Humber Teaching
NHS Foundation Trust

STANDARD OPERATING PROCEDURE ADMINISTRATION OF SUBCUTANEOUS FLUIDS (HYPODERMOCLYSIS)

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VALIDITY – All local SOPS should be accessed via the Trust intranet

CHANGE RECORD

Version	Date	Change details
1.0	*19/05/20*	*New document*
1.1	*09/02/2021*	*Update/review re: Covid-19*
1.2	*14/06/2023*	*Reviewed and minor updates. Approved at Physical Health and Medical Devices Group (14 June 2023).*

Contents

1. INTRODUCTION

To provide a framework for safety and guidance for Registered Practitioners in the administration of subcutaneous fluids in the community setting, thereby preventing an unwanted hospital admission. The administration of fluids by the subcutaneous route (S/C) is a safe, reliable, and minimally invasive method of assisting the control of delirium, nausea and thirst in end stage chronic disease and in the elderly.

Definition
The infusion of a solution into the subcutaneous tissues is called Hypodermoclysis. Subcutaneous fluids(S/C) can be given in this way to maintain hydration in patients who have mild to moderate dehydration. The procedure is relatively simple and involves insertion of a Needle safe infusion device, e.g. BD Saf-T-Intima infusion device into the subcutaneous layer of the skin, where an extensive network of lymphatic and blood vessels allows the fluids to be readily absorbed. This route is used most commonly in palliative and end of life care settings.

Owing to the relative ease in setting up and administering subcutaneous fluids, the procedure can be carried out in the home setting by community/ district practitioners. The administration of s/c fluids enables people who require fluids to remain at home if this is their wish. This will prevent unnecessary admissions to hospital, thereby promoting choice, comfort and dignity to patients who choose to remain at home or in a care home setting, if that is their preferred place of care.

All Registered practitioners undertaking infusion therapy must firstly demonstrate evidence of competence, skills and knowledge in relation to the specific task to be undertaken and have completed the appropriate training.

Hypodermoclysis is another term for the administration of fluids via subcutaneous infusion in order to achieve fluid maintenance or replacement in mildly dehydrated patients for whom intravenous access may be difficult or who cannot tolerate sufficient oral intake. Hypodermoclysis for hydration is recommended for relatively small amounts of fluid (1 to 2 litres over 24 hours).

2. SCOPE

This standard operating procedure is intended to give guidance to all trained staff working within Humber Teaching NHS Foundation Trust, delivering services to patients over 18 years old in the community, care homes, community hospitals and other bedded units. This Standard Operating Procedure (SOP) is to aid the safe setting up and monitoring of subcutaneous hydration therapy delivery. Decisions to commence subcutaneous fluid delivery follow a thorough assessment and multi professional discussion, and clear rationale, which includes the patient and where appropriate their families/carers, ensuring a flexible and responsive service to meet individual patients care needs.

3. DUTIES AND RESPONSIBILITIES

Chief Pharmacist will ensure the medication used in infusion is implemented and monitored as stated in the safe and secure handling of medicines procedures.

Service Managers, Modern Matrons and appropriate professional leads will ensure dissemination and implementation of the within the sphere of their responsibility. They should also ensure staff are supported in attending relevant training and that time is dedicated to the provision and uptake of training and sign off competencies.

Charge Nurse/Team Leaders/Clinical Leads will disseminate and implement the agreed SOP. They will maintain an overview of associated training needs for their respective teams. The charge nurse/clinical leads/team leader will ensure mechanisms and systems are in place to facilitate staff

to attend relevant training as part of their appraisal process in order to undertake training and sign off competencies.

All relevant clinical staff working in the community setting – applicable to Registered Practitioners employed within a community hospital or in the patient's home environment will familiarise themselves and follow the agreed SOP and associated guidance and competency documents. They will use approved documentation and complete relevant paperwork as per policy and Standard Operating Procedures as relevant to each clinical activity. They will make their line managers aware of barriers to implementation and completion.

Clinical staff should be clear about the principles of accountability and delegation and should refer to their appropriate code of conduct. Prior to delegating care, the registered clinician must ensure that the non-registered clinician has the necessary skills and competence to safely perform the delegated task/s. The non-registered clinician is deemed competent once all competencies are signed off for the specific area.

Prior to the assessment of competence, the non-registered clinician must have received appropriate training that includes theoretical and practical components.

4. TRAINING REQUIREMENTS

Full records of training (including dates) should be recorded, and a log kept within the team. The assessment of competence should be documented and should include assessment of the non-registered clinician's knowledge as well as of their practical skills.

Registered practitioners must have undergone the relevant training session and the management of an s/c infusion/injection is covered in the Trusts syringe pump training.

Additionally during any outbreak such as flu/Covid-19 PPE recommendations should be followed.

5. PRINCIPLES

5.1. Maintaining Hydration at End of Life (last few days)

Patients who are in the last few days or weeks of life are often unable to tolerate oral hydration. The prime goal of any treatment towards the end of life must be the comfort of the patient and be symptom led. Considerations around how to approach the issue of hydration at the end of life are complex and involve not only physical, psychological and social concerns, but also ethical dilemmas. It is therefore imperative that decisions to rehydrate a dying patient must be a multidisciplinary decision. Important: A decision to rehydrate a dying patient **must** be a multi-disciplinary decision. Quality of life at this time is paramount. (NICE 2015, GMC Guidance "Treatment and Care towards end of life: good practice in decision making, 2010).

Discussing the risks and benefits of clinically assisted hydration with the dying person and those important to them. Clinically assisted hydration may relieve distressing symptoms or signs related to dehydration, but may cause other problems. There is little evidence that artificial hydration in dying patients in the terminal phase influences survival or symptom control.

Indication
The main indication for Hypodermoclysis is symptomatic management of rehydration. This technique is particularly useful in the elderly. Clinical situations in which Hypodermoclysis should be considered for fluid replacement rather than intravenous infusions are:

- When adequate oral fluid intake is not feasible
- When there is no acute or specific indication requiring a direct intravenous line, i.e. mild to moderate dehydration
- When the establishment or maintenance of an intravenous line presents problems

Contraindications
Hypodermoclysis should not be used for patients who require more than 2 litres of fluid in 24 hours).

It should never be regarded as an alternative to the intravenous route and should not be used to treat:

- Acute life threatening conditions i.e. major dehydration
- Shock
- Diabetic coma
- Severe renal or hepatic failure

It should be used cautiously in patients with:
- Coagulation defects (Noble-Adams, 1995)
- Possible tissue fibrosis resulting from previous radiotherapy, injury or surgery, since absorption will be decreased
- Pre-existing heart disease. Subcutaneous fluids (like intravenous fluids) can lead to fluid overload. Care needs to be taken with the volume and rate of the infusion as well as the total sodium load.
- Pre-existing Oedema
- Poor tissue perfusion, i.e. Peripheral Vascular Disease

For people being started on clinically assisted hydration:
- Monitor at least every 12 hours for changes in the symptoms or signs of dehydration
- For any evidence of benefit or harm
- Continue with clinically assisted hydration if there are signs of clinical benefit
- Reduce or stop clinically assisted hydration if there are signs of possible harm such as fluid overload, or if they no longer want it

For people already on clinically assisted hydration before the last days of life:
- Review the risks and benefits of continuing clinically assisted hydration with the person and those important to them
- Consider whether to continue, reduce or stop clinically assisted hydration as the person nears death
- Important: A decision to rehydrate a dying patient MUST be a multi-disciplinary decision Quality of life at this time is paramount. (NICE 2015, GMC Guidance)

5.2. Prescribing

The GP or Non-medical prescriber (NMP) must prescribe on the patient's Medical Administration Record (MAR) Fluid Prescription sheet, 0.9% Sodium Chloride for intravenous infusion. This will be delivered subcutaneously over the required time period, (e.g. Sodium Chloride for injection over 24 hours).

No more than one litre of fluid should be infused within a 24-hour period.

The MAR form must be signed by GP or NMP for authorisation of procedure by Registered Practitioner. No medication should be added to the infusion fluid.

5.3. Administration

Change administration set every 72 hours whilst infusing continuous fluids or 24-hourly if administering an intermittent infusion.

- Ensure prescription is correctly completed on the agreed prescription sheet
- Ensure fluid balance chart is maintained
- Ensure subcutaneous care plan is maintained
- Ensure the prescribing clinician has documented a review date for the infusion.
- Document baseline urea and electrolyte result and stipulate the date of a repeat blood test if required. (This will be at the discretion of the practitioner for end of life patients as this may not be necessary or required.)
- Document if a medication review took place prior to commencement of subcutaneous fluids and if any drugs have been discontinued.
- Administration of subcutaneous fluids should be documented in the patients notes, in addition to the date and time of commencement, the following should be recorded:
    - Insertion site including whether the wing tipped needle/ Needle safe infusion device, e.g. BD Saf-T-Intima has been re-sited and condition of surrounding skin
    - Type of giving set used
    - Expected time of end of infusion and actual time of finish if any discrepancy
    - Staff must not add any medication to bags of fluid for subcutaneous infusion
    - Batch number and date of expiry for winged tipped needle/Needle safe infusion device, e.g. BD Saf-T-Intima

Family and/or carers attending those receiving SC fluids should be advised on who to contact should there be any concern or problems encountered with the infusion. This will include contact details for services both in- and out of hours.

If notification is received that a patient appears to have died, and this is an expected death, staff should attend at the earliest possible opportunity and complete verification of death processes as per Humber policy. Once death has been verified, the SC fluid infusion (and any syringe driver etc.) can be discontinued and the contents suitably disposed.

Equipment required

- Prescribed fluid
- Intravenous giving set
- 70% alcohol
- Needle safe infusion device, e.g. BD Saf-T-Intima
- Sharps box
- Prescription chart
- Sterile permeable dressing
- Drip stand
- Tagging for lines with date and signature
- Non sterile gloves with ANTT technique

Additionally during COVID-19 outbreak COVID19 PPE recommendations should be followed

Site of infusion

The subcutaneous infusion should be sited in a position with good lymphatic drainage.

Infusion sites

Lateral aspects of the upper arms and thighs
Abdomen
Anterior chest below the clavicle
Occasionally the back
These areas usually have adequate amounts of subcutaneous tissue and will not interfere with movement.

Sites must be rotated to minimise tissue damage to maximise absorption

Sites that are not acceptable include:

- Pre-existing oedema sites
- Limbs with lymph oedema
- Sites of previous radiotherapy
- Sites with skin damage, swelling or scarring
- On the site of a mastectomy
- Close to a stoma site

Suitable fluids

- Sodium chloride 0.9% as directed by the prescriber
- Drip rate/rate of infusion should be as per prescription chart
- Staff must not add any medication to bags of fluid for subcutaneous infusion

Fluids not suitable for subcutaneous administration

- No fluids other than 0.9% sodium chloride must be administered and all subcutaneous fluids must be prescribed

Calculating Drip Flow Rate

As the fluid is infused by gravity, an electronic pump to regulate the flow/rate of administration is not required. 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. Infusion speed via the S/C route can be unpredictable and it is recognised that controlled infusion rates cannot always be achieved.

The usual formula for calculating drip flow rate (unless otherwise indicated) is as follows:

Infusion rate calculator

$$\text{Number of drops per minute} = \frac{\text{Volume of fluid (mls)} \times \text{number of drops per ml}}{\text{Duration of infusion in minutes}}$$

For example: 1 litre of normal saline to be infused over 12 hours

$$\frac{1000\text{mls (volume of infusion)} \times 20 \text{ drops per ml}}{12 \text{ (hours)} \times 60 \text{ minutes}} = \frac{20{,}000}{720} = 28 \text{ drops per minute}$$

To calculate the volume in drops, it is necessary to know how many drops 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 60.

Procedure

Discuss with patient and family clear rationale and obtain consent where possible and give an information leaflet to support verbal communication.	Document in records that this conversation has taken place. Contact numbers for the Community teams should be given to the patient/carers/family and they should be encouraged to report any pain, discomfort or concerns at the insertion site.
Site Choice	When choosing a site for infusion, consider: • patient mobility • comfort • access • skin condition Any area with adequate subcutaneous tissue may be used. Potential sites include: • abdomen • anterior and lateral aspects of chest wall • anterior thigh • upper arm • Scapula The site should be rotated every 72 hours to reduce risk of complications
Areas that should not be used for cannula placement include	Lymphoedematous limbs: The rate of absorption would be adversely affected. A break in the skin integrity would increase the risk of infection in a limb that is already susceptible. • • Over bony prominences: The amount of subcutaneous tissue is diminished therefore impairing the rate of absorption. • • Previously irradiated skin areas: Radiotherapy can cause sclerosis of small blood vessels, thus reducing skin perfusion. • Near a joint: Excessive movement may cause cannula displacement and patient discomfort. • Near a surgical or chronic wound site. • Sites of infection • Areas of inflammation (Dougherty & Lister 2007; RCN 2005)
Choice of Cannula – 'Points to practice re how to insert the Needle safe infusion device, e.g. BD Saf-T-Intima for subcutaneous infusion therapy' in HFT syringe pump policy Setting up procedure	Humber Teaching NHS Foundation Trust requires the use of a Saf- T – Intima, operating a needle guarded system (see syringe pump policy). • Skin should be cleaned with 70% alcohol wipe • Needle safe infusion device, e.g. BD Saf-T-Intima should be inserted at a 30-45 degree angle into chosen site

	and covered with a sterile transparent film dressing • Attach the fluid bag and the administration set. • Ensure the line is primed before attaching it to the patient. Ensure the line has a start time/dated
Fluids to be infused and prescribed	Sodium Chloride 0.9% Maximum 1 litre in 24 hours. Maximum 2 litres using same site. Under no circumstances should any other fluids be administered via the subcutaneous gravity fed route. The Sodium Chloride will be prescribed on the Trust's Medicine Administration Record (MAR) by the prescriber.
Calculating rate of subcutaneous infusion	To deliver a 1 Litre (1000 ml) bag of Sodium Chloride 0.9% over 12 hours Using an infusion set that contains 20 drops per ml Volume (in drops) = Infusion rate (drops per minute) Time (in minutes) Number of drops = 1000mL x 20 = 20,000 drops Time in minutes = 60 x 12 = 720 minutes 20,000 = 27.7 drops per minute Therefore round up to the nearest whole number = 28 drops per minute. **The drip rate should be as per fluid prescription chart** **Fluids must be gravity fed and regulated (i.e. using a drip stand, giving set and calculating the drip rate) and NOT infused using a pump**
Documentation	Documentation in the patients record should contain complete information regarding the subcutaneous infusion therapy and should comply with the NMC Code of professional standards of practice and behaviour (March 2015.) • Evidence of consent (or other measures taken where a patient lacks capacity and best interest decision is in place) • Date and time of insertion/commencement of therapy and site • Rate of infusion, and fluid being infused • Evidence of consequent monitoring to include report on site check, rate of infusion, patient's tolerance of therapy including observing for signs of infection, fluid accumulation, or

	discomfort. This needs to be undertaken on every nursing visit. • The discontinuation of therapy and rational (including date/time and volume infused) • Signature and name, date and time must be printed • If subcutaneous fluids are commenced efficacy needs to be reviewed every 24 hours.
Training needs	The Leadership Alliance for the dying person (2014) emphasises the importance of education "which must have the effect that registered practitioners must be able to access and monitor nutritional and fluid status. Identifying signs of dehydration and acting appropriately to address these". Following the multidisciplinary decision and the MAR chart been completed, Hypodermoclysis can be commenced by any registered practitioner who is competent in administering subcutaneous injections and insertion of a subcutaneous needle. This is covered in syringe driver training.
Monitoring and audit	Adherence to these guidelines will be monitored through adverse incident reporting on DATIX within Humber Teaching NHS Foundation Trust. This will identify any additional training requirements and help to ensure safe and evidence based practice is delivered.

Adverse Effects

Site is red and inflamed	Needle may have been placed intradermally	Re-site immediately, away from affected area. Check for nickel allergy, use Silhouette soft set if necessary
Localised oedema	Most common adverse effect	Massage area as oedema will re-absorb. Re-site if uncomfortable for the patient
Pain	Can be related to the insertion of the needle	Adjust needle position slightly to exclude nerve ending placement. Re-site needle if pain persists
Infusion running too slowly	Check gravity feed	Raise height of infusion bag. Check lines for occlusion
Large white flat area around site	Needle may need re-siting if red and inflamed	

6. REFERENCES

Mental Capacity Act 2005: Deprivation of liberty safeguards - Code of Practice to supplement the main Mental Capacity Act 2005 Code of Practice
Nursing and Midwifery Council (2008) Standards for Medicines Management. NMC, London.- updated march 2022
GMC Guidance towards end of life: good practice in decision making, GMC 2010.
Care of dying adults in the last days of life Quality standard Published: 2 March 2017
SYRINGE DRIVER PROTOCOL (Prot525)

RELEVANT POLICIES/PROCEDURES/PROTOCOLS/GUIDELINES

- Medicines Optimisation Policy
- Consent to assessment, examination and treatment policy and procedure
- Reporting of adverse incidents policy and procedure
- Policy for medical and non-medical devices and equipment of high cost/volume for use in patient areas management and procurement
- Corporate Statutory and Mandatory Training Policy
- Safe and Secure Handling of Medicines Proc
- Hand Hygiene Policy
- Standard Precautions Policy
- Waste Management Policy

Appendix 1: Administration of Subcutaneous Fluids (Hypodermoclysis) – Annual Competency Assessment Tool

Performance Standard

The practitioner will be able to demonstrate the knowledge and ability to set up and administering subcutaneous fluids safely.

Action

To work with/be observed by the assessor in the setting up of subcutaneous fluids.

Success Criteria

The practitioner can explain and demonstrate the correct procedures for setting up, using, cleaning, decontamination and storage of the above piece of equipment and is aware of any indications and contraindications for its use. The practitioner also explains/demonstrates when a medical device needs part of the device replacing/replacing of whole device/servicing or withdrawing from service.

Criteria	Additional Comments
Indications for use	
Priming and selecting infusion set	
Priming, Siting and commencing	
Adherence to ANTT 6.	Ensure working areas is cleaned with a clinell wipe. Decontaminate hands and put on clean non sterile gloves and apron. Additional PPE will be required during COVID-19 outbreak.
Setting of infusion rate/ checking of infusion site	
Care of patient	
Observations	
Documentation	

Assessor's Comments:

Signed: …….. Name: …….

Assessor's Signature…….. Name:……

Date:……