

بسم الله الرحمن الرحيم

تفريغ اللاب الأول للبياترك العملي

GROWTH & DEVELOPMENT/ IV. FLUID

***Growth:** is an increase in size of one or all body parts (quantitative change).

- Growth is measured in cm/kg/meter (quantitative measurements.)

***development:** progressive change in the function of systems.

The system already exists but the maturation process and functioning of it will be more advanced.(qualitative change) .

*** Patterns (directions) of growth:**

1. Cephalocaudal \Rightarrow growth proceeds from head to toe.

2. Proximodistal \Rightarrow growth proceeds from center of body to outward.

***Growth measurements:**

1. Physical measurements: measuring length, weight, head circumference and chest circumference.

2. Physiological measurements: assessments of vital signs.

***Developmental measurements:**

1. Motor skill development:

A. Fine motor skill.

B. Gross motor skill.

2. Intellectual development (cognition).

3. Social development.

4. Emotional development.

5. Moral development.

*** Factors influencing growth and development:**

1. Genetics\ heredity factors.

2. Nutritional status \Rightarrow here we focus at prenatal period

- The mother's nutritional status during pregnancy affects the birth weight.

And baby's illness period, hyperthermia and any problem in the baby's stomach or intestine will lead to weight reduction because of **loosing fluids**.

-For example if we measured the infant's weight and noticed that the baby's current weight is less than the previous month then we should ask the mother if her child has been ill recently and ask about vomiting, diarrhea or temperature elevation.

Today we will talk about physical measurements and motor skill development.

Physical development

1. New born stage (first 4 weeks of life).

A. Weight:

*Normal range: 2.700kg \Rightarrow 4.000kg

* In the first 7-10 days the baby losses 5-10% of his weight because of loss of fluids then he will gain it back very fast.

* The first 4 months the baby gains almost 3/4 kg for each month.

AGE GAIN

0 – 3 months	900g/month
3 – 6 months	600g/month
6 – 9 months	500g/month (1/2 kg)
9 – 12 months	250g/month (1/4 kg)

* To estimate the predictable baby's weight we use this rule:

$(\text{Ages in months} + 9) / 2 = \text{predicted weight}$

Example: we have a 6 months old pt. and the teacher asks us "what is the normal weight for this age "?

Weight = $(6+9) / 2 = 7.5 \text{ kg}$.

B. length :

* the normal range : 48 cm \Rightarrow 53 cm

For the new born male, the average weight is 50 cm.

For the new born female, the average weight is 49 cm.

AGE GAIN

0 – 3 months	3cm/month
3 – 6 months	2cm/month
6 – 9 months	1.5cm/month(1/2 kg)

-At 1 year the height is 75cm.

-At 3 years = 87.5cm

-At 4 years = 100cm (1 m)

Just for knowledge-For length we use this rule:

Age in years * 6 + 77 = predicted length

And it's applied only for pt's under 6 years.

**for example if the pediatrics length at birth is 50cm:

At first year his length will (birth length + 25cm)

Second year (first year length + 12.5cm)

Third year(second year length+7cm)

Fourth year (third year length+7cm)

Fifth year (fourth year length+2-4 cm)

C. head and chest circumference:

* Normal ranges: H.C (33cm \rightleftarrows 35cm)

C.C (30.5 cm \rightleftarrows 33 cm)

*C.C is smaller than H.C in about 2 \rightleftarrows 3 cm.

* The head weight forms $\frac{1}{4}$ of the total body weight.

AGE H.C INCREASES

0 – 3 months	3cm/month
3 – 6 months	2cm/month
6 – 12 months	1.5cm/month

* during that the C.C increases , until H.C = C.C AT 1 year old .

*** WEIGHING-SCALES:**

A scale used to measure the weight for patients less than 3 years of age.

* The most important point as a nurse putting the scale on zero level (zeroing the scale).

A. First of all you should clean the scale and warm it.

B. Put the baby in the supine position.

C. If the baby is wearing a diaper, we measure the weight of a dry diaper then we subtract it from the total baby's weight ,Or we ask the mother to change the diaper if it no clean.

D. All of baby's body parts should be in the scale.

E. We read the value after the baby calm down.

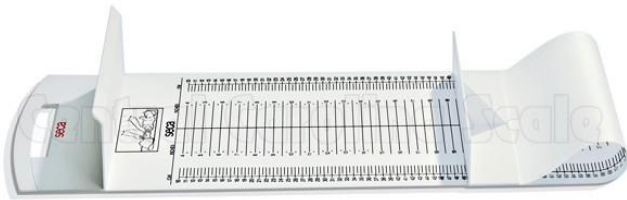
* For pts above 3 years old we measure the weight with a regular scale (we shouldn't forget to put it on zero level).

*for pts who disallow the nurse to weighs him , we weighs his mother without him(A) we record her weight after that we weighs the mother and her baby together(B) after that we substract the the weight (B) from weight (A) $B-A=C$ C:is baby weight



For measuring the length:

*The length: a device we use to measure baby's (Under 3 years old) height.



* Put the baby in the supine position, head should be on the fixed side of the device; the knees and feet are extended by the nurse then read the value.

* If we don't have this device we use the meter.

- To measure using a meter we fix the baby's head, extend his knees and feet and then measure his/her length. Or we can draw a small line parallel to the occipital area (the point of the head) and another line at the feet and then measure the distance btw the two lines WITHOUT taking in consideration the baby's arm or ear.

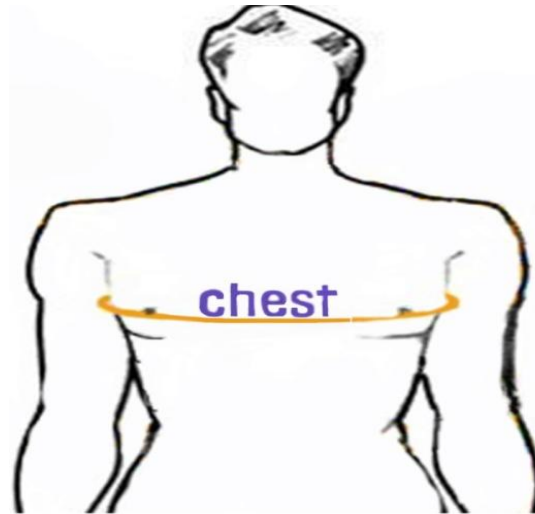
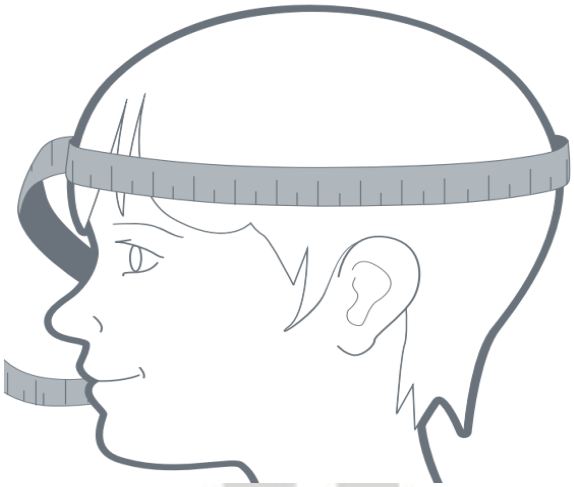
* We need to be sure that when measuring the length with a meter that the meter is under the ear and arm NOT over as this will give a false reading.

* for children's above 3 years old we use the regular device or the meter , they should Stand up straight , without their shoes on, remove any heavy clothes that hump their shoulder and looking forward .

* HOW TO MEASURE H.C AND C.C:

- H.C \implies we put the meter on the occipital area, then we start from the middle of forehead (remember the meter shouldn't be on eye browse or ears) , we finish at the same point we started.

- C.C \implies put the meter on the chest parallel to the nipples, start from the middle of the chest between the nipples and finish at the same point (we have to do it while clothes are off).



*How do we know whether the measurements are normal or not?

GROWTH CHART

- Growth charts give us an indication about how the weight & age / length & age / HC & age are appropriate with each other.

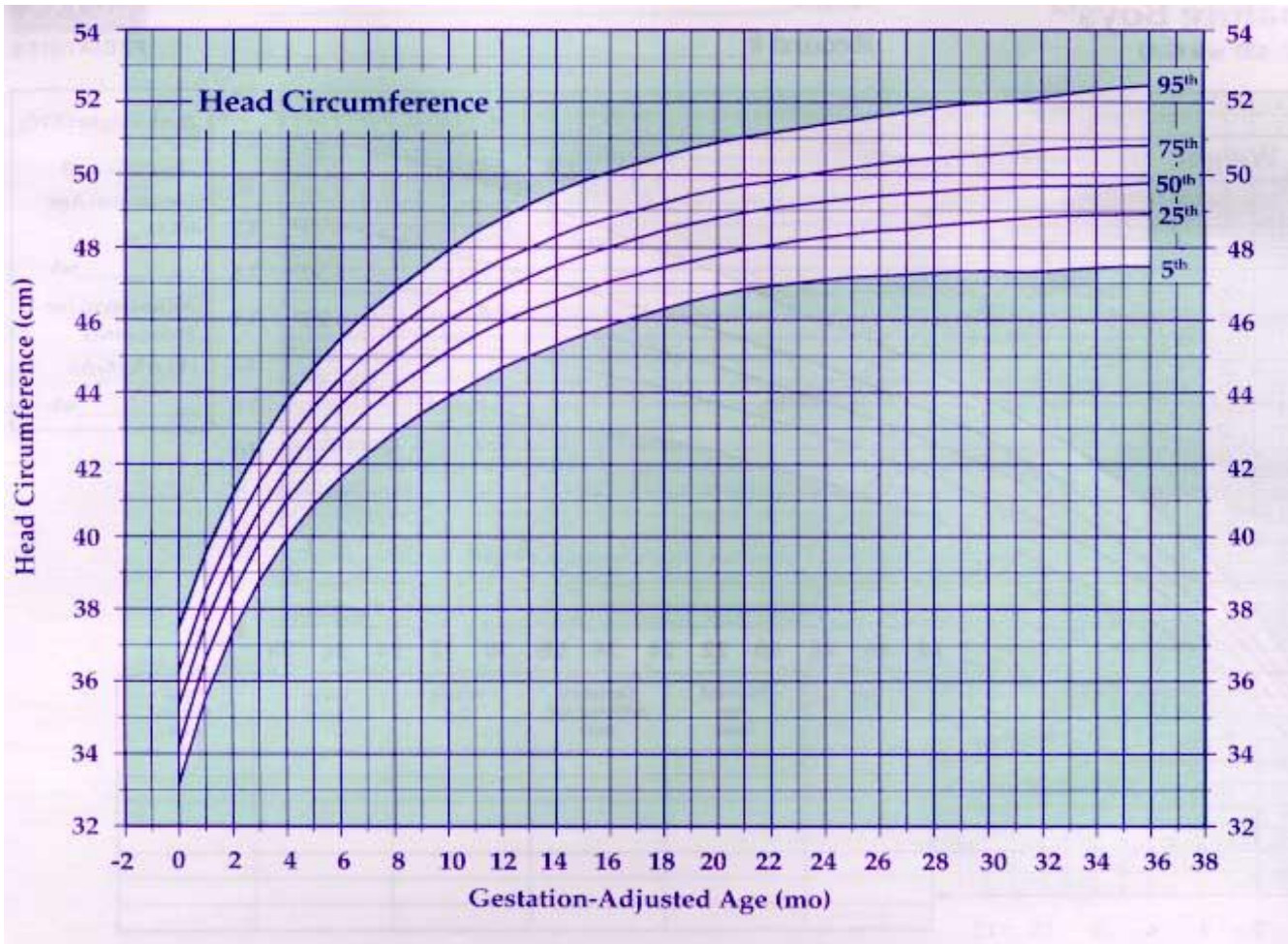
* There is another parameter that shows the pt.'s health status which is measuring the BMI.

$BMI = \text{weight} \div \text{height in meter}^2$ when we have a 6 months old baby with a 44 cm of head circumference then if we draw the two lines we will intercept each other on a point on the growth chart which represents the 60% of world population within this circumference .

* Those whose H.C falls below the 5th percentile are small in head size and need medical consultation.

* Those whose measurements are above the 95th percentile are large in head size and need medical consultation.

* And those on border lines need more investigation.



95 p: normal + above appropriate

75p : normal + appropriate

50 p : normal +average

25 p : normal +within average

5 p: normal + below appropriate

IV fluid

*IV fluid administration in pediatrics is **similar** to that of adults in the method and reasons of administration.

*IV fluid expires after 24hrs.

*Microdropper can be kept for 48hrs.

*Cannula can be left for 72 hrs.

Main differences are:

- 1- The size of cannula is relatively small in children.
- 2- The types of IV fluid.

Why the dehydration occur in pediatrics more than the adults:

- *their metabolic rate is higher than adult
- *increase in their breathing cycle (60-80)
- *their body surface area big comparing to their Wight

The purposes of giving IV fluid:

- 1- To reverse dehydration/ replacement of fluid: gastroenteritis (infection in the GI tract) is a common cause of persistent vomiting and diarrhea in children both of which lead to fluid loss.
- 2- To correct electrolyte imbalances: some children enter the hospital suffering from disturbances in significant electrolytes (especially potassium and sodium).

Fluids in our body are divided into three compartments:

- 1- Intracellular fluid: inside the cells.
- 2- Extracellular fluid: This includes plasma and blood and the interstitial fluid.
 - *Interstitial fluid is the fluid surrounding the cells.
- 3- Transcellular: which is the fluid inside the body cavities (ex. Synovial fluid which is the fluid btw. the joints).

* **Osmolarity:** the concentration of the solute inside the fluid.

* Look at the Osmolarity on the bottle of the IV fluid to identify wither it's isotonic or not.

Normal range of Osmolarity = 275 – 350 mOsm (isotonic status)

Less than **275** → hypotonic

More than **350** → Hypertonic

****Examples of isotonic solutions:***

- Normal saline (N/S) 0.9%
- Ringer lactate
- D5W (Dextrose 5% water)
- **1/5 glucose saline** (G/S) → majorly dealt with in pediatrics and is the most common in the doctor order of a child patient.

****Examples on hypotonic solutions: <275***

- Half strength normal saline 0.45% 1\3 glucose saline

***Examples on hypertonic solutions: >350**

- D10W
- D25W

- During hospitalization each pt. has an intake&output chart.

Intake includes: fluid ingested, nasogastric tube and IV fluid administered.

***Intake** for each pt. is measured hourly and the total is calculated at the end of the day.

Output includes: urine, stool, blood discharge, emesis and gastric lavage.

*To measure the stool for a baby (especially if he has diarrhea) we depend on the weight of the diaper, a clean dry diaper is measured and the baby's wet diaper is placed in a plastic bag and measured and the difference calculated is the fluid loss. The baby is also observed for IV fluid complications. Any Fluid lost through vomiting is estimated and we may ask the mother about the characteristics of the emesis (consistency, odor, color...etc.).

***Rule:** each gm → 1 cc.

So if the diaper weighs 130 gm for example then the baby has lost 130 cc of fluid.

*When writing soapies and saying the pt. verbalized instead in pediatrics we write the pt.'s mother verbalized.

- What does the doctor depend on when ordering IV fluid for a child?

Answer: On the pt's weight and electrolyte status

Rules for calculating the fluid requirements per day:

1- Weight less than 10 kg → 100ml/kg

Ex. Fluid requirements for a child weighing 7 kg are 700 ml.

2- Weight btw. 10 – 20 kg → 1000ml + 50ml/kg (for every kilo after 10)

Ex. If a child weighs 13 kg then his fluid requirements= 1000 + 50*3 = 1150 ml/daily

3- Weight more than 20 kg → 1500 ml + 20ml/kg (for every kilo after 20)

Ex. If a child weighs 23 kg then his fluid requirements= 1500 + 20*3 = 1560 ml/daily

Preparing 1/5 Glucose saline (if not available in the department):

1/5 glucose saline is prepared using 0.9% NS and D5W

- Example of a doctor order: 500 cc 1/5 G/S + 10 mEq KCL Q8hrs.

A- To prepare the 500 cc of 1/5 glucose saline:

1) 0.9% NS → $1/5 * 500 = 100$ cc

2) D5W → $4/5 * 500 = 400$ cc

- Now add the 100 cc of NS with the 400 cc of D5W to get the 500 cc of 1/5 GS.

B- To prepare the 10 mEq of KCL:

- Rule: each 100 cc → 2 mEq

500 cc → 10 mEq (just so now we know that the order is correct).

- The dose on the bottle of KCL comes in two forms:

- 1) 1 mEq/ml (and in this case we draw 10 cc).
- 2) 2 mEq/ml (and in this case we draw 5 cc).

*Remember that KCL is never given push via cannula and is diluted in a solution (giving KCL push may lead to cardiac arrest).

* Always check the serum KCL before giving it.

* Always check the bottle of KCL before giving it as its bottle is easily mistaken for distilled water.

*Before giving KCL ask the mother when was the last time the child voided (urinary retention can lead to hyperkalemia and this should be reported SO child needs to have voided within 24hrs.).

Using the Microdropper to mix the D5W with the NS:

The Microdropper:-

-The Microdropper consists of a spike which must be kept STERILE at all times by covering it with its cover and not dangling it around.

-A Microdropper also has a clamp that differs from the Macrodropper.

- There is also the bottle of the Microdropper which holds up to 150 cc. the bottle is labeled from 0 – 150 and contains a plastic rubber that floats when filled with fluid to the exact point/ volume of fluid in the Microdropper.

- The Microdropper like any dropper has a chamber in which you can see the number of drops and another clamp that seals off the drops.

*make sure both clamps are closed before installing the IV fluid bottle.

- The Microdropper ends with a needle that should be covered at all times to maintain sterility and the tube is hung at the IV pole (not dangling).

*Many children enter the hospital with an asthmatic attack but leave suffering from gastroenteritis due to the break in sterility (nosocomial infection).

Calculating the drop rate/flow rate:

*The drop factor (DF) for the Microdropper = 60

Equation: (volume * Drop factor)/ (time*60)

Ex. 1/5 GS 800 + 18 mEq KCL Q8hrs :- (this is just an example, you won't find a doctor order of 800 cc :p)

→ $800 * 60 / 8 * 60 = 100$ drops/min

Preparing the IV fluid:

- The typical IV fluid bottle contains 500 cc. Since we need 400 cc D5W and 100 cc NS it would be a waste to completely empty the N/S bottle just to get 100 cc, instead we get rid of 100 cc of D5W by using the Microdropper.

- Before using any IV fluid we should check its expiration date, it must be clear not turbid and date of opening.

- After opening the IV fluid bottle swipe the opening with an alcohol swab.

- Keep the bottle upright on the surface of the bottle when inserting the spike in a circular motion to avoid any splashing.
- Put bottle on IV pole to allow the fluid to exit by gravity and keep the Microdropper slightly tilted so that the rubber plastic floats instead of staying at the bottom when filling it with fluid.
- Fill the Microdropper with 100 cc of D5W (which we are going to discard), bring it close to the sink, open clamp and discard WITHOUT breaking sterility OR carefully remove spike and open the Microdropper bottle and discard the 100 cc D5W. In either ways don't forget to close clamp after finishing.
- Use Salem syringe to gather 100 cc of NS and add it into the D5W OR use the Microdropper to add the 100 cc of NS.
- The previous method is used if 1/5 GS is not available in the hospital however if it is then we use it directly.
- Apply pressure to drop chamber and empty the tube from any air bubbles.
- Check 5 rights.
- Do 5 steps (hand washing, introduce myself, explain procedure, provide privacy and wear gloves).
- *Equipment: gloves, syringe for flush, water for injection, alcohol swab, dry cotton.
- *Most parents confuse the flush with medication and need reassurance.
- * Remember hand washing and sterility is important in all steps wither it's dealing with IV fluid or giving medication).
- Aspire 10 cc of KCL (this depends on the KCL bottle)
- *Normal value of potassium is 3.5 – 5.3 mOsm
- The KCL is added to the 500 cc 1/5 glucose saline through a specific opening for syringes and shake the bottle gently.
- Label the fluid bottle with the containing solution, the date and time, the drop rate.
- Label the Microdropper (on the side that doesn't have the numbers) with the same thing as the fluid bottle and with the exact content of the doctor order + your signature.
- Inform the parents of the time at which the fluid administration should stop.
- Flush cannula. (Apply same steps as IV medication administration).
- Insert tube in cannula opening.
- Start drop flow according to calculated rate.
- Hand washing.
- Return equipment.
- Documentation.
- Dispose of sharp equipment in sharp container.
- Monitor for complications.

Complications of IV fluid administration:

A) Local complications:

1- Phlebitis: caused by breakage in sterility, if the cannula is placed at a joint, if the needle used is too large for the vein.

- Characterized by redness, swelling, pain on palpation and localized warmth.
- When this occurs D/C cannula, inform physician and apply warm compressors

2- Thrombophlebitis: occurs when there is a thrombus occluding the cannula.

3- Infiltration: means that the cannula is out of the vein and that fluid is accumulating in the surrounding subcutaneous space.

- When touching the pt.'s skin it feels cold (because fluid is underneath) with possible edema.
- Tell mother to elevate extremity to drain the fluid.

4- Extravasations: occurs when the cannula is out and the medication continues to leak under the skin which leads to a chemical burn.

- Usually occurs in patients undergoing chemotherapy or certain antibiotics.

*In all cases the IV fluid should be DC, the physician should be informed and the cannula should be removed and inserted at a different site.

B) Systemic complications:

1- Fluid overload: this occurs if the flow rate is too fast or if the amount of fluid given is more than the amount needed.

- Characterized by: Hypertension, SOB, dyspnea, decreased RR.
- Stop the IV fluid, place pt. in semi sitting position and administer diuretic if prescribed by physician.

2- Air embolism: occurs when we don't empty the tube completely from air bubbles or if we don't close the cannula and leave it open.

- Characterized by cyanosis, SOB
- Place pt. on left side to prevent the emboli from travelling to the heart.

*In all cases the IV fluid should be DC, the physician should be informed

Medication administration:

Before giving any medication check for the five rights:

- 1- Right patient.
- 2- Right medication.
- 3- Right route.
- 4- Right frequency.
- 5- Right signature.
- 6- Right dose.

- If the medication misses any of these rights you should not give the medication.
- Check medication name three times:
 - **First**, when checking if the medication is in stock.
 - **Second**, when preparing the medication.
 - **Third**, when taking the medication to the pt.

Dose calculation:

- * In children medication dose is calculated according to the pt.'s weight.
- * Children are lower in weight than adults so they require a lower dose.
- * Maximum dose for some medications is 750 mg.
- * the dose is divided into:
 - 1- The dose on the bottle in stock (**stock dose**).
 - 2- The dose written in the doctor's order (**order dose/pt.dose**).

For example Ampicillin (an antibiotic) is available in a stock dose of 1 gm (powder) but the doctor's order is 500 mg, in this case there will be dilution to get the wanted dose.

* Dilute with either: normal saline OR water for injection.

100 mg → 1 cc

500 mg → 5 cc

750 mg → 7.5 cc

1000 mg (1 gm) → 10 cc and so on

Routes of administration:

-Oral, S/L (sublingual), buccal mucosa, topical (optic/ oral/ ocular), rectal, injection (IM/SC/IV/ID).

-Some children enter the hospital and only need an IV injection in situations like: continuous diarrhea or status asthmatics.

-If the route is orally then the child is usually discharged.

Oral medication:

Either: syrup, tablet, powder (diluted with distilled water) or suspension.

***If the medication is a syrup:**

- For example if the medication available in stock is 400 mg and we need 200 mg we need to know

these 400 mg are available in how many ml ?

Ex. Each 5 ml contains 400 mg therefore I draw 2.5 ml since the needed amount is 200 mg.

Before drawing medication:

- Check expiration date.
- Check opening date: if more than one week discard the bottle.
- Shake the bottle well.
- Choose the right syringe to aspire medication.
- Remove the needle from the syringe and discard it (in the sharp container).

Aspiring/drawing medication:

- 1- Open the medication bottle.
 - 2- Insert the syringe inside it.
 - 3- Aspire 2.5ml or the required amount of medication.
 - 4- Label the syringe (pt. name, medication name, rout, date).
 - 5- Put it in the pt.'s medication bag.
- * Don't return the needle to the syringe because you or another nurse may mistaken it to be given IM/IV.

Giving the medication:

- Take the medication to the pt.'s room.
- Check the pt.'s name from his mother.
- Never give the pt. medication when his mother or caregiver isn't there.
- The mother may give the medication orally instead of you however if she doesn't know how then we should teach her.

If you give the medication:

- 1- squeeze the child's cheeks.
- 2- Insert syringe in his mouth to the buccal mucosa.
- 3- Push medication slowly.

If the medication is a tablet:

Ex. Available stock dose is 50mg and the doctor's order is 25mg, DON'T break the tablet in half because the dose needs to be accurate.

Rule: 50 mg → 2 cc

25 mg → 1 cc

- 1- Remove the syringe plunger.
- 2- Put the tablet inside the syringe.
- 3- Crush the tablet with the plunger.
- 4- Aspire distal water (2cc).
- 5- Shake it until the medication dissolves.
- 6- Discard any excess amount.
- 7- Give it in the previous way to the patient.

" that is available in the مدقة* If the medication is too hard then we can use a special "hammer hospital.

* Since the dilute is a small amount we can put the dissolved medication in a special medication cup.

Rectal medication:

* Usually the mother needs to be there and she's the one that gives it to the child

Ex: -Antipyretic medication (revanin:acetaminophen):

125 mg < 1 year (infant)

250 mg > year

- Analgesic medication (ex.eflabun)

If you give the medication to the patient:

More than one years old:

- Check that the pt. doesn't have diarrhea.
- Put pt. on later side.
- Use gloves, separate cheeks of buttocks, and insert it.

OR if the pt. is less than one years old: elevate his legs and insert it

- Apply pressure rectally to make sure suppository is in.

Topical medication:

* most commonly for cases of diaper rash.

* tell the mother to:

- Clean immediately after removing diaper.
- Clean with water and don't use any alcohol.
- Dry area well.
- Put medication.
- Give it 1 – 2 minutes to be absorbed then cover it.

Injections

STAT: once and immediately.

1*1: once daily.

1*2: twice daily

1*3: Q8hrs.

2*4: Q6hrs.

ID injection:

- Used for sensitivity tests with an insulin syringe at angle of 10 – 15 degrees and injected until we .(بحجم حبة العدس)have a slight protrusion
- Check it after 10-15 minutes.
- Check for itching, redness or rashes.

SC injection:

- In children it is given in the abdomen, thigh or the lateral space around the deltoid muscle.
- At an angle btw. 45 – 60 degrees.
- Small doses only (maximum dose is 1 cc).
- The mother can assist you by holding the child, supporting his arm or stabilizing his head.
- Expose the upper lateral third of the arm.
- Wipe with cotton swab (usually NS **NOT** alcohol for vaccinations and insulin medication).
- the bevel of the needle should be up.
- Hand above the syringe when you hold it.
- Squeeze the muscle.
- Insert $\frac{3}{4}$ of the needle in.
- Place a ball of dry cotton under the syringe to make sure the exit angle is the same as the angle of insertion. (If the angle is different it will cause pain to the child).
- The abdomen and thigh are used only for insulin injections.

IV medication:

Ex. Ceftriaxone 300 mg IV Q12hrs. Available stock dose is 1000 mg.

* Ceftriaxone expires 24hrs after opening so remember to keep it in the refrigerator and to label it with the amount diluted and date of opening

- Check medication sheet or cardix for order.
- Check the order from the pt.'s file (pink page).
- Check the rest of the 5 rights.
- Take medication from the stock and dilute it:

1000 mg → 10 cc

300 mg → 3 cc

* While diluting if you sense resistance or pressure slightly elevate the needle but don't remove it completely and release the plunger allowing air to exit the vial into the syringe.

- Shake the medication and aspire required amount (3cc).
- Check that there are no air bubbles in the syringe.
- Label the syringe.
- Gather equipment: Alcohol swab, dry cotton, gloves, water for injection, syringe and medication and head to the patient.
- Check the pt.'s name from the mother.
- Explain procedure to the mother and make sure that the medication hasn't been given before.
- Take pt. to treatment room.
- Before giving the medication via cannula flush with water for injection and apply pressure when you switch the flush syringe with the medication syringe to prevent blood loss.

* Never give any medication to the pt. without the mother's presence.

* Don't give the injection in the child's room (this may frighten the child and give him a sense of insecurity in his own room).

-Checking the cannula:

- * Before deciding if the cannula is out straighten the vein esp. if the cannula is placed at a joint (elbow, foot or forearm).
- * Check the physical signs that the cannula is out: pain, swelling, redness and oozing.
- * If while giving the medication you sense resistance than usually the cannula is out.
- Flush with distal water before and after giving medication.
- Stabilize the cannula with your non-dominant hand.
- Remove upper cap of cannula and place the white cap in it's place
- While flushing check for oozing or resistance.
- Give medication slowly, flush after and put cap back to close the cannula.
- Clean everything behind you.

- * "In patients" are usually given medication via cannula, however sometimes the dr.'s order involves giving the medication IV STAT (In emergency situations), in this case it is injected directly into the vein
- * Some medication (ex. Gentamycin (aminoglycosides) ,Vancomycin, Tinem and Epipnem) are not given directly by "push" into the cannula since they have severe side effects and need to be diluted via Microdropper with a bottle of NS. Some of their side effects include:
 - Nephrotoxicity (kidney shutting down).
 - Ototoxicity (hearing damage).
 - Allergic reaction.
 - Red man syndrome (generalized flushing).

- Dilute the medication in NS, swap rubbery area of the Microdropper, put the diluted medication in there and give it to the pt. slowly.
- * The amount of NS given is counted as input.

IM medication:

- A- Deltoid muscle for children older than 6 years.
- B- Dorsal gluteus.
- C- Vastuslateralis.
- D- Ventrogluteal.
- E- Rectus femoris.

Deltoid muscle:

- Never give an IM injection in the deltoid to children less than 6 years of age.
- Advantages: accessible, easily mapped/located.
- Disadvantages: holds small amount (max. 2cc).

Vastuslateralis:

- It is the first muscle mature after birth.
- Advantages: easily accessible, mature at birth, holds large amount (max.3cc), no major blood vessels or nerves, can be given btw. 3 – 8 years old.
- Located in the outer later aspect of the thigh between the knee and the greater trochanter laterally.

- To locate it:

* Divide the lateral side of the thigh into 3 parts from top to bottom.

* Injection sites should be in the middle third.

* There are two approaches for vastuslateralis muscle injection:-

- With the pt. in the supine position, swab with alcohol cotton in circular motion.

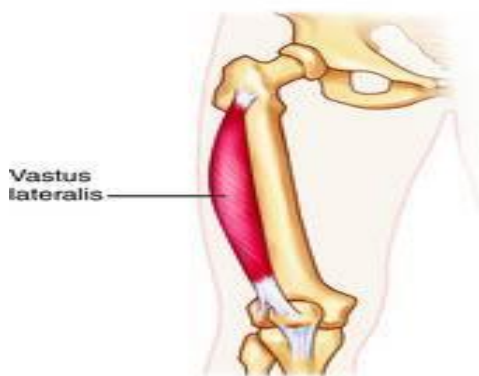
- With non-dominant hand extend the knee fixing it on the table/board or bed.

- Squeeze the muscle and inject at a 90 degree angle.

- Aspire for blood to make sure that you didn't enter a blood vessel and give medication slowly.

OR by taking an angle of 60 degrees toward the knee.

* If you feel that the muscle is small in size insert the syringe at a 60 degree angle to avoid hitting the bone and in this case you should make sure that the angle of exit is the same as the insertion angle OR enter only $\frac{3}{4}$ of the needle and this is more difficult.



ook.com/healing.nursing

Rectus Femoris muscle:

- Advantages: easily mapped/accessed, holds large amount and mature at birth.

- Disadvantages: visualized by child and close to the sciatic nerve and blood vessels.

Landmarks:

1- Located in the thigh (frontal view).

2- Divide the anterior side of the thigh into 3 parts from top to bottom

3- Inject in the middle third.

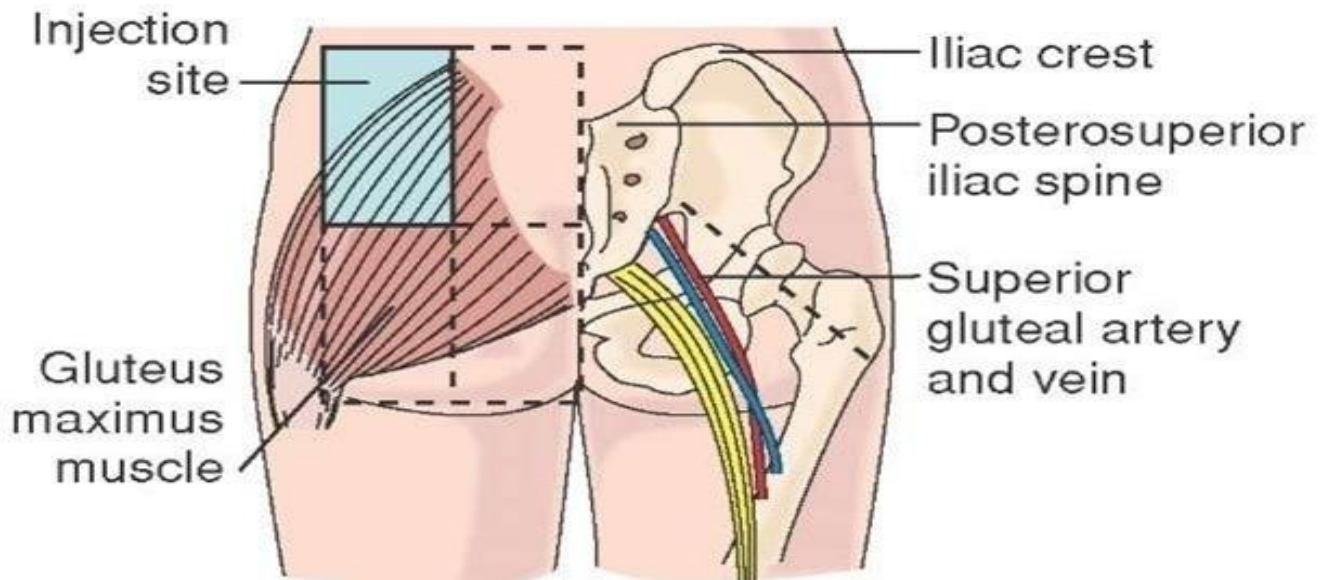
* Since we aren't professionals we are going to give via vastuslateralis route.



Dorsogluteal muscle:

- Advantages: large muscle, easy access.
- Disadvantage: close to the sciatic nerve
- Given after 3 years of age.

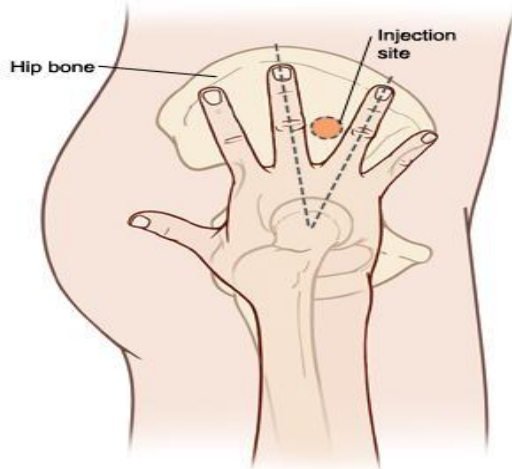
Landmarks: divide buttocks into 4 quadrants (half way down the middle and half way across), injection site is in the outer upper quadrant toward the hip.



Ventrogluteal muscle:

- Advantage: far away from the sciatic nerve (the safest), easily accessed and holds large amount.
- Matures after the child walks (at one year) and usually given at 3 years
- Given in supine or lateral position but after 3 years can be given in standing position.
- Land mark:
 - * Place palm of opposite hand on the head of the greater trochanter.
 - * Place thumb on groin.
 - * Place index finger on anterior superior iliac spine.
 - * Spread third finger laterally along iliac crest to form V shape.
 - * Palpate for well developed muscle at site.
 - * Inject in the formed V site.

* If injecting on the left side than my right hand will be on the left leg and vice versa.



<http://www.facebook.com/healing.nursing>

الفرص الجميلة تمر علينا دون أن
نستوقفها ،،
لأنها تندش داخل ملابس بالية اسمها
"العمل الشاق"
(محمد مستجاب)

**Done by:-
Saja Al-Sehyab
Sereen Abu-zaid**

Forgive Us For Any Mistakes

**لجنة التمريض .. Healing Group .. فكرة تحياً على نبض قلوبكم .. (:
#الفريق الأكاديمي**