

Home Intravenous (IV) Antimicrobial Therapy

Intended Audience

Prescribers, Pharmacists, VON Nurses, Continuing Care Nurses, community pharmacy.

General Principles

1. Information was developed based on a maximum of two home visits per day (site dependent). Antimicrobials dosed more frequently than twice daily are not recommended for home administration if room temperature stability is less than 12 h.
2. If data supports 24 h stability at room temperature, preparation instructions (Table 2) are provided for a single IV bag containing 24 h of drug. Bag changed once q24 h. Infusion device/pump required.
3. If data supports 12 h stability at room temperature, preparation instructions (Table 2) are provided for a single IV bag containing 12 h of drug. Bag changed q12 h. Infusion device/pump required.
4. Preparation instructions provided in Table 2 are for common 24 h doses; not exhaustive.
5. Vial reconstitution details are not addressed in Table 2. Refer to manufacturer's information. If the concentration of a reconstituted vial differs from concentration(s) provided in Table 2, drug volume and final volume must be recalculated.
6. The number of needle punctures into the injection port of an IV bag should be minimized by using a needle with a Clave/MicroClave clear neutral connector with attached needle for withdrawals and additions (refer to Figure 1).
7. Total volume in Table 2 is used for pump programming. Calculations based on Baxter IV bags (NS Health contract brand).
8. Total volume in Table 2 is calculated as: Total volume = bag volume including average overfill (Table 1) MINUS diluent volume removed (if applicable) PLUS diluent volume added (if applicable) PLUS drug volume added. If the addition of drug volume to a bag will exceed the capacity of the IV bag (Table 1), 50 mL should be removed from the IV bag before drug is added; refer to acyclovir 3,801-4,500 mg as an example. Baxter provides additional volume deviation in Table 1 (+/- mL) that may be used to adjust pump settings if a bag runs dry or residual volume remains.
9. Administration via gravity is only permitted for bags that contain one dose. IV bags containing multiple doses must be administered by infusion device/pump. This must be specified in the drug order. Pumps used by VON/Home Care can be programmed to administer intermittent doses at specified intervals over a 24-hour period. This is the preferred method of administration. For example, cefazolin can be programmed to deliver 2 g every 8 h. Between doses the pump is programmed to deliver a low infusion rate to maintain vein patency known as a "to keep vein open [TKVO]" rate. In specific situations, a continuous infusion may be required. The fourth column (Table 2) specifies whether a continuous infusion is permitted.
10. Any deviation from preparation instructions (e.g., doses or amount/type of diluent) in Table 2 may change stated stability/hang time. Stability is concentration and diluent specific. Contact NS Health Drug Information; 902-473-4211 (Monday to Friday 8 am- 4 pm) if alternative preparation is required.
11. Table 2 may not contain all antimicrobials. Contact NS Health Drug Information; 902-473-4211, Monday to Friday 8 am- 4 pm if additional information is required.

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12. If a drug is prepared in an aseptic environment/laminar flow hood and assigned an extended stability at refrigerated temperatures, extended stability and hang time are only valid if the IV bag is transported to client's home using appropriate cold chain procedures.
https://policy.nshealth.ca/Site_Published/NSHA/document_render.aspx?documentRender.IdType=6&documentRender.GenericField=&documentRender.Id=108784
13. When administering a dose from a 50 mL IV bag, IV tubing with minimum priming volume should be selected (pump vs. gravity) to ensure administration of entire dose. Flushing recommended.

Stability considerations

Preparing IV antimicrobials outside an aseptic environment (e.g., outside laminar flow hood, in client's house, in clinic, etc.)

1. If an antimicrobial is prepared outside an aseptic environment, it must be hung within 1 h of preparation.
2. Products prepared outside an aseptic environment **MUST NOT** be prepared and stored for administration at a later time.
3. Long term chemical stability column in Table 2 does **NOT** apply to antimicrobials prepared outside an aseptic environment.

Preparing IV antimicrobials inside an aseptic environment (i.e., inside laminar flow hood)

1. If an antimicrobial is prepared inside an aseptic environment, a longer stability may be assigned. Table 2 and Table 4 are tools to assist in determination of beyond use date (BUD).
2. Stability in Table 2 was determined using multiple references; conservative stability is assigned. Fourteen (14) days not exceeded since it is not supported by NAPRA Model Standards.
3. Community pharmacies may deviate from preparation recommendations in Table 2; however, total amount of drug in bag, total volume of bag, fridge and room temperature stability must be stated on label. References to support stability should be retained at the community pharmacy.

Table 1. Baxter IV Bags; Average Overfill, Deviation and Maximum Volume

Stated volume (mL)	Volume including average overfill (+/- deviation) [mL]	Maximum volume to be added to IV bag (mL)
50	58 (+/-5)	71
100	110 (+/-5)	61
250	280 (+/-15)	66
500	547.5 (+/-17.5)	76
1,000	1,050 (+/-20)	128

Information provided by Baxter Feb 10, 2023

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Figure 1. Clave connector with attached needle to reduce needle punctures in injection port of IV bag



Preparation Examples

#1 Acyclovir (weight based dosing; dose range provided to support preparation)

800 mg IV q8 h

Refer to Table 2. Maximum hang time: 24 h at room temperature. Prepare one bag containing 3 doses that will last 24 h.

800 mg x 3 doses = 2,400 mg. Prepare 2,400 mg in 250 mL IV bag.

2,400 mg DIVIDED BY 50 mg/mL = 48 mL of acyclovir 50 mg/mL.

Maximum volume that can be added to a 250 mL IV bag is 66 mL (Table 1). Diluent removal not required.

Add 48 mL acyclovir 50 mg/mL to 250 mL IV bag.

Calculate total volume using average overfill of a 250 mL IV bag (Table 1). Volume (with average overfill) of a 250 mL bag is 280 mL.

Total volume (for pump programming) = 280 mL + 48 mL = 328 mL

Pump Programming Example

Total volume = 328 mL

Each dose administered over 1 h (Table 2). Dose time 1 h/dose x 3 doses/24 h = 3 h. 24 h - 3 h = 21 h of KVO time.

Priming and KVO volume: (21 h x KVO at 1 mL/h + 10 mL [prime volume]) = 31 mL.

Dose volume is 328 mL - 31 mL = 297 mL. Three doses are contained in 297 mL.

297 mL divided by 3 = 99 mL for each dose.

Dose volume = 99 mL to infuse over 1 h (60 minutes) at q8 h frequency.

Because 250 mL IV bag has a total volume deviation of 15 mL (Table 1) the dose volume can be adjusted by 5 mL per dose; from 99 mL to 94 mL if the IV bag is empty before 24 h or the dose volume can be adjusted from 99 mL to 104 mL if the IV bag contains residual volume after 24h.

#2 Acyclovir (removal of diluent required)

1,300 mg IV q8 h

Refer to Table 2. Maximum hang time: 24 h at room temperature. Prepare one bag containing 3 doses that will last 24 h.

1,300 mg x 3 doses = 3,900 mg. Prepare 3,900 mg in 500 mL IV bag.

3,900 mg DIVIDED BY 50 mg/mL = 78 mL of acyclovir 50 mg/mL.

Maximum volume that can be added to a 500 mL IV bag is 76 mL (Table 1). Adding 78 mL will exceed capacity of the bag.

Remove 50 mL diluent from 500 mL bag.

Add 78 mL acyclovir 50 mg/mL to bag.

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Calculate total volume using average overfill of 500 mL IV bag (Table 1). Volume (with average overfill) of a 500 mL IV bag is 547.5 mL
 Total volume (for pump programming) = 547.5 - 50 mL + 78 mL = 575.5 mL

Pump Programming Example

Total Volume 575.5 mL

Each dose administered over 1 h (Table 2). Dose time 1 h/dose x 3 doses/24 h = 3 h. 24 h - 3 h = 21 h of KVO time.

Priming and KVO volume: (21 h KVO at 1 mL/h + 10 mL [prime volume]) = 31 mL

Dose volume is 575.5 mL - 31 mL = 544.5 mL. Three doses contained in 544.5 mL

544.5 mL divided by 3 = 181.5 mL for each dose

Dose volume = 181.5 mL to infuse over 1 h (60 minutes) at q8 h frequency.

Because 500 mL IV bag has a total volume deviation of 17.5 mL (Table 1) the dose volume can be adjusted by 5.8 mL/dose; from 181.5 mL to 175.7 mL if the bag is empty before 24 h or the dose volume can be adjusted from 181.5 mL to 187.3 mL if the IV bag contains residual volume after 24h.

#3 Ampicillin (exception to preparation instructions; final concentration must be 10 mg/mL or less)

2 g IV q4h

Refer to Table 2. Maximum hang time: 24 h at room temperature if concentration is less than 10 mg/mL.

2 g x 6 doses = 12 g.

For a final maximum concentration of 10 mg/mL, a final total volume of 1,200 mL is required for 12 g ampicillin.

1,200 mL exceeds the capacity of 1,000 mL bag (Table 1).

Prepare IV bag as a 12 h bag (contains 12 h of doses; 3 doses). Patient will use a bag q12 h.

2 g x 3 doses = 6 g.

6 g = 6,000 mg DIVIDED BY 10 mg/mL = 600 mL total volume required for 6 g ampicillin.

The volume including average overfill of a 500 mL Baxter bag is 547.5 mL +/- 17.5 mL deviation (table 1). Minimum volume could be as low as 530 mL (547.5 mL - 17.5 mL = 530 mL).

600 mL total volume required - 530 mL (minimum volume in 500 mL bag) = 70 mL must be added to bag. 70 mL represents drug volume PLUS additional diluent required. 70 mL total volume added to the bag achieves a concentration of 10 mg/mL or less. Up to 76 mL can be added to a 500 mL bag (Table 1).

AURO 2 g vials are reconstituted to 250 mg/mL

6,000 mg DIVIDED BY 250 mg/mL = 24 mL ampicillin 250 mg/mL.

70 mL total (additional diluent and drug) - 24 mL (drug) = 46 mL additional NS required.

Add 46 mL NS to 500 mL IV bag; then add 24 mL ampicillin 250 mg/mL.

Total volume (for pump programming) = 547.5 mL + 46 mL (additional NS) + 24 mL (drug) = 617.5 mL

FRESENIUS KABI 2 g vials are reconstituted to 180 mg/mL

6,000 mg DIVIDED BY 180 mg/mL = 33.3 mL ampicillin 180 mg/mL.

70 mL total (additional diluent and drug) - 33.3 mL (drug) = 36.7 mL additional NS required.

Add 36.7 mL NS to 500 mL IV bag; then add 33.3 mL ampicillin 180 mg/mL.

Total volume (for pump programming) = 547.5 mL + 36.7 mL (additional NS) + 33.3 mL (drug) = 617.5 mL

NOTE: Four (4) or more reconstituted ampicillin concentrations are possible depending on ampicillin brand and vial size.

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If using a different ampicillin concentration than those above, calculate the volume of drug required then subtract that number from 70 mL to determine the additional volume of NS that must be added to the bag to produce a 10 mg/mL concentration.

Pump Programming Example

Total Volume 617.5 mL

Each dose administered over 30 min (Table 2). Dose time 30 min/dose x 3 doses/12 h = 90 min = 1.5 h. 12 h - 1.5 h = 10.5 h of KVO time

Priming and KVO volume: (10.5 h KVO at 1 mL/h + 10 mL [prime volume]) = 20.5 mL.

Dose volume is 617.5 mL - 20.5 mL = 597 mL. Three doses contained in 597 mL.

597 mL divided by 3 = 199 mL for each dose.

Dose Volume = 199 mL to infuse over 30 minutes at q4 h frequency.

Because 500 mL IV bag has a total volume deviation of 17.5 mL (Table 1) the dose volume can be adjusted by 5.8 mL/dose; from 199 mL to 193.2 mL if the bag is empty before 12 h or the dose volume can be adjusted from 199 mL to 204.8 mL if the IV bag contains residual volume after 12 h.

A new bag must be hung q12 h.

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Table 2. IV Antimicrobials for Home Administration

Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Acyclovir 50 mg/mL Drug dose and drug volume varies with patient weight	Prescriber Order __ mg IV q__ h via pump e.g., 750 mg IV q8 h Prepare 24 h bag containing 2,250 mg Preparation Instructions Diluent: D5W or NS 750 to 2,500 mg in 250 mL TV = 280 mL + drug volume 2,501 to 3,800 mg in 500 mL TV = 547.5 mL + drug volume 3,801 to 4,500 mg in 500 mL Drug volume is in excess of 76 mL; therefore, exceeds bag capacity. Remove 50 mL from diluent bag. Add drug. TV = 547.5 mL - 50 mL + drug volume	24 h	Intermittent dose over 1 h Dosing interval q8 h Dosing interval extended in renal dysfunction	14 days (fridge); 1-10 mg/mL Storage in fridge may cause crystallization. Rewarm to solubilize crystals before administering

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Ampicillin[^] Preparation based on 2 g vials Reconstitution and concentration are brand specific	Prescriber Order Order: __ g IV q__ h via pump e.g., 2 g IV q4 h Prepare 12 h bag containing 6 g SPECIAL Preparation Instructions Refer to preparation example #3 AURO BRAND (2 g vial = 250 mg/mL) Diluent: NS 6 g/600 mL [^] Add 46 mL NS to 500 mL IV bag Add 24 mL of ampicillin 250 mg/mL $TV = 547.5 + 46 \text{ mL} + 24 \text{ mL} = 617.5 \text{ mL}$ FRESENIUS KABI BRAND (2 g vial = 180 mg/mL) Diluent: NS 6 g/600 mL [^] Add 36.7 mL NS to 500 mL IV bag Add 33.3 mL of ampicillin 180 mg/mL $TV = 547.5 + 36.7 \text{ mL} + 33.3 \text{ mL} = 617.5 \text{ mL}$	Standard hang time: 12 h	Intermittent dose over 30 min Dosing interval q4-6 h Dosing interval extended in renal dysfunction CIVI permitted	4 days (fridge); up to 10 mg/mL [^] Maximum concentration of 10 mg/mL to support hang time of 12 or 24 h. Refer to preparation example #3

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Caspofungin 50 mg vial; reconstituted to 5 mg/mL	Prescriber Order __ mg IV q24 h Calculate amount of drug to be administered per dose and prepare bag per information below Preparation Instructions using 50 mg vial (5 mg/mL) Diluent: NS 35 mg in 100 mL Add 7 mL caspofungin 5 mg/mL TV = 110 mL + 7 mL = 117 mL 50 mg in 100 mL Add 10 mL caspofungin 5 mg/mL TV = 110 mL + 10 mL = 120 mL 70 mg in 250 mL Add 14 mL caspofungin 5 mg/mL TV = 280 mL + 14 mL = 294 mL 150 mg in 500 mL Add 30 mL caspofungin 5 mg/mL TV = 547.5 mL + 30 mL = 577.5 mL	24 h	Intermittent dose: 35-70 mg over 1 h 150 mg over 2 h Dosing interval q24 h Admin via gravity permitted	14 days (fridge) 0.2-0.5 mg/mL

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Caspofungin (continued) 70 mg vial; reconstituted to 7 mg/mL	Preparation Instructions using 70 mg vial (7 mg/mL) Diluent: NS 35 mg in 100 mL Add 5 mL caspofungin 7 mg/mL $TV = 110 \text{ mL} + 5 \text{ mL} = 115 \text{ mL}$ 50 mg in 100 mL Add 7.1 mL caspofungin 7 mg/mL $TV = 110 \text{ mL} + 7.1 \text{ mL} = 117.1 \text{ mL}$ 70 mg in 250 mL Add 10 mL caspofungin 7 mg/mL $TV = 280 \text{ mL} + 10 \text{ mL} = 290 \text{ mL}$ 150 mg in 500 mL Add 21.4 mL caspofungin 7 mg/mL $TV = 547.5 \text{ mL} + 21.4 \text{ mL} = 568.9 \text{ mL}$			

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Cefazolin Preparation based on 1 g vials; reconstituted to 100 mg/mL	Prescriber Order __ g IV q__ h via pump e.g., 2 g IV q8 h Prepare 24 h bag containing 6 g Preparation Instructions Diluent: D5W or NS 4 g in 250 mL Add 40 mL cefazolin 100 mg/mL TV = 280 mL bag + 40 mL = 320 mL 6 g in 500 mL Add 60 mL cefazolin 100 mg/mL TV = 547.5 mL bag + 60 mL = 607.5 mL	24 h	Intermittent dose: 1-2 g over 10-30 min 3 g over 15-60 min Dosing interval q8 h Interval may be extended if probenecid is used Dosing interval extended in renal dysfunction CIVI permitted	10 days (fridge); 5-20 mg/mL

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Ceftazidime Preparation based on 2 g vials Reconstitution and concentration are brand specific	Prescriber Order __ g IV q__ h via pump e.g., 2 g IV q8h Prepare 24 h bag containing 6 g Preparation Instructions FRESENIUS KABI BRAND (2 g vial = 180 mg/mL) Diluent: D5W or NS 3 g in 250 mL Add 16.7 mL ceftazidime 180 mg/mL TV = 280 mL + 16.7 mL = 296.7 mL 4 g in 250 mL Add 22.2 mL ceftazidime 180 mg/mL TV = 280 mL + 22.2 mL = 302.2 mL 6 g in 250 mL Add 33.3 mL ceftazidime 180 mg/mL TV = 280 mL + 33.3 mL = 313.3 mL	24 h	Intermittent dose over 20 min – 8 h Dosing interval q8 h Dosing interval extended in renal dysfunction CIVI permitted	10 days (fridge); 5-40 mg/mL

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Ceftazidime (continued)	STERIMAX BRAND (2 g vial = 175 mg/mL) Diluent: D5W or NS 3 g in 250 mL Add 17.1 mL ceftazidime 175 mg/mL TV = 280 mL + 17.1 mL = 297.1 mL 4 g in 250 mL Add 22.9 mL ceftazidime 175 mg/mL TV = 280 mL + 22.9 mL = 302.9 mL 6 g in 250 mL Add 34.3 mL ceftazidime 175 mg/mL TV = 280 mL + 34.3 mL = 314.3 mL			

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Ceftobiprole Preparation based on 500 mg vial; reconstituted to 50 mg/mL	Prescriber Order __ mg IV q__ h via pump e.g., 500 mg IV q8h Prepare 24 h bag containing 1,500 mg Preparation Instructions Diluent: NS **SPECIAL INSTRUCTIONS for 1,500 mg** 1,500 mg in 750 mL Remove 250 mL from 1,000 mL IV bag Add 30 mL ceftobiprole 50 mg/mL TV = 1,050 - 250 mL + 30 mL = 830 mL 1,000 mg in 500 mL Add 20 mL ceftobiprole 50 mg/mL to 500 mL IV bag TV = 547.5 mL + 20 mL = 567.5 mL 500 mg in 250 mL Add 10 mL ceftobiprole 50 mg/mL to 250 mL IV bag TV = 280 mL + 10 mL = 290 mL **SPECIAL INSTRUCTIONS for 250 mg** 250 mg in 130 mL total volume Add 25 mL diluent to 100 mL IV bag Add 5 mL ceftobiprole 50 mg/mL TV = 110 mL + 25 mL + 5 mL = 140 mL	24 h MUST PROTECT FROM LIGHT DURING INFUSION	Intermittent dose over 2 h Dosing interval q8 h Dosing interval extended in renal dysfunction	MUST BE PROTECTED FROM LIGHT 3 days (fridge); 1.92 mg/mL Concentration based on drug dose divided by stated bag volume (not average overfill) PLUS drug volume Pump programming volume calculated using average overfill volume

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Ceftolozane tazobactam Preparation based on 1.5 g vial; reconstituted to 132 mg/mL	Prescriber Order __ g IV q8 h via pump e.g., 1.5 g IV q8h Prepare 24 h bag containing 4.5 g Preparation Instructions Diluent: D5W or NS 4.5 g in 250 mL Add 34.1 mL ceftolozane-tazobactam 132 mg/mL $TV = 280 \text{ mL} + 34.1 \text{ mL} = 314.1 \text{ mL}$ 9 g in 500 mL Add 68.2 mL ceftolozane-tazobactam 132 mg/mL $TV = 547.5 \text{ mL} + 68.2 \text{ mL} = 615.7 \text{ mL}$	24 h	Intermittent dose over 1 h Dosing interval q8 h	7 days (fridge); 1.5-30 mg/mL

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Ceftriaxone Preparation based on 1 g or 2 g vials; reconstituted to 100 mg/mL	Prescriber Order __ g IV q__ h e.g., 2 g IV q12h Prepare 24 h bag containing 4 g Preparation Instructions Diluent: D5W or NS 1 g in 50 mL Add 10 mL ceftriaxone 100 mg/mL TV = 58 mL + 10 mL = 68 mL 2 g in 50 mL Add 20 mL ceftriaxone 100 mg/mL TV = 58 mL + 20 mL = 78 mL 4 g in 100 mL Add 40 mL ceftriaxone 100 mg/mL TV = 110 mL + 40 mL = 150 mL	24 h	Intermittent dose over 15-30 min Dosing interval q12-24 h Admin via gravity permitted Residual volume in tubing may be a significant portion of a dose delivered in 50 mL bag. Flushing recommended.	10 days (fridge); 10-40 mg/mL

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Ciprofloxacin	Prescriber Order __ mg IV q__ h Ready-to-use bag 400 mg in 200 mL	24 h	Intermittent dose over 1 h Dosing interval q8-12 h Dosing interval extended in renal dysfunction Admin via gravity permitted	Manufacturer's expiry 14 days if removed from overwrap Protect from light if overwrap removed
Cloxacillin Preparation based on 2 g vials; reconstituted to 250 mg/mL	Prescriber Order __ g IV q4 h via pump e.g., 2 g IV q4h Prepare 24 h bag containing 12 g Preparation Instructions Diluent: NS 12 g in 500 mL Add 48 mL cloxacillin 250 mg/mL TV = 547.5 mL + 48 mL = 595.5 mL	24 h	Intermittent dose over 30-40 min Dosing interval q4 h CIVI permitted	14 days (fridge); 5-50 mg/mL

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Home Intravenous (IV) Antimicrobial Therapy

Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Dalbavancin Preparation based on 500 mg vial; reconstituted to 20 mg/mL	Order: __ mg or g IV q__ weeks Calculate amount of drug to be administered per dose and prepare bag per information below Preparation Instructions Diluent: D5W 375 mg in 250 mL Add 18.8 mL dalbavancin 20 mg/mL TV = 280 mL + 18.8 mL = 298.8 mL 500 mg in 250 mL Add 25 mL dalbavancin 20 mg/mL TV = 280 mL + 25 mL = 305 mL 750 mg in 250 mL Add 37.5 mL dalbavancin 20 mg/mL TV = 280 mL + 37.5 mL = 317.5 mL 1 g in 250 mL Add 50 mL dalbavancin 20 mg/mL TV = 280 mL + 50 mL = 330 mL 1.125 g in 250 mL Add 56.3 mL dalbavancin 20 mg/mL TV = 280 mL + 56.3 mL = 336.3 mL	24 h	Intermittent dose over 30 min Dosing interval q1-2 weeks	48 h (fridge); 1-5 mg/mL

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Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Dalbavancin (continued)	1.5 g in 500 mL Add 75 mL dalbavancin 20 mg/mL TV = 547.5 mL + 75 mL = 622.5 mL			
Daptomycin Preparation based on 500 mg vial; reconstituted to 50 mg/mL Reconstitution diluent is brand specific Drug dose and drug volume varies with patient weight	Order: __ mg IV q__ h Calculate amount of drug to be administered per dose and prepare bag per information below Preparation Instructions Diluent : NS Up to 700 mg in 50 mL TV = 58 mL + drug volume 701 to 1,400 mg in 100 mL TV = 110 mL + drug volume	12 h	Intermittent dose over 30 min Dosing interval q24 h Dosing interval extended in renal dysfunction Admin via gravity permitted Residual volume in tubing may be a significant portion of a dose delivered in 50 mL bag. Flushing recommended.	Stability is brand specific Vials marketed by Accord, Dr. Reddy's and Sandoz 10 days (fridge); 2.5-20 mg/mL Cubicin RF marketed by Sunovion 3 days (fridge); 1-14 mg/mL if reconstituted with sterile water for injection 5 days (fridge); 1-14 mg/mL if reconstituted with bacteriostatic water for injection

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Home Intravenous (IV) Antimicrobial Therapy

Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Ertapenem Preparation based on 1 g vial; reconstituted to 100 mg/mL	Order: __ mg or g IV q24 h Calculate amount of drug to be administered per dose and prepare bag per information below Preparation Instructions Diluent: NS 500 mg in 50 mL Add 5 mL ertapenem 100 mg/mL TV = 58 mL + 5 mL = 63 mL 1 g in 100 mL Add 10 mL ertapenem 100 mg/mL TV = 110 mL + 10 mL = 120 mL	17 h	Intermittent dose over 30 min Dosing interval q24 h Admin via gravity permitted Residual volume in tubing may be a significant portion of a dose delivered in 50 mL bag. Flushing recommended.	5 days (fridge); 10 mg/mL Stability limited to 5 days (F) due to formation of degradation products. Degradation products reach unacceptable levels more quickly at higher concentrations (i.e., 20 mg/mL).
Fluconazole	Order: __ mg IV q24 h A dose may require the administration of multiple or partial vials/bags (e.g., 400 mg IV q24 h = 2 x 200 mg/100 mL vials/bags) Ready-to-use vial/bag 200 mg in 100 mL	24 h	Administer at 200 mg/h Dosing interval q24 h Admin via gravity permitted	Manufacturer's expiry

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Home Intravenous (IV) Antimicrobial Therapy

Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Gentamicin 40 mg/mL Drug dose and drug volume varies with patient weight	Intensive Dosing Order: __ mg IV q24 h Calculate amount of drug to be administered per dose and prepare bag per information below Preparation Instructions Diluent: NS Dose in 100 mL TV = 110 mL + drug volume	24 h	Intermittent dose over 1 h Dosing interval q24 h Dosing interval extended in renal dysfunction Admin via gravity permitted	10 days (fridge); 0.5-10 mg/mL
Levofloxacin	Order: __ mg IV q24 h Ready-to-use bag 250 mg in 50 mL 500 mg in 100 mL 750 mg in 150 mL	24 h	Intermittent dose: 250 mg-500 mg over 1 h 750 mg over 1.5 h Dosing interval q24 h Dosing interval extended in renal dysfunction Admin via gravity permitted	Manufacturer's expiry 14 days if removed from overwrap Protect from light if overwrap removed

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Home Intravenous (IV) Antimicrobial Therapy

Antimicrobial	Prescriber Order and Preparation	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Meropenem Preparation based on 500 mg or 1 g vials; reconstituted to 50 mg/mL	Order: __ mg or g IV q__ h via pump If the order is written for q8h, the prescriber MUST be contacted to switch dosing to q6 h or q12 h due to limited room temperature stability and home visit timing Change 500 mg q8 h to 1 g q12 h Change 1 g q8 h to 500 mg q6 h Change 2 g q8 h to 1.5 g q6 h If meropenem is dosed q6 h, calculate amount of drug to be administered in 12 h (e.g., 500 mg IV q6 h. Prepare a 12 h bag containing 1 g If meropenem is dosed q12 h or q24 h, prepare bag as a single dose per information below Preparation Instructions Diluent: NS 500 mg in 100 mL Add 10 mL meropenem 50 mg/mL TV = 110 mL + 10 mL = 120 mL 1 g in 250 mL Add 20 mL meropenem 50 mg/mL TV = 280 mL + 20 mL = 300 mL	12 h	Intermittent dose over 30 min Dosing interval q6-8 h If meropenem is dosed q8h in hospital, home therapy order MUST be changed to q6 h or q12 h regimen to facilitate preparation of a 12 h bag. Refer to "Prescriber Order and Preparation" column Dosing interval extended in renal dysfunction CIVI permitted	Maximum concentration of 8 mg/mL to support hang time of 12 h 7 days (fridge); 1-4 mg/mL 5 days (fridge); 5-8 mg/mL

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Home Intravenous (IV) Antimicrobial Therapy

Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Meropenem (continued)	2 g in 250 mL Add 40 mL meropenem 50 mg/mL TV = 280 mL + 40 mL = 320 mL 3 g in 500 mL Add 60 mL meropenem 50 mg/mL TV = 547.5 mL + 60 mL = 607.5 mL			
Metronidazole	Order: __ mg IV q__ h Ready-to-use bag 500 mg in 100 mL	24 h	Intermittent dose over 20 min Dosing interval q6-12 h Admin via gravity permitted	Manufacturer's expiry 30 days if removed from overwrap Protect from light if overwrap removed

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Home Intravenous (IV) Antimicrobial Therapy

Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Penicillin G Sodium* Preparation based on 5 MU vials Reconstitution and concentration are brand specific	Order: __ MU IV q__ h via pump e.g., 4 MU IV q4h Prepare 12 h bag containing 12 MU Preparation Instructions Diluent: NS 12 MU in 250 mL* FRESENIUS KABI BRAND (5 MU vials = 500,000 units/mL) Add 24 mL Pen G 500,000 units/mL TV = 280 mL + 24 mL = 304 mL	12 h*	Intermittent dose over 30 min Dosing interval q4-6 h Dosing interval extended in renal dysfunction CIVI permitted	3 days (fridge)*; 48,000 units/mL

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Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Piperacillin/Tazobactam Various vial sizes; reconstituted to 0.194 g/mL (concentration refers to piperacillin AND tazobactam content)	Order: __ g IV q__ h via pump e.g., 3.375 g IV q6h Prepare 24 h bag containing 13.5 g Preparation Instructions Diluent: D5W or NS 4.5 g in 100 mL Add 23.2 mL Pip/taz 0.194 g/mL $TV = 110 \text{ mL} + 23.2 \text{ mL} = 133.2 \text{ mL}$ 6.75 g in 100 mL Add 34.8 mL Pip/taz 0.194 g/mL $TV = 110 \text{ mL} + 34.8 \text{ mL} = 144.8 \text{ mL}$ 9 g in 250 mL Add 46.4 mL Pip/taz 0.194 g/mL $TV = 280 \text{ mL} + 46.4 \text{ mL} = 326.4 \text{ mL}$ 13.5 g in 250 mL Drug volume is in excess of 66 mL; therefore, exceeds bag capacity Remove 50 mL from diluent bag. Add 69.6 mL Pip/taz 0.194 g/mL $TV = 280 \text{ mL} - 50 \text{ mL} + 69.6 \text{ mL} = 299.6 \text{ mL}$	24h	Intermittent dose over 30 min - 8 h Dosing interval q6 h Dosing interval extended in renal dysfunction CIVI permitted	7 days (fridge); 22.5-90 mg/mL (concentration range refers to piperacillin AND tazobactam content) Applies to EDTA containing and EDTA free formulations

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Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Piperacillin/Tazobactam (continued)	18 g in 250 mL Drug volume is in excess of 66 mL; therefore, exceeds bag capacity Remove 50 mL from diluent bag. Add 92.8 mL Pip/taz 0.194 g/mL TV = 280 mL - 50 mL + 92.8 mL = 322.8 mL			
Tobramycin 40 mg/mL Drug dose and drug volume varies with patient weight	Intensive dosing Order: __ mg IV q__ h Calculate amount of drug to be administered per dose and prepare bag per information below Preparation Instructions Diluent: NS Dose in 100 mL TV = 110 mL + drug volume	24 h	Intermittent dose over 1 h Dosing interval q24 h Dosing interval extended in renal dysfunction Admin via gravity permitted	14 days (fridge); 0.2-10 mg/mL

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Antimicrobial	Prescriber Order and Preparation Total volume (TV) = IV bag volume including average overfill (Table 1) MINUS removed volume (if applicable) PLUS added diluent volume (if applicable) PLUS drug volume	Maximum hang time (at room temperature)	Intermittent infusion duration Usual dosing interval Dosing interval extended in renal dysfunction Continuous intravenous infusion (CIVI) or administration via gravity permitted	Long term CHEMICAL stability & corresponding concentration range (only valid if prepared in aseptic environment/laminar flow hood; only one criterion in assigning BUD)#
Vancomycin Preparation based on 1 g vials; reconstituted to 50 mg/mL Drug dose and drug volume varies with patient weight	Order: __ g IV q__ h e.g., 1.5 g IV q12h Prepare 24 h bag containing 3 g Preparation Instructions PERIPHERAL (maximum concentration = 5 mg/mL) Diluent: D5W or NS Up to 2.5 g in 500 mL TV = 547.5 mL + drug volume 2.75 g to 4 g in 1,000 mL TV = 1,050 mL + drug volume CENTRAL (max conc=20 mg/mL) Diluent: D5W or NS Up to 2 g in 100 mL TV = 110 mL + drug volume 2.25 g to 3.25 g in 250 mL TV = 280 mL + drug volume Greater than 3.5 g to 4 g in 250 mL Drug volume is in excess of 66 mL; therefore, exceeds bag capacity Remove 50 mL from diluent bag. Add drug. TV = 280 mL – 50 mL + drug volume	24 h	NS Health standard administration time Up to 750 mg over 1 h 1 g-1.25 g over 1.5 h 1.5-1.75 g over 2 h 2 – 2.5 g over 3 h 2.75-4 g over 4.5 h Maximum rate = 15 mg/min Dosing interval q8-12 h Dosing interval extended in renal dysfunction CIVI permitted	14 days (fridge); up 20 mg/mL

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Home Intravenous (IV) Antimicrobial Therapy

Table footnotes: CIVI - continuous intravenous infusion

Represents CHEMICAL stability. To determine beyond use date (BUD) of a product prepared in an aseptic environment, Table 4 (below) may be used.

^ Preparation detailed using ampicillin 250 mg/mL (Auro brand) and ampicillin 180 mg/mL (Fresenius Kabi brand). If another concentration of reconstituted solution is used, instructions are not valid.

* As of February 2023 no community pharmacy in HRM will prepare Penicillin G Sodium. Preliminary data from a stability study conducted at Dalhousie University suggests chemical stability of 12 MU/250 mL in NS to be 3 d (F) and 12 h (RT). Publication in process.

Table 3. Antimicrobials NOT Routinely Recommended for Home IV Therapy

Antimicrobial	Rationale
Amoxicillin Clavulanate	Room temperature stability: 1 h; Only possible if renal function permits q12h dosing AND staff can go to client's home q12 h
Ampicillin (final concentration greater than 10 mg/mL)	Room temperature stability: 8 h
Imipenem cilastatin	Room temperature stability: 8 h Only possible if renal function permits q12h dosing AND staff can go to client's home q12 h

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Table 4. Beyond use Dating for Sterile Preparations Prepared in an Aseptic Environment

NAPRA Beyond Use Dating is based on maximum length of <u>sterility</u> . Beyond Use Dating may be shorter if <u>chemical stability</u> is shorter.				
Risk of Contamination	Contamination Risk Level	At Controlled Room Temperature	With Storage in Refrigerator	With Storage in Freezer
Low	- Final product compounded using <u>up to 3 “sterile units”</u> - No more than <u>2 septum punctures</u> at the injection site for each sterile unit - Simple aseptic transfer technique <u>Drug prepared for one patient (patient specific dose)</u>	48 hours	14 days	45 days
Medium	- Final product compounded using <u>4 or more “sterile units”</u> - Complex manipulations - Prolonged preparation time <u>Batch preparations (for more than one patient)</u>	30 hours	9 days	45 days

References

1. Bing DC, Nowobilski-Vasilios A, editors. Extended Stability of Parenteral Drugs. Bethesda(MD): American Society of Health System Pharmacists; 2017.
2. Trissel LA. Handbook on injectable drugs. Bethesda (MD): American Society of Hospital-System Pharmacists; 2017.
3. Manufacturers’ data; on file at Drug Information Centre, Central Zone, NS Health.
4. Firstline, NS Health. Available from: [Firstline – Clinical Decisions](#)

Revised: May 15, 2025

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