3 Giving fluids (rehydration)

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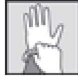
Making oral rehydration salts (ORS)



Attention

- Ready-made standard ORS sachets are best
  - Only make up ORS if ready-made products not available
- Important to get **right measurements of salt, sugar and water**. Don't be tempted to think ‘more is better’
- **Do not** use any fluid other than water when making up ORS solution
- **Do not** dilute ready-made ORS
  - Changes make-up of salts and sugars in solution, may not rehydrate well enough

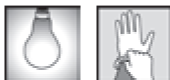
What you need

- Container with 1L clean drinking water
- Normal (standard) sized teaspoon
- Sugar
- Salt

What you do

- Wash your hands
- Add to 1L of water in container
  - 8 teaspoons of sugar
  - ½ teaspoon of salt
- Mix well with spoon

Putting in nasogastric tube (NGT)



Used to

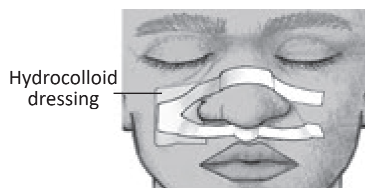
- Give fluids to dehydrated child
- Give medicines to child unable drink
- Remove air and fluid from stomach after trauma or obstructed bowel — to stop vomiting

Attention

- Use the correct nasogastric tube
  - For feeding — single lumen (8–10Fr)
  - For emptying stomach
    - Single lumen feeding tube — infants and children under 5 years (8–10Fr)
    - Double lumen tube (eg *Salem Sump*) — children over 5 years (10–12Fr), children over 12 years and adults (12–16Fr)
- In hot weather, cool tube in freezer or ice water for 10–15 minutes to make it firm
- **Do not** use nasogastric tube if
  - Broken nose or cheekbones
  - Bruising behind ears, blood and/or clear fluid coming from ears or nose, any signs of skull fracture. Consider how they were injured

What you need

- If child — helper to wrap and hold them
- Correct size nasogastric tube — see above
- Water-based lubricant
- Local anaesthetic spray *OR* lidocaine (lignocaine) 2% gel for adults
- Small strip of hydrocolloid dressing
- Cloth tape
- Pencil torch
- pH test strips
- 20mL syringe
- Vomit bowl, if person awake
- Marking pen
- Paper tape
- Drainage bag (if needed)



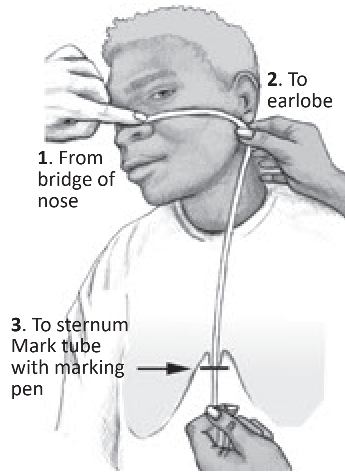
3.1

What you do

- Stick small strip of hydrocolloid dressing on cheek on same side of nose as tube is going — F 3.1
- Cut cloth tapes long enough to tie around person's head plus a bit extra

►

- Cut strip of paper tape long enough to go around tube and stick to person's nose and to hydrocolloid dressing on cheek — F 3.1



3.2

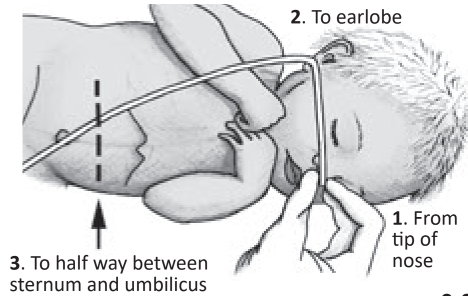
Measure length of nasogastric tube needed

Adults

- Hold tube upside down. Measure from bridge of nose, to earlobe, to bottom of breastbone (sternum). Mark tube with marking pen — F 3.2

Infants and children

- Hold tube upside down. Measure from tip of nose, to earlobe, to halfway between bottom of breastbone and umbilicus. Mark tube with marking pen — F 3.3



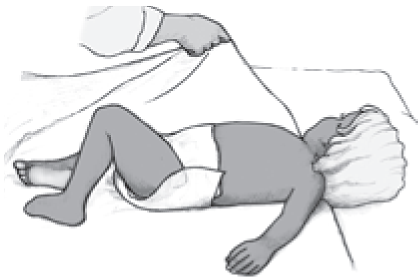
3.3

Prepare child

- Wrap child as shown — F 3.4–F 3.7
- If child restless — put bandage mittens on, so when you unwrap them, they don't pull tube straight out

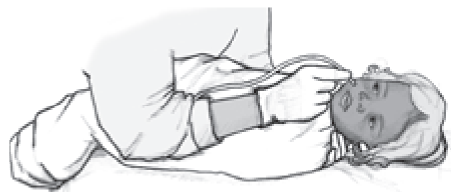
Position head

- Infants — bend head forward a little
- Adults — keep head straight or tilted back slightly

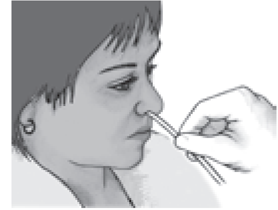

3.4

3.5

3.6


3.7

Put tube in



3.8

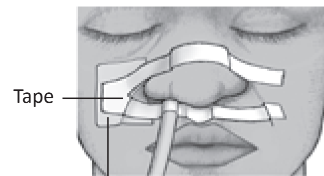
- Attach 20mL syringe to end of tube
- Lubricate tip of nasogastric tube or wet under tap
- Tell person it is normal to feel urge to gag, reassure them
- Keeping tube in straight line, gently push it back through chosen nostril — F 3.8, F 3.9
- Feed tube down back of throat, into food pipe (oesophagus) until pen mark reaches front of nose
  - If person awake — ask them to swallow a few times
- If person seems to be choking — take tube out straight away. Calm person/carer, try again
- Look in mouth with pencil torch as you push tube down. If tube coiled in back of mouth — take out and try again
- If small child — make sure they can't pull tube straight out
  - Put cloth tape around tube and tie behind head
  - *OR* put piece of tape around tube and stick to cheek or nose temporarily

3.9

Check tube in stomach

- Pull back (aspirate) small amount of fluid with 20mL syringe
- Check fluid acidity with pH test strip. Placement confirmed if pH 1.0–4.0
  - **Do not** use litmus paper for pH testing
- If unable to pull back fluid or if pH greater than 4.0 — advance tube 5cm and retest
- If pH still greater than 4.0 — either pull tube out and try again, or repeat testing in 30 minutes
- If you can't pull back fluid for testing — either pull tube out and start again, or x-ray
- If unable to confirm placement by pH testing — x-ray recommended before giving feeds/medicines by nasogastric tube

Now



3.10

- Plug end of nasogastric tube with stopper
- If tube has 2 outlets — put blue vent valve in blue outlet
- If tube in right place — tape properly to hydrocolloid dressing — F 3.10
- If still not secure — leave cloth tape in place and/or use more paper tape to stick tube to forehead so end hangs over ear, and/or pin it onto their clothes (out of sight if child)
- When you unwrap infant, be ready to stop them pulling tube straight out

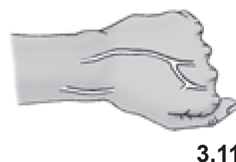
Putting in IV cannula and starting a drip

Used to give IV fluids and/or medicines. IV cannula connected to

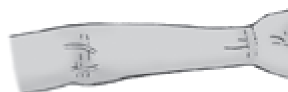
- Bung — if no fluids needed
- Drip — if fluids needed

Attention

- **Make sure you are putting needle into vein,** not into artery or nerve
- Can use vein in side of neck (external jugular), but if you go too close to chest you can cause a pneumothorax
- Always lie person down in case they faint
- If person has had mastectomy or dialysis fistula — use other side
- If person critically unwell or in cardiac arrest and putting in IV cannula likely to be difficult or take too long — consider IO needle (*p88*)



3.11



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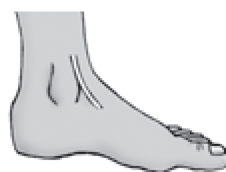


3.13

- Biggest veins usually found
  - On back of hand and side of wrist — F 3.11
  - On inside crease of elbow — F 3.12
  - Just in front of inside ankle bone — F 3.13
  - On inner forearm — common in men
  - In groin (femoral vein) — in emergency only
- Look at, then feel (palpate) and bounce vein. Big (prominent) veins sometimes not the best
- Lower arm/leg below level of the heart to help fill veins
- If cold — warm body part to help find vein
  - Put hand in bowl of warm (not hot) water for 5 minutes

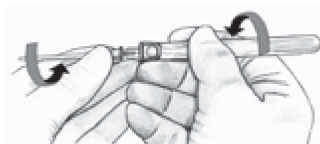
What you need

- Helper if possible
- Sterile dressing pack — to use as sterile area (optional)
- Bluey
- Tourniquet
- Alcohol wipes
- Tape
- 8cm x 6cm piece of see-through sticky dressing
- IV bag sticker and drip stand or somewhere to hang fluid bag, if needed
- Sterile bung or prepared intravenous giving set, short extension and IV fluids
- 10mL normal saline in syringe

- Intravenous cannula of right size
  - 22–24G infants and children
  - 20G adults
  - 16G adult trauma, resuscitation or shock — for rapid fluid resuscitation

What you do

- If drip needed — write date and time on IV bag sticker with marker
  - Connect IV fluids to line, prime line with fluid, let out any air bubbles
- Choose vein you are going to use, put bluey underneath
- Lay out dressing pack and equipment. Wash hands, put on gloves
- Clean site with alcohol wipe, let dry
- Put on tourniquet, ask person to make a fist, hold it, then relax
  - *OR* if small child — ask helper to squeeze limb with their hands
- Wait for vein to swell
- Loosen plastic cannula from needle base by twisting 180° — F 3.14
- Pull person's skin down, to hold vein still — F 3.15
- Hold IV cannula with needle bevel facing upward, at 20–30° angle to skin. 20° for small vein, 30° for deep vein. Insert into vein and see flashback of blood
- Lower cannula to nearly level with skin, gently push 6–12mm into vein
- Slide teflon cannula fully up vein, while holding trocar still
  - Press firmly on skin above plastic cannula. Press with your thumb or arch made by your thumb and forefinger around limb — F 3.16
- Undo tourniquet **then** take out needle/trocar
- Use piece of tape to secure cannula
- Flush with 5–10mL **normal saline** to make sure you are in vein. Should be no swelling above cannula site
- Connect bung or IV line to cannula. Run IV fluids as needed



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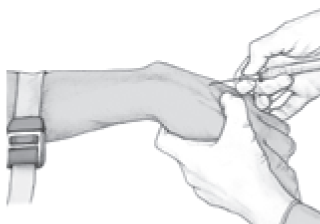


3.15

3.16

- Put on see-through dressing — can check site for redness or swelling
- Tape IV line to skin in a loop, bandage lightly over cannula and tubing
- May need to splint area to stop movement
- If person complains of pain or pressure — check cannula in vein, not in tissue (swelling)

Putting in butterfly IV needle

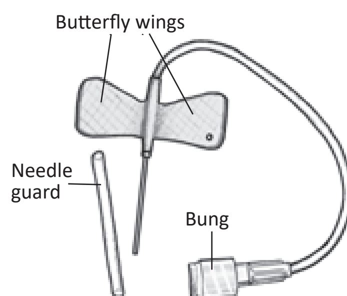
Good for giving one-off doses of IV medicines, taking blood from small children and people with small, thin veins, if you can't get IV cannula in.

Attention

- **Make sure you put needle into vein,** not into artery or nerve
- Always lie person down in case they faint

- If young child — consider wrapping them first (*p82*)
- Can use same veins as for IV cannula (*p84*) and smaller veins in back of hands, feet, ankles, scalp
- If butterfly needle to be left in place — remember that sharp point of needle can puncture vein, especially if person restless. Check site often for swelling, redness, pain

What you need



3.17

- Helper if possible
- Sterile dressing pack — to use as sterile area (optional)
- Bluey
- Tourniquet
- Alcohol wipes
- Butterfly needle with plastic tubing and screw-down bung of right size — F 3.17
- Paper tape
- 8cm x 6cm piece of see-through sticky dressing, if needed
- 10mL normal saline in syringe if giving IV medicines or attaching IV infusion
- IV bag sticker and drip stand or somewhere to hang fluid bag, if needed

What you do

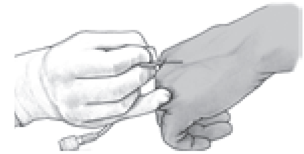
- If drip needed — write date and time on IV bag sticker with marker
  - Connect IV fluids to line, prime line with fluid, let out any air bubbles
- Choose IV injection site, put bluey underneath
- Lay out dressing pack and equipment. Wash hands, put on gloves
- Clean site with alcohol wipe, let dry
- Put on tourniquet *OR* use helper's hands to squeeze child's limb
- Wait for vein to swell
- Unscrew bung ¼ turn before inserting needle. Lets blood flow back into tubing during insertion so you know you are in vein
- Fold up wings of butterfly to get good grip — F 3.18

3.18

- Angle needle with bevel upward, parallel to skin, then down into vein — F 3.19
- Blood will flow back into needle and plastic tubing. Tighten bung

If taking blood

- Take screw top off bung, connect syringe, or have syringe attached before starting. May need to tape butterfly wings to skin to stop movement
- Take enough blood to fill blood bottles needed


3.19

If giving IV medicine or IV infusion

- Flush using 10mL syringe of **normal saline**
- Let blood flow most/all the way back to bung before connecting to drip
- Then take off tourniquet and tape butterfly 'wings' firmly to skin
- If leaving butterfly needle in place — check skin at site for signs of redness, swelling, pain

Putting in intraosseous needle

Emergency life-saving procedure. Needle put into bone marrow space to give fluids, antibiotics and other medicines. Used when you can't get IV cannula in.

Types of IO needles/devices

- Different types of IO needles and devices available
  - Spring-loaded devices use spring to insert IO needle (eg *FAST1*, *BIG*)
  - Drill devices use battery powered drill to insert IO needle (eg *EZ-IO*)
  - Traditional IO needles use trocar and IO needle (eg *Cook*, *Jamshidi*)
- All devices use same insertion sites and follow same basic principles
  - Spring-loaded and drill devices are easier and quicker to use

Attention

- The following are basic principles only
  - **Always** check manufacturer's instructions for your device
- Manual IO needle should only be used if no other devices available
- Practise regularly with IO device on fresh chicken thighs or the barrel of a 5mL syringe so you know how to use in emergency
  - Keep one needle open for this purpose
- Can look frightening to parent/carer so explain what you need to do, reassure them it is standard procedure
- If small child — can use ordinary large 16–19G injection needle, but easier with proper sized, pre-packaged, sterile IO needle and handle
- If person very unwell — local anaesthetic not required
- If IV fluid leaks out of site you tried before — stop with firm direct pressure
- **Do not** tape over manufacturer's securing devices — follow the instructions

Do not put IO needle into broken bone, through burnt or badly infected skin.

What you need

- Device
  - Spring-loaded IO (eg *BIG* or *EZIO*)
    - Adult — blue
    - Big babies and children — red
  - *OR* IO drill and appropriate size needle kit
    Note: Make sure you check inside packet for securing devices
  - *OR* IO needle in correct size
    - Adult 12G
    - Child 16G, or wide bore injection needle 16–19G
- Helper
- Clean towel

- Bluey
- Sterile dressing pack, optional
- Povidone-iodine antiseptic solution
- Sterile extra gauze swabs
- IV line primed with normal saline
- 5mL normal saline in syringe
- Local anaesthetic (lidocaine [lignocaine] 1%), syringe and needles, if needed
- Sterile gloves
- Splint
- See-through sticky dressing, if needed

What you do

- Put rolled up towel under knee to help hold leg still
- Lay out dressing pack and equipment
- Wash hands and put on sterile gloves
- Clean site
- Put in local anaesthetic, if using
- Insert IO needle — see *Spring-loaded device* (*below*), *Drill* (*p90*), or *Manual IO* (*p90*)

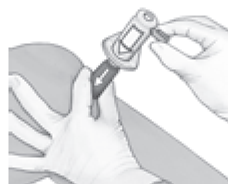
Locating proximal tibia insertion site

- Feel for bump on the shin under the kneecap (tibial tuberosity)
  - Adult — go 2cm across toward other leg (medially), then 1cm up
  - Child — go 1cm under bump, then 1cm across toward other leg (medially)

Note: You are trying to avoid the joint.

Spring-loaded device

- Choose device
  - Blue for adults — use on proximal tibia, medial malleolus or humerus
  - Red for children — use on proximal tibia
- Remove device from package, face device (in direction of arrow) away from person and user
- Wind red device to select the correct age (0–3, 3–6, 6–12)
- Locate insertion point and stabilise leg
- Position gun on chosen location at 90° (right angle), hold coloured barrel firmly with non-dominant hand — F 3.20
- Remove safety latch — F 3.20, put somewhere safe
- Position dominate hand with fingers under wings, palm over barrel — F 3.21. Push down firmly, have arm straight to reduce kickback



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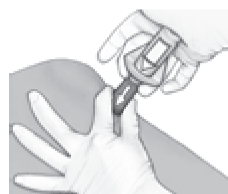
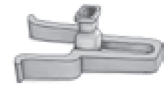


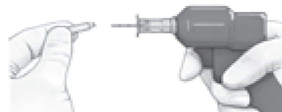
3.21

- Lift device up and off site gently, then remove trocar by twisting and pulling upward. If tight — use artery forceps
- Stabilise cannula with safety latch — F 3.22


3.22

If using drill

- Attach correct sized needle, remove safety cap — F 3.23
- Locate insertion point and stabilise limb
- Insert needle to 5mm mark — F 3.24, at 90° (right angle) to bone — F 3.25
- Operate drill until you hear the ‘pop’
- Hold needle set and remove drill — F 3.26
- Unscrew trocar and remove from catheter
- Secure needle with stabiliser if provided or see *Secure needle* (*p91*)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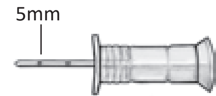

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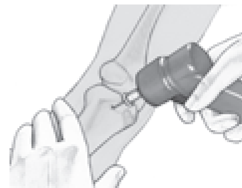
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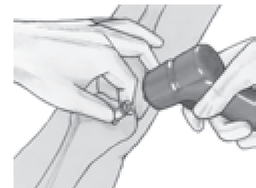
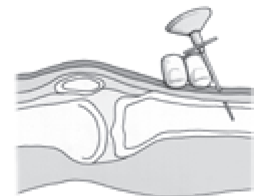
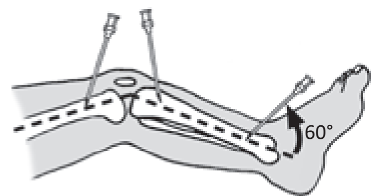

3.26

Manual insertion

Always angle needle at 60° away from joint — F 3.27. Avoids damage to growth plates (epiphyses) in children's bones.


3.27

- Choose site — F 3.28
- Use non-dominant hand to stabilise limb — F 3.29. Keep bone stable, skin tight
- With handle of needle in palm of your dominant hand, hold shaft of needle about 1cm from point — F 3.29
- Start at 90° (right angle) to bone until needle ‘bites’, then angle needle at 60° away from joint. **Slowly** and firmly push and grind it in using clockwise and anti-clockwise screwing motion of wrist and hand
- You will feel a ‘give’ and a ‘crunch’ when needle goes through bone into marrow. Needle should now stand on its own
- Hold outer needle firmly while you take out inner needle (trocar)
- Aspirate and start bolus and medicine
- Secure needle (*p91*)



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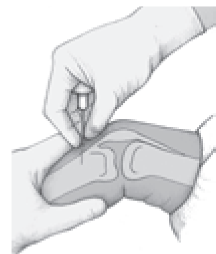
3.29

Aspirate and start bolus and medicine

- Aspirate blood sample if needed (often difficult)
- Flush needle with **normal saline** to clear any bits of bone or marrow
  - If conscious — use **lidocaine (lignocaine) 1%** then 5mL **normal saline**
    - 15–30kg — 1mL lidocaine (lignocaine) 1%
    - Over 30kg — 2mL lidocaine (lignocaine) 1%
- To give bolus to baby or child — use 20mL syringe to give 10–20mL as IV push
- Connect IV line — often difficult to get them to run freely
- When infusion running, carefully check above, below, behind needle site for swelling. Swelling may mean fluid going into tissues. Stop and start again at another site

Secure needle

- Use tool supplied with device — allows for checking needle and site
  - If no tool supplied or using manual insertion — secure by placing see-through dressing on either side of needle
- Splint leg