Teplizumab-mzwv Infusion Guide for Clinicians

Disclaimer

This guide is intended to serve as an educational and informational resource only. It does not constitute medical or legal advice, nor is it a substitute for individualized clinical judgment, institutional policy, or regulatory guidance. While the National Infusion Center Association (NICA) has made every effort to ensure the accuracy and relevance of the information provided, NICA assumes no responsibility or liability for any errors, omissions, or outcomes resulting from the use of this guide. Implementation of any recommendations is at the sole discretion of each facility. Providers are encouraged to consult applicable federal, state, and local regulations, professional guidelines, and subject matter experts when developing or modifying infusion services. Because standards of care and regulatory requirements may evolve, users should verify that practices remain current and evidence-based.

Introduction

This guide is intended to support infusion clinicians and care teams in the safe and effective administration of teplizumab-mzwv for patients with stage 2 type 1 diabetes. It outlines practical considerations for intake, preparation, administration, monitoring, and follow-up, incorporating current clinical guidance, product labeling, and lessons learned from real-world implementation. While this guide is not a substitute for clinical judgment or regulatory guidance, it is designed to help standardize processes, reduce delays, and promote a positive treatment experience for patients and families.

Pre-Infusion

1. **Medical Necessity and Eligibility**
    - **a.** Before initiating teplizumab, confirm that the patient meets the approved indication and clinical criteria for treatment. Refer to the ***Referral Checklist*** for guidance on diagnostic testing and required documentation.
    - **b.** In addition to clinical appropriateness, ensure that all payer-specific requirements—such as documentation of medical necessity and prior authorization—have been addressed.
2. **Needs Assessment**
    - **a.** Conduct a structured assessment of the patient's and/or caregiver's educational needs prior to treatment initiation. This should include identifying any preferred learning styles, health literacy levels, and potential communication barriers, such as language, cognitive delays, or sensory sensitivities. Use this information to guide how education is delivered and documented.
    - **b.** Provide interpreter services and accessible formats when needed, in accordance with language assistance and accessibility policies.
3. **Patient/Caregiver Education**
    - **a.** Provide verbal and written education about teplizumab, including an overview of the infusion process, potential side effects, signs of cytokine release syndrome (CRS), lab monitoring requirements, and what to expect during and after treatment.
    - **b.** Share a copy of the FDA-approved patient medication guide, and review with the patient and/or caregiver, allowing time for questions and discussion. Reinforce education at each visit, particularly in multi-day treatment courses.
    - **c.** Ensure information is presented in a developmentally and culturally appropriate manner.

4. **Informed Consent and Assent**
    a. Obtain informed consent from the patient or legal guardian in accordance with federal, state, and facility policies. For pediatric patients, obtain age-appropriate assent when possible, ensuring the child has a chance to participate in understanding the treatment in a way they can comprehend.
    b. Consent should include acknowledgment of treatment purpose, potential risks and side effects, expected outcomes, and available alternatives. Ensure documentation of consent is completed and stored in the medical record prior to the first infusion.
5. **Medical History & Baseline Assessment**
    a. Measure and record weight (use this first weight to calculate each daily dose) and height.
    b. Hold infusion and notify provider for any of the following contraindications:
        i. Abnormal vital signs
        ii. Active serious infection or chronic active infection, other than localized skin infections
        iii. Signs/symptoms of cytokine release syndrome (CRS) following previous infusion (fever, nausea, fatigue, myalgia, arthralgia)
        iv. Recent vaccination:
            1. Live-attenuated vaccine within the last 8 weeks.
            2. Inactivated or mRNA vaccine within the last 2 weeks.
        v. Possibility of pregnancy. Perform a urine pregnancy test for patients of reproductive potential prior to the first treatment.
        vi. Abnormal lab values (see table below for recommended monitoring frequency):
            1. Lymphocyte count less than 1,000 lymphocytes/μL
            2. Hemoglobin less than 10 g/dL
            3. Platelet count less than 150,000 platelets/μL
            4. Absolute neutrophil count less than 1500 neutrophils/μL
            5. Acute Epstein-Barr virus (EBV) or cytomegalovirus (CMV)

A full set of vital signs includes:

- Temperature
- Blood pressure
- Heart rate
- Oxygen saturation
- Respiratory rate

6. **Premedicate**
    a. To reduce the risk of cytokine release syndrome (CRS), for the first 5 days of treatment premedicate with antipyretics (NSAIDs or acetaminophen),

antihistamines (use second-generation antihistamines due to overall tolerability and safety), and/or antiemetics 30 minutes prior to the start of the infusion and per protocol/prescriber order.

It's important to note that first-generation antihistamines like diphenhydramine can cause side effects, such as sedation and dizziness, which may mimic or exaggerate mild infusion-related reactions, potentially complicating clinical assessment. Diphenhydramine also carries the risk of paradoxical excitation or agitation, especially in pediatric patients, which can increase distress and disrupt care delivery. These considerations suggest that second-generation antihistamines, which have a more favorable side effect profile, may be preferable in some cases.

Clinicians should weigh the benefits of diphenhydramine's H1-blocking potency against these potential drawbacks and consider whether a non-sedating second-generation agent may offer better tolerability, especially in pediatric patients.

b. Based on the patient's response to treatment, consider extending the premedication period as appropriate and based on the prescriber's order.

7. Recommended Assessment

a. The prescriber must indicate whether tests should be processed STAT for same-day review prior to treatment, or as routine for review before the next scheduled infusion.

	Physical Exam	Vital signs	CBC w/ diff	BMP	AST/ALT/ Bili	Infectious agents	Urine preg	Premeds
Pre-Rx	✓	✓	✓	✓	✓	✓		
Day 1	✓	✓	✓		✓		✓	✓
Day 2	✓	✓						✓
Day 3		✓	✓		✓			✓
Day 4		✓						✓
Day 5		✓	✓		✓			✓
Day 6		✓						
Day 7		✓						
Day 8		✓	✓		✓			
Day 9		✓						
Day 10		✓						
Day 11		✓						
Day 12		✓						
Day 13		✓						
Day 14		✓	✓		✓			

Table adapted from: Mehta, S. et al. (2024). Pediatric Endocrine Society statement on considerations for use of teplizumab (Tzield™) in clinical practice. Hormone Research in Paediatrics.

8. **Calculate Dose:**

   a. Use measured weight from Day 1 and height to calculate the body surface area (BSA):

> Because teplizumab dosing is based on body surface area (BSA), infusion centers must measure both **height and weight**—which may be a departure from typical workflows that only require weight. If your site does not routinely measure height, be sure to obtain appropriate equipment (such as a stadiometer or measuring tape) to ensure accurate BSA calculations.

   i. Use the Mostellar BSA formula to calculate BSA:

$$m^2 = \sqrt{\frac{weight\ (kg)\ x\ height\ (cm)}{3{,}600}}$$

   ii. Use the BSA calculate each daily dose:

Day 1: 65 mcg x (calculated BSA)

Day 2: 125 mcg x (calculated BSA)

Day 3: 250 mcg x (calculated BSA)

Day 4: 500 mcg x (calculated BSA)

Days 5-14: 1,030 mcg x (calculated BSA)

   iii. Calculate the required volume of teplizumab-mzwv

   1. *Dose in mcg* ÷ 100 mcg = *volume (mL)*

   2. Round to the nearest tenth (e.g., 0.6 mL).

> Large adults with BSA ≥1.94 m^2 will require more than one vial per dose on days 5–14.

9. **Vascular Access**

   a. Obtain vascular access or assess the patency of existing vascular access device per organizational policy.

Medication Preparation

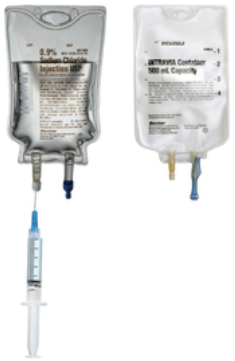
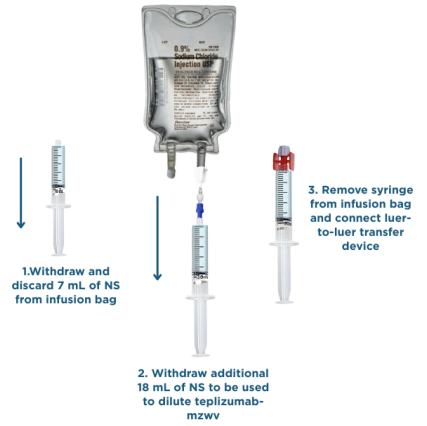
1. **Preparation Area**
    - **a.** Choose a designated medication preparation area that is clean, dry, uncluttered, hard, non-porous surface that can be disinfected prior to use.
    - **b.** If the designated area is within 3 feet of a sink, a splash guard is required to help prevent the risk of microbial contamination.
    - **c.** This area is free from contamination sources such as food, vermin, visible and non-visible microbial contamination (e.g., rust, glass particles or shavings, hair), and obvious contamination sources such as standing water and biohazardous materials or specimens.
    - **d.** Disinfect the surface before starting preparation.

    Before beginning preparation:

    - **a.** Perform hand hygiene
    - **b.** Gather supplies as applicable based on method used (see below)
    - **c.** Follow Aseptic Non Touch Technique (ANTT®) throughout preparation procedure.
2. **Withdraw Medication**
    - **a.** Perform hand hygiene and don clean gloves.
    - **b.** Inspect teplizumab vial: solution should be clear, colorless, and particulate-free. Confirm expiration date.
    - **c.** Remove the flip-top cap and disinfect[1] the vial septum.
    - **d.** Withdraw 2 mL of teplizumab into a 3 mL syringe.
    - **e.** Remove and discard the needle from the syringe.
    - **f.** Attach a sterile dead-end cap.
3. **Initial Dilution**
    - **a.** Dilute 2 mL of teplizumab in 18 mL of 0.9% Sodium Chloride to prepare the intermediate solution of 2 mg/20 mL using one of the following options:

[1] vigorously scrub with antiseptic and allow to completely air dry

Preparation Per Manufacturer's Instructions		Alternative Preparation Method*** Minimizes contamination and needlestick injury risk. This method differs from manufacturer instructions and may constitute compounding under applicable regulations. Facilities should follow internal protocols and regulatory guidance.
Supplies • teplizumab vial(s) • 20 mL vial of 0.9% Sodium Chloride Injection • PVC infusion bag with 25 mL 0.9% Sodium Chloride • 30 mL empty vial • 3 mL syringe • 10 mL syringe • 30 mL syringe • Blunt fill needles • Alcohol prep pads	**Supplies** • teplizumab vial(s) • Infusion bag with 0.9% Sodium Chloride Injection • Sterile 50 mL (or larger) empty PVC infusion bag • PVC infusion bag with 25 mL 0.9% Sodium Chloride • 3 mL syringe • 10 mL syringe • 30 mL syringe • Blunt fill needles • Alcohol prep pads	**Supplies** • teplizumab vial(s) • PVC infusion bag with 50 mL 0.9% Sodium Chloride Injection • 3 mL syringe • 10 mL syringe • 30 mL syringe • Bag access spike with needleless connector • Luer-to-luer transfer connector • Alcohol prep pads
A. Empty 30 mL Vial & 30 mL Vial of Saline:	**B. Empty 50 mL Infusion bag & 50 mL Bag of Saline:**	**C. Sterile 30 mL syringe**

		
A. Disinfect* septa of empty 30 mL vial** and a 20 mL vial of 0.9% Sodium Chloride. B. Withdraw 18 mL 0.9% Sodium Chloride and slowly inject into the empty sterile vial. C. Discard remaining 0.9% Sodium Chloride and syringe/needle.	A. Disinfect the injection ports on both infusion bags. B. Withdraw 25 mL from 50 mL bag 0.9% Sodium Chloride into a 30 mL syringe. C. Change needle and transfer 18 mL of 0.9% Sodium Chloride into empty PVC infusion bag. D. Discard syringe with remaining 7 mL 0.9% Sodium Chloride Injection. E. Bag with 25 mL 0.9% Sodium Chloride remaining will contain final preparation.	A. Spike a 50 mL bag of 0.9% Sodium Chloride using bag spike with needleless connector. B. Disinfect needleless connector. C. Withdraw 7 mL into a 10 mL syringe; discard per policy. D. Disinfect needleless connector. E. Withdraw 18 mL into a 30 mL sterile syringe. F. Disconnect syringe and attach a luer-to-luer syringe transfer device. G. Bag with 25 mL 0.9% Sodium Chloride remaining will contain final preparation.
* "Disinfect" = vigorously scrub with antiseptic such as alcohol or CHG, and allow to completely air dry	** Using a larger-volume container provides more space for dilution and reduces the risk of contamination or spillage during preparation.	*** The technique described in this section represents a clinically accepted variation from manufacturer instructions intended to minimize the risk of microbial contamination and needlestick injury. This guidance does not constitute a recommendation to deviate from the manufacturer's labeled instructions and is provided solely for informational purposes. Clinicians should follow their facility's protocols, professional judgment, and applicable regulatory standards when preparing and administering medications.

b. Dilute teplizumab-mzwv 2mg:

i. Use strict aseptic technique to carefully add 2 mL teplizumab to the prepared container with 18 mL of 0.9% Sodium Chloride.

1. If using the alternative preparation method- attach the syringe with 2 mL of teplizumab to the luer-to-luer transfer connector attached to the 30 mL syringe containing 18 mL of 0.9% Sodium Chloride Injection and slowly transfer teplizumab into the syringe, taking care not to create turbulence or foaming.

ii. Gently invert the diluted teplizumab to allow the solution to evenly disperse. Do not shake.

4. Final Preparation

a. Use appropriate size syringe(s) to accurately withdraw the ordered volume of diluted teplizumab from the intermediate solution containing 2 mg/20 mL (100 mcg/mL).

Multiple syringes may be required to accurately measure certain doses (e.g., to obtain 2.3 mL teplizumab, using a 3 mL syringe to withdraw 2 mL and a 1 mL syringe to withdraw 0.3 mL).

b. Disinfect the injection port of PVC infusion bag containing 25 mL 0.9% sodium chloride.

c. Slowly instill required volume of teplizumab solution.

d. Gently mix by inverting; do not shake.

e. Label the prepared solution with drug, dose, volume, date, and time of preparation.

f. Begin the infusion within 2 hours of preparation and complete within 4 hours of the start of the preparation. Discard the solution if it has not been administered within 4 hours of preparation.

Infusion Administration

1. Verify the patient's identity using two unique identifiers and confirm the correct dosage for the treatment day.

2. Administer Infusion:

a. Attach an administration set to the prepared teplizumab infusion bag.

b. Prime the infusion set.

c. Follow organizational policy to assess and disinfect the vascular access device.

d. Connect the administration set to the vascular access device.

e. Infuse over 30 minutes. A rate-control device, such as an infusion pump is recommended.

f. Monitor vital signs every 15 minutes and assess for signs of adverse reactions.

i. Watch for symptoms like fever, chills, nausea, rash, or hypotension. If present, immediately STOP the infusion and treat per orders or organizational protocol.

3. When infusion is complete, flush the administration set (at the same infusion rate) with a sufficient volume of 0.9% Sodium Chloride Injection to ensure all residual medication is delivered.

This is a small but important operational step given the small total volume – the small residual volume in the dead space of the admin set can result in missing a significant fraction of a day's dose if not flushed.

Post-Infusion Monitoring and Care

1. Assess for manifestations of an adverse reaction, including assessment of vital signs.
2. Observation Period: Maintain vascular access and continue to monitor the patient for signs of adverse reactions for one (1) hour post-infusion.
3. Discharge Instructions: Review and provide a written copy of the post-infusion instructions with the patient and caregiver, including signs of adverse effects to monitor at home, who to contact with questions or concerns, and when to seek medical attention.
4. Follow-up Appointment: Remind the patient of their next appointment time and reinforce the importance of strict adherence to the 14-day schedule.
5. Missed Dose: If a dose is missed, administer the remaining doses on consecutive days to complete the course of treatment (provided the reason for interruption isn't a contraindication to further treatment). Do not administer 2 doses in the same day.

Appendix: Visual References

Luer-to-luer transfer connector	Bag access spike with needleless connector