bridge

IV TRAINING

Clinical IV Solutions Administration Manual

Version 1.0

14 Training Modules | 62 Chapters | 4 Product Lines

For Licensed Nursing Professionals Under Medical Oversight

Bridge Global Health

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TRAINING MODULE

Foundations & Governance

Purpose, regulatory scope, and clinical governance essentials for IV therapy practice.

3 chapters in this module

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CHAPTER 1 OF 62

Foundations & Governance

Purpose & Scope

This manual establishes standardized clinical procedures for the safe administration of IV solutions in outpatient, wellness, and clinical settings utilizing Bridge Global Health supply products.

This manual applies to:

KEY POINTS

- Registered Nurses (RN)
- Licensed Practical/Vocational Nurses (LPN/LVN where permitted)
- Advanced Practice Nurses (NP)
- Operating within their state scope of practice and under medical direction

Module Progress: 1 of 3 chapters

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CHAPTER 2 OF 62

Foundations & Governance

Regulatory & Scope of Practice Considerations

All IV therapy must comply with applicable regulations and operate within the clinician's scope of practice. Understanding these requirements is essential for safe, lawful practice.

All IV therapy must:

KEY POINTS

- Comply with state nurse practice acts
- Follow written standing orders or provider protocols
- Operate under physician medical director oversight where required
- Adhere to USP <797> sterile handling principles where applicable
- Clinicians must not practice beyond licensure
- Clinicians must not compound outside permitted scope
- Clinicians must not administer non-approved substances

Module Progress: 2 of 3 chapters

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Foundations & Governance

Clinical Governance & Medical Oversight

Robust clinical governance ensures patient safety and professional accountability. Every facility must maintain oversight structures and documentation.

Facilities should maintain:

KEY POINTS

- Written protocols for hydration therapy
- Medical director approval for treatment algorithms
- Emergency transfer agreements if required
- Adverse event reporting systems

Module Progress: 3 of 3 chapters

TRAINING MODULE

Fluid Science & Indications

Fluid & electrolyte physiology, IV solution classifications, and clinical indications.

3 chapters in this module

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CHAPTER 4 OF 62

Fluid Science & Indications

Fluid & Electrolyte Physiology

Understanding body fluid distribution is fundamental to safe IV therapy. The body's water is distributed across compartments, and IV solutions interact with these compartments differently.

Body Fluid Distribution:

KEY POINTS

- Intracellular Fluid (ICF) constitutes approximately 2/3 of total body water
- Extracellular Fluid (ECF) constitutes approximately 1/3 (intravascular + interstitial)
- Isotonic solutions primarily expand intravascular space
- Excess administration may result in peripheral edema
- Excess administration may result in elevated blood pressure
- Excess administration may result in pulmonary congestion

Module Progress: 1 of 3 chapters

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Fluid Science & Indications

IV Solution Classifications

IV solutions are classified by their tonicity relative to blood plasma. Understanding each type is critical for selecting the appropriate solution for clinical scenarios.

KEY POINTS

- Isotonic 0.9% Sodium Chloride (Normal Saline): First-line hydration fluid, compatible with most additives, no fluid shift between compartments
- Balanced Crystalloids (Lactated Ringer's): Contains sodium, potassium, calcium, lactate; useful for electrolyte support; avoid in severe renal dysfunction
- Dextrose-Containing Solutions: Provide glucose substrate; monitor glucose in diabetics; risk of rebound hypoglycemia if misused

Module Progress: 2 of 3 chapters

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Fluid Science & Indications

Clinical Indications for IV Hydration

IV hydration is indicated in specific clinical scenarios where oral rehydration is insufficient or impractical. Proper patient selection ensures optimal outcomes.

Clinical indications include:

KEY POINTS

- Mild to moderate dehydration
- Gastrointestinal fluid loss
- Heat exhaustion support
- Fatigue associated with fluid depletion
- Pre/post procedure hydration

Module Progress: 3 of 3 chapters

TRAINING MODULE

Patient Assessment & Safety

Contraindications, pre-infusion assessment, and informed consent standards.

3 chapters in this module

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CHAPTER 7 OF 62

Patient Assessment & Safety

Contraindications & Risk Stratification

Identifying contraindications before initiating IV therapy is a critical safety step. Patients must be stratified by risk to prevent adverse outcomes.

Absolute Contraindications:

KEY POINTS

- Absolute: Decompensated heart failure
- Absolute: Pulmonary edema
- Absolute: Severe renal failure without clearance
- Relative: Uncontrolled hypertension
- Relative: Severe electrolyte imbalance
- Relative: Pregnancy (consult provider)

Module Progress: 1 of 3 chapters

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Patient Assessment & Safety

Pre-Infusion Clinical Assessment Protocol

A thorough pre-infusion assessment establishes baseline patient status and identifies potential risks. This assessment must be completed and documented before any infusion begins.

Required Assessment:

KEY POINTS

- Blood pressure
- Heart rate
- Respiratory rate
- Temperature (if indicated)
- Weight (if dosing weight-based)
- Medical history review
- Medication review
- Allergy verification

Module Progress: 2 of 3 chapters

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Patient Assessment & Safety

Informed Consent Standards

Informed consent is both a legal requirement and an ethical obligation. Patients must understand the procedure, its risks, and available alternatives before agreeing to treatment.

Consent must include:

KEY POINTS

- Purpose of IV hydration
- Risks (infection, infiltration, allergic reaction)
- Alternatives to IV therapy
- Opportunity for questions
- Documentation of patient agreement

Module Progress: 3 of 3 chapters

TRAINING MODULE

Infection Control & Preparation

Aseptic technique, sterile compounding, and additive compatibility principles.

3 chapters in this module

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Infection Control & Preparation

Infection Control & Aseptic Standards

Strict infection control practices are the foundation of safe IV therapy. Aseptic technique must be maintained throughout every step of the infusion process to prevent healthcare-associated infections.

Core infection control practices:

KEY POINTS

- Hand hygiene before and after patient contact
- Gloves during preparation and insertion
- Disinfect all vial stoppers and ports
- Allow antiseptic to air dry fully
- Maintain clean preparation surface

Module Progress: 1 of 3 chapters

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Infection Control & Preparation

Sterile Compounding & Additive Preparation

Sterile compounding requires meticulous attention to technique. Each step must be performed in sequence to maintain sterility and ensure accurate medication delivery.

Procedure:

KEY POINTS

- 1. Perform hand hygiene
- 2. Don gloves
- 3. Disinfect preparation surface
- 4. Scrub vial stopper for 15 seconds
- 5. Draw medication using sterile syringe
- 6. Remove air bubbles
- 7. Disinfect IV bag port
- 8. Inject additive slowly
- 9. Gently invert bag to mix
- 10. Label immediately

Module Progress: 2 of 3 chapters

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Infection Control & Preparation

Additive Compatibility & Stability Principles

Before mixing any additives with IV solutions, compatibility and stability must be verified. Incompatible combinations can result in precipitation, reduced efficacy, or patient harm.

Before mixing, always:

KEY POINTS

- Verify compatibility with saline or LR
- Confirm proper dilution ratios
- Check manufacturer stability guidance
- Avoid precipitation or cloudiness

Module Progress: 3 of 3 chapters

TRAINING MODULE

Equipment & Technology

Equipment standards, IV catheter safety engineering, and product specifications.

2 chapters in this module

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CHAPTER 13 OF 62

Equipment & Technology

Equipment Standards & Product Specifications

Using approved, standardized equipment is essential for safe IV therapy. All equipment must meet safety engineering standards and be inspected before use.

Approved Equipment:

KEY POINTS

- Auto-retractable IV catheters
- Blood control IV systems
- 6-inch extension sets
- Sterile saline flush syringes
- Non-DEHP tubing if required

Module Progress: 1 of 2 chapters

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Equipment & Technology

IV Catheter Technology & Safety Engineering

Modern IV catheters incorporate safety engineering features designed to protect both the patient and the clinician. Understanding these systems is essential for proper device selection and use.

KEY POINTS

- Auto-Retractable Systems: Needle retracts upon withdrawal, reducing accidental sharps injury and meeting OSHA safety-engineered device standards
- Blood Control Technology: Minimizes blood leakage and reduces contamination risk during insertion

Module Progress: 2 of 2 chapters

TRAINING MODULE

Vascular Access & Insertion

Venous anatomy, peripheral IV insertion protocol, and securement standards.

3 chapters in this module

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Vascular Access & Insertion

Venous Anatomy & Vascular Access Principles

A thorough understanding of venous anatomy is essential for successful peripheral IV access. Selecting the appropriate vein improves first-attempt success rates and patient comfort.

Preferred Sites:

KEY POINTS

- Dorsal hand veins
- Cephalic vein (forearm)
- Median cubital vein
- Avoid sites near joints
- Avoid infected tissue
- Avoid extremities with lymphedema

Module Progress: 1 of 3 chapters

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Vascular Access & Insertion

Peripheral IV Insertion Clinical Protocol

Peripheral IV insertion is a core clinical competency. Following a standardized protocol ensures patient safety and improves insertion success rates.

Step-by-step protocol:

KEY POINTS

- 1. Apply tourniquet
- 2. Palpate vein
- 3. Clean site (30 seconds)
- 4. Allow full drying
- 5. Anchor vein
- 6. Insert bevel up at 10-30 degree angle
- 7. Confirm flashback
- 8. Advance catheter
- 9. Release tourniquet
- 10. Activate safety device
- 11. Attach extension set
- 12. Flush with saline
- 13. Secure dressing

Module Progress: 2 of 3 chapters

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Vascular Access & Insertion

Securement & Stabilization Standards

Proper securement prevents catheter migration, reduces complications, and maintains line patency. All IV sites must be secured using approved methods.

Securement requirements:

KEY POINTS

- Transparent sterile dressing
- Stabilization device if needed
- Ensure no catheter kinking
- Confirm patient comfort

Module Progress: 3 of 3 chapters

TRAINING MODULE

Infusion Management

Extension sets, tubing systems, infusion rate determination, and IV push protocol.

4 chapters in this module

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Infusion Management

Extension Sets & Blood Control Systems

Extension sets serve as a critical interface between the catheter and the infusion system. They reduce manipulation at the insertion site and improve access for IV push medications.

Benefits of extension sets:

KEY POINTS

- Reduced catheter movement at insertion site
- Easier IV push access without disturbing the catheter
- Decreased infiltration risk

Module Progress: 1 of 4 chapters

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Infusion Management

Tubing Systems & Infusion Delivery Methods

Understanding infusion delivery methods is essential for accurate fluid administration. Both gravity and pump-based systems have specific setup and monitoring requirements.

KEY POINTS

- Gravity Infusion: Standard hydration delivery; adjust roller clamp; monitor drip rate
- Pump Infusion (if used): Set programmed rate; verify volume to be infused

Module Progress: 2 of 4 chapters

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Infusion Management

Infusion Rate Determination

Infusion rates must be determined based on clinical assessment and patient factors. Administering fluids too quickly or too slowly can both lead to complications.

General guidance:

KEY POINTS

- 250 mL over 30-45 minutes
- 500 mL over 45-60 minutes
- Adjust based on patient age
- Adjust based on cardiac history
- Adjust based on patient tolerance

Module Progress: 3 of 4 chapters

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Infusion Management

IV Push Administration Protocol

IV push administration delivers medication directly into the bloodstream through the IV access. It requires careful technique, proper dilution, and controlled administration speed.

IV push procedure:

KEY POINTS

- Confirm medication is approved for IV push
- Dilute per manufacturer guidance
- Flush before administration
- Administer slowly per protocol
- Flush after completion

Module Progress: 4 of 4 chapters

TRAINING MODULE

Monitoring & Response

Infusion monitoring, adverse event management, and emergency response standards.

3 chapters in this module

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Monitoring & Response

Monitoring During Infusion

Continuous monitoring during infusion is essential for early detection of complications. Regular assessment intervals ensure timely intervention if adverse events occur.

Assess every 10-15 minutes:

KEY POINTS

- IV site condition (swelling, redness, pain)
- Patient symptoms (comfort, pain, distress)
- Vital signs if indicated

Module Progress: 1 of 3 chapters

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Monitoring & Response

Adverse Event Recognition & Management

Rapid recognition and appropriate management of adverse events can prevent serious patient harm. All clinicians must be able to identify and respond to common IV complications.

KEY POINTS

- Infiltration: Stop infusion, elevate limb, apply compress
- Extravasation: Stop infusion, notify provider, follow protocol
- Allergic Reaction: Stop infusion, activate emergency protocol

Module Progress: 2 of 3 chapters

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Monitoring & Response

Emergency Response Standards

Every IV therapy setting must be prepared for emergencies. Having the right equipment, medications, and escalation pathways in place saves lives.

Maintain at all times:

KEY POINTS

- Emergency medication kit per protocol
- Blood pressure monitor
- Oxygen supply (if applicable)
- Clear emergency escalation pathway

Module Progress: 3 of 3 chapters

TRAINING MODULE

Documentation & Compliance

Legal recordkeeping, inventory control, OSHA compliance, and quality assurance.

4 chapters in this module

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Documentation & Compliance

Documentation & Legal Recordkeeping

Thorough documentation protects the patient, the clinician, and the organization. Every infusion must be fully documented with specific required elements.

Required documentation elements:

KEY POINTS

- Date and time of infusion
- Solution type administered
- Additives included
- Lot numbers for traceability
- Site location used
- Infusion duration
- Patient tolerance notes
- Nurse signature

Module Progress: 1 of 4 chapters

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Documentation & Compliance

Inventory Control & Storage Standards

Proper inventory management ensures product integrity and availability. Storage conditions directly affect the safety and efficacy of IV supplies.

Storage requirements:

KEY POINTS

- Store per manufacturer guidance
- Protect from extreme temperatures
- Rotate stock using FIFO (First In, First Out)
- Monitor expiration dates regularly

Module Progress: 2 of 4 chapters

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Documentation & Compliance

OSHA & Bloodborne Pathogen Compliance

OSHA compliance is mandatory for all clinical settings handling sharps and bloodborne pathogens. Adherence protects staff from occupational exposure.

OSHA requirements:

KEY POINTS

- Use safety-engineered sharps devices
- Immediate disposal into sharps container
- Follow bloodborne pathogen training standards

Module Progress: 3 of 4 chapters

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Documentation & Compliance

Quality Assurance & Clinical Auditing

Quality assurance programs drive continuous improvement and ensure consistent clinical standards. Regular auditing identifies areas for improvement before problems occur.

QA program components:

KEY POINTS

- Incident reporting system
- Quarterly protocol review
- Continuous improvement process

Module Progress: 4 of 4 chapters

TRAINING MODULE

Competency & Checklists

Competency validation framework and clinical checklists for daily practice.

2 chapters in this module

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Competency & Checklists

Competency Validation Framework

Annual competency validation ensures clinicians maintain the skills and knowledge required for safe IV therapy. Validation must be documented and include both cognitive and psychomotor assessment.

Annual validation must include:

KEY POINTS

- Sterile preparation demonstration
- IV insertion skill verification
- Emergency response review
- Documentation audit

Module Progress: 1 of 2 chapters

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Competency & Checklists

Clinical Checklists

Clinical checklists standardize practice and reduce errors. They should be used as active tools during procedures, not merely as retrospective documentation.

Available checklists:

KEY POINTS

- Pre-Infusion Checklist
- Insertion Checklist
- Infusion Monitoring Checklist
- Adverse Event Checklist
- Post-Infusion Documentation Checklist

Module Progress: 2 of 2 chapters

TRAINING MODULE

Bridge | MedSource IV Catheter Product Training

Comprehensive product-level training on Bridge IV catheters manufactured by MedSource Labs. Covers safety mechanisms, insertion techniques, and best practices for ClearSafe and TrueSafe product lines.

8 chapters in this module

IV Catheter 101 — Fundamentals

This module provides a foundational understanding of peripheral IV catheter technology. IV catheters are among the most commonly used medical devices worldwide, yet significant knowledge gaps persist regarding their design, safety features, and proper usage.

A peripheral IV catheter consists of several key components: the catheter hub, the flexible catheter tube (cannula), the introducer needle with bevel, a flash chamber for blood visualization, and — in modern safety catheters — an integrated needlestick prevention mechanism.

Catheter gauge sizes range from 14G (largest, for trauma and rapid fluid resuscitation) to 26G (smallest, for neonatal and pediatric use). The most common sizes used in outpatient and wellness settings are 20G (general purpose), 22G (smaller veins and elderly patients), and 24G (pediatric and fragile veins).

The catheter material — typically FEP (fluorinated ethylene propylene) or polyurethane — determines flexibility, kink resistance, and biocompatibility. Bridge IV catheters, manufactured by MedSource Labs, use advanced polymer formulations optimized for patient comfort and extended dwell time.

Understanding flow rates is essential: a 20G catheter delivers approximately 60 mL/min, a 22G approximately 36 mL/min, and a 24G approximately 22 mL/min. These rates directly impact your infusion time calculations and patient throughput.

KEY POINTS

- Modern IV catheters integrate safety mechanisms to prevent needlestick injuries
- Gauge selection depends on infusion type, vein size, patient age, and solution viscosity
- Catheter material affects flexibility, biocompatibility, and dwell time
- Flow rate is determined by catheter gauge — larger gauge means faster flow
- Bridge | MedSource IV catheters are engineered for outpatient, wellness, and in-home settings

Module Progress: 1 of 8 chapters

Bridge | MedSource ClearSafe Comfort IV Catheters

The Bridge | MedSource ClearSafe Comfort IV Catheter, manufactured by MedSource Labs and brought to market by Bridge, features a slide-style needle retraction safety mechanism. This design provides a smooth, controlled activation that ensures full and safe needle retraction into the catheter body after venipuncture.

The ClearSafe Comfort line includes both Blood Control (BC) and Standard (non-BC) configurations. The Blood Control variant features an integrated valve at the catheter hub that prevents blood reflux during catheter connection, reducing blood exposure risk for clinicians and minimizing cleanup requirements.

An audible click-lock feature provides tactile and auditory confirmation of secure needle retraction and encapsulation. This dual-confirmation system helps ensure the safety mechanism has been properly activated, reducing the risk of accidental needlestick injuries during disposal.

The slide-style activation allows for single-handed operation. After successful venipuncture — confirmed by a flash of blood in the flash chamber — the clinician simply slides the safety mechanism forward while stabilizing the catheter hub. The needle is instantly retracted and permanently locked inside the housing.

ClearSafe Comfort catheters are available in gauges 18G through 24G with catheter lengths from 1.00 inch (25mm) to 1.25 inches (32mm), covering the full range of outpatient and wellness infusion needs.

KEY POINTS

- Slide-style safety mechanism for smooth, controlled needle retraction
- Blood Control (BC) variant prevents blood reflux during connection
- Audible click-lock confirms secure needle encapsulation
- Single-handed activation for improved workflow efficiency
- Available in 18G-24G with 1.00" to 1.25" catheter lengths

Module Progress: 2 of 8 chapters

Bridge | MedSource TrueSafe Comfort IV Catheters

The Bridge | MedSource TrueSafe Comfort IV Catheter, manufactured by MedSource Labs and brought to market by Bridge, features a push-button needle retraction safety mechanism. This design provides instant, one-step needle retraction at the press of a button, immediately encapsulating the used needle inside the catheter housing.

TrueSafe Comfort catheters feature the RapidFlash notched needle design in gauges 20G through 24G. The notched needle creates a channel along the needle bevel that provides quick, clear visual confirmation of successful venipuncture through faster flash-back visualization.

The push-button mechanism is positioned for intuitive thumb activation. After confirming venipuncture via flash-back, the clinician presses the button to instantly retract the needle into the safety housing. An audible click confirms permanent needle encapsulation.

Like the ClearSafe line, TrueSafe Comfort catheters are available in both Blood Control (BC) and Standard configurations. The Blood Control variant includes an integrated check valve that eliminates blood leakage during catheter connection and disconnection sequences.

The TrueSafe Comfort line is particularly well-suited for high-volume settings like medspas and wellness clinics where speed and consistency of insertion are critical to patient throughput and satisfaction.

KEY POINTS

- Push-button safety mechanism for instant, one-step needle retraction
- RapidFlash notched needle for faster flash-back visualization (20G-24G)
- Intuitive thumb-activated button placement for natural hand positioning
- Blood Control (BC) variant with integrated check valve available
- Optimized for high-volume outpatient and wellness settings

Module Progress: 3 of 8 chapters

Safety Mechanisms — Slide vs. Push-Button

Both the ClearSafe (slide-style) and TrueSafe (push-button) safety mechanisms are engineered to meet OSHA Bloodborne Pathogens Standard requirements and FDA safety IV catheter classification. Understanding the differences helps clinicians select the right product for their practice setting and personal technique preference.

Slide-style activation (ClearSafe): The safety mechanism is engaged by sliding a component along the catheter body. This provides a controlled, gradual retraction that some clinicians prefer for its tactile feedback throughout the activation process. Ideal for clinicians who value precise control during the safety activation step.

Push-button activation (TrueSafe): A single button press instantly retracts and locks the needle. This provides the fastest activation time and is preferred in high-volume environments. The immediate response also reduces the window of exposure between needle withdrawal and safety engagement.

Both mechanisms feature permanent needle encapsulation — once activated, the needle cannot be re-exposed. Both include audible click confirmation. Both meet the Needlestick Safety and Prevention Act requirements for safer medical devices.

When training staff across a practice, some organizations choose to standardize on one mechanism type for consistency, while others stock both and allow clinician preference. Bridge recommends evaluating both in your clinical workflow before committing to a standard.

KEY POINTS

- Slide-style: controlled, gradual retraction with continuous tactile feedback
- Push-button: instant one-step retraction for fastest activation time
- Both meet OSHA and FDA safety standards with permanent needle encapsulation
- Both feature audible click-lock confirmation of secure retraction
- Evaluate both mechanisms in your clinical workflow to determine best fit

Module Progress: 4 of 8 chapters

Blood Control Technology & Check Valves

Blood Control (BC) IV catheters incorporate an integrated check valve mechanism at the catheter hub that prevents blood from flowing back through the catheter during connection and disconnection procedures. This technology significantly reduces clinician blood exposure and minimizes contamination of the work area.

The check valve operates passively — it allows fluid to flow into the patient during infusion but blocks reverse flow when the infusion line is disconnected or the catheter is being connected to extension tubing. No additional steps or activation are required by the clinician.

In non-BC standard catheters, blood naturally flows back through the catheter once the needle is removed due to venous pressure. This requires the clinician to apply digital pressure proximal to the catheter tip during connection, creating potential for blood exposure. BC catheters eliminate this step entirely.

Blood Control technology is particularly valuable in outpatient and wellness settings where: (a) patients may be seated rather than supine, increasing venous pressure; (b) multiple connection/disconnection cycles occur during a session; (c) maintaining a clean, professional environment is important for patient confidence.

Bridge recommends Blood Control catheters as the standard of care for all non-acute infusion settings. The marginal cost difference is offset by reduced cleanup time, lower blood exposure risk, and improved patient perception of care quality.

KEY POINTS

- Integrated check valve passively prevents blood reflux during connection
- Eliminates need for digital pressure during catheter connection procedures
- Reduces clinician blood exposure and workstation contamination
- Particularly valuable for seated patients and multi-connection workflows
- Recommended as standard of care for all Bridge non-acute infusion settings

Module Progress: 5 of 8 chapters

IV Catheter Insertion — Bridge Best Practices

Successful IV catheter insertion combines proper vein selection, patient positioning, skin preparation, needle angle, and smooth catheter advancement. This module covers Bridge-specific best practices optimized for our ClearSafe and TrueSafe catheter product lines.

Step 1 — Vein Selection and Preparation: Apply the tourniquet 4-6 inches above the intended insertion site. Assess available veins visually and by palpation. Select a straight, resilient vein that is well-anchored by surrounding tissue. Prepare the site with chlorhexidine antiseptic using a 30-second friction scrub and allow to dry completely.

Step 2 — Insertion Angle and Technique: Anchor the vein by applying gentle traction distal to the insertion site. Insert the catheter bevel-up at a 15-30 degree angle for superficial veins. Watch for blood flash in the flash chamber — with TrueSafe RapidFlash needles, the notched needle design provides faster visualization.

Step 3 — Catheter Advancement: Once flash is confirmed, lower the angle to 10-15 degrees and advance the catheter 2-3mm further to ensure the catheter tip (not just the needle tip) is within the vein lumen. Then advance the catheter off the needle using a smooth, steady motion while maintaining vein stabilization.

Step 4 — Safety Activation and Securement: For ClearSafe — slide the safety mechanism forward until you hear the click. For TrueSafe — press the button to instantly retract the needle. Apply a transparent semi-permeable membrane dressing. Document the insertion: date, time, gauge, location, number of attempts, and patient response.

KEY POINTS

- Apply tourniquet 4-6 inches above site; prep with chlorhexidine for 30 seconds
- Insert bevel-up at 15-30 degrees; watch for blood flash in chamber
- Advance 2-3mm past flash to ensure catheter tip enters the vein lumen
- ClearSafe: slide mechanism forward; TrueSafe: press the button to retract
- Document insertion details including gauge, location, attempts, and patient response

Module Progress: 6 of 8 chapters

Catheter Maintenance, Monitoring & Removal

Proper catheter maintenance during the infusion period and correct removal technique are essential for patient safety and comfort. This module covers Bridge protocols for ongoing IV site monitoring, dressing management, and catheter discontinuation.

Site Assessment Protocol: Visually inspect and palpate the IV site every 2 hours during continuous infusion, or before each intermittent infusion. Assess for the five signs of complications: redness, swelling, tenderness, warmth, and streak formation (indicating phlebitis or infection). Document each assessment.

Dressing Management: Replace the transparent dressing if it becomes damp, loosened, or visibly soiled. Do not apply tape directly over the insertion site. Ensure the dressing maintains a secure, occlusive seal around the catheter entry point. The catheter hub should be stabilized to prevent pistoning (in-and-out movement).

Catheter Dwell Time: Per Bridge protocol, peripheral catheters in outpatient and wellness settings should be used for the duration of the infusion session only. Do not leave catheters in place between appointments. For extended infusion courses, establish a new peripheral site at each session.

Removal Procedure: Clamp or stop the infusion. Don clean gloves. Gently remove the transparent dressing by stabilizing the skin. Apply a sterile gauze pad over the site and withdraw the catheter in a smooth, steady motion parallel to the vein. Apply firm pressure for 2-3 minutes (longer for patients on anticoagulants). Apply a sterile adhesive bandage. Inspect the catheter tip to confirm it is intact.

KEY POINTS

- Inspect IV site every 2 hours for redness, swelling, tenderness, warmth, and streaking
- Replace transparent dressing if damp, loosened, or soiled
- Do not leave catheters between appointments — single-session use only
- Remove catheter parallel to vein; apply firm pressure for 2-3 minutes minimum
- Always inspect the catheter tip after removal to confirm it is intact

Module Progress: 7 of 8 chapters

Product Troubleshooting & FAQs

This module addresses common troubleshooting scenarios and frequently asked questions specific to Bridge | MedSource ClearSafe and TrueSafe IV catheter products.

Issue: No flash-back after insertion. Possible causes: (a) Needle bevel is not within the vein lumen — withdraw slightly and redirect at a lower angle. (b) Tourniquet is too loose or has been on too long — reapply. (c) Patient is dehydrated or has low blood pressure — apply warm compress to the site for 3-5 minutes and attempt on a more visible vein. (d) Vein has rolled — use more anchoring traction on the skin distal to the insertion point.

Issue: Blood flash seen but catheter will not advance. Possible causes: (a) Catheter tip has not entered the lumen — advance needle-catheter unit 2-3mm further before attempting catheter advancement. (b) Catheter is against a valve or vein wall — slightly rotate the catheter or gently flush with 1-2 mL normal saline. (c) Vein is too small for the selected gauge — downsize to a smaller gauge catheter.

Issue: Safety mechanism did not activate (ClearSafe). Check that you are sliding the mechanism fully forward until the audible click. Do not force the mechanism — if it does not engage smoothly, the needle may not be in the correct position. Follow your facility's safety needle incident protocol if the mechanism fails to lock.

Issue: Safety mechanism did not activate (TrueSafe). Ensure the button is pressed firmly and fully. The button should click and the needle should retract completely. If the mechanism does not engage, do not reuse the device. Dispose in sharps container and report per facility incident protocol. All Bridge | MedSource safety devices undergo 100% function testing during manufacturing.

KEY POINTS

- No flash-back: check angle, tourniquet tension, hydration status, and vein anchoring
- Catheter won't advance: advance further past flash, rotate, or downsize gauge
- ClearSafe: slide fully forward until audible click confirms retraction
- TrueSafe: press button firmly and fully — needle retracts and locks instantly
- Report any safety mechanism failures per facility incident protocol

Module Progress: 8 of 8 chapters

TRAINING MODULE

Bridge IV Solutions Product Training

Product-level training on Bridge 0.9% Sodium Chloride IV solutions in Fleboflex containers. Covers formulation, PVC-free container technology, compatibility, administration, and safety.

8 chapters in this module

Bridge IV Solutions — Product Overview

Bridge partners with Grifols — a global healthcare leader — to supply 0.9% Sodium Chloride Injection, USP in the Fleboflex polypropylene container system. This module provides a foundational overview of the product, its indications, and why it represents the standard for non-acute IV infusion settings.

0.9% Sodium Chloride Injection, USP (Normal Saline) is a sterile, nonpyrogenic solution for fluid and electrolyte replenishment. It contains 9 g/L Sodium Chloride (154 mEq/L sodium, 154 mEq/L chloride) with an osmolarity of 308 mOsmol/L. It is indicated as a source of water and electrolytes for intravenous administration.

The solution is packaged in the Fleboflex container — a flexible, totally collapsible bag fabricated from a polypropylene multilayer film. Unlike traditional PVC bags, Fleboflex is free of PVC, plasticizers (including DEHP), adhesives, and latex. This eliminates concerns about plasticizer leaching into solution, making it particularly suitable for wellness and medspa environments.

Fleboflex containers are available in 50 mL, 100 mL, 250 mL, 500 mL, and 1000 mL sizes — covering the full range of infusion volumes used in outpatient settings from small vitamin pushes to full hydration protocols.

The container meets Class VI US Pharmacopeia (USP) testing for plastic containers, confirming the biological safety of the container system. Bridge recommends Fleboflex as the standard IV solution container for all partner clinics and providers.

KEY POINTS

- 0.9% Sodium Chloride: 9 g/L NaCl, 308 mOsmol/L, sterile and nonpyrogenic
- Fleboflex container is PVC-free, DEHP-free, latex-free, and adhesive-free
- Available in 50, 100, 250, 500, and 1000 mL sizes
- Meets Class VI USP biological safety testing for plastic containers
- Bridge standard of care for all non-acute IV infusion settings

Module Progress: 1 of 8 chapters

Fleboflex Container Technology & Design

The Fleboflex container represents a significant advancement over traditional PVC IV bags. Understanding its material science and design features helps clinicians appreciate why it is the preferred choice for modern outpatient infusion settings.

The container is fabricated from a polypropylene multilayer film. Polypropylene is a highly compatible material used for the preparation of intravenous mixtures — including drugs that have shown incompatibility with other plastics such as PVC. The solution contacts only polypropylene throughout the entire fluid path, including the inner membranes of both the medication and outlet ports.

Key design features include: rounded upper and lower corners that prevent accidental punctures during handling; an integrated eyelet support for safe suspension during infusion; and a totally collapsible design that eliminates the need for air venting during administration. The bag is lightweight and fully transparent, allowing clear visual inspection of the solution at all times.

The Grifols port system features medication and outlet ports designed with rigid, long tubes to prevent perforation due to needle insertion. The internal membrane provides safe attachment of the infusion set. Importantly, no parts of the cover need to be removed or broken to access the outlet port — reducing contamination risk.

Each container is individually overwrapped in a polypropylene protective sleeve that maintains sterility and limits evaporative moisture loss. The overwrap is transparent for visual inspection and features a peelable opening system for clean, easy access.

KEY POINTS

- Polypropylene multilayer film — solution contacts only polypropylene throughout
- Totally collapsible design eliminates need for air venting during infusion
- Rounded corners and integrated eyelet for safe handling and suspension
- Grifols port system with rigid long tubes to prevent needle perforation
- Individual polypropylene overwrap maintains sterility until use

Module Progress: 2 of 8 chapters

Why PVC-Free Matters — Clinical Advantages

Traditional IV bags are made from polyvinyl chloride (PVC) that requires plasticizers — most commonly DEHP (di-2-ethylhexyl phthalate) — to achieve flexibility. DEHP can leach from the bag into the IV solution, particularly when lipophilic drugs are infused or when the bag is exposed to heat or extended storage. Fleboflex eliminates this concern entirely.

DEHP is classified as a probable human carcinogen and endocrine disruptor. While exposure levels from a single IV bag are typically below regulatory thresholds, cumulative exposure across multiple infusion sessions — common in wellness and recurring treatment protocols — is a growing clinical concern. PVC-free containers remove this variable entirely.

Polypropylene demonstrates superior chemical compatibility compared to PVC. Drugs such as nitroglycerin, diazepam, and certain chemotherapy agents are known to adsorb onto PVC surfaces, reducing delivered dose. Fleboflex maintains full drug potency by eliminating surface adsorption — this is particularly important when administering high-value wellness formulations.

From an environmental perspective, PVC manufacturing and disposal generate dioxins and other persistent organic pollutants. Polypropylene is readily recyclable and does not produce toxic byproducts during incineration. For clinics promoting wellness and sustainability, PVC-free IV containers align brand values with clinical practice.

Bridge recommends educating patients on the PVC-free advantage when discussing infusion quality. Patients in wellness settings are typically informed consumers who appreciate premium, safer materials — the Fleboflex PVC-free distinction supports patient confidence and clinical differentiation.

KEY POINTS

- PVC bags require DEHP plasticizer that can leach into IV solution
- DEHP is classified as a probable carcinogen and endocrine disruptor
- Polypropylene eliminates drug adsorption seen with PVC (e.g., nitroglycerin, diazepam)
- PVC-free containers are environmentally superior — no dioxin production
- PVC-free messaging supports patient confidence in wellness settings

Module Progress: 3 of 8 chapters

Drug Compatibility & Admixture Guidelines

Fleboflex containers have undergone extensive drug-container compatibility studies conducted by Grifols. These studies confirm stability and compatibility with a selected number of commonly used drug admixtures, making Fleboflex suitable for compounding in wellness and outpatient settings.

Validated drug compatibilities at refrigerated (5 degrees C) and room temperature (25 degrees C) include: Ondansetron (anti-nausea) stable for 10 days at both temperatures; Morphine stable for 10 days at both temperatures; Cyclophosphamide stable for 6 days refrigerated and 5 days at room temperature; and numerous other agents commonly used in outpatient infusion.

Critical rule: Compatibility of any additive with 0.9% Sodium Chloride MUST be verified before adding medication. Consult pharmacy references and manufacturer documentation. If discoloration, precipitates, insoluble complexes, or crystals appear after mixing, do NOT use the solution — discard immediately.

For wellness infusion protocols (vitamins, minerals, NAD+, glutathione, etc.), always verify that each additive is compatible with both the 0.9% NaCl solution AND the polypropylene container. While polypropylene has superior compatibility compared to PVC, individual drug interactions should always be confirmed.

Solutions containing additives should not be stored — prepare immediately before administration and discard any unused portion. This single-use approach aligns with Bridge clinical protocols for all outpatient infusion settings.

KEY POINTS

- Grifols has published compatibility data for 14+ drug admixtures in Fleboflex
- Always verify additive compatibility before mixing — check both solution and container
- Discard immediately if discoloration, precipitates, or crystals appear after mixing
- Solutions with additives must not be stored — prepare immediately before administration
- Single-use protocol: discard any unused portion after each infusion session

Module Progress: 4 of 8 chapters

Preparation & Administration — Bridge Protocol

This module covers the step-by-step Bridge protocol for preparing and administering 0.9% Sodium Chloride from the Fleboflex container system. Following these steps ensures sterility, safety, and compliance with FDA-labeled directions for use.

Step 1 — Opening: Peel off the polypropylene overwrap and remove the solution container. Visually inspect the container for damage. If the outlet port protector is damaged, detached, or not present, discard the container — solution path sterility may be compromised. Note: some opacity of the plastic from the sterilization process is normal and will clear gradually.

Step 2 — Inspection: Check for leaks by squeezing the inner bag firmly. If any leaks are found, discard the solution. Inspect the solution for particulate matter and discoloration. The solution must be clear with no precipitates. Do not use unless solution is clear and container is undamaged.

Step 3 — Setup: Suspend the container from the eyelet support. Remove the plastic protector from the outlet port at the bottom of the container. Attach the administration set per the set manufacturer's directions. Use non-vented administration sets — Fleboflex is totally collapsible and requires no air inlet. If vented sets are used, keep the air vent closed.

Step 4 — Critical Safety Warning: Do NOT connect flexible plastic containers in series — this risks air embolism from residual air in the primary container. Do NOT pressurize the bag to increase flow rates — this also risks air embolism from incomplete air evacuation. Use a dedicated line without connections to avoid air embolism.

KEY POINTS

- Peel overwrap, inspect container and port protector before use
- Squeeze bag to check for leaks — discard if any are found
- Use non-vented administration sets — Fleboflex requires no air inlet
- NEVER connect flexible containers in series — risk of air embolism
- NEVER pressurize the bag to increase flow rate — risk of air embolism

Module Progress: 5 of 8 chapters

Adding Medications to Fleboflex Containers

Fleboflex containers feature a resealable medication port designed for safe additive injection. This module covers the correct technique for adding medications both before and during infusion administration.

Adding medication BEFORE administration: Prepare the medication site on the bag. Using a syringe with a 19-22 gauge needle, puncture the resealable medication port and inject the additive. Hold the container securely during injection. Insert the needle perpendicular to the port surface. After injection, mix the solution and medication thoroughly by gently inverting and rotating the bag multiple times.

Adding medication DURING administration: Close the clamp on the administration set. Prepare the medication site. Using a syringe with a 19-22 gauge needle, puncture the resealable medication port and inject. Remove the container from the IV pole or turn to an upright position. Mix the solution and medication thoroughly. Return the container to the in-use position and resume administration.

For Fleboflex Luer bags (where available): The needle-free medication port accepts direct syringe or vial connection without needle puncture, further reducing sharps injury risk. The twist-off administration port is accessed by torsion rather than protector removal.

After ANY additive introduction: verify the solution remains clear with no discoloration, precipitates, or crystals. If any abnormality is observed, do not administer — discard the entire bag and prepare a fresh solution. Never store bags after additives have been introduced.

KEY POINTS

- Use 19-22 gauge needles for the resealable medication port — insert perpendicular
- Mix thoroughly after adding any medication — invert and rotate the bag
- During-infusion additions: clamp the set first, then inject, mix, and resume
- Fleboflex Luer variant offers needle-free medication access
- Inspect solution after every additive — discard if any discoloration or precipitates

Module Progress: 6 of 8 chapters

Important Safety Information & Warnings

This module covers the critical safety information, warnings, and precautions for 0.9% Sodium Chloride Injection, USP as required by the FDA prescribing information. All Bridge clinicians must be familiar with these warnings.

Hypersensitivity Reactions: Reactions including hypotension, pyrexia, tremor, chills, urticaria, rash, and pruritus have been reported. If any signs develop — including tachycardia, chest pain, dyspnea, or flushing — stop the infusion immediately and institute appropriate therapeutic countermeasures.

Electrolyte Imbalances: Fluid Overload — IV sodium chloride can cause overhydration, hypervolemia, and pulmonary congestion depending on volume, rate, and patient condition. Avoid in patients at risk for fluid overload. Hyponatremia — can lead to encephalopathy with headache, nausea, seizures, lethargy, and vomiting. Monitor serum sodium levels. Hypernatremia — risk increases in patients with hyperaldosteronism, heart failure, liver disease, renal disease, or pre-eclampsia.

Special Populations: Pediatric patients may have impaired ability to regulate fluids and electrolytes — closely monitor plasma electrolytes. Geriatric patients are at increased risk of electrolyte imbalances and may require dose adjustment. Pregnancy — use only if benefit justifies risk. Nursing mothers — exercise caution.

Drug Interactions: Corticosteroids and corticotropin increase risk of sodium and fluid retention. Lithium clearance may be increased. Diuretics, certain antiepileptics, and psychotropic medications increase hyponatremia risk. Monitor serum electrolytes when co-administering with any of these drug classes.

KEY POINTS

- Stop infusion immediately for any hypersensitivity reaction signs
- Monitor for fluid overload, hyponatremia, and hypernatremia
- Closely monitor electrolytes in pediatric and geriatric patients
- Review drug interaction risk: corticosteroids, lithium, diuretics, antiepileptics
- Use in pregnancy only when benefit clearly justifies potential fetal risk

Module Progress: 7 of 8 chapters

Storage, Handling & Supply Specifications

Proper storage and handling of IV solutions is critical to maintaining product integrity, sterility, and patient safety. This module covers the Bridge-recommended protocols for receiving, storing, and inventorying Fleboflex IV solutions.

Storage Conditions: Store at 20-25 degrees C (68-77 degrees F) per USP Controlled Room Temperature. Excursions between 15-30 degrees C (59-86 degrees F) are permitted. Brief exposure up to 40 degrees C (104 degrees F) does not adversely affect the product. Always store units in their moisture barrier overwrap until ready for use.

Product Identification: Each container is labeled with the National Drug Code (NDC), lot number, and expiration date. Available NDCs for Fleboflex bags: 50 mL (76297-001-11), 100 mL (76297-001-21), 250 mL (76297-001-31), 500 mL (76297-001-01), 1000 mL (76297-001-41). Fleboflex Luer variants have separate NDCs in the 76297-001-5x through 9x range.

Inventory Management: Bridge recommends FIFO (First In, First Out) rotation for all IV solution inventory. Conduct monthly expiration date audits. Do not use any container past its labeled expiration date. After opening the overwrap, the contents should be used immediately and not stored for subsequent infusion.

Receiving and Inspection: Upon delivery, inspect all cases for visible damage, temperature exposure indicators (if present), and proper labeling. Reject and quarantine any cases showing signs of freezing, excessive heat exposure, or physical damage. Document all received inventory including lot numbers for traceability.

KEY POINTS

- Store at 20-25 degrees C (68-77 degrees F); keep in overwrap until use
- Available in 50, 100, 250, 500, and 1000 mL with individual NDC codes
- FIFO inventory rotation with monthly expiration audits required
- Use immediately after opening overwrap — do not store opened containers
- Inspect all deliveries and document lot numbers for full traceability

Module Progress: 8 of 8 chapters

TRAINING MODULE

Bridge IV Administration Sets Training

Product-level training on Bridge IV administration sets (tubing). Covers macrodrip and microdrip gravity sets, drop factor science, flow rate calculations, product catalog, and clinical best practices.

8 chapters in this module

IV Administration Sets — Product Overview

Bridge IV Administration Sets provide the critical fluid path between the IV solution container and the patient's venous access device. These gravity infusion sets — commonly referred to as 'tubing' — are available in macrodrip and microdrip configurations to meet the full range of outpatient, wellness, and in-home infusion needs.

All Bridge IV administration sets are manufactured to meet rigorous quality standards: individually packaged, sterile, non-pyrogenic, and not made with natural rubber latex or DEHP. The tubing is medical-grade PVC, and every set features a rotary male Luer lock connector for secure attachment to catheter hubs and extension sets.

The product line is organized by three drop factors: 10 gtt/mL (macrodrip, large drops), 15 gtt/mL (macrodrip, medium drops), and 60 gtt/mL (microdrip, fine drops). Each drop factor is color-coded on the packaging for instant identification in clinical settings — preventing wrong-set errors during high-volume workflows.

Standard configurations include non-vented drip chambers (designed for flexible collapsible bags like Fleboflex), roller clamps for flow rate adjustment, Y-site injection ports (split septum or needleless PRN), and rotary male Luer lock connectors. Extended variants include pre-attached 6-inch extension sets, back-check valves, flow regulators, and stopcocks.

Bridge recommends standardizing on a single drop factor across your practice for consistency — with 15 gtt/mL being the most versatile choice for non-acute settings. This module series covers the full product catalog, drop factor science, flow rate calculations, and clinical best practices.

KEY POINTS

- Three drop factors: 10 gtt/mL, 15 gtt/mL (macrodrip) and 60 gtt/mL (microdrip)
- All sets: sterile, non-pyrogenic, latex-free, DEHP-free, medical-grade PVC
- Color-coded packaging for instant identification of drop factor
- Non-vented drip chambers designed for collapsible containers like Fleboflex
- Bridge recommends standardizing on 15 gtt/mL for most non-acute settings

Module Progress: 1 of 8 chapters

Drop Factor Science — Macrodrip vs. Microdrip

The drop factor is the number of drops required to deliver exactly 1 mL of fluid. It is determined by the size of the drip orifice inside the drip chamber of the tubing set. Understanding drop factors is foundational to safe, accurate gravity infusion delivery.

Macrodrip sets (10 gtt/mL and 15 gtt/mL) deliver larger drops of fluid. Fewer drops per minute are required to achieve a given flow rate, making them suitable for moderate-to-high volume infusions in adult non-acute settings. The 10 gtt/mL set delivers the fewest, largest drops — resulting in the lowest drop count per minute for any given flow rate. The 15 gtt/mL set delivers slightly smaller drops, requiring a higher count but offering finer manual control.

Microdrip sets (60 gtt/mL) deliver very small drops — 60 drops per mL. Because each mL is divided into many small drops, the clinician has much finer control over the infusion rate without using an electronic pump. Microdrip sets are the preferred choice when precision is critical: low-volume infusions, pediatric patients, neonatal patients, and patients with limited fluid tolerance.

Clinical selection guidance: Use 10 gtt/mL when infusing larger volumes (500-1000 mL) at moderate rates and you want to minimize drop counting time. Use 15 gtt/mL as a versatile all-purpose set — it balances count simplicity with adjustment precision. Use 60 gtt/mL for any infusion under 100 mL/hr, for slow medication drips, or when working with pediatric or fluid-sensitive patients.

Important: the drop factor is printed on every Bridge administration set package. Always verify the drop factor before calculating drip rates. Using the wrong drop factor in your calculation will result in incorrect infusion delivery — a preventable clinical error.

KEY POINTS

- 10 gtt/mL: largest drops, lowest count — ideal for high-volume adult infusions
- 15 gtt/mL: versatile all-purpose — best balance of simplicity and precision
- 60 gtt/mL: finest control — required for low-volume, pediatric, or precision infusions
- Drop factor is always printed on the package — verify before every calculation
- Wrong drop factor in calculations leads to incorrect infusion delivery

Module Progress: 2 of 8 chapters

Flow Rate Calculations for Gravity Infusion

When administering IV fluids by gravity (without an infusion pump), clinicians control the flow by counting drops per minute and adjusting the roller clamp. The universal formula for calculating gravity drip rate is: Drops/min = (Total Volume in mL / Total Time in minutes) x Drop Factor (gtt/mL).

Example 1 — 15 gtt/mL set: An order for 500 mL over 4 hours. Convert time: 4 hours x 60 = 240 minutes. Calculate: (500 / 240) x 15 = 31.25, round to 31 drops per minute. Set the roller clamp so that approximately 31 drops fall per minute in the drip chamber.

Example 2 — 10 gtt/mL set: Same order — 500 mL over 4 hours. Calculate: (500 / 240) x 10 = 20.8, round to 21 drops per minute. Notice how the lower drop factor requires fewer counted drops per minute for the same infusion rate.

Example 3 — 60 gtt/mL set: An order for 50 mL over 30 minutes. Calculate: (50 / 30) x 60 = 100 drops per minute. Microdrip sets are used here because the fine drop size allows for precise delivery of smaller volumes. For microdrip sets, the math simplifies: mL/hr = gtt/min (since 60 gtt/mL / 60 min/hr = 1).

Clinical best practice: Always count drops over a full 60 seconds when setting or verifying a gravity drip rate — never extrapolate from a 15-second count, as this amplifies counting errors by 4x. Recount after any patient movement, position change, or clamp adjustment. Document the verified drip rate and the time of verification.

KEY POINTS

- Formula: Drops/min = (Volume mL / Time min) x Drop Factor gtt/mL
- 15 gtt set: 500 mL over 4 hrs = 31 gtt/min; 10 gtt set = 21 gtt/min
- Microdrip shortcut: with 60 gtt/mL, mL/hr equals drops/min
- Always count drops over a full 60 seconds — never extrapolate from 15 seconds
- Recount after any patient movement, position change, or clamp adjustment

Module Progress: 3 of 8 chapters

Bridge Standard Administration Sets — Product Catalog

The Bridge standard administration set line provides the core gravity tubing for everyday infusion workflows. All standard sets feature non-vented drip chambers (designed for collapsible containers like Fleboflex), roller clamps, Y-site injection ports, needleless PRN adapters, and rotary male Luer lock connectors.

83-inch Standard Sets (Split Septum Y-Site + Needleless PRN): MS-83110 (10 Drop, 50/case), MS-83115 (15 Drop, 50/case), MS-83160 (60 Drop, 50/case). These are the primary workhorse sets for most Bridge infusion settings. The 83-inch length provides comfortable reach from IV pole to patient in both seated and reclined positions.

83-inch Sets with Pre-Attached 6-inch Extension: MS-831106 (10 Drop, 50/case), MS-831156 (15 Drop, 50/case), MS-831606 (60 Drop, 50/case). Identical to standard sets but with a 6-inch extension set pre-attached at the distal end. The extension reduces manipulation at the catheter hub during connection and disconnection, lowering infection risk.

Shorter-Length Sets (Y-Site + Needleless PRN): MS-83401 (72-inch, 10 Drop, 50/case), MS-83406 (78-inch, 15 Drop, 50/case), MS-83403 (72-inch, 60 Drop, 50/case). Shorter tubing for compact infusion spaces, bedside chairs, or mobile infusion carts where the IV pole is positioned close to the patient.

Multi-Feature Sets: MS-83210 (83-inch, 10 Drop, two Needleless PRNs, 50/case) — dual injection ports for multi-medication protocols. MS-83171T (88-inch, 60 Drop, Vented Drip Chamber, two Pinch Clamps, Split Septum Y-Site, Double Sided Tape, 50/case) — specialized microdrip set for precise administration from glass bottles or rigid containers.

KEY POINTS

- 83-inch is the standard length — comfortable reach for seated and reclined patients
- Extension set variants (6-inch pre-attached) reduce catheter hub manipulation
- 72/78-inch shorter sets for compact spaces and mobile infusion carts
- MS-83210: dual needleless PRN ports for multi-medication protocols
- MS-83171T: vented microdrip set for glass bottles or rigid containers

Module Progress: 4 of 8 chapters

Bridge Extended-Length Administration Sets

Bridge extended-length administration sets (100+ inches) are designed for clinical environments where additional tubing length is required — in-home infusion with floor-standing poles, ambulatory infusion chairs, or any setup where the solution container is positioned farther from the patient.

MS-83175 (100-inch, 10 Drop, 50/case): Non-vented drip chamber, two slide clamps, roller clamp, two split septum Y-sites, male rotary Luer lock. The dual Y-sites and dual clamps provide maximum flexibility for complex infusion protocols requiring multiple injection points.

MS-83105 (105-inch, 15 Drop, 50/case): Vented drip chamber, back-check valve, slide clamp, roller clamp, two needleless PRN Y-sites, male rotary Luer lock. The back-check valve prevents retrograde flow when the infusion container runs dry — a critical safety feature for unattended or longer-duration infusions.

MS-83122 (122-inch, 15 Drop, 50/case): The longest set in the Bridge catalog. Vented drip chamber, roller clamp, back-check valve, stopcock, needleless PRN Y-site, male rotary Luer lock. The integrated stopcock provides on/off control at the distal end without interrupting the primary flow path.

MS-83310 (104-inch, 10 Drop, 50/case): Vented drip chamber, roller clamp, two needleless PRNs, two split septum Y-sites, roller clamp, slide clamp, male rotary Luer lock, plus a 6-inch pre-attached extension set. This is the most fully-featured set in the Bridge line — designed for complex multi-medication in-home infusion protocols.

KEY POINTS

- 100+ inch sets for in-home infusion, ambulatory chairs, and floor-standing poles
- MS-83105: back-check valve prevents retrograde flow when container empties
- MS-83122: 122-inch with integrated stopcock for distal on/off control
- MS-83310: most fully-featured set — dual ports, extension, and dual clamps
- All extended sets use rotary male Luer lock for secure catheter connection

Module Progress: 5 of 8 chapters

Understanding Administration Set Components

Every Bridge IV administration set consists of several functional components, each serving a specific clinical purpose. Understanding these components enables proper set selection, correct priming, and effective troubleshooting.

Drip Chamber: The clear, rigid plastic chamber at the top of the set where the spike enters the solution container. The drip orifice inside determines the drop factor (10, 15, or 60 gtt/mL). During use, fill the drip chamber to the halfway mark — this allows clear visualization of drops while preventing air from entering the tubing. Non-vented chambers are used with collapsible bags; vented chambers include a filtered air inlet for rigid or glass containers.

Roller Clamp: The primary flow control device. Rolling the wheel compresses the tubing to regulate flow rate. Position the roller clamp on a straight section of tubing, away from Y-sites. When counting drops, make small incremental adjustments — large movements cause overshooting. Always clamp fully when disconnecting or changing containers.

Y-Site Injection Ports: Split septum Y-sites accept standard needles (for medication injection), while needleless PRN adapters accept Luer-lock syringes without needles — reducing sharps injury risk. When injecting through a Y-site, clamp the main line first (unless ordered otherwise), inject slowly, then unclamp and resume flow. Clean the port with alcohol before and after each access.

Rotary Male Luer Lock: The distal connector that attaches to the catheter hub or extension set. The rotary (twist-lock) mechanism provides a secure, leak-free connection that resists accidental disconnection during patient movement. Always twist clockwise to secure — never over-tighten, as this can damage the connector threads.

KEY POINTS

- Fill drip chamber to halfway mark for clear drop visualization
- Non-vented chambers for collapsible bags; vented for rigid/glass containers
- Position roller clamp on straight tubing — make small incremental adjustments
- Clean Y-site ports with alcohol before and after every access
- Rotary Luer lock: twist clockwise to secure — do not over-tighten

Module Progress: 6 of 8 chapters

Administration Set Priming & Setup Protocol

Proper priming of the IV administration set removes all air from the tubing before connecting to the patient. Air in the line can cause discomfort, anxiety, and in extreme cases, air embolism. This module covers the Bridge step-by-step priming protocol.

Step 1 — Preparation: Verify the correct drop factor on the package label. Open the outer packaging and remove the administration set. Close the roller clamp completely. If the set includes slide clamps, close those as well. Inspect the entire set for damage, kinks, or defects.

Step 2 — Spike the Container: Remove the protective cover from the spike (top of the set). Remove the outlet port protector from the Fleboflex container. Insert the spike firmly into the outlet port using a twisting motion until fully seated. Hang the container on the IV pole.

Step 3 — Prime the Drip Chamber: Squeeze the drip chamber gently to fill it to the halfway mark. Do not overfill — you need to see drops falling to set the rate. If using a vented set with a glass bottle, ensure the air vent is open.

Step 4 — Prime the Tubing: Open the roller clamp slowly and allow fluid to flow through the entire length of tubing, through all Y-sites, and out the distal Luer lock connector. Hold the distal end over a waste receptacle. Watch the tubing carefully — tap any sections where air bubbles are trapped to dislodge them. Once a continuous, bubble-free stream flows from the distal connector, close the roller clamp. The set is now ready for connection to the patient's catheter hub.

KEY POINTS

- Always close the roller clamp before spiking the container
- Fill drip chamber to halfway — overfilling obscures drop visualization
- Spike Fleboflex outlet port firmly with a twisting motion until fully seated
- Prime until bubble-free flow exits the distal Luer lock connector
- Tap tubing sections to dislodge any trapped air bubbles during priming

Module Progress: 7 of 8 chapters

Administration Set Troubleshooting & Best Practices

This module addresses common troubleshooting scenarios and clinical best practices specific to Bridge IV administration sets in gravity infusion workflows.

Issue: Infusion is running too fast or too slow. First, recount the drip rate over a full 60 seconds. If the rate has drifted, readjust the roller clamp with small incremental movements. Common causes of rate drift: patient position change (arm elevation changes venous pressure), roller clamp slippage on wet or kinked tubing, or IV pole height change. Gravity flow rate is directly proportional to the height difference between the container and the insertion site — raising the pole increases flow, lowering it decreases flow.

Issue: No drip or flow has stopped. Check for: (a) roller clamp or slide clamp fully closed — open it; (b) kinked tubing — straighten the line; (c) empty container — replace with a new bag; (d) catheter occlusion — assess the IV site and flush per protocol; (e) drip chamber overfilled — invert the chamber briefly to lower the fluid level back to halfway.

Issue: Air bubbles in the tubing. Small bubbles trapped along the tubing walls are common and generally not clinically significant in peripheral gravity infusions. However, large bubbles or continuous air should be addressed: clamp the line, tap the tubing section to move bubbles toward the drip chamber (they will rise out of the fluid path), and re-prime if necessary. Never run a line with visible large air pockets toward the patient.

Best practices for Bridge clinics: Change administration sets every 96 hours per CDC guidelines for continuous infusion, or with each new infusion session in outpatient settings. Label each set with the date and time of first use. Dispose of used sets in appropriate biohazard waste. Never reuse a set that has been disconnected — always use a fresh set for each patient encounter.

KEY POINTS

- Recount drip rate over 60 seconds after any position, pole, or clamp change
- No flow: check clamp, kinks, container level, catheter patency, and chamber fill
- Small wall-adherent bubbles are common — tap tubing to dislodge toward drip chamber
- Change sets every 96 hours (continuous) or per session (outpatient/wellness)
- Label every set with date/time of first use; never reuse a disconnected set

Module Progress: 8 of 8 chapters

TRAINING MODULE

Bridge Fleboflex Luer Bag Training

Product-level training on the Fleboflex Luer needle-free IV bag system. Covers Luer valve technology, needle-free compounding, partially-filled configurations, high-flow performance, and non-acute workflow advantages.

8 chapters in this module

Fleboflex Luer — Product Overview

The Fleboflex Luer is an advanced IV bag system that combines all the PVC-free, DEHP-free, latex-free polypropylene advantages of the standard Fleboflex container with a needle-free Luer-lock valve for medication access. Manufactured by Grifols and distributed by Bridge, it delivers 0.9% Sodium Chloride Injection, USP (9 g/L NaCl, 308 mOsmol/L, sterile, nonpyrogenic) in a partially-filled, totally collapsible container.

The defining innovation is the Luer-lock injection/extraction port — a needle-free valve that accepts direct syringe or vial-adaptor connections. This eliminates every needle puncture traditionally required during IV bag compounding, removing the risk of accidental needlestick injuries and reducing microbiological contamination from repeated membrane punctures.

Fleboflex Luer containers are available in four partially-filled configurations: 50/100 mL, 100/250 mL, 250/500 mL, and 500/1000 mL. The first number is the fill volume of 0.9% NaCl; the second is the total container capacity. The headroom between fill and capacity is reserved for additive volume — enabling large-volume multi-additive compounding directly inside the bag without overfilling.

Each container meets Class VI U.S. Pharmacopeia (USP) biological safety testing for plastic containers. The solution contacts only polypropylene throughout the fluid path, including the inner membranes of the medication and infusion ports. The polypropylene multilayer film provides full transparency for continuous visual inspection.

Bridge positions Fleboflex Luer as the preferred IV bag for any setting that routinely compounds multi-additive infusions — wellness clinics, med spas, outpatient infusion centers, and in-home IV therapy providers. The needle-free workflow, large additive capacity, and reduced bag entries make it the safest and most efficient option for non-acute compounding.

KEY POINTS

- Needle-free Luer-lock valve eliminates all needle punctures during compounding
- Partially filled: 50/100, 100/250, 250/500, 500/1000 mL configurations
- PVC-free, DEHP-free, latex-free, adhesive-free polypropylene construction
- Class VI USP biological safety certified — solution contacts only polypropylene
- Bridge preferred IV bag for multi-additive non-acute compounding workflows

Module Progress: 1 of 8 chapters

Luer Valve Technology — Needle-Free Access

The Fleboflex Luer injection/extraction port uses a Luer-lock valve with automatic locking for safe, quick, and repeatable access to the interior of the bag. Understanding this mechanism is critical to proper technique and maintaining sterility during compounding.

How it works: Connect a standard Luer-lock syringe to the valve by inserting and giving a small rotational twist to engage the auto-lock. The connection is secure — no dripping occurs at connection or disconnection. Once locked, push or pull the syringe plunger to add or withdraw solution. When finished, reverse the rotational twist to disconnect cleanly.

The valve seals automatically upon disconnection, preventing any fluid leakage or environmental contamination between accesses. This is a fundamental advantage over traditional rubber-septum ports, which can core (create particulate fragments) after repeated needle punctures and lose seal integrity over time.

For vial reconstitution, Fleboflex Luer is compatible with standard male vial adaptors. The workflow is: (1) place the vial adaptor onto the medication vial using the blister technique (press adaptor awl through vial stopper without removing the blister, then remove the blister), (2) connect the vial-plus-adaptor assembly to the Luer valve on the bag, and (3) reconstitute by transferring solution between bag and vial as needed.

The Luer valve is also compatible with Closed System Transfer Devices (CSTDs) that use a Luer interface, making Fleboflex Luer suitable for hazardous drug compounding workflows where closed-system containment is required.

KEY POINTS

- Luer-lock auto-locking valve: insert, twist to lock, add/remove solution, twist to disconnect
- No dripping at connection or disconnection — automatic seal on release
- Eliminates rubber-septum coring and seal degradation from repeated needle punctures
- Compatible with standard male vial adaptors for needle-free vial reconstitution
- Compatible with Closed System Transfer Devices (CSTDs) for hazardous drug handling

Module Progress: 2 of 8 chapters

Reduced Bag Entries — Contamination Control

Traditional IV bag preparation in a multi-additive wellness setting requires multiple entry points: spike insertion for the administration set, plus separate needle punctures for each medication additive. A typical 4-additive vitamin infusion requires 5+ separate bag entries — each one an opportunity for contamination.

Fleboflex Luer reduces this to a controlled, repeatable single Luer access interface. All additives are introduced through the same needle-free Luer port using sequential syringe connections. The administration set connects via the separate twist-off infusion port. The total number of bag manipulations drops dramatically.

Fewer entries means fewer contamination opportunities. Every needle puncture through a traditional septum port carries risk: skin flora from the clinician's hands, environmental airborne particulates, and coring fragments from the rubber membrane itself. The Luer valve's smooth, mechanical connection eliminates all three contamination vectors.

In high-volume settings where 20-50+ infusion bags are prepared daily, the cumulative reduction in contamination risk is substantial. Bridge internal quality data shows that needle-free compounding workflows correlate with lower rates of particulate contamination compared to needle-puncture workflows.

Bridge protocol for Fleboflex Luer: Always swab the Luer port with alcohol before the first connection of each compounding session. Use a fresh syringe for each additive. Never leave a syringe connected to the port between additions. Visually inspect the solution after every additive for clarity, discoloration, and precipitates.

KEY POINTS

- Traditional 4-additive prep requires 5+ bag entries; Luer reduces to one port
- Needle-free access eliminates coring, airborne, and touch contamination vectors
- High-volume settings see cumulative contamination risk reduction across all preps
- Swab the Luer port with alcohol before first connection of each session
- Use a fresh syringe per additive; visually inspect after every addition

Module Progress: 3 of 8 chapters

Partially-Filled Design & Additive Capacity

Unlike standard Fleboflex bags that are filled to their labeled volume, Fleboflex Luer bags are intentionally partially filled — leaving significant headroom for additives. This design is purpose-built for compounding environments where multiple medications, vitamins, or minerals are added to a single base solution.

Additive volume capacity (maximum volume at 50 mbar pressure): 50/100 mL container holds up to 136 mL of additives; 100/250 mL holds up to 289 mL; 250/500 mL holds up to 422 mL; 500/1000 mL holds up to 639 mL. These are validated maximums — always confirm that your total compounded volume does not exceed the container's maximum removable volume.

Maximum removable volumes: 50/100 mL = 187 mL; 100/250 mL = 394 mL; 250/500 mL = 677 mL; 500/1000 mL = 1,139 mL. Residual volume (fluid remaining after administration) ranges from 0.2-2.6 mL depending on container size. Air volume inside ranges from 4-30 mL depending on size.

For wellness infusion clinics, the partially-filled design means you can start with a 100/250 mL Luer bag (100 mL of saline) and add up to 289 mL of vitamin/mineral concentrates, glutathione, NAD+, or other additives — all through the single Luer port, without any needle punctures, with room to spare.

Container selection guide: Use the 50/100 mL for small IV pushes and single-additive protocols. Use 100/250 mL for standard multi-vitamin wellness drips. Use 250/500 mL for hydration-plus-additive protocols. Use 500/1000 mL for high-volume hydration with multiple additives or extended infusion sessions.

KEY POINTS

- 50/100 mL: up to 136 mL additives; 100/250 mL: up to 289 mL additives
- 250/500 mL: up to 422 mL additives; 500/1000 mL: up to 639 mL additives
- Residual volume is only 0.2-2.6 mL — minimal waste across all sizes
- 100/250 mL is the sweet spot for standard multi-vitamin wellness drips
- Always verify total compounded volume does not exceed maximum removable volume

Module Progress: 4 of 8 chapters

Workflow Efficiency in High-Volume Settings

In outpatient wellness clinics, med spas, and mobile IV therapy operations, preparation speed directly impacts patient throughput, staff satisfaction, and revenue. Fleboflex Luer is engineered to streamline the compounding workflow at every step.

Time savings per bag: Eliminating needle punctures removes the time spent uncapping needles, puncturing membranes, applying digital pressure during withdrawal, recapping or disposing of sharps, and inspecting puncture sites for coring. For a 4-additive infusion, this can save 60-90 seconds per bag preparation — significant when compounding 30+ bags per day.

Ergonomic benefits: Repeated needle puncture through rubber septum ports requires sustained grip force and precise wrist movement. Over hundreds of preparations, this contributes to repetitive strain injury (RSI) in the hands, wrists, and forearms. The Luer valve's push-twist-inject motion requires less force and less precise alignment, reducing cumulative ergonomic strain.

Standardization benefits: Because the Luer connection is mechanical (push + twist) rather than technique-dependent (needle angle + depth + force), compounding consistency improves across staff members with different experience levels. New staff can be trained on Luer technique faster than needle-puncture technique, and the error rate is lower.

Sharps reduction: Every needle puncture eliminated is a sharp eliminated from the waste stream. For a clinic compounding 40 bags per day with 4 additives each, switching from needle-puncture to Luer eliminates approximately 160 needle exposures and 160 sharps disposals per day — reducing both injury risk and biohazard waste volume.

KEY POINTS

- Saves 60-90 seconds per 4-additive bag — significant at 30+ bags/day
- Reduces RSI risk from repetitive needle puncture and grip force
- Mechanical push-twist connection standardizes technique across all skill levels
- Eliminates ~160 needle exposures per day in a 40-bag, 4-additive clinic
- Reduces sharps waste volume and associated biohazard disposal costs

Module Progress: 5 of 8 chapters

Fleboflex Luer Preparation & Administration Protocol

This module covers the step-by-step Bridge protocol for preparing and administering infusions using the Fleboflex Luer container system. These instructions apply to all four partially-filled configurations.

Step 1 — Opening: The overwrap is designed to be opened by pulling apart the two sheets. Peel off one sheet by the corner while holding the other sheet at one end and carefully remove the solution container. The overwrap should not be removed until the product is ready for use — it serves as a moisture barrier.

Step 2 — Inspection: Visually inspect the container for particulate matter and discoloration. Check for minute leaks by squeezing the inner container firmly. If the ports are damaged, detached, or not present, discard the container. Some opacity of the plastic from sterilization is normal and will clear gradually. Do not administer unless the solution is clear and the seal is intact.

Step 3 — Adding Medications (before administration): Swab the Luer port with alcohol. Connect a Luer-lock syringe to the Luer valve — insert and give a small rotational twist to lock. Inject the additive. Disconnect by reverse-twisting. Repeat for each additive using a fresh syringe each time. After all additions, mix the solution thoroughly by gently inverting and rotating the bag multiple times. Visually inspect for clarity — if discoloration, precipitates, or crystals appear, discard immediately.

Step 4 — Administration Setup: Suspend the container from the eyelet support. Break the twist-off administration port by means of torsion (twisting). Attach the administration set per the set manufacturer's directions. Use non-vented sets for Fleboflex Luer. Prime the administration set and begin infusion. CRITICAL: Do not connect flexible containers in series. Do not pressurize the bag to increase flow rate. Both risk air embolism.

KEY POINTS

- Remove overwrap by peeling apart sheets — keep sealed until ready for use
- Squeeze container firmly to check for leaks before use
- Swab Luer port with alcohol; use fresh syringe for each additive; mix thoroughly
- Break twist-off administration port by torsion — no protector removal needed
- NEVER connect in series or pressurize the bag — risk of air embolism

Module Progress: 6 of 8 chapters

Fleboflex Luer Drug Compatibility & Hazardous Compounding

Fleboflex Luer has undergone extensive drug-container compatibility testing by Grifols. The polypropylene container material demonstrates superior compatibility compared to PVC — particularly for drugs known to adsorb onto PVC surfaces or that are sensitive to plasticizer leaching.

Validated drug compatibilities in 0.9% NaCl at 25 degrees C (77 degrees F) include 20 agents: Bleomycin sulfate (7 days), Carboplatin (7 days), Cisplatin (7 days), Cytarabine (7 days), Dacarbazine (1 day — protect from light), Docetaxel (7 days), Etoposide (7 days), Epirubicin (7 days), Fludarabine (7 days), Gemcitabine (7 days), Idarubicin (7 days), Ifosfamide (7 days), Irinotecan (7 days), Methotrexate (7 days), Mitoxantrone (7 days), Oxaliplatin (7 days), Paclitaxel (7 days), Vinblastine (7 days), Vincristine (7 days), and Vinorelbine (7 days).

For hazardous drug compounding, Fleboflex Luer is compatible with any Closed System Transfer Device (CSTD) that uses a Luer interface. The needle-free Luer valve provides the closed-system containment point on the bag side — no needle puncture means no open pathway for hazardous drug vapor or liquid escape during transfer.

For wellness and non-acute settings: Always verify compatibility of each additive (vitamins, minerals, NAD+, glutathione, amino acids, etc.) with both 0.9% NaCl solution and the polypropylene container before compounding. While polypropylene has superior compatibility, individual additive interactions must always be confirmed against pharmacy references.

Critical rule: Solutions containing additives must not be stored. Prepare immediately before administration and discard any unused portion. If discoloration, precipitates, insoluble complexes, or crystals appear after mixing, do NOT use — discard the entire bag and prepare fresh.

KEY POINTS

- 20 validated drug compatibilities in polypropylene at 25 degrees C
- Compatible with Closed System Transfer Devices (CSTDs) for hazardous drugs
- Polypropylene eliminates PVC surface adsorption and plasticizer leaching
- Always verify individual additive compatibility before compounding
- Never store compounded solutions — prepare immediately; discard unused portions

Module Progress: 7 of 8 chapters

Fleboflex Luer Supply Specifications & NDC Reference

This module provides the complete supply specifications, NDC codes, and ordering reference for the Fleboflex Luer product line. Accurate product identification ensures correct inventory management and traceability.

Fleboflex Luer NDC codes: 50/100 mL (76297-001-51, 90 units per carton), 100/250 mL (76297-001-61, 50 units per carton), 250/500 mL (76297-001-71, 32 units per carton), 500/1000 mL (76297-001-81, 24 units per carton), 1000 mL (76297-001-91, 10 units per carton). Note the NDC numbering: Luer variants use the 5x-9x suffix range, while standard Fleboflex uses 01-41.

Storage conditions: Store at 20-25 degrees C (68-77 degrees F) per USP Controlled Room Temperature. Excursions between 15-30 degrees C (59-86 degrees F) are permitted. Brief exposure up to 40 degrees C (104 degrees F) does not adversely affect the product. Always store units in the moisture barrier overwrap until ready for use.

Performance specifications: High resistance to pressure cuffs — responds satisfactorily to 400 mmHg pressure for 72 hours. High flow rate of solution through the twist-off administration port. Totally collapsible design eliminates need for air venting during gravity infusion. Lightweight and fully transparent for continuous visual inspection.

Inventory management: Bridge recommends FIFO (First In, First Out) rotation for all Fleboflex Luer inventory. Conduct monthly expiration date audits. Each container includes the National Drug Code, lot number, expiration date, and sequential number for full traceability. Upon delivery, inspect all cases for visible damage and temperature exposure. Reject and quarantine any cases showing signs of freezing, excessive heat, or physical damage.

KEY POINTS

- Luer NDCs: 50/100 mL (001-51), 100/250 mL (001-61), 250/500 mL (001-71), 500/1000 mL (001-81)
- Store at 20-25 degrees C in overwrap; brief exposure up to 40 degrees C is acceptable
- 400 mmHg pressure resistance for 72 hours — high-flow gravity performance
- FIFO rotation with monthly expiration audits — full lot traceability required
- Inspect all deliveries; reject and quarantine any cases with damage or heat exposure

Module Progress: 8 of 8 chapters

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Training Complete

This manual contains the complete Bridge IV training curriculum. For questions, updates, or additional training resources, contact your Bridge representative.

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