 µg/mL (25 mg/500 mL)	D5W	669±1.53	1.017	680	3.29±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>LEVETIRACETAM</b> (vial 500 mg/5 mL) <b>ACCORD HEALTHCARE, S.L.U.</b>	5 mg/mL (500 mg/100 mL)	D5W	318±0.58	1.020	325	5.17±0.01	NO
		NS	302±0.58	1.007	304	5.52±0.01	NO
	10 mg/mL (1000 mg/100 mL)	D5W	343±2.31	1.020	350	5.32±0.01	NO
		NS	325±1.53	1.011	329	5.47±0.01	NO
	15 mg/mL (1500 mg/100 mL)	D5W	366±1.53	1.021	374	5.34±0.01	NO
		NS	346±0.58	1.009	349	5.47±0.01	NO
<b>LINEZOLID (bag 600 mg/300 mL)</b> <b>FRESENIUS KABI ESPAÑA, S.A</b>	2 mg/ml	-	296±1.53	1.043	309	4.83±0.01	NO
<b>MAGNESIUM SULFATE</b> (SULMETIN SIMPLE® amp 1500 mg/10 mL) <b>SANOFI-AVENTIS, S.A.</b>	30 mg/mL (15.000 mg/500 mL)	D5W	384±1.53	1.030	396	5.63±0.01	NO
		NS	354±1.00	1.022	362	5.77±0.02	NO
	75 mg/mL (7.500 mg/100 mL)	D5W	483±1.73	1.046	505	5.05±0.01	NO
		NS	469±0.58	1.039	488	5.63±0.01	NO
		1/2S	400±1,15	1,037	414	5,50±0,01	NO
<b>MANNITOL (OSMOFUNDINA® 20 % 250 mL)</b> <b>B.BRAUN MEDICAL, SA.</b>	20%	-	1253±1.15	1.066	1335	6.29±0.01	YES
<b>MEROPENEM</b> (vial 500 mg, 1 g) <b>FRESENIUS KABI ESPAÑA, S.A</b>	20 mg/mL (1.000 mg/50 mL)	D5W	439±2.31	1.028	451	7.91±0.02	NO
		NS	409±0.58	1.015	415	7.87±0.00	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT	
<b>METAMIZOL MAGNESIUM (NOLOTIL® amp 2 g/5 ml)</b> <b>BOEHRINGER INGELHEIM ESPAÑA S.A.</b>	20 mg/mL (2 g/100 mL)	D5W	372±0.58	1.024	381	6.62±0.01	NO	
		NS	351±1.53	1.018	357	7.08±0.01	NO	
	160 mg/mL (8 g/50 mL)	D5W	786±1.53	1.054	829	7.05±0.01	NO	
		NS	772±1.73	1.043	805	7.18±0.01	NO	
		1/2S	753±1,00	1,041	784	6,84±0,01	NO	
	<b>METHYLPREDNISOLONE (SOLU MODERIN® amp 8mg, amp 125 mg, amp 500 mg)</b> <b>PFIZER, S.L.U</b>	0.8 mg/mL (40 mg/50 mL)	D5W	299±2.08	1.021	305	7.46±0.01	NO
NS			279±0.58	1.015	283	7.59±0.01	NO	
2.5 mg/mL (250 mg/100 mL)		D5W	302±0.58	1.021	309	7.72±0.01	NO	
		NS	284±0.00	1.018	289	7.53±0.01	NO	
5 mg/mL (250 mg/50 mL)		D5W	310±0.58	1.021	316	7.75±0.01	NO	
		NS	290±0.58	1.009	292	7.62±0.01	NO	
10 mg/mL (1 g/100 mL)		D5W	316±0.58	1.022	323	7.74±0.01	NO	
		NS	298±1.53	1.012	301	7.64±0.01	NO	
<b>METOCLOPRAMIDE (amp 10 mg/2 mL)</b> <b>KERN PHARMA, S.L.</b>		0.2 mg/mL (10 mg/50 mL)	D5W	295±1.53	1.019	301	4.13±0.01	NO
			NS	274±1.15	1.007	276	5.64±0.01	NO



Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>METRONIDAZOLE (FLAGYL® bag 500 mg/100 mL) SANOFI-AVENTIS, S.A.</b>	5 mg/ml	-	274±1.53	1.035	284	5.35±0.05	NO
<b>MICAFUNGIN (MYCAMINE® vial 100 mg) ASTELLAS PHARMA, S.A.</b>	1 mg/mL (100 mg/100 mL)	D5W	301±0.58	1.020	307	4.35±0.01	NO
		NS	279±1.15	1.007	281	5.90±0.01	NO
<b>MIDAZOLAM (amp 50 mg/10 mL) ACCORD HEALTHCARE, S.L.U.</b>	1 mg/mL (100 mg/100 mL)	D5W	275±1.15	1.017	280	3.55±0.01	NO
		NS	259±1.15	1.006	261	3.76±0.01	NO
<b>MILRINONE (COROTROPE® amp 10 mg/10 mL) SANOFI-AVENTIS, S.A.</b>	0.2 mg/mL (20 mg/100 mL)	D5W	298±0.58	1.019	303	3.49±0.01	NO
		NS	280±0.58	1.010	282	3.52±0.01	NO
<b>MONOPOTASSIUM PHOSPHATE (amp 1 M 10 mL) B.BRAUN MEDICAL, SA.</b>	1 amp/250 mL	D5W	364±0.58	1.024	372	4.36±0.01	YES
		NS	340±0.58	1.011	344	4.34±0.01	YES
	2 amp/250 mL	D5W	422±1.00	1.027	433	4.35±0.01	YES
		NS	400±1.73	1.015	406	4.29±0.01	YES

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>MORPHINE HYDROCHLORIDE</b> (amp 1% 10 mg/mL, amp 2% 40 mg/2 mL) <b>B.BRAUN MEDICAL, SA.</b>	0.2 mg/mL (20 mg/100 mL)	D5W	287±0.58	1.019	292	4.25±0.00	NO
		NS	276±1.53	1.007	278	5.78±0.02	NO
	0.5 mg/mL (50 mg/100 mL)	D5W	285±2.00	1.018	290	4.34±0.04	NO
		NS	275±1.00	1.006	277	5.70±0.01	NO
	1 mg/mL (100 mg/100 mL)	D5W	283±1.53	1.018	288	4.39±0.01	NO
		NS	277±1.00	1.007	279	5.56±0.01	NO
<b>MYCOPHENOLATE MOFETIL</b> (CELLCEPT® vial 500 mg) <b>ROCHE FARMA, S. A.</b>	6 mg/mL (1 vial/84 mL)	D5W	307±1.73	1.023	314	3.80±0.01	NO
<b>NIMODIPINE</b> (vial 10 mg/50 mL) <b>ALTAN PHARMACEUTICALS</b> S.A.U.	200 µg/ml	-	-	1.032	.*	6.94±0.03	NO
<b>NITROGLYCERIN</b> (SOLINITRINA® amp 5 mg/5 mL) <b>KERN PHARMA, S.L.</b>	100 µg/mL (50 mg/500 mL)	D5W	-	0.999	.*	4.25±0.01	NO
		NS	2151±43.21	0.991	2132	5.45±0.01	NO
		1/2S	2021±1.15	0.990	2000	5.46±0.01	NO
	200 µg/mL (50 mg/250 mL)	D5W	-	0.988	.*	4.28±0.01	NO
		NS	2168±23.63	0.980	2125	5.42±0.01	NO
		1/2S	-	0.977	.*	6.21±0.02	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>NITROPRUSSIDE</b> (vial 50 mg) <b>MYLAN PHARMACEUTICALS,</b> <b>S.L.</b>	50 µg/mL (50 mg/1000 mL)	D5W	298±0.58	1.018	304	6.29±0.01	NO
	200 µg/mL (50 mg/250 mL)	D5W	299±1.00	1.019	305	6.97±0.01	NO
<b>NOREPINEPHRINE</b> (amp 0.1% 10 mg/10 mL) <b>B.BRAUN MEDICAL, SA.</b>	80 µg/mL (40 mg/500 mL)	D5W	297±1.00	1.013	300	4.02±0.01	YES
		NS	279±1.53	1.006	280	3.92±0.01	YES
	120 µg/mL (30 mg/250 mL)	D5W	296±0.58	1.014	300	3.80±0.01	YES
		NS	278±0.58	1.006	280	3.82±0.00	YES
	240 µg/mL (60 mg/250 mL)	D5W	289±0.58	1.016	294	3.68±0.01	YES
		NS	279±1.15	1.006	280	3.67±0.02	YES
<b>OMEPRAZOLE</b> (vial 40 mg) <b>LABORATORIOS NORMON</b>	0.4 mg/mL (40 mg/100 mL)	D5W	296±1.00	1.020	302	9.45±0.01	NO
		NS	265±1.00	1.007	267	9.80±0.01	NO
	0.48 mg/mL (120 mg/250 mL)	D5W	303±0.58	1.020	309	9.60±0.00	NO
		NS	282±1.15	1.006	284	9.90±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>ONDANSETRON</b> (amp 8 mg/4 mL) <b>ACCORD HEALTHCARE, S.L.U.</b>	0.08 mg/mL (4 mg/50 mL)	D5W	297±1.53	1.020	303	4.09±0.01	NO
		NS	280±0.58	1.003	281	4.26±0.01	NO
	0.16 mg/mL (8 mg/50 mL)	D5W	300±0.58	1.021	306	3.97±0.01	NO
		NS	288±0.58	1.007	290	4.06±0.01	NO
<b>PARACETAMOL</b> (vial 1.000 mg/100 mL) <b>FRESENIUS KABI ESPAÑA, S.A</b>	10 mg/ml	-	275±2.08	1.039	286	6.47±0.27	NO
<b>PENICILLIN G SODIUM</b> (SODIOPEN® vial 2.000.000 UI vial 5.000.000 UI) <b>LABORATORIO REIG JOFRE</b>	40.000 UI/mL	NS	380±0.58	1.014	385	5.81±0.01	NO
	100.000 UI/mL	NS	610±1.73	1.031	629	6.13±0.01	NO
		1/2S	421±1.00	1.021	436	6.12±0.01	NO
<b>PENTAMIDINE ISETIONATE</b> (PENTACARINAT® vial 300 mg) <b>SANOFI-AVENTIS, S.A.</b>	1.2 mg/mL (300 mg/250 mL)	D5W	290±1.53	1.020	295	4.25±0.01	YES
		NS	278±1.53	1.007	280	5.65±0.01	YES

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>PHENYTOIN</b> (vial 250 mg/5 mL) <b>LA BOTICA DE VILLAVERDE</b>	2 mg/mL (100 mg/50 mL)	NS	577±1.15	1.007	581	11.24±0.01	YES
		1/2S	427±1.00	1.005	429	11.38±0.02	YES
	3 mg/mL (150 mg/50 mL)	NS	715±1.15	1.008	720	11.50±0.01	YES
		1/2S	592±1.00	1.006	596	11.63±0.01	YES
	5 mg/mL (250 mg/50 mL)	NS	1036±0.58	1.010	1046	11.86±0.00	YES
		1/2S	899±1.00	1.007	905	11.86±0.01	YES
<b>PIPERACILLIN/TAZOBACTAM</b> (vial 4 g/0.5 mg) <b>FRESENIUS KABI ESPAÑA, S.A</b>	40 mg/mL (2 g/50 mL)	D5W	402±1.15	1.031	415	5.53±0.01	NO
		NS	381±1.53	1.023	390	5.68±0.01	NO
	80 mg/mL (4 g/50 mL)	D5W	480±1.53	1.044	501	5.77±0.02	NO
		NS	464±1.53	1.037	482	5.78±0.01	NO
		1/2S	442±1.15	1.036	458	5.31±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT	
<b>POTASSIUM CHLORIDE</b> (amp 2 M 10 mEq/5 mL) <b>B.BRAUN MEDICAL, SA.</b>	0.04 mEq/mL (4 amp/1.000 mL)	D5W	373±0.58	1.021	380	4.11±0.00	YES	
		NS	352±1.00	1.009	355	5.53±0.01	YES	
	0.06 mEq/mL (6 amp/1.000 mL)	D5W	398±1.53	1.025	408	4.36±0.01	YES	
		NS	389±0.58	1.009	392	6.45±0.01	YES	
	0.2 mEq/mL (2 amp/100 mL)	D5W	631±1.00	1.027	648	4.21±0.01	YES	
		NS	628±0.58	1.017	639	5.54±0.01	YES	
		1/2S	510±1.53	1.015	518	5.26±0.01	YES	
	0.4 mEq/mL (4 amp/100 mL)	D5W	990±2.00	1.036	1026	4.30±0.01	YES	
		NS	973±1.00	1.024	996	5.74±0.01	YES	
		1/2S	871±1.53	1.024	892	5.27±0.01	YES	
	<b>PROPOFOL (2% vial 50 mL, 1% vial 50 mL)</b> <b>FRESENIUS KABI ESPAÑA, S.A.</b>	1%	-	307±0.01	0.999	307	8.08±0.01	NO
		2%	-	335±2.00	1.022	342	7.88±0.07	NO
<b>RANITIDINE</b> (amp 50 mg/5 mL) <b>LABORATORIOS NORMON</b>	1 mg/mL (50 mg/50 mL)	D5W	274±0.58	1.018	279	6.64±0.01	NO	
		NS	256±1.00	1.007	258	7.22±0.02	NO	

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>REMIFENTANIL</b> (vial 1 mg, vial 5 mg) <b>LABORATORIOS NORMON</b> (vial 1 mg) <b>LABORATORIO REIG JOFRE</b> (vial 5 mg)	20 µg/mL (1 mg/50 mL)	D5W	287±0.00	1.020	293	3.50±0.01	NO
		NS	283±0.58	1.007	285	3.70±0.01	NO
	50 µg/mL (5 mg/100 mL)	D5W	286±1.00	1.019	291	3.60±0.01	NO
		NS	285±0.58	1.007	287	3.69±0.00	NO
	100 µg/mL (5 mg/50 mL)	D5W	285±1.53	1.020	291	3.41±0.01	NO
		NS	285±1.00	1.007	287	3.47±0.01	NO
<b>RIFAMPICIN</b> (RIFALDIN® vial 600 mg) <b>SANOFI-AVENTIS, S.A.</b>	6 mg/mL (600 mg/100 mL)	D5W	282±2.08	1.020	288	8.28±0.01	NO
		NS	262±2.00	1.009	264	8.31±0.01	NO
<b>ROCURONIUM</b> (vial 50 mg/5 mL) <b>FRESENIUS KABI ESPAÑA, S.A</b>	2.4 mg/mL (600 mg/250 mL)	D5W	295±1.15	1.017	300	4.05±0.01	NO
		NS	279±1.00	1.007	281	3.99±0.00	NO
	5 mg/mL (500 mg/100 mL)	D5W	294±0.58	1.015	298	4.02±0.01	NO
		NS	283±0.00	1.008	285	3.98±0.00	NO
<b>SODIUM BICARBONATE</b> (VENOFUYESN® frasco 1M (8.4%) 250 mL) FRESENIUS KABI ESPAÑA, S.A	8.40%	-	1567±1.00	1.081	1694	8.34±0.00	YES
<b>SODIUM CHLORIDE</b> (amp 20% 10 mL) <b>B.BRAUN MEDICAL, SA.</b>	8 mg/mL (1 amp/250 mL)	NS	516±0.58	1.012	523	5.94±0.01	YES
	20 mg/mL (1 amp/100 mL)	NS	874±1.15	1.020	892	5.72±0.01	YES

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>SODIUM CHLORIDE (2% 500 mL HYPERTONIC) FRESENIUS KABI ESPAÑA, S.A</b>	2%	-	636±2,00	1,038	660	5,09±0,03	YES
<b>TEICOPLANIN (TARGOCID® vial 400 mg) SANOFI-AVENTIS, S.A.</b>	4 mg/mL (200 mg/50 mL)	D5W	297±0.58	1.021	303	7.48±0.02	NO
		NS	280±0.58	1.006	282	7.49±0.01	NO
	8 mg/mL (400 mg/50 mL)	D5W	297±1.53	1.022	304	7.73±0.01	NO
		NS	282±2.52	1.008	284	7.50±0.01	NO
<b>THIOPENTAL (vial 1 g/20 mL) B.BRAUN MEDICAL, SA.</b>	20 mg/mL (1 g/50 mL)	D5W	400±1.00	1.023	409	10.74±0.01	NO
		NS	392±1.53	1.013	397	11.16±0.01	NO
<b>TIGECYCLINE (TYGACIL® vial 50 g) PFIZER, S.L.U</b>	0.5 mg/mL (50 mg/100 mL)	D5W	283±1.53	1.020	289	4.96±0.09	NO
		NS	268±0.58	1.008	270	5.39±0.01	NO
	1 mg/mL (100 mg/100 mL)	D5W	275±1.00	1.020	281	5.05±0.01	NO
		NS	257±0.58	1.007	259	5.40±0.02	NO
<b>TOBRAMYCIN (240 mg/80 mL bag) B.BRAUN MEDICAL. SA.</b>	3 mg/mL (240 mg/80 mL)	-	313±0.58	1.010	316	5.12±0.01	NO
<b>TRANEXAMIC ACID (AMCHAFIBRIN® amp 500 mg/5 mL) MYLAN PHARMACEUTICALS, S.L.</b>	10 mg/mL (500 mg/50 mL)	D5W	340±2.08	1.020	346	6.65±0.01	NO
		NS	314±1.15	1.009	316	7.09±0.02	NO



Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
<b>URAPIDIL</b> <b>(ELGADIL® amp 50 mg/10 mL)</b> <b>TAKEDA FARMACEUTICA</b> <b>ESPAÑA, S.A.</b>	2 mg/mL (100 mg/50 mL)	D5W	802±0.58	1.016	815	6.12±0.01	NO
		NS	778±0.58	1.008	785	5.99±0.01	NO
		1/2S	695±1.15	1.007	700	5.95±0.01	NO
	5 mg/mL (250 mg/50 mL)	-	1610±2.00	1.012	1629	6.18±0.01	NO
<b>UROKINASE</b> <b>(vial 100.000 UI)</b> <b>UCB PHARMA, S.A.</b>	1.000 UI/mL (100.000 UI/100 mL)	NS	272±0.00	1.007	274	6.10±0.01	NO
<b>VALPROIC ACID</b> <b>(DEPAKINE® vial 400 mg)</b> <b>SANOFI-AVENTIS, S.A.</b>	4 mg/mL (400 mg/100 mL)	D5W	334±1.00	1.018	340	6.95±0.01	NO
		NS	324±1.00	1.010	327	7.04±0.01	NO
	40 mg/mL (800 mg/20 mL)	D5W	705±1.15	1.022	720	6.82±0.01	NO
		NS	691±1.53	1.014	701	6.81±0.00	NO
		1/2S	592±2.00	1.009	597	6.80±0.01	NO

Table 2 (continued)

DRUG	CONCENTRATION	DILUENT	MEAN OSMOLALITY <sup>a</sup>	DENSITY <sup>b</sup>	MEAN OSMOLARITY <sup>c</sup>	pH	VESICANT
VANCOMYCIN (vial 500 mg) LABORATORIO REIG JOFRE	4 mg/mL (1.000 mg/250 mL)	D5W	279±1.00	1.020	285	3.61±0.01	YES
		NS	261±1.15	1.009	263	3.74±0.02	YES
	5 mg/mL (500 mg/100 mL)	D5W	273±0.58	1.020	278	3.70±0.01	YES
		NS	255±1.00	1.009	257	3.72±0.01	YES
	10 mg/mL (1.000 mg/100 mL)	D5W	249±1.53	1.020	254	3.61±0.01	YES
		NS	233±1.73	1.010	235	3.51±0.02	YES
VORICONAZOLE (vial 200 mg) KERN PHARMA, S.L.	2 mg/mL (200 mg/100 mL)	D5W	335±0.58	1.025	343	4.20±0.00	NO
		NS	321±1.00	1.016	326	5.38±0.01	NO
	4 mg/mL (400 mg/100 mL)	D5W	378±1.53	1.028	389	4.48±0.02	NO
		NS	359±1.00	1.016	365	5.44±0.01	NO

Color legend: *red* high risk, *orange* moderate risk, *green* low risk

*I/2S* sodium chloride 0.45%, *D5W* dextrose 5% in water, *NS* sodium chloride 0.9%

<sup>a</sup>Mean osmolality expressed in mOsm/kg as the mean ± standard deviation of three different measures

<sup>b</sup>Density expressed as g/mL

<sup>c</sup>Osmolarity expressed in mOsm/L


\*Osmolality values were above the osmometer calibration range

-There is no diluent specified in ready to use drugs

**Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License, which permits any non-commercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative

Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc/4.0/>.

## Authors and Affiliations

Silvia Manrique-Rodríguez<sup>1,2,3</sup>  · Irene Heras-Hidalgo<sup>1,2</sup> · M. Sagrario Pernia-López<sup>1,2,3</sup> · Ana Herranz-Alonso<sup>1,2,3</sup> · M. Camino del Río Pisabarro<sup>4,5</sup> · M. Belén Suárez-Mier<sup>4,6</sup> · M. Antonia Cubero-Pérez<sup>4,7</sup> · Verónica Viera-Rodríguez<sup>4,8</sup> · Noemí Cortés-Rey<sup>4,9</sup> · Elizabeth Lafuente-Cabrero<sup>4,10</sup> · M. Carmen Martínez-Ortega<sup>4,11</sup> · Esther Bermejo-López<sup>12,13</sup> · Cristina Díez-Sáenz<sup>14</sup> · Piedad López-Sánchez<sup>3,15</sup> · M. Luisa Gaspar-Carreño<sup>3,16</sup> · Rubén Achau-Muñoz<sup>3,16</sup> · Juan F. Márquez-Peiró<sup>3,17</sup> · Marta Valera-Rubio<sup>3,18</sup> · Esther Domingo-Chiva<sup>3,19</sup> · Irene Aquerreta-González<sup>3,20</sup> · Ignacio Pellín Ariño<sup>12,21</sup> · M. Cruz Martín-Delgado<sup>12,21</sup> · Manuel Herrera-Gutiérrez<sup>12,22</sup> · Federico Gordo-Vidal<sup>12,23</sup> · Pedro Rascado-Sedes<sup>12,24</sup> · Emilio García-Prieto<sup>12,25</sup> · Lucas J. Fernández-Sánchez<sup>26</sup> · Sara Fox-Carpentieri<sup>27</sup> · Carlos Lamela-Piteira<sup>3,28</sup> · Luis Guerra-Sánchez<sup>29</sup> · Miguel Jiménez-Aguado<sup>29</sup> · María Sanjurjo-Sáez<sup>1,2,3</sup>

<sup>1</sup> Pharmacy Department, Hospital General Universitario Gregorio Marañón, Madrid, Spain

<sup>2</sup> Instituto de Investigación Sanitaria Gregorio Marañón, Madrid, Spain

<sup>3</sup> Sociedad Española de Farmacia Hospitalaria (SEFH), Madrid, Spain

<sup>4</sup> Sociedad Española de Infusión y Acceso Vascular (SEINAV), Madrid, Spain

<sup>5</sup> Nursing Department, Hospital Universitario Donostia, San Sebastián, Spain

<sup>6</sup> Nursing Department, Hospital Universitario Central de Asturias, Oviedo, Spain

<sup>7</sup> Nursing Department, Hospital Clínico San Carlos, Madrid, Spain

<sup>8</sup> Nursing Department, Hospital Universitari i Politècnic La Fe, Valencia, Spain

<sup>9</sup> Nursing Department, Complejo Hospitalario Universitario A Coruña, La Coruña, Spain

<sup>10</sup> Nursing Department, Hospital del Mar, Barcelona, Spain

<sup>11</sup> Preventive Medicine, Hospital Universitario Central de Asturias, Oviedo, Spain

<sup>12</sup> Sociedad Española de Medicina Intensiva Crítica y Unidades Coronarias (SEMICYUC), Madrid, Spain

<sup>13</sup> Intensive Care Department, Hospital General Universitario Gregorio Marañón, Madrid, Spain

<sup>14</sup> Nursing Department (Intensive Care), Hospital General Universitario Gregorio Marañón, Madrid, Spain

<sup>15</sup> Pharmacy Department, Hospital General de Tomelloso, Ciudad Real, Spain

<sup>16</sup> Pharmacy Department, Hospital Intermutual de Levante, Valencia, Spain

<sup>17</sup> Pharmacy Department, Hospital Perpetuo Socorro, Alicante, Spain

<sup>18</sup> Pharmacy Department, Hospital Universitario Virgen de la Victoria, Málaga, Spain

<sup>19</sup> Pharmacy Department, Complejo Hospitalario Universitario de Albacete, Albacete, Spain

<sup>20</sup> Pharmacy Department, Clínica Universitaria de Navarra, Pamplona, Spain

<sup>21</sup> Intensive Care Department, Hospital de Torrejón de Ardoz, Madrid, Spain

<sup>22</sup> Intensive Care Department, Hospital Regional Universitario de Málaga, Málaga, Spain

<sup>23</sup> Intensive Care Department, Hospital Universitario del Henares, Madrid, Spain

<sup>24</sup> Intensive Care Department, Complejo Hospitalario Universitario de Santiago de Compostela, La Coruña, Spain

<sup>25</sup> Intensive Care Department, Hospital Universitario Central de Asturias, Oviedo, Spain

<sup>26</sup> Department of Anesthesia, Hospital Universitario Central de Asturias, Oviedo, Spain

<sup>27</sup> Nursing Department, Hospital Universitario Nuestra Señora de Candelaria, Tenerife, Spain

<sup>28</sup> Pharmacy Department, Hospital Álvarez-Buylla, Mieres, Spain

<sup>29</sup> Nursing Department (Coronary Unit), Hospital General Universitario Gregorio Marañón, Madrid, Spain