

Subcutaneous fluids

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Subcutaneous fluids (i.e., parental fluid hydration through a subcutaneous line) is a fantastic option in some patients, especially those with mild dehydration, with difficult venous access or the elderly with agitation, be it from delirium or dementia.

Remember that a subcutaneous line can also be used for many medications (e.g., morphine, midazolam).

Unlike intravenous cannulation, there isn't usually a problem with "access" with a subcutaneous line and most nursing staff are qualified in their insertion.

Butterfly needle

Fluids through a subcutaneous line in the interscapular area is most useful in the delirious/combatative elderly patient with poor oral intake. Running 500-1000 mL of 0.9% NaCl solution overnight will help prevent dehydration.

There are specific subcutaneous needles that can be used, but in their absence, you can substitute with the more readily available 19- or 21-gauge butterfly needle.

The needle should be inserted into an area where it is stable and unlikely to be dislodged. The upper chest, interscapular area, abdomen and lateral aspect of thighs are all suitable locations. The needle should be sited such that it lies within the subcutaneous space but superficial to the underlying fascia. A sterile adhesive dressing (e.g., an Opsite) should be placed over the needle to keep the site sterile and fixed.

The interscapular area is a particularly good location for the agitated patient as they are unlikely to pull out the line.

Equipment:

- Specific subcutaneous line, *or*
- 19 or 21 gauge butterfly needle

Position:

- upper chest
- interscapular area (*preferred*)
- abdomen
- lateral aspect of thighs

Fluid choice:

- 0.9% NaCl (normal saline)
- avoid dextrose and additives

Rate:

- absolute maximum: 80 mL/h
- aim for 60 mL/h or lower if possible

Contraindications:

- local skin problems (cellulitis, skin tears, rash)
- existing tissue oedema
- significant dehydration

The absolute maximum fluid rate is 80 mL/h, though this is often not tolerated over a 24 hour period. For a continuous infusion, try to keep the rate of fluid at or below 60 mL/h. You will need to use a lower rate if the patient develops tissue oedema. Areas such as the abdomen and interscapular area can generally tolerate more than the upper thigh.

Given the limitations of the rate of fluid and the fact that the fluid does not directly enter the intravascular space, subcutaneous fluids are an inappropriate choice for anything worse than mild dehydration.

The safest fluid for subcutaneous use is isotonic saline, i.e., 0.9% NaCl (normal saline). You should probably avoid giving any solution with dextrose through a subcutaneous line as it can cause pain and fibrosis. Additives should also be avoided. Be aware that there is no consensus.

Obviously, you cannot give subcutaneous fluids if there is local inflammation or cellulitis.

Subcutaneous fluids are pointless if the patient has a condition that results in generalised tissue oedema (e.g., hypoalbuminaemia) as the fluid will simply stay in the interstitium.

Change the subcutaneous line every 48-72 hours.

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