Chemical Stability of Drugs for Use with InfuLife® Disposable Elastomeric Infusion Pumps

InfuLife® is a disposable elastomeric infusion system manufactured by First Medical Source, LLC, indicated for continuous infusion of medications for antibiotic therapy, chemotherapy, and pain management through intravenous, intra-arterial, intramuscular, subcutaneous, or epidural routes. InfuLife® is suitable for ambulatory patients and patients receiving home or alternate-site care.

Source of the data. The stability information below is compiled exclusively from publicly available published sources: peer-reviewed studies of drug solutions in elastomeric infusion devices and other containers, standard drug-compatibility references and drug manufacturers' product information (see References). The InfuLife® fluid path is made of material types commonly used in elastomeric infusion pumps, including a silicone drug reservoir; studies performed in silicone-reservoir devices are marked †, and studies performed in containers other than elastomeric devices are marked ¶. Unless otherwise indicated, the studies were not performed in InfuLife® pumps. As with any admixture, the pharmacist determines the suitability of each preparation, storage condition and in-use period, and follows the drug manufacturer's package insert.

The data relate to the chemical stability of the drugs tested and not to sterility. See the Notes following the table for important conditions of use.

Reported Chemical Stability of Drugs in Elastomeric Infusion Devices

Medication	Concentration	Diluent	Room	Refrigerated	Frozen	References
ACYCLOVIR Na *	0.83-10 mg/ml	NS	14 days, then 24 hrs at 32 °C	--	--	35
AMOXICILLIN	25 mg/ml	SW	12 hrs	24 hrs	--	31
AMPICILLIN Na	20 mg/ml	NS	8 hrs	3 days	--	16,34
	15 mg/ml #	NS	24 hrs at 25 °C	72 hrs	--	36
AMPICILLIN Na + CEFTRIAXONE Na (mixture)	24 + 8 mg/ml	NS	24 hrs (25-30 °C)	48 hrs	--	37
AZITHROMYCIN	1-2 mg/ml	NS/D5W	24 hrs	7 days	--	3
AZTREONAM	50 mg/ml	NS/D5W	48 hrs at 37 °C	--	--	38
CARBENICILLIN	2 gm/50 cc	D5W	24 hrs	3 days	4 wks	11,13,15
CEFAZOLIN Na	5, 40 mg/ml †	NS/D5W	3 days	26 days	--	17
	25 mg/ml	NS	24 hrs ‡	--	--	22
	20 mg/ml	NS/D5W	24 hrs	7 days	12 wks	16,34
CEFEPIME	12.5 mg/ml	NS	24 hrs ‡	--	--	22
CEFONICID	1 gm/50 cc	D5W	24 hrs	3 days	8 wks	10,11,13
CEFOPERAZONE Na	2-50 mg/ml	NS/D5W	24 hrs	5 days	3 wks	3,4
CEFOTETAN Disodium	10-40 mg/ml	NS/D5W	24 hrs	4 days	1 wk	3
CEFOXITIN Na	10 mg/ml	NS/D5W	24 hrs	7 days	--	3,4
CEFTAROLINE	6 mg/ml	NS/D5W	24 hrs	44 hrs	--	28
CEFTAZIDIME	60 mg/ml	NS	--	14 days	14 days	9
	5-60 mg/ml †	NS/D5W	1 day	4 days	--	17
	20 mg/ml	NS/D5W	18 hrs	7 days	12 wks	16,34
CEFTIZOXIME Na	20-40 mg/ml	NS/D5W	48 hrs	7 days	--	3
CEFTOLOZANE-TAZOBACTAM	1.25+0.63 – 25+12.5 mg/ml	NS	24 hrs	7 days	--	23
CEFTRIAXONE Na	10-100 mg/ml	NS	72 hrs	10 days	--	3
	10-40 mg/ml	NS/D5W	--	--	26 wks	3
	5, 40 mg/ml †	NS/D5W	2 days	14 days	--	17
	20 mg/ml	NS/D5W	3 days	10 days	26 wks	16,34
CEFUROXIME Na	1-30 mg/ml	NS/D5W	24 hrs	7 days	6 mths	3,4
CEPHALOTHIN Na	1 gm/50 cc	D5W	12 hrs	4 days	6 wks	10,11,14
CEPHAPIRIN Na	1 gm/50 cc	D5W	24 hrs	10 days	8 wks	10,11,13
CEPHRADINE	500 mg/50 cc	D5W	10 hrs	2 days	6 wks	11,14

Medication	Concentration	Diluent	Room	Refrigerated	Frozen	References
CHLORAMPHENICOL	1 gm/50 cc	D5W	30 days	30 days	6 mths	10,11,12,14
CIMETIDINE HCl	300 mg/50 cc	D5W	48 hrs	8 days	4 wks	10,11,14
CISPLATIN *	0.2 mg/ml	NS	14 days	--	--	3
CLINDAMYCIN PO4	6, 9, 12 mg/ml	NS/D5W	16 days	32 days	8 wks	3
	1, 12 mg/ml †	NS/D5W	7 days	27 days	--	17
COLISTIMETHATE Na	0.8 mg/ml	NS	--	7 days	--	29
CYCLOPHOSPHAMIDE + MESNA (mixture)	1.8 + 0.54, 10.8 + 3.2 mg/ml ¶	D5W	6 hrs	48 hrs	--	39
DEXAMETHASONE	40 mg/50 cc	D5W	24 hrs	--	--	12,13
DOXYCYCLINE	0.1-1 mg/ml	NS/D5W	48 hrs	3 days	--	3
	1 mg/ml	D5W	--	--	8 wks	3
ERTAPENEM	10 mg/ml	NS	--	72 hrs	--	26
ERYTHROMYCIN	500 mg/100 cc	D5W	8 hrs	1 day	4 wks	10,11,13
ETOPOSIDE *	0.1 mg/ml	NS	24 hrs	--	--	40
	0.1 mg/ml	D5W	12 hrs	--	--	40
	0.4 mg/ml	NS/D5W	24 hrs	--	--	40
	0.6 mg/ml	NS	8 hrs	--	--	40
	0.6 mg/ml	D5W	6 hrs	--	--	40
FENTANYL + HYDROMORPHONE + NEFOPAM + ONDANSETRON or RAMOSETRON (mixture)	0.016 + 0.08 + 0.8 + 0.32 (or 0.012) mg/ml §	NS	96 hrs	--	--	33
FENTANYL + OXYCODONE + NEFOPAM + ONDANSETRON or RAMOSETRON (mixture)	0.016 + 0.4 + 0.8 + 0.32 (or 0.012) mg/ml §	NS	96 hrs	--	--	33
FLUCLOXACILLIN	10, 50 mg/ml † #	NS-CB	24 hrs at 32 °C	13 days	--	20
FLUOROURACIL *	0.1, 25 mg/ml #	NS/D5W	7 days at 30 °C	42 days	--	32
	50 mg/ml #	RTU	42 days + 7 days at 30 °C	--	--	32
FLUOROURACIL + FOLINIC ACID (mixture) *	6.5 + 4 mg/ml ¶	NS/D5W	120 hrs at 32 °C	--	--	41
FOSFOMYCIN	64 mg/ml	WFI	--	5 days	--	42
	96 mg/ml	D5W	5 days at 34 °C	--	--	42
GANCICLOVIR Na *	5 mg/ml	NS	24 hrs	5 days	--	16,34
GENTAMICIN SO4	1 mg/ml	NS/D5W	--	--	30 days	3
	0.8 mg/ml	NS	24 hrs	--	--	16,34
GRANISETRON HCl	0.02 mg/ml	NS	--	7 days	--	2
	0.02 mg/ml	D5W	--	14 days	--	2
IFOSFAMIDE + MESNA (mixture)	10 + 10, 20 + 20, 30 + 30 mg/ml ¶	NS	14 days	--	--	43
IMIPENEM-CILASTATIN Na	5 mg/ml	NS	10 hrs	2 days	--	3
	5 mg/ml	NS/D5W	4 hrs	1 day	--	16,34
LEVOFLOXACIN	5 mg/ml	NS/D5W	72 hrs	14 days	6 mths	3
LINCOMYCIN HCl	1 gm/100 cc	D5W	24 hrs	1 day	--	10,11,13
MEROPENEM	4 mg/ml	NS	--	7 days	--	18
	10, 20 mg/ml	NS	--	5 days	--	18
	6 mg/ml (pH 6.5)	NS	--	6 days	--	19
MEROPENEM-VABORBACTAM	5.7 + 5.7 mg/ml	NS	12 hrs	120 hrs	--	27
METHICILLIN Na	1 gm/50 cc	D5W	24 hrs	4 days	4 wks	10,11,12
METHOTREXATE Na	0.03 mg/ml	D5W	7 days	--	--	3
	1.25-12.5 mg/ml	NS	7 days	105 days	--	3
MEZLOCILLIN Na	1 gm/50 cc	D5W	48 hrs	7 days	4 wks	10,11
MINOCYCLINE	100 mg/500 cc	D5W	24 hrs	1 day	--	10,11,13
MOXALACTAM Na	1 gm/50 cc	D5W	24 hrs	4 days	6 mths	10,11,13

Medication	Concentration	Diluent	Room	Refrigerated	Frozen	References
NAFCILLIN Na	20 mg/ml	NS/D5W	24 hrs	4 days	12 wks	16,34
NETILMICIN	100 mg/100 cc	D5W	72 hrs	3 days	--	11,13
OFLOXACIN	0.4-4 mg/ml	NS/D5W	72 hrs	14 days	6 mths	4
ONDANSETRON HCl	0.03-0.3 mg/ml	NS/D5W	--	14 days	--	1
OXACILLIN	10-100 mg/ml	NS	7 days	8 days	30 days	8
	10-100 mg/ml	D5W	2 days	8 days	30 days	8
PENICILLIN G – K	10,000 U/ml	D5W	24 hrs	24 hrs	30 days	3
	2,000 U/ml	NS	24 hrs	4 days	--	3
PENICILLIN G – Na	2,500, 50,000 U/ml	NS/D5W	--	21 days	--	25
PIPERACILLIN Na	30 mg/ml	NS/D5W	24 hrs	7 days	4 wks	16,34
PIPERACILLIN-TAZOBACTAM	22+3, 80+10 mg/ml #	NS-CB	24 hrs at 32 °C	13 days	--	21
	50 + 6.25 mg/ml	NS	24 hrs ‡	--	--	22
QUINUPRISTIN-DALFOPRISTIN	2 mg/ml	D5W	5 hrs	54 hrs	--	5
RANITIDINE HCl	0.5-2 mg/ml	NS/D5W	7 days	30 days	30 days	3,6
TEMOCILLIN	10, 20 mg/ml #	WFI	24 hrs at 25 °C	4 wks	--	24
TIGECYCLINE	0.21-0.83 mg/ml #	NS	24 hrs at 32 °C	7 days	--	44
TOBRAMYCIN SO4	0.8 mg/ml	NS	24 hrs	--	--	16,34
VANCOMYCIN HCl	5 mg/ml	D5W	17 days	63 days	--	7
	1, 5 mg/ml †	NS/D5W	7 days	27 days	--	17
	5 mg/ml	NS/D5W	24 hrs	14 days	9 wks	16,34
	37.5 mg/ml	NS/D5W	48 hrs at 37 °C	--	--	38
VORICONAZOLE	2 mg/ml	NS/D5W	4 hrs	96 hrs	--	30

NS: Normal Saline (0.9% sodium chloride) NS-CB: citrate-buffered 0.9% sodium chloride D5W: 5% Dextrose in Water RTU: Ready to Use (undiluted) SW: Sterile Water WFI: Water for Injection

NOTES

The storage times reflect the times selected by the investigators or manufacturers in the cited sources and do not necessarily represent the limits of acceptable stability.

* Attention must be paid to the drug's potential for precipitation, which may occur depending on preparation, storage conditions, concentration, pH and diluent. For example, fluorouracil 50 mg/ml mixed with folinic acid formed a precipitate in one study (ref. 45), and aciclovir 18.75 mg/ml (4,500 mg in 240 ml) precipitated within 4 hours at 32 °C (ref. 35).

** Susceptible to crystallization when refrigerated.

Room temperature is as defined in the cited source. An elastomeric pump worn close to the body may reach 30–33 °C. For drugs with limited room-temperature stability (e.g., meropenem, ampicillin, imipenem-cilastatin, penicillin G, cyclophosphamide), keep the filled pump refrigerated until use and limit the in-use period accordingly.

Where several entries are listed for the same drug and concentration, they reflect different studies and conditions. Select the entry that matches the actual preparation, diluent and storage conditions.

† Study performed in an elastomeric device with a silicone reservoir. The InfuLife® reservoir is also silicone, but results may still differ between devices.

‡ Tested at 26–31 °C to simulate a pump worn close to the body.

Combined: tested under refrigeration for the time in the Refrigerated column, followed by the in-use period stated in the Room column.

§ Tested as an analgesic mixture in a portable balloon infuser at 24 °C, protected from light; the chemical assay was performed on reduced-strength mixtures.

¶ Tested in a container other than an elastomeric device (polyvinyl chloride or polyethylene bag, glass, or portable-pump cassette). Results in an elastomeric reservoir may differ.

Drug stability can be influenced by the materials in contact with the solution. Some drugs have shown different results in silicone and polyisoprene devices (for example, caspofungin, which is therefore not listed). Because these data were not generated in InfuLife®, the pharmacist should apply professional judgment and consult the drug manufacturer's product information and current compatibility references.

LOCAL ANESTHETICS

No published study reporting storage stability of lidocaine, bupivacaine, levobupivacaine or ropivacaine in elastomeric infusion devices was identified, and these drugs are therefore not listed in the table. Published studies report that local anesthetics can adsorb onto infusion-balloon materials (refs. 46–48). At pH 7.4, effluent concentrations of lidocaine, bupivacaine and ropivacaine decreased by 6–14% within minutes, with bupivacaine adsorbed most strongly (ref. 47). With commercially available lidocaine and ropivacaine solutions, the decrease was about 4.5% in all balloon types tested, including a silicone balloon (ref. 48). Chemical stability has been reported for sufentanil–ropivacaine and sufentanil–levobupivacaine solutions stored for 6 months at 4 °C in

polypropylene and polyvinyl chloride containers (ref. 49), and for bupivacaine–morphine–clonidine mixtures stored for up to 90 days in portable pump reservoir bags (ref. 50). These containers are not elastomeric devices.

INFULIFE® FLUID-PATH MATERIALS

The components of InfuLife® that contact the drug solution are made of the following material types:

Component	Material
Elastomeric reservoir (bladder)	Medical-grade silicone elastomer
Pump core	ABS (acrylonitrile butadiene styrene)
Fill port (Y-site with check valve)	ASA, MABS, silicone
Protective caps	Polypropylene
Extension tubing	PVC (polyvinyl chloride)
In-line 1.2 µm filter	Acrylic housing; PTFE and polyethersulfone membranes
Flow restrictor	Glass capillary in silicone tubing
Luer connectors	MABS (methyl methacrylate ABS)

INFULIFE® BIOLOGICAL SAFETY TESTING

The finished, sterilized InfuLife® device was tested in 2024 by WuXi AppTec (Suzhou) Co., Ltd., an independent laboratory accredited under the FDA Accreditation Scheme for Conformity Assessment (ASCA). The in vivo studies were conducted in compliance with Good Laboratory Practice (21 CFR Part 58). Extracts were prepared in polar (saline) and non-polar (sesame oil) vehicles unless noted.

Test	Method	Result
Cytotoxicity	ISO 10993-5, MEM elution, L-929 cells	Grade 0 – non-cytotoxic
Sensitization	ISO 10993-10, guinea pig maximization	0% sensitization – not a sensitizer
Intracutaneous reactivity	ISO 10993-23, rabbit	Score 0 – meets requirements
Acute systemic toxicity	ISO 10993-11, mouse	No systemic toxicity
Subchronic systemic toxicity	ISO 10993-11, 14-day, rat (IV and IP)	No subchronic toxicity
Material-mediated pyrogenicity	USP <151>, rabbit (saline extract)	Non-pyrogenic
Hemolysis	ASTM F756, extract method	Hemolytic index 0.7% – non-hemolytic

Biological safety testing shows that extracts of the InfuLife® fluid path did not cause adverse biological responses. It does not measure drug stability, and it is not a substitute for the stability references listed in this document.

REFERENCES

1. Jhee SS et al. Stability of ondansetron hydrochloride in a disposable, elastomeric infusion device at 4 °C. Am J Hosp Pharm. 1993; 50:1918-20.
2. Chung KC, Chin A, Gill MA. Stability of granisetron hydrochloride stored in a disposable elastomeric infusion device. Am J Health-Syst Pharm. 1995; 52:1541-3.
3. Trissel LA. Handbook on Injectable Drugs, 12th edition. Bethesda, MD: American Society of Health-System Pharmacists, 2003.
4. Physicians' Desk Reference, 55th edition. Medical Economics Company, Oradell, NJ, 2001.
5. Manufacturer's Product Information.
6. Stewart JT, Warren FW, Johnson SM, Galante LJ. Stability of ranitidine in intravenous admixtures stored frozen, refrigerated, and at room temperature. Am J Hosp Pharm. 1990; 47:2043-2046.
7. Das Gupta V, Stewart KR, Nohria S. Stability of vancomycin HCl in 5% dextrose and 0.9% sodium chloride injections. Am J Hosp Pharm. July 1986; 43:1729-1731.
8. McEvoy GK. AHFS Drug Information 98. American Society of Health-System Pharmacists, 1998.
9. Stendal T et al. Drug stability and pyridine generation in ceftazidime injection stored in an elastomeric infusion device. Am J Health-Syst Pharm. 1998; 55:683-685.
10. Trissel LA. Handbook on Injectable Drugs, 8th edition. Bethesda, MD: American Society of Health-System Pharmacists, 1994.
11. McEvoy GK, Litvak K, Welsh OH. AHFS 95 Drug Information. Bethesda, MD: American Society of Health-System Pharmacists, 1995.
12. Trissel LA, Grimes CR, Gallelli JF. Parenteral Drug Information Guide. American Society of Hospital Pharmacists, 1975.
13. King JC. Guide to Parenteral Admixtures. Kabi Vitrum Inc., 1986.
14. Capilk JF, Valters JK Jr. Guidelines for the Preparation of Intravenous Admixture Solutions. Cutter Medical, Berkeley, CA, 1980.
15. Manufacturers' product information: Carbenicillin (Roerig, Bristol).
16. Fernández-Rubio B, del Valle-Moreno P, Herrera-Hidalgo L, et al. Stability of antimicrobials in elastomeric pumps: a systematic review. Antibiotics. 2022; 11(1):45.
17. Walker SE, Iazzetta J, Law S, Biniecki K. Stability of commonly used antibiotic solutions in an elastomeric infusion device. Can J Hosp Pharm. 2010; 63:212-224.

18. Smith DL, Bauer SM, Nicolau DP. Stability of meropenem in polyvinyl chloride bags and an elastomeric infusion device. Am J Health-Syst Pharm. 2004; 61:1682-1685.
19. Foy F, Luna G, Martinez J, et al. An investigation of the stability of meropenem in elastomeric infusion devices. Drug Des Devel Ther. 2019; 13:2655-2665.
20. Allwood MC, Stonkute D, Wallace A, et al. Assessment of the stability of citrate-buffered flucloxacillin for injection when stored in two commercially available ambulatory elastomeric devices: a study compliant with the NHS Yellow Cover Document requirements. Eur J Hosp Pharm. 2020; 27:90-94.
21. Jamieson C, Ozolina L, Seaton RA, et al. Assessment of the stability of citrate-buffered piperacillin/tazobactam for continuous infusion when stored in two commercially available elastomeric devices for outpatient parenteral antimicrobial chemotherapy: a study compliant with the NHS Yellow Cover Document requirements. Eur J Hosp Pharm. 2020.
22. Voumard R, Van Neyghem N, Cochet C, et al. Antibiotic stability related to temperature variations in elastomeric pumps used for outpatient parenteral antimicrobial therapy (OPAT). J Antimicrob Chemother. 2017; 72:1462-1465.
23. Raby E, Naicker S, Sime FB, et al. Ceftolozane-tazobactam in an elastomeric infusion device for ambulatory care: an in vitro stability study. Eur J Hosp Pharm. 2020; 27:e84-e86.
24. Carryn S, Couwenbergh N, Tulkens PM. Long-term stability of temocillin in elastomeric pumps for outpatient antibiotic therapy in cystic fibrosis patients. J Antimicrob Chemother. 2010; 65:2045-2046.
25. Hossain MA, Friciu M, Aubin S, Leclair G. Stability of penicillin G sodium diluted with 0.9% sodium chloride injection or 5% dextrose injection and stored in polyvinyl chloride bag containers and elastomeric pump containers. Am J Health-Syst Pharm. 2014; 71:669-673.
26. Phipps D, Peacock F, Smith L. Stability of ertapenem in an elastomeric infusion device. Int J Pharm Compd. 2011; 15:252.
27. Chen IH, Martin EK, Nicolau DP, Kuti JL. Assessment of meropenem and vaborbactam room temperature and refrigerated stability in polyvinyl chloride bags and elastomeric devices. Clin Ther. 2020; 42:606-613.
28. Al Madfai F, Zaidi STR, Ming LC, Wanandy T, Patel RP. Physical and chemical stability of ceftaroline in an elastomeric infusion device. Eur J Hosp Pharm. 2018; 25:e115-e119.
29. Abdulla A, van Leeuwen RWF, de Vries Schultink AHM, Koch BCP. Stability of colistimethate sodium in a disposable elastomeric infusion device. Int J Pharm. 2015; 486:367-369.
30. Harmanjeet H, Zaidi STR, Ming LC, Wanandy T, Patel RP. Physicochemical stability of voriconazole in elastomeric devices. Eur J Hosp Pharm. 2018; 25:e88-e92.
31. Binson G, Grignon C, Le Moal G, et al. Overcoming stability challenges during continuous intravenous administration of high-dose amoxicillin using portable elastomeric pumps. PLoS ONE. 2019; 14:e0221391.
32. Krämer I, Erdnuess F, Thiesen J. Physicochemical stability of Fluorouracil Accord in three different concentrations in portable elastomeric infusion pumps. GaBI J. 2024; 13(2):107-110.
33. Lee CH, Kim AR, Lee MK, et al. Intravenous patient-controlled analgesia: in vitro stability profiles of mixtures containing fentanyl, hydromorphone, oxycodone, nefopam, ondansetron, and ramosetron. J Anal Sci Technol. 2020; 11:32.
34. Allen LV Jr, Stiles ML, Prince SJ, et al. Stability of 14 drugs in the latex reservoir of an elastomeric infusion device. Am J Health-Syst Pharm. 1996; 53:2740-2743.
35. Sime FB, Wallis S, Jamieson C, et al. Evaluation of the stability of aciclovir in elastomeric infusion devices used for outpatient parenteral antimicrobial therapy. Eur J Hosp Pharm. 2025; 32:272-277.
36. Rodríguez-Martínez L, Castro-Balado A, Hermelo-Vidal G, et al. Ampicillin stability in a portable elastomeric infusion pump: a step forward in outpatient parenteral antimicrobial therapy. Pharmaceutics. 2023; 15(8):2099.
37. Fernández-Rubio B, Herrera-Hidalgo L, Luque-Márquez R, et al. Stability of ampicillin plus ceftriaxone combined in elastomeric infusion devices for outpatient parenteral antimicrobial therapy. Antibiotics. 2023; 12(3):432.
38. Loeuille G, D'Huart E, Vigneron J, et al. Stability studies of 16 antibiotics for continuous infusion in intensive care units and for performing outpatient parenteral antimicrobial therapy. Antibiotics. 2022; 11(4):458.
39. Menard C, Bourguignon C, Schlatter J, et al. Stability of cyclophosphamide and mesna admixtures in polyethylene infusion bags. Ann Pharmacother. 2003; 37:1789-1792.
40. Klasen A, Kessari R, Mercier L, et al. Stability of etoposide solutions in disposable infusion devices for day hospital cancer practices. Drugs R D. 2014; 14:13-23.
41. Milano G, Etienne MC, Cassuto-Viguier E, et al. Long-term stability of 5-fluorouracil and folinic acid admixtures. Eur J Cancer. 1992; 29A:129-132.
42. Manca A, Palermiti A, Mula J, et al. Stability study of fosfomycin in elastomeric pumps at 4 °C and 34 °C: technical bases for a continuous infusion use for outpatient parenteral antibiotic therapy. Pharmaceutics. 2023; 15(9):2347.
43. Zhang Y, Kawedia JD, Myers AL, et al. Physical and chemical stability of high-dose ifosfamide and mesna for prolonged 14-day continuous infusion. J Oncol Pharm Pract. 2014; 20:51-57.
44. Wolie ZT, Unwin S, Burke A, et al. Evaluation of the stability of tigecycline in elastomeric infusion devices used for outpatient parenteral antimicrobial therapy. JAC Antimicrob Resist. 2025; 7(3):dlaf074.
45. Lokiec F, Amirault P, Bonnans H, et al. Stabilité du mélange 5-fluorouracile-acide folinique: influence des concentrations, du contenant et de la forme d'acide folinique. Bull Cancer. 1999; 86:946-954.
46. Takakura K, Muramatsu I, Miyamoto E, et al. Adsorption of lidocaine into a plastic infusion balloon. Anesth Analg. 2000; 91:192-194.
47. Mizogami M, Tsuchiya H, Takakura K. Local anesthetics adsorbed onto infusion balloon. Anesth Analg. 2004; 99:764-768.
48. Ueta K, Suzuki T, Uchida I, et al. Adsorption of local anesthetic into disposable infusion balloon [in Japanese]. Masui. 2006; 55:344-347.

49. Lin Q, Van Schepdael A, Adams E. Six months stability investigation of sufentanil and ropivacaine/levobupivacaine admixtures in plastic containers by LC-UV. J Pharm Biomed Anal. 2020; 190:113541.
50. Wulf H, Gleim M, Mignat C. The stability of mixtures of morphine hydrochloride, bupivacaine hydrochloride, and clonidine hydrochloride in portable pump reservoirs for the management of chronic pain syndromes. J Pain Symptom Manage. 1994; 9:308-311.

InfuLife® is a registered trademark of First Medical Source, LLC.

REVISION HISTORY

Rev	Date	Description
A	—	Initial release.
B	October 2026	Added data and references 27–38; added storage-condition and in-use temperature notes. Superseded.
C	November 2026	Removed all data, references, source documents and trademarks introduced in Rev B and the fluid-path material statement. Drug table compiled exclusively from publicly available published sources: peer-reviewed studies, standard drug-compatibility references and manufacturers' product information. Entries supported only by unpublished laboratory reports were replaced with published studies where available and otherwise removed. Added source-of-data statement, conditions-of-use notes including a note on local anesthetics, InfuLife® fluid-path materials and biological safety test summary.

CONTACT US

First Medical Source, LLC
support@firstmedicalsource.com