CONE HEALTH
The Network for Exceptional Care

Subcutaneous Fluids using Hyaluronidase

CONE HEALTH PEDIATRICS
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Subcutaneous fluids using Hyaluronidase are indicated when a patient needs IV fluids and other forms of access (IV, NG) have been attempted and are unsuccessful or less preferred by the provider or patient. Oral rehydration is typically preferred over SQ fluids when feasible.

When NOT to use:

1. Severe dehydration (>15 % dehydrated)
2. Need for IV access for reasons other than IV fluids (e.g., medications)
3. Hyponatremia (< 130 mEq/l, hypernatremia (>155 mEq/L), or hypokalemia (<3.0 mEq/L)

How to order/which fluids:

1. Order Hyaluronidase 1 ml (150 units). This will be given prior to fluid infusion in order to create a "pocket" for absorption
2. Appropriate fluids for subcutaneous administration include **NS, LR, D5NS, D5LR, D5 ½ NS and D5 ¼ NS**
3. No fluids with additives should be infused SQ
4. For infants under 29 days the daily dose of fluid should not exceed **25 ml/kg/day** and the hourly dose should not be more than **2 ml/minute (120 ml/hour)**
5. Change the route of fluid administration to "SQ"
6. **Boluses** fluids should be NS or LR and typically 20 ml/kg over 1 hour
7. **Maintenance** fluids should be NS, LR, **D5NS, D5LR, D5 ½ NS, and D5 ¼ NS** at the same rate you would use for IV fluids
8. Note: All patients will develop localized swelling that should feel soft and boggy when palpated and is slightly cool to the touch. This swelling is expected and does not hurt the patient.
9. If you want to continue to infuse SQ fluids at the same site, Hylauronidase should be re-ordered after 24 hours. The tubing should be disconnected, 1 mL of hyaluronidase should be injected, and then the tubing can be reconnected and the infusion restarted.

Preparation for Subcutaneous Fluid Administration

1. Consider application of topical anesthetic to potential site
2. Gather equipment
    a. Nonsterile gloves
    b. Appropriate sized catheter. Options include:
        i. 4-22 gauge angiocatheter
    c. Appropriate skin disinfectant (i.e. Chloraprep, betadine, alcohol)
    d. Tegaderm, tape, etc. for securing purposes
    e. IV fluids (NS, LR, D5NS, D5LR, D5 ½ NS or D51/4 NS), extension set, tubing and pump, labeled and assembled
    f. Human recombinant hyaluronidase 150 units/1ml (Hylenex)
    g. 3-5 mL NS flush
3. Perform hand hygiene and apply appropriate PPE
4. Disinfect the intended insertion site with appropriate disinfectant.

5. Select an access device (24 or 22 gauge angiocatheter).
6. Assemble fluid infusion equipment.
7. Draw up 150 units (1 mL) Hylenex in 3 mL or 5 mL syringe.
8. Gently pinch skin and lift into a small mound to ensure placement in the subcutaneous tissue. Avoid areas with compromised integrity such as edema, pain, excoriation, infection, bruising, or scar tissue.
9. Insert the angiocatheter (bevel up and directed cephalad) into the selected insertion site at a 20- to 30-degree angle
10. Observe for blood return. If blood return is observed, remove the device and select a new site.
11. Apply a transparent sterile dressing (tegaderm) over the infusion device. Avoid placing transparent dressing over the area where swelling will develop from the subcutaneous fluid administration as the patient will feel a stretch or pull from the adhesive aspect of the dressing. Instead, place a tegaderm loosely over the insertion site. This will minimize coverage over the area that will experience the most swelling. Additional tape can be used to secure the tubing as needed to avoid pulling of the line.
12. Label the site, pump, and tubing as “SQ”. Date, time, and initial the insertion site. Place tape/labels stating “no IV injection” over the ports of the tubing so that no medication is inadvertently injected subcutaneously. Tubing without injection ports may be used if available
13. Hyaluronidase administration
    a. Connect the syringe containing 150 units (1 mL) Hylenex directly to the hub of the angiocatheter. Slowly inject 1ml (150units/ml) of Human recombinant hyaluronidase (Hylenex) via subcutaneous infusion device.
    b. After administration of Hylenex (human recombinant hyaluronidase), connect a primed extension set and slowly infuse a 3-5 ml fluid bolus of NS in order to create a “pocket.” Then connect the primed IV tubing to the extension set.
    c. If the initial catheter is dislodged AFTER the hyaluronidase is given, repeat the catheter insertion using a new device into the area near the original insertion site. No additional human recombinant hyaluronidase (Hylenex) is necessary.
    d. If the site needs to be rotated, Hylenex recombinant may be re-administered at the new site in less than 24 hours.

Explaining What to Expect During Hyaluronidase to Parents/Caregivers

1. A slightly red, fist-sized ball appears at the infusion site for the first 5 min after the fluid infusion is initiated.
2. The swelling then softens as it spreads over a space covering approximately 12 x 8 cm (approximately 5 x 3 in).
3. The swelling resolves soon after completion of the fluid infusion.
4. The SC procedure is usually less painful than IV fluid administration; the patient may feel a little stretching or pulling at the infusion site, and the area may feel cool.
5. If an infusion pump is used, it may make a beeping sound as it gets started and if the patient lies on his/her back.
6. Staff observes the patient and the fluid administration during the procedure to ensure that all is well

Evidence Base

Spandorfer, Philip R. (2011) Subcutaneous Rehydration, Updating a Traditional Technique. Pediatric Emergency Care. 27 (3): 230-236

Allen, C.H, Etzwiler, L.S., Miller, M.K., et al. (2009). Recombinant human hyaluronidase-enabled subcutaneous pediatric rehydration. Pediatrics, 124(5), e859-e868

Nursing Procedure for Initiating Subcutaneous Fluid Administration with hylenex recombinant. Baxter. 2017. www.hylenex.com.