Alpha-1 Antitrypsin Deficiency and Augmentation Therapy Zemaira

Dear Nursing Colleague,

Thank you for caring for individuals affected by Alpha-1 Antitrypsin Deficiency (Alpha-1) who are receiving augmentation therapy. Alpha-1 is one of the most common serious genetic disorders and it is believed that only 6,000 of the estimated 100,000 Americans with Alpha-1 have been diagnosed to date. An additional 20 million Americans are estimated to be genetic carriers of this disorder. Alpha-1 can cause liver disease in children or severe liver and lung disease in adults, presenting as early emphysema and cirrhosis. Currently, the World Health Organization, the American Thoracic Society, and the European Respiratory Society recommend that all adults with the following conditions be tested for Alpha-1COPD including chronic bronchitis and emphysema, chronic asthma, unexplained bronchiectasis, family history of Alpha-1 and chronic liver disease.

This packet contains an instructional DVD along with supplemental written materials comprising an educational program titled "Alpha-1 Antitrypsin Deficiency and Augmentation Therapy". **This program has been created by AlphaNet, Inc., a non-profit health management company that provides a wide range of support services to individuals with Alpha-1. AlphaNet has created this program as a service to the Alpha-1 community and for the individuals, agencies and facilities that provide infusion services for them.**

The goal is to improve the knowledge of the nurses caring for people with Alpha-1 Antitrypsin Deficiency, including safe and effective augmentation therapy with Zemaira.

Instructions for this program are included in the packet. Upon successful completion of the Post Test, with a grade of at least 80%, along with the submission of the Registration and Evaluation Forms, each participant will receive a certificate and 3 contact hours that will be valid till February 12, 2021.

This continuing education activity was approved by Colorado Nurses Association, an accredited approver by the American Nurses Credentialing Center's Commission on Accreditation.

Planners and presenters of this CNE activity have disclosed no conflict of interest including no relevant financial relationships with any commercial companies pertaining to this CNE activity.

Please don't hesitate to contact AlphaNet should have any questions regarding this educational program.

Sincerely,

Teresa Kitchen, BSN, RN
Clinical Nurse Manager
AlphaNet, Inc.

Guidelines for Home Intravenous Zemaira Infusion

PURPOSE:
To provide specific guidelines for the intravenous administration of Zemaira ® ($Alpha_1$-Proteinase Inhibitor Human).

INDICATION:
Intended to treat the unopposed protease activity, which causes pulmonary emphysema and necrotizing panniculitis in individuals with severe Alpha-1 Antitrypsin Deficiency. Not indicated for the treatment of liver disease due to Alpha-1 Antitrypsin Deficiency.

SELECTION CRITERIA:
Medical Criteria:

- Patient should be under the care of a licensed physician familiar with the use of Zemaira including indications, dosing, method of administration, and potential adverse reactions;
- Initial infusion to be done in a medically supervised setting, with epinephrine injection/EpiPen and emergency equipment available.
- Establish home care services with a licensed home health agency/home infusion company with qualified IV nurses trained in the procedure if insurance benefits allow

Additional considerations for home infusion:
- Patients who are motivated and physically able may be taught to self-administer Zemaira. Others may be infused by a significant other who has been properly trained in the procedure.
- The patient should be capable and feel comfortable with performing self-care safely after sufficient training and education. If not, the primary care giver must meet those requirements.
- It is important to have second responsible individual in the home during infusions.
- The home must be clean and have a working telephone.
- A contingency plan should be in place for untoward events occurring before, during, and after the infusion.

HOW SUPPLIED:
- Trade name “Zemaira” manufactured by CSL Behring.
- Supplied in single use vials with the functional activity in milligrams stated on the label of each vial. Vial size is 1000 mg approximate activity. Milligrams per vial vary from lot to lot produced. Carefully read the prescription label and the milligrams contained in each vial since a given prescribed dose may require the reconstitution of varying numbers of vials per lot, depending on the milligrams per vial. It is usual practice, if a partial vial is calculated to complete the dose, to use the entire vial. Please contact the pharmacist if you have any questions or concerns regarding dosing or calculations.
- The approximate 1000 mg vials are reconstituted with 20 ml of sterile water.

DOSE, ROUTE, and ADMINISTRATION:
- The recommended dose is 60 mg/kg body weight IV once weekly.
- Given by intermittent intravenous infusion.
- Recommended administration rate is 0.08 ml/kg/min, but this should be adjusted according to patient’s clinical condition and tolerance. Do not exceed rate of 0.08ml/kg.min
- All connections for IV tubing’s etc. for home infusion shall be leur lock
- Infusion can be administered via gravity infusion or IV pump. If the patient or caregiver administers without a nurse present, they will be taught to accurately regulate the IV rate.
- The reconstituted solution should be filtered during administration. To ensure proper filtration of Zemaira, use an I.V. administration set with suitable 5-micron filter.
- If the patient’s prescription is for infusion other than weekly, it is recommended that weekly amounts are prepared and pooled, utilizing one set up of equipment per bag. This means that multiple bags may be administered.

DOCTOR’S ORDERS:

Will include:

- Dosage calculated according to patient's weight
- Route of administration
- Frequency of infusions
- Any premedications
- Laboratory monitoring parameters and schedule if indicated
- Standing order for use of epinephrine injection/EpiPen 0.3 mg IM prn anaphylaxis

CONTRAINDICATIONS

Do not use in patients with known selective IgA deficiency with antibody to IgA, due to the increased risk of severe hypersensitivity reactions, including anaphylaxis.

SIDE EFFECTS/POTENTIAL COMPLICATIONS

Side effects are reported to be mild and generally rare; they include:

- Fatigue
- Injection site pain
- Dizziness
- Headache
- Tingling
- Itching
- Increased plasma volume-use with cautions in patients as risk for circulatory overload.
- Anaphylaxis (rare).

NURSING IMPLICATIONS

- Assess needs of patient and/or primary caregiver: physical, psychosocial, & cognitive.
- Assess the patient's understanding of Zemaira therapy, potential side effects and risks of blood borne pathogen transmission.
- Educate the patient/caregiver against smoking, and second-hand smoke as smoke inactivates the drug and serves to further promote lung destruction.
- Administer within 3 hours after reconstitution. DO NOT refrigerate reconstituted Zemaira as a precipitation may occur. The reconstituted Zemaira should be kept at room temperature until administered.
- Instruct patient and/or caregiver on proper storage of drug and supplies, therapy requirements, and procedures: Universal Precautions, aseptic technique, catheter care, connect, disconnect, medication preparation/handling and disposal of used supplies.
- Instruct patient in self-monitoring: including but not limited to: temperature, reporting of side effects, weight changes, over all status, including any changes in activity or exercise tolerance.
- Instruct patient to report significant changes to healthcare provider.
- If patient self-administers, plan home care follow-up with appropriate medical care team members at regular intervals. Establish a known and reliable contingency plan.
- Provide follow-up communication (verbal or written) including lab results, changes in condition to the physician, pharmacist, and other health care team members.
- Document all assessments, instruction sessions, home visits and follow-up plan.
- For home patient visits with RN performing the administration, documentation in the nursing notes should include:
    - Total Zemaira given milligrams and milliliters, Lot Numbers, concentration in vial, Exp. date
    - Route of infusion
    - Length of infusion
    - Baseline cardiopulmonary assessment (including breath sounds)
    - Baseline vital signs
    - Weight
    - Changes in condition, activity or exercise tolerance, sputum production, cough
    - Any patient complaints
    - Patient tolerance of infusion
    - Any adverse reaction and intervention

- Vital signs are assessed at baseline, then 10-15 minutes into the infusion and prn for any patient complaint during the infusion. Temperature is checked at baseline and end of infusion, or prn with patient complaint.
- Document and report any unusual or severe side effects to **CSL Behring at: 1-866-936-2472.**

PHARMACY IMPLICATIONS:

- Discuss procedure for obtaining prescriptions, renewals, and changes in therapy with the physician.
- Determine prescription appropriateness against the defined treatment goals and patient diagnosis.
- Document in the clinical record all communication with the physician, laboratories, home health nurse, and others involved in the patient's care.
- Discuss follow-up communication requirements (verbal or written) for the physician or other health care team members.
- Zemaira may be stored in the refrigerator or stored at room temperature not exceed 77° F. Allow vials to warm to room temperature if refrigerated prior to reconstitution.
- The manufacturer recommends administering the solution within 3 hours of reconstitution as the product contains no preservative.
- DO NOT refrigerate reconstituted Zemaira as a precipitate may occur. The reconstituted Zemaira should be kept at room temperature until administered.

MISCELLANEOUS:

- Empty vials of diluent should be disposed of in household trash or recycled if applicable in the patient's local area.
- Empty vials of reconstituted Zemaira are to be disposed of in household trash. The only exception to this information is if your IV tubing has visible blood back up, at any time during the infusion then it should be considered biohazardous and discarded in the biohazard container. You should dispose of needles and other hazardous materials in the biohazard container.

References:

Physician's Desk Reference, Thomson Reuters, 63rd Edition, 2009
Nursing IV Drug Handbook, 9th Edition, Lippincott Williams and Wilkins, 2009
CSL Behring, Zemaira, Drug Package Insert September 2015

Guidelines For
Zemaira® Home Mixing

Zemaira per patient prescription	Tape
Alcohol wipes	IV catheter/insertion supplies
Non-sterile gloves	IV administration tubing with luer lock
Empty IV bag(s)	5 Micron Filter
Fluid Transfer Set	Biowaste container

Zemaira may be stored at room temperature not to exceed 77° F, or refrigerated, prior to reconstitution. If refrigerated, remove Zemaira from the refrigerator prior to infusion and allow it to warm to room temperature. Check lot numbers, mg of functional activity per vial and expiration dates and remove the correct number of boxes to prepare the prescribed dose.

Maintain strict asepsis while performing all preparation activities!

Reconstitution

Step 1. Identify and clean a designated work area. Gather supplies needed.

Step 2. Wash your hands.

Step 3. Remove the vials of unreconstituted Zemaira and diluent from their boxes. In each box is a double ended plastic transfer device.

Step 4. Remove the protective lids from the diluent and Zemaira powder vials, and aseptically wipe each rubber seal with an alcohol pad, using one pad for each vial, and allow them to dry.

Step 5. Don non-sterile gloves. Remove the protective plastic cover on the white end of the double ended plastic transfer device and penetrate the middle of the rubber seal of the diluent vial while firmly anchoring the vial on the table. This diluent vial contains sterile water and this vial must always be pierced first.

Step 6. Remove the protective cover on the green end of the transfer device and insert it into the Zemaira protein powder vial while firmly anchoring the vial on the table. The Zemaira vial has a vacuum and will automatically draw the diluent into the vial.

You'll notice that the double ended transfer device is color coded. As a helpful reminder try this:
WHITE=WATER
GREEN=PROTEIN

Step 7. After the diluent has been transferred into the Zemaira vial, remove the empty diluent vial and transfer device by grasping the device at its hub and withdrawing it with the vial as one unit. Dispose of the transfer spike and the empty glass vial into the household trash or recycling receptacle.

Step 8. Repeat this process until all vials of diluent are transferred into each vial of Zemaira powder.

Step 9. To assist with getting the powder into solution, gently roll or swirl the vial. **Do not shake or agitate** to avoid foaming.

Step 10. Inspect the solution for particles or clumps and continue to roll and swirl the vial until all the powder is completely mixed and in solution. If, after approximately 15 minutes of mixing, the solution remains cloudy, discolored, has particulates or otherwise looks suspicious, set it aside and do not use it. Notify the pharmacy, as they may want to retrieve that vial. After reconstitution, Zemaira is clear in color with more viscosity than water.

Getting the Zemaira into solution can take some time and is more difficult when the Zemaira and diluent are cold.

Once Zemaira is reconstituted, the contents of the vials need to be transferred or pooled into an empty sterile IV bag, in preparation for infusion.

If the patient's prescription for infusion is other than weekly, it is recommended that batches of the weekly dose of 60mg/kg be reconstituted and pooled. While infusing the first batch, subsequent batches can be reconstituted, pooled and then infused sequentially until the entire dose is given.

Pooling

Step 1. Wash hands and don non-sterile gloves.

Step 2. Aseptically wipe each rubber seal on the reconstituted vials of Zemaira with an alcohol wipe, using one wipe for each vial and allow them to dry.

Step 3. While the vials are drying, remove the Fluid Transfer Set from its package and close the roller clamp on the tubing. The Fluid Transfer Set includes a universal spike, leur connector and an unattached 17 gauge by 1-inch needle. Firmly secure the 17-gauge needle to the leur connector. A universal spike is already attached to the distal end of the tubing.

Step 4. Wipe the injection port of the empty IV bag with an alcohol pad and allow it to dry. Insert the 17-gauge needle into the rubber injection port and secure the connection with tape.

Step 5. Remove the clear protective cap of the spike end of the fluid transfer set and while holding the vial of reconstituted Zemaira firmly on the table, insert the spike into the center of the rubber seal.

Step 6. Allowing the IV to lie flat on the table. Invert the vial, holding it approximately 10-12 inches above the table surface; open the roller clamp on the transfer tubing to allow the fluid to flow. The flow should begin automatically as the gravity pulls fluid into the bag.

If the flow does not start readily, try adjusting the spike in the port and try squeezing and the crimping the transfer set to force a small amount of air back into the vial. Also, you can pull the walls of the empty IV bag apart to create a mild suction that will help to initiate the flow.

Step 7. Allow the vial to empty and engage the roller clamp on the tubing as soon as the vial is empty. Do not allow the fluid transfer set to empty completely between vials.

Step 8. Aseptically remove the spike and insert it into the next vial using the same technique. Maintain strict aseptic technique. Disengage the roller clamp of the tubing to allow the flow to resume.

Step 9. Repeat these steps until all vials are pooled into the IV bag.

Step 10. With the last vial, allow the transfer set to empty completely assuring that the entire drug is pooled into the IV bag.

Step 11. Close the roller clamp to prevent leaking. While holding up the bag, remove the transfer set with the mini spike, along with the last empty vial of Zemaira still attached, and dispose of the set-up as a complete unit into the household trash. Dispose of the 17-gauge needle into the biowaste receptacle.

Step 12. Discard all the empty Zemaira vials in the household trash.

Step 13. Once the entire drug is pooled into the IV bag and prior to initiating the Zemaira infusion, the administration tubing must be primed.

Step 14. Once the tubing is completely primed, attach a 5-micron filter to its distal end and while holding the filter up, slowly prime the filter allowing the fluid to evenly wet the filter paper.

Step 15. Attach the filtered end of the tubing to the indwelling infusion catheter.

Zemaira is now ready for infusion.

NOTE: At the end of the infusion, all IV bags and administration tubing can be disposed of into the household trash unless contaminated with visible blood at any time during the infusion. If blood has been observed, the IV bags and IV administration tubing must be disposed of into the biohazardous waste container.

Infusion Calculations

RECOMMENDED DOSE: 60 mg/kg IV weekly

*****Zemaira is available in approximate 1000mg vials with 20 ml of sterile water as diluent**

*****Milligrams contained in each vial vary from lot to lot produced*****

Carefully read the prescription label and the mg amounts contained in each vial. Doses given are equal to or slightly greater than the calculated dose due to the varying assays. No drug is withdrawn or wasted. The number of vials reconstituted to achieve the patient's dose will vary from lot to lot. One can not safely assume that the same number of vials is reconstituted for each infusion prepared from subsequent lots.

Please contact the pharmacist if you have any questions or concerns regarding dosing or calculations.

DOSE CALCULATION:

Example: Individual weighing 155 lbs.

Step 1:

Convert lbs to kg by dividing by 2.2

155 ÷ 2.2 = 70 kg

Multiply 60 mg (prescribed weekly dose) x 70 kg= 4200 mg

Dose is 4200 mg IV weekly

Step 2:

Determine how many vials of Zemaira will be needed to formulate the required dose. For our example we will use 1078 mg per vial.

Divide the calculated dose of 4200 mg by the number of milligrams in a vial.

4200mg ÷ 1078mg = 3.9 vials

Remember that no drug is wasted: therefore, total vials to be infused will be 4. Total mgs is 4312 mg and total fluid volume: 160 ml (4 x 20 ml)

RECOMMENDED INFUSION RATE: 0.08 ml/kg/min

RATE CALCULATION:

Using the same example of a 70kg individual:

To calculate the patient's infusion rate using the recommended rate of 0.08 ml/kg/min you would do the following steps

Step 1. Multiply 0.08 ml x 70 kg = 5.6 ml/min

Step 2. Convert ml/min to ml/hr by multiplying by 60 (60 min/hour)
5.6 ml x 60 min = 336 ml/hr

Step 3. Calculate the drop rate using the formula as shown

$$\frac{\text{Drops (gtt) of IV set}}{60 \text{ (min in hour)}} \times \text{total hourly volume} = \text{gtts/minute}$$

In this example, the calculation would look like this:

$$\frac{\text{10 gtts**}}{\text{60 min/hr}} \times 336 = 56 \text{ drops/min}$$

**** Remember to check the drop factor of your specific IV tubing as Drop factor rates vary**

Step 4. Divide 56 by 4 as there are four 15-second periods in a minute

$56 \div 4 = 14$ drops

Step 5: Count 14 drops/15 seconds to regulate the rate