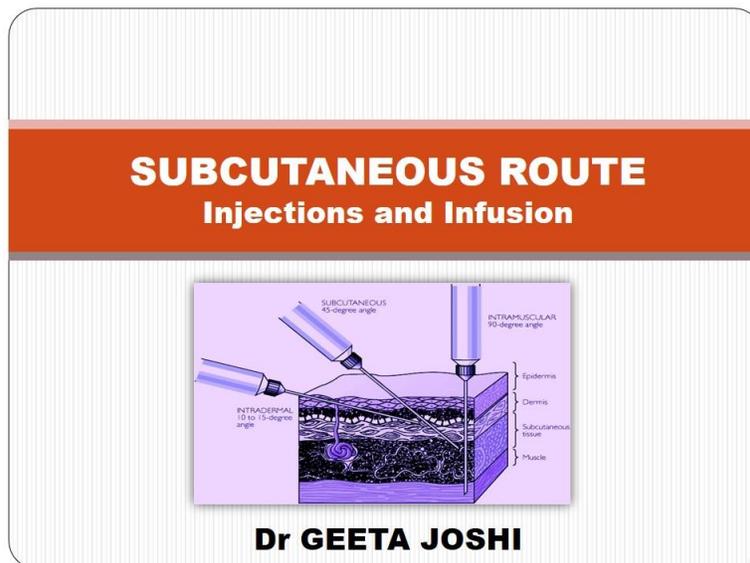


**Basic Certificate in Palliative Care**  
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**Week-10**  
**Lecture 05: Subcutaneous Route**

This is week number 10, lecture number 5.

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Namaste (Hindi word meaning greetings), I am going to talk about subcutaneous route of various drug injections and infusions. In the modern era of medicine with very high technology available, subcutaneous route of injection of the drug is almost forgotten, but it is still relevant in the palliative care setup. So, we will have a primary knowledge about the subcutaneous route.

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## **SUBCUTANEOUS INFUSION**

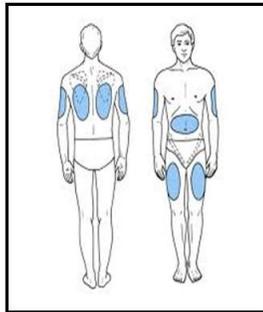
**INTRODUCTION OF FLUID INTO THE  
BODY VIA SUBCUTANEOUS ROUTE.**

**HYPODERMOCLYSIS**

Subcutaneous infusion is the introduction of fluid into the body via subcutaneous route. It is also called Hypodermoclysis.

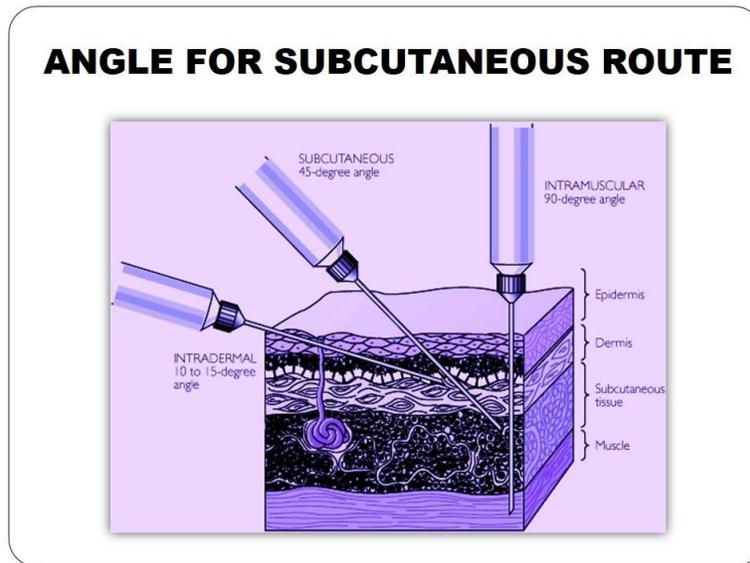
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### **SITES FOR SUBCUTANEOUS INJECTION / INFUSION**



These are the common sites where you can select that site for the subcutaneous injection or subcutaneous infusion. It is in like backside of the thorax chest wall, on the side of the arms, even forearms you can select, on the abdomen and front side of the thighs. These are the common sites where you can put a cannula and give drugs via subcutaneous route.

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What should be the angle of insertion of the cannula when you are selecting subcutaneous route? For intramuscular injection always the angle should be right angle perpendicular.

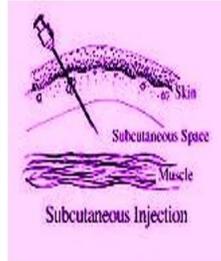
For intradermal injection it should be acute angle 10 to 15 degree of the angle, but for the subcutaneous route it should be this angle between your needle and skin should be 45 degree. This you must remember, then it is easier to get into the subcutaneous tissue. If you see the anatomy of our skin, the first layer is epiderma, then dermis and this subcutaneous tissue. Here, so you have to pierce the epidermis and dermis and then you are entered into the subcutaneous tissue where you can inject the drug. After the subcutaneous tissue comes the muscles where you inject the intramuscular drugs route.

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### **BUTTERFLY CANNULA**



### **NEEDLE IN SITU**



Subcutaneous injection can be taken up with a butterfly cannula everybody is familiar with this or you can put a needle in situ, but this is difficult to maintain the needle. So, ideally is the butterfly cannula.

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### **CANNULA INSERTION**



How to insert the cannula? This is shown on the abdomen, you pinch the abdomen, skin and subcutaneous tissue in your hand and insert the cannula at 45 degree angle till you pierce the dermis epidermis and dermis and enter into the subcutaneous tissue. Fix the

cannula and cannula distal end is has a injection pot through which you can attach the syringe and give injection or you can attach a IV set and give infusion.

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### **INDICATION**

- **Mild Dehydration**
- **Loss Of Intravenous Patency**
- **Intractable / Chronic Symptoms**
- **Palliative Sedation**

When subcutaneous route is preferred when patient has got mild dehydration and there is no intravenous venous access possible. All veins are either thrombose or used up or collapse in that case you can use subcutaneous route.

Intractable chronic symptoms will require frequent injection of the drug. So, subcutaneous route is preferred. Some of the symptoms like continuous nausea, vomiting you cannot give anything orally since patient is vomiting then and IV access every day is not possible. So, at home you can put a subcutaneous cannula and patients relatives are educated to inject the drug through it. So, this type of symptoms when it requires long term treatment then you subcutaneous route is preferred.

At the end of life palliative sedation suppose the patient is dying in a severe pain or delirium and his veins are collapse he is in hypotension or shock extremities are cold kami you cannot find a vein at that case you can give your drugs through subcutaneous route.

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## **CONTRAINDICATIONS**

- **Local Skin Problems (Cellulitis, Skin Tears, Rash)**
- **Existing Tissue Oedema**
- **Significant Dehydration**

Contraindication for subcutaneous injections are local skin problem like cellulitis, skin tear or rash and there is associate, this existing tissue edema like in lower limb there is edema you cannot select the subcutaneous route or sometimes lymph edema following breast surgery and also thing you cannot give injection subcutaneous or there, when there is a significant dehydration severe dehydration then it is difficult to give the drug through subcutaneous route.

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## **SUBCUTANEOUS INJECTIONS**

Cyclizine, Clonazepam, Dexamethasone,  
Fentanyl, Morphine, Ondansetron,  
Hyoscine butylbromide, Octreotide,  
Hyoscine, hydrobromide, Phenobarbitone ,  
Glycopyrrolate, Haloperidol, Ketamine,  
Hydromorphone, Oxycodone, Sufentanil,  
Ketorolac, Levomepromazine,  
Metoclopramide, Methadone, Midazolam

These are the drugs which are commonly can be given by subcutaneous route the usually in palliative care scenario we need to give clonazepam, dexamethasone, ondansetron, morphine sometimes phenobarbitone, sometimes ketamine, haloperidol, glycopyrrolate. These are the drugs and midazolam, these are the drug which can be given subcutaneously and commonly given subcutaneously in palliative care scenario.

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**SUBCUTANEOUS DRUGS  
CONTRAINDICATED**

- Phenothiazine's - Prochlorperazine (Stemetil), Chlorpromazine (Largactil)
  
- Promethazine (Phenergan) – too irritant
  
- Phenytoin
  
- Diazepam - irritant and absorbed onto PVC. Precipitates at certain dilutions

The drugs which cannot be given subcutaneous because they are irritant in nature these are phenothiazines that is stemetil, largactil no more used, promethazine, phenergan it is too irritant, phenytoin it is given for the seizures, but cannot be even subcutaneous and diazepam. If you want to sedate the patient it is better to give midazolam subcutaneously rather than giving diazepam which is very irritant and absorb into the peripheral vein capillaries and precipitate at certain dilution.

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## **SUBCUTANEOUS FLUID**

- Normal Saline 0.9%
- Amount: 500-1000 ml/ 24 hours.
- Avoid dextrose and additives
  - →(cause pain and fibrosis.)
- Rate: Absolute maximum: 80 ml/h
- Aim for 60 ml/h or lower if possible

Subcutaneous fluids sometimes you have to give when patient is dehydrated or constantly vomiting, in this case you can give only normal saline 0.9 percent. You can the amount which is given is about 500 to 1000 ml in 24 hours, but avoid giving dextrose and dextrose with any other injections like multivitamin injections or such thing should not be given in subcutaneous route it will cause pain and fibrosis at local site. Usually when you are giving any fluid in subcutaneous or normal saline in subcutaneous route you should the rate of the injection should be 80 ml per hour and finally, you can slow down to 60 ml per hour or maybe less than that.

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## **ADVANTAGES**

- **Easy to administer and maintain**
- **Inexpensive**
- **Less painful**
- **Reduction in multiple punctures**
- **Less infection**
- **No need of line maintenance**
- **Accidental rapid infusion is prevented**
- **Better for home settings**

Advantage of subcutaneous route is very wider area on the body is available for subcutaneous injection is it is easy to administer the cannula and maintain the cannula it is inexpensive that butterfly cost is about 5 to 10 rupees.

It is less painful, it will avoid the multiple puncture. If you are trying venous access if you are not successful with first attempt, you may have to do second attempt, maybe third attempt. So, multiple punctures not required in subcutaneous route usually you get into the subcutaneous route if you have selected proper site. Less chance of infection. No need of line maintenance like in IV intravenous you have to maintain the cannula otherwise it may go out by venipuncture through and through and you might have to select another vein. Here you, it can last up to 24 to 48 hours. Accidentally you cannot transfuse more fluid through in subcutaneous route and it can be, it is better to maintain this in home setting.

We always encourage palliative care patient to be cared at home instead of in hospital. At home they are in familiar atmosphere along with their loved ones and the people coming and meeting them. So, in such situation it is always if any injection is required it is preferred to be given by subcutaneous route as patients relatives are educated about this and they can take care of this whole system at home.

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### **STUDY ON HYPODERMOCLYSIS**

- **36 nursing home residents**
- **North America**
- **Average of 85 years**
- **>71% returned to functional state**
- **Biochemistry evaluation before and after the procedure with no adverse effects**

There is one study was taken up on effect of efficacy of hypodermoclysis that is giving fluids and drugs by subcutaneous route. It was taken up in 36 nursing home residents in North America and average age was of the people was 85 years and more than 71 percent return to functional state means whatever drugs they were given in subcutaneous route it was effective and that made them get back to their functional state almost 71 percent.

So, biochemistry evaluation before and after the procedure with no adverse effect they also need some biochemical test, chemistry test before and after the subcutaneous route and they found that indeed change any there was no change in biochemistry of the blood. So, this is the way subcutaneous route is very effective has many advantages particularly in palliative care setup and particularly when you want to treat the patient at home. It has a definite role when the patient is dying or in terminal stage where the venous access is not possible, it has got a definite role when patient is vomiting when you cannot give any drug orally and so everybody should learn how to insert the subcutaneous cannula, which drug to choose and the dose to be chosen for the effective symptom and pain management. Thank you very much.