PROCEDURE AND GUIDELINES FOR THE ADMINISTRATION OF SUBCUTANOUS FLUIDS

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Introduction

Hypodermoclysis is a term for maintaining hydration. Hypodermoclysis (subcutaneous infusion) is a relatively safe, simple and cost effective technique, suitable for use in the community and inpatient facilities with a range of client/patient groups.

Clinical Policy References

This procedure should be used along with the following policies, procedures, guidelines and protocols:

NHS Lothian Infection Control Manual
Subcutaneous fluid administration in palliative care
PGD 160P Sodium chloride 0.9% for subcutaneous use in Care of the Elderly Areas
Safe use of medicines policy
Medicines Administration training and competency assessment

Indications for administration of subcutaneous fluids

- Acute problems such as mild infections, vomiting and diarrhoea.
- Temporary confusion due to changes in medication that may have precipitated dehydration because an adequate fluid intake cannot be maintained.
- Mild dehydration usually indicated by urea and electrolyte imbalance where the usual methods of re-hydration, i.e. oral or I.V. hydration, are not possible or inappropriate. Symptoms of mild dehydration can include oliguria, lethargy and weakness, dry mouth, decreased skin turgor.

Subcutaneous fluids should be used with caution where there is a history of cardiac and or renal failure and bleeding disorder in patients who have existing fluid overload. Consideration for administration should be symptom led but blood tests for urea and electrolytes will be done to confirm appropriateness.

Contra-indications

• Severe dehydration (hypotension, pre-renal or renal failure)
• Cardiac failure
• Pre-renal or renal failure
• Low platelet or coagulation disorders
• Existing fluid overload
• Marked oedema
Known hypersensitivity to any component of the medicine
Informed non-consent
Patient requires IV treatment (severe electrolyte disturbance, hypercalcaemia, hypovolaemia

Suitable sites for infusion

Rotate sites to minimise tissue damage:-

- Abdomen

- Chest
- Lateral aspect of upper arm or thigh
- Over scapula for patients at risk of removing a cannula if confused and if due to confusion and or agitation.

Do not use on:
Lymphoedematous tissue
Skin which has recently been irradiated
Where there is an existing rash
Peripheral limbs, i.e. below knee or below elbow
The upper chest wall in very thin people due to risk of causing pneumothorax**.**

Calculation / rate of subcutaneous infusion

As the fluid is infused by gravity, an electronic pump to regulate the rate of administration is not required and should not be used.

To set up a manually controlled drip accurately by eye, the number of drops per minute need to be counted, then applied to the formula below:

Rate= Volume (in drops)
Time (in minutes)

To calculate the volume in drops, it is necessary to know how many drops of fluid are contained within one millilitre (ml). This information should be available on the packaging of the administration set.

The volume in mls is then multiplied by the number of drops per ml to give the volume in drops. Similarly to find the rate in minutes, change the hours into minutes by multiplying by sixty (Hutton, 1990).

Two common sizes are 20 drops per ml and 15 drops per ml. A paediatric infusion controller is available which delivers 60 drops per ml (University of Nottingham, 2001).

Examples

1000 mls (volume of infusion) x 20 (drops) = 20,000 = 27.7 drops
12 (hours) x 60 (mins) 720

1000mls (volume of infusion) x 15 (drops) = 15,000 = 20.8 drops
12 (hours) x 60 (mins) 720

These calculations should then be rounded up to a whole number.

Procedure for the administration of subcutaneous fluids

Equipment

- Apron
- Infusion line
- Infusion fluid as prescribed by a medical practitioner or suitably trained healthcare professional
- Prescription chart
- Portable drip stand if available or appropriate to environment
- Becton Dickinson (BD) Saf-T-Intima 24 gauge single port cannula

- Syringes and needles
- Diluent for flushing cannula
- Non-sterile gloves
- Alcohol-impregnated swab
- Transparent dressing
- Sharps bin

PROCEDURE	RATIONALE
Staff member to introduce themselves and identify correct patient verbally or confirm with family/carers	Risk management to identify correct patient
Explain and discuss the procedure with the patient and relevant family members/carers.	Patients to be actively involved in decision making
Obtain informed consent.	To ensure that the patient is aware of the procedure and informed consent is obtained & consent documented
Check history of any allergies	Reduce risk of allergic reactions
Before administering any prescribed drug consult the patient's prescription chart and ascertain the following: • Patient identifiable details are correct • Check fluid with the prescription chart • Inspect the infusion fluid • Date and time of administration	To ensure that the correct type and quantity of fluid is administered To ensure that the fluid is clear, colourless and in date

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• Route of administration • Validity of prescription • Signature of practitioner • Is the prescription written on the relevant documentation?	
Maintain patient privacy	Privacy and dignity in health care
Select a site that has no evident tissue/skin damage on the abdomen, chest, thigh, or lateral aspect of upper arm.	To avoid tissue damage and infection
Wash and dry hands thoroughly as per NHS Lothian Infection control manual	To avoid cross contamination
Apply apron and non sterile gloves	To avoid cross contamination
Prime administration set with the prescribed fluid	In preparation for administration
Clip excess hair form selected site if applicable	To ensure the dressing will adhere to the skin and reduce the risk of the subcutaneous needle falling out.
Cleanse area of chosen site with alcohol swab for a minimum of 30 seconds and allow to dry	Reduce risk of transfer of any transient micro-organisms from skin to subcutaneous tissues
Write on transparent dressing 'for Subcutaneous Use Only' and date cannula put in.	To ensure only subcutaneous medications or fluids are administered via this route
Prepare a syringe for flushing the cannula.	To ensure the patency of the line and the BD Saf-T-Intima has a dead space of 0.2 mls.
When inserting the cannula, the side with the bumps on the wings should be face down. Check the needle is sharp side down. To move the needle round, gently hold the yellow connector and turn the white needle introducer. Pinch cannula wings to lock the needle in place. Check the needle is sharp side down. To move the needle round, gently hold the yellow connector and turn	

the white needle introducer. Pinch cannula wings to lock the needle in place.	
Gently hold skin fold between thumb and forefinger at the site chosen	To ensure subcutaneous tissue has been chosen
Insert cannula at a 45-degree angle bubble surface face down. Gentle press the wings to the persons skin and pull out the introducer in a smooth single movement. The needle will go into the chamber, put in the sharps bin.	Patient comfort, and ease of cannula insertion Less trauma to underlying tissue (Pergallo & Dittko, 1997)
If blood appears in the line, withdraw the needle and repeat the process.	To ensure that blood vessels are not punctured during the insertion of the subcutaneous cannula.
Coil the butterfly line.	To prevent kinking and ensure the security of the line
Secure the inserted needle with transparent dressing.	To ensure stability of device and protection of site
Commence infusion and adjust the flow regulator to the rate of administration prescribed	To prevent over hydration and tissue damage
Clear all equipment and prepare for disposal following appropriate polices	Safe management of healthcare waste
Remove and dispose of gloves and apron and decontaminate hands	To prevent contamination of items used following procedure. To remove any accumulated transient skin flora that may have built up under the gloves
Document on the healthcare record and in if applicable the nursing care plan including serial number of the butterfly needle used, site, date and time.	To record patient care
Ask patient's views following procedure	To ascertain patients perceived level of comfort following process and allow time for any questions

Removal of Subcutaneous needle

Staff member to introduce themselves and identify correct patient verbally or confirm with family/carers	Risk management to identify correct patient
Explain the procedure to the patient and obtain informed consent	Patients to be actively involved in decision making
Wash hands and apply apron and non sterile gloves as per NHS Lothian Infection Control Manual	To avoid cross contamination
Turn off giving set and disconnect patient.	To avoid any spillages
Carefully remove dressing from around the site, do not use scissors.	Reduce the risk of accidental damage
Remove cannula carefully, taking care to avoid splashes to eye/face. Cover site with gauze/ cotton wool depending on availability and wound and once removed, press firmly on site until haemostasis achieved.	To avoid any cross contamination.
Apply tape to gauze/cotton wool or adhesive dressing.	
Discard used cannula into sharps bin	Reduce the risk of injury
Dispose of apron and gloves as per NHS Lothian infection control manual and perform hand hygiene	Reduce the risk of cross contamination
Document procedure in the patient's healthcare record.	To ensure good record keeping

Site Monitoring and Care

All patients who are receiving subcutaneous fluids will have their needle site and infusion rate checked once after the first one hour of commencement and then four- six hourly for the first 48hours. Patient's family/carers will be instructed by the nursing team how to monitor the needle site and what to do in the event of the needle being displaced.

Subsequent patient contact will be dependent on the infusion rate and fluid bag change.

- The BD Saf-T-Intima™ 24 Gauge cannula (yellow) single lumen should be changed at least every 7 days (as per manufacturer's instructions) for administration of subcutaneous fluids.

The giving set should be changed every time a new infusion fluid is administered or if the fluid is running continuously every 72 hours. A sterile bung should be placed on the butterfly when fluids are not being administered.

Complications

Complications can occur anytime from hours following insertion to over three years, dependant on the condition of the patient or fluids infused. (Twycross et al 1998)
The needle should be re-sited if any of the following occur.
• The patient complains of pain at the administration site
• The skin surrounding the needle insertion site becomes inflamed /red
• The skin surrounding the needle insertion site becomes white and hard
• Blood is present in the giving set and/or butterfly
• The needle becomes dislodged or there is leakage at needle site
• Localised oedema
• Bleeding / bruising
• Signs of fluid overload

Infusion must be stopped if the following occur: Pulmonary oedema; suspected fluid overload i.e. increased respiratory rate, decreased oxygen saturation or tachycardia.

Record date of change in documentation.

References

Pergallo & Dittko. (1997) *Thinking subcutaneous injection technique*. American Journal of Nursing, 5, 71-72.

Twycross R. Willcock A. Thorp S. (1998) Syringe Drivers. In Palliative Care formulary. Radcliffe Medical Press. Oxford. 183-202