

## 12 Medicines

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# Managing a remote clinic dispensary

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Standards for setting up a dispensary in remote areas.

## Room design

- Big enough to store medicines for chronic disease and acute imprest separately, space for 2 fridges
- Lockable door, security screens on all windows, no public access
- Well lit
- Constant room temperature (less than 25°C) with good air circulation. Air conditioners should be connected to back-up power supply
- Shelving — clearly labelled, enough room to store and display medicines
  - If shelving above shoulder height — non-slip step or two-rung ladder
- Workbench with waterproof top, large enough for at least 2 practitioners to prepare medicines for dispensing
  - If workbench low — adjustable swivel chair on wheels
- Computer with access to internet and electronic file notes
- Stainless steel sink, elbow control taps, soap dispenser, paper towel holder
- Equipment for dispensing medicines — purified water, measuring devices, medicine cups, paper cups, syringes, tablet cutters, mortar and pestle (for crushing tablets), tablet counter (eg triangle)
- Equipment for packaging medicines — dose aids, labels, cartons, bottles, time of day (sun and moon) stickers, warning labels. If clinic prepares heat-sealed blister packs — need iron and heatproof pad for sealing
- 2 containers for return of unwanted medicines (RUM)

## Lockable safe

- Safe attached to wall, large enough to store all controlled drugs and prescription medicines that can be misused, eg **benzodiazepines, codeine**
- Drug register for recording supply and use of all restricted S4 and S8 medicines. In some states you may need 2 separate books

## Cold storage areas

- 2 refrigerators
  - 1 for vaccines storage (*p334*) — purpose built vaccine refrigerator
    - Display current Vaccine Cold Chain Graph
  - 1 for all other medicines needing refrigeration
  - Both monitored daily for temperature — should be 2–8°C

## References

- Medicine specific books such as
  - *Australian Medicines Handbook*
  - *Medicines Book for Aboriginal and Torres Strait Islander Health Practitioners and Health Workers*
  - *Australian Therapeutic Guidelines*

- *Australian Immunisation Handbook*
- *Australian Injectable Drugs Handbook*
- Best-practice guidelines, eg *CARPA STM*, *WBM*

## Ordering medicines

- Chronic diseases medicines can be ordered through PBS or S100
- Restock all imprest and prescription medicines every month
  - If medicines going out of date — think about reducing imprest size
  - Think about whether you need to keep medicine in stock before re-ordering
- Make orders for wet season or events (eg ceremonies, sports carnivals) in advance
- Discuss special projects (eg mass treatment programs, clinical trials) with pharmacy in advance to give them time to organise stock

## Stock management

**Remember:** Check medicine stocks in your Remote Emergency Kit (p20) and ambulance (p22) as well.

- Store and transport medicines at recommended temperatures, eg under 25°C for shelf medicines, 2–8°C for fridge medicines
- Unpack and store medicines as soon as possible after delivery
- Store in categories by active ingredient in alphabetical order. Label shelves with generic names of medicines
  - ATSIHP/AHW medicines can be stored separately for convenience
- Document how your medicine stock is organised to make it easier for all staff, including visiting doctors, nurses
- If using imprest list — keep list in same order as medicines on shelves. Makes it easy to fill your order. Fill imprest list as you check along shelf
- Work with supplying pharmacist to develop and regularly review imprest list. Keep order quantities at level that reflects twice your order period usage, eg if you order monthly, keep 2 months worth of stock. This covers you for any delays in delivery or unexpected high use
- Keep medicine containers neat and clean so easy to find, labels easy to read
- Circle expiry date on new stock or write clearly on container. Put behind current stock — try to make sure older stock (first to expire) is used first
- If expiry date only printed on outer package
  - Keep stock inside package until it is going to be used
  - *OR* If items need to be taken out of packaging — write expiry date on each separate item
- Check expiry date on current stock once a month. Make this part of your routine clinic checklist
- Try to use, or redistribute in region, any stock soon to expire
- Dispose of expired stock according to health centre policy

# Storing and transporting vaccines or medicines

## Attention

Always have **anaphylaxis kit** (*CARPA STM p35*) ready when giving vaccines.

- If you are carrying vaccines or medicines in vehicles — keep them out of the sun, cover with blankets or pillows

## Maintaining cold chain process — vaccines

If not stored at correct temperature — vaccines will not work and people will not be immunised.

- Cold chain process monitors vaccine storage temperatures and lets you know if there are any problems
- Many states require practitioners to have formal training in how to give and store vaccines — for more information see The National Vaccine Storage Guidelines (Strive for 5).

## Attention

- **Never separate vaccines from cold chain monitors**
  - Monitors are put in bag with vaccines by pharmacy so you can check they are kept at right temperature (2–8°C) during travel to clinic
  - If vaccines too warm or too cold when they arrive — store where they will not be used, talk with pharmacy or state vaccine centre to find out
    - If vaccines need to be thrown away
    - What caused problem with temperature
- **Don't open fridge door**
  - During power cuts or fluctuations
  - Unless you know what you need — find it quickly, close door
- **If you know power is going off for more than a few hours — get ready**
  - Take vaccines out, close door quickly
  - Surround or wrap vaccines loosely in insulating material, eg polystyrene chips, shredded paper, bubble wrap, newspaper, put in esky
  - Put esky back in fridge with ice bricks, keep door closed
  - Never let bare ice bricks touch vaccines — may freeze

**Note:** Extreme temperature changes, eg very hot days followed by very cold nights, affect fridge temperatures and can cause vaccines to freeze. Monitor very carefully, adjust fridge settings slightly if you need to, but don't make sudden, drastic changes. Fridge temperature controls can be tricky.

## What you need

- **Purpose built vaccine refrigerator** plugged into back-up power supply (if available). Should have
  - Clear (glass) door, clearly labelled shelves so you can see what's inside without opening door
  - Temperature probe on inside, temperature monitor on outside
  - Minimum of one heat and one freeze sensitive monitor on each shelf
  - Vaccines stored away from sides, top, bottom
  - Stock rotated (new stock behind current stock)
  - Sign on door to remind people to keep it closed
- Temperature monitor chart for recording daily temperatures
- Two types of cold chain monitor
  - **Freeze-sensitive** — turns purple if vaccine stored below freezing
  - **Heat-sensitive** — gradually turns blue if vaccine stored above 8°C
- Ice bricks and esky (in case of power or fridge failure)

## What you do

- Check and mark on cold chain monitor cards — date vaccines arrived in clinic, colour of monitors
- Monitor card will indicate freezing or heat exposure
  - Follow instructions about what to do for each vaccine
  - If vaccine not listed on card — contact supplying pharmacy
- Check cold chain cards each time you take out vaccine for use
- Check and mark cold chain cards once a week, note changes to monitors
- Do daily check of highest and lowest fridge temperatures, using special thermometer, record on temperature graph chart
  - Temperature should be kept at 2–8°C. If big variations — find out why. May be the weather, power supply, fridge, thermometer/monitor
  - **Fix problem as soon as you can to stop loss of vaccines and possibility of giving vaccines that won't work**

## Storing, transporting, checking controlled drugs

### Attention

- **Take a lot of care with routine checking of controlled drugs.** If working alone — ask visiting medical staff to check with you as often as possible
- **Before you give controlled drug to patient** you must know your state's laws and best-practice procedures. If you are alone — good idea to at least have patient check label and amounts with you, if possible
- **Never leave controlled drugs in vehicles** when carrying from town. Check local requirements about transport and receipt of these drugs

## What you do

- Keep controlled drugs (and some prescription medicines) in strong metal safe attached to wall — see *Managing a remote clinic dispensary* (p332)
- When drugs arrive, ask colleague to check them into drug register with you, sign and return pharmacy receipt as soon as you can
- Always do a check with arriving and departing relief staff
- Check and record in register at least once a week or as required by your health service policy. Add this to your routine clinic checklist
- Ask your visiting pharmacist to check balances and entries each time they visit, record this in drug register

# Giving medicines



**Remember:** Right person, right medicine, right dose, right route, right time.

- Make sure you are *legally* allowed to give the medicine

## What you do

### Follow the 5 rights

- **RIGHT patient**
  - Make sure you have right patient and right set of records
    - Ask patient's name, date of birth, skin name, next of kin
    - Check patient's name and date on prescription
- **RIGHT medicine**
  - Check name and spelling of medicine against prescription
  - Check use-by date on package
  - **Is it safe for this patient**
    - **Always ask about** allergies, pregnancy, breastfeeding, other medicines, medical problems, eg kidney problems
  - Could it interact with other medicines patient is taking
  - Is it in your protocol manual, eg *CARPA STM*, *WBM*
  - Look up in reference manual, eg *AMH*, *Medicines Book*. What is it, how does it work
  - Are you allowed to give medicine or should you contact doctor or pharmacist
- **RIGHT dose**
  - Check dose on prescription and in reference manual, eg *AMH*, *CARPA STM*, *WBM*
  - Check strength — medicine can be packaged in a range of different strengths and forms
  - Measure dose carefully using proper equipment
  - If dose is by weight — check person's weight. **Always weigh children**
  - Watch and help parent/carer give first dose to children
- **RIGHT route**
  - Check how to give (administer) medicine, eg orally (tablets, syrups, sublingual, buccal), by injection (IM, IV, SubCut), transdermal
- **RIGHT time**
  - Check how and when medicine should be taken, eg night, morning, with food, on an empty stomach

## Label medicine

See example of completed medicine label — F 12.1 (*below*)

- **KEEP OUT OF REACH OF CHILDREN** written in red on white background
- Name (active ingredient) of medicine and strength (mcg, mg, g)
- Total number of tablets or amount of liquid in package
- How to take — dose and number of times, eg Take 1 tablet 3 times a day
- Special directions, eg take with food, keep in fridge. Use stickers if available
- Name of patient
- Name, address, phone number of clinic
- Your name or initials
- Date you gave out medicine
- Use-by (expiry) date, taken from original packet
- Prescription reference number (if your clinic uses these)

**KEEP OUT OF REACH OF CHILDREN**

DRUG Metformin STRENGTH 500mg

Take one (1) tablet/capsule/ml three (3) times a day with food as directed

Patient Peter Jones

Issued by Ross Collins ATSIHP Date 20.4.14

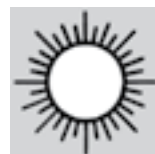
CLINIC Mt. Eagle Clinic NT ph8912 3456 Qty 100 tabs  
Use by Aug 2015

12.1

- If poor English or eyesight — use medicine time stickers
  - Morning/evening — F 12.2
  - Middle of the day — F 12.3
  - Night time, before bed — F 12.4



12.2



12.3



12.4

## Check what you have done and record

- Record in file notes, hand-held copy for travellers, in register (eg Schedule 8) if needed
- Make sure file notes include
  - Name of medicine, date and time of supply
  - Reasons for giving
  - Name of person ordering medicine, or protocol used
  - Strength and amount (quantity) given, eg 2mg in 4ml, 20 x 500mg tabs
  - Way it is given (route), eg by mouth (oral), by injection into muscle (IM)



- Dosing instructions, eg Take 1 tablet 3 times a day
- Counselling given, including any possible side effects
- Name and designation of person supplying medicine

### Before giving medicine make sure person knows

- Why they are taking the medicine
- Possible side effects
- When and how to take it
- How to store it, eg in fridge, away from children

Ask them to repeat what you told them to make sure they understand.

### Check

- Are tests needed, eg blood tests
- Does person need to come back to clinic, when

## Dose administration aids

Includes dosette boxes, blister packs, sachets.

### Filling dose administration aids (dose aids)

#### Attention

- **Do not** get distracted when filling dose aid. Focus on the job
- **Do not** use dose aid label to refill aid — it may be an old prescription
- If person visiting from another community — ask if they have a copy of their prescription/s. If not — ask their clinic to fax current one/s

#### What you need

- Up-to-date prescription or file notes
- Dose aid
- Pen
- Medicine/s — from medicine basket in pharmacy, or stored under person's name. Take **extra care** to collect right medicine

#### What you do

- **Check**
  - Right person and right prescription or file notes
  - Reusable dose aid clean. Most come apart for easier cleaning, refilling
  - Preparation area clean and tidy, hands clean
  - **Dose aid label** — you must check every time dose aid is filled
    - Full name of person
    - Name and strength of medicine

- Amount to give, how to give, how often
- Name of clinic where usually filled
- Label and changes to it are clear. If not — use new label
- **Fill dose aid.** Put in medicines one at a time. Follow current prescription in same order
- Put medicine packet back into basket or move to one side
  - **Do not** put packets back onto shelves or throw away empty containers until dose aid has been checked
- Record in file notes — date, your name and designation, whether dose aid was given to person or stored for later collection
- Check again you have right person, they understand how to use dose aid
- **Check** filled dose aid by following procedure below
- Before sealing, ask another staff member to check medicine/s in dose aid. If not possible — make a second check yourself
- Write on sticker across end of dose aid — date, your name, clinic name

## Checking filled dose aid

### What you do

- **Check**
  - Medicine used has not expired
  - Both original medicine packet and label on dose aid match prescription
  - One full day's medicine by emptying out cell/s and refilling from prescription, checking colours from original packets if needed
  - Each of the other cells for **same number and colour**, eg 2 small white + 2 large white + 1 yellow + 1 blue/white capsule = 6
- **Sign and date** record of dose aid check in file notes, or on prescription. Make sure person filling dose aid has also signed file notes or prescription
- **Close dose aid**, seal if possible. Some reusable dose aids can be sealed by putting a sticker across opening end. Initial and date sticker

## Medicine by delivery type

### Attention

- If medicine bitter — have person suck on an ice cube beforehand
- Give children sultanas, fruit, orange juice to help cover unpleasant taste

## Giving tablets

### Attention

- **Do not crush enteric-coated tablets or slow-release tablets.** If not sure — check prescription or refer to a reference manual

## What you do

- **To halve tablets**
  - Only halve tablets that have a line — F 12.5
  - Use a tablet cutter or sharp knife on clean piece of paper towel
- **To crush tablets**
  - Check manufacturer's instructions to see if this is OK
  - Crush between 2 spoons or use pestle and mortar. Mix with honey and/or give with a drink of water



12.5

## Giving syrups

### What you do

- If syrup not premixed — add exact amount of sterile water prescribed on bottle. If sterile water not available — use clean tap water
  - Use graduated measure or syringe for exact measurements
- Shake syrup bottle to mix well. Watch for powdery lumps
- Put medicine cup on bench and bend down so cup at eye level to check you are pouring out exact amount. If amount small — use syringe

## Giving medicines under tongue (sublingual) or inside cheek (buccal)

### Attention

- Sublingual medicines may only be effective for a certain period of time after packet opened, eg 3 months
  - **Do not** use if packet open and has no date, or has been open too long
- When opening new packet, write today's date on it
- Get person to wet tablet with saliva and put under tongue. Wait for it to dissolve. If any tingling — tell them to put in cheek instead

## Putting medicine patches onto skin (transdermal)

### Attention

- Make sure **old** transdermal patch removed. Some changed straight away, some need to stay off for 10–12 hours, eg **glyceryl trinitrate**
- Check how long new patch should stay on — may be hours or days
- Wear gloves **OR** if too difficult to put on patch wearing gloves — wash hands straight afterwards so you don't absorb any medicine yourself

### What you do

- Clean new site, dry carefully. If person hairy — shave area so patch sticks
- Take foil off patch, smooth patch onto site sticky-side down
- Write time and date applied on edge of patch

- If person very sweaty or weather hot or humid — put plastic see-through dressing or sticky tape over patch to keep in place

## Giving medicine through nasogastric tube

- See *Putting in nasogastric tube* (p82)

### Attention

Tube **must** be in right place before you start giving medicine.

### What you need

- Litmus paper and/or stethoscope and syringe to test tube's position
- 10–20ml syringe barrel — you don't need plunger
- Medicine in a medicine cup
- 20ml of tap water in a cup

### What you do

- Test that tube is in stomach (p83)
- Fold small piece of nasogastric tube over to clamp it off
- Take out tube stopper/plug, connect syringe barrel to tube
- Fill syringe barrel with medicine
- Unfold tube, hold tube and syringe up high to let medicine flow down tube.  
**Do not** force with syringe plunger
- When empty, add 10–20ml of water to syringe barrel, hold it up to flush.  
When empty, fold tube over again to clamp it off
- Take off syringe, unfold tube, put back stopper/plug

## Giving rectal suppositories

### Attention

- **Do not** let suppository get too warm, will soften and be hard to put in

### What you do

- Lie person on left side
- Take suppository out of packet, lubricate pointy end
- Separate buttocks, ask person to breathe deeply and try to relax
- Using forefinger, gently push suppository into anus (pointed end first), to length of your finger — F 12.6
- Do again if second suppository needed
- Take out finger, gently hold buttocks together until urge to pass faeces gone
- Wipe area with tissues



12.6

# Giving medicines and injections to babies and young children



## What you do

### For infants

- Use dropper or syringe to put one drop at a time onto tongue and wait for them to swallow — F 12.7
- *OR* Use syringe nozzle between gums and cheek to give small amounts at a time — wait for swallow reflex
- *OR* If breast fed — use syringe nozzle between breast and side of baby's mouth to give small amounts at a time — F 12.8



12.7



12.8

### For young children

- Hold in positions shown — F 12.9, F 12.10
  - If kicking, put legs between carer's thighs and ask carer to hold tight
- For medicine — keep medicine cup to lips, so if child spits out syrup you can catch it and give it to them again



12.9



12.10

# Giving medicines by injection, injection sites

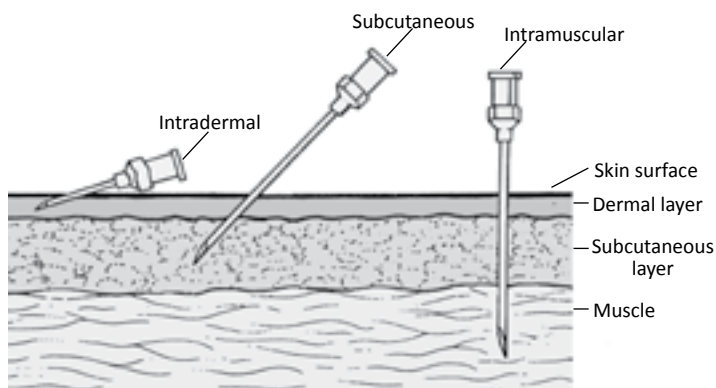


## Attention

To prevent needle stick injuries, always carry injections in plastic tray or kidney dish.

- Always check file notes, ask person about allergies or adverse reactions
- Remember the **5 rights** (p337) before giving any medicine
- Always check manufacturer's instructions
- If injection site dirty or bloody — wash with soap and water
- Draw up solution, put needle in sharps container
  - Except insulin syringes — needles can't be removed
- Put on fresh, sterile needle to give injection
- **To stop injection stinging**
  - Before giving — clean site with alcohol swab, let dry completely
  - After giving — use gauze or cotton wool to press down firmly on site
  - Check manufacturer's guidelines

## Angle and depth of injections — F 12.11



12.11

## Injection sites

### SubCut or IM injection sites

- Outside (anterolateral) thigh (vastus lateralis), baby or toddler — F 12.12
- Outside (anterolateral) thigh (vastus lateralis), child or adult — F 12.13
- Upper arm (deltoid) — F 12.14



12.12



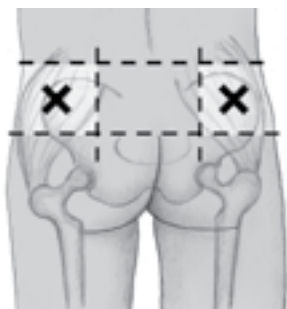
12.13



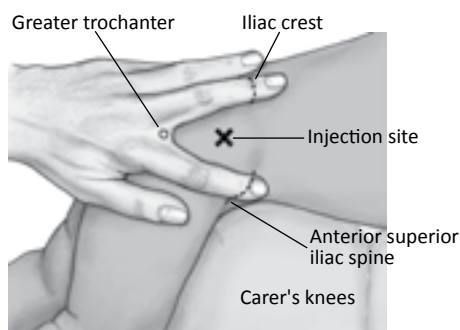
12.14

### IM injection sites

- Buttock (gluteal) — F 12.15
- Ventrogluteal — F 12.16



12.15



12.16

## Intradermal injections

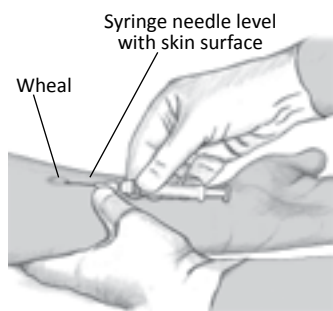
Used for BCG or Mantoux testing

### What you need

- Injection tray
- Alcohol swab
- Insulin syringe
- Gauze swab
- Injection solution

## What you do

- Choose injection site, clean with alcohol swab, let dry completely
- Draw up solution
- Hold syringe with needle's bevel edge facing up and lying flat to skin
- Slide bevel edge under skin until it disappears, then a **little** further (into intradermal tissue)
  - **Keep level with skin** — F 12.17
- Slowly inject solution until you see raised area (wheal)
- **If wheal is not appearing** — adjust needle position and continue injection
  - **Do not** repeat dose
- **Do not** put pressure on site after taking out needle. Ask person to blow on area until it dries
- **Do not** rub site or put on sticking plaster. Leave open to air



12.17

## Mantoux test or BCG

- First check person's Mantoux test status
- Only give Mantoux test or BCG if authorised to do so
- Inner forearm most commonly used for Mantoux test — F 12.17
- **Check regional guidelines** to see if BCG given in right or left upper arm (deltoid area)
- **Never** cover BCG or Mantoux test injection site with dressing

## SubCut injections

### Attention

- If person has daily medicines, eg insulin for diabetes — change injection site often

## What you do

- For angle and depth of injection — see F 12.11 (*p344*)
- For injection sites — see F 12.12, F 12.13 (*p345*)
  - Fatty pad below umbilicus can also be used in diabetes

## SubCut cannula

Used if people in palliative care or can't swallow medicines. More comfortable than repeated IM or IV injections, less likely to become infected.



## Attention

- *Intima* catheter — F 12.18 allows for regular administration of medicine by
  - Injecting into side portal
  - Continuous infusion through syringe driver
- If *Intima* catheter not available — use 22–24G cannula with bung
- Rotate sites. Make a plan using sites that allow person the most movement
- **Do not** use metal butterfly needles. Need re-siting more often, less comfortable



12.18

## What you do

### Choose site

- Anterior chest wall
- Above pectoralis muscle
- Anterior abdominal wall — **do not** use if ascites, abdominal disease, oedema
- Upper arm — **do not** use if bed-bound and needs frequent turning
- Outer thigh
- Above shoulder blades — good if person restless or disorientated

### Do not use

- Breast tissue or skin folds
- Portacath and CVC sites
- Stoma sites
- Tumour masses, tumour nodules, oedematous areas
- Scar tissue, mastectomy sites
- Bony areas — use intercostal spaces on chest wall

### Inserting *Intima* catheter or SubCut cannula/needle

- Clean site with alcohol swab, allow to dry. Trim hairs if needed
- Lift fold of skin between forefinger and thumb, insert full length of cannula/needle at 30° angle
- Tape down butterfly flaps with film dressing, (eg *Opsite*, *Tegaderm*, *IV 3000*)
- Remove metal insert, dispose of in sharps container
- Attach injectable bungs to outlets (if not already there)
- Prime line with sterile water or **normal saline** before injecting medicine

### Follow-up

- Label site with date of insertion, record site in file notes
- Check site before giving injection
- Check site regularly for swelling, redness, leakage when injection given
- Resite in 7–10 days

## IM injections

### Attention

- Using small bore needle **causes more pain**, as more pressure needed
- Best site for babies and toddlers is outside (anterolateral) thigh (*p345*)

### What you do

- Choose site — F 12.12—12.16 (*p345*)
- Usually use 25mm long needle. Use 16mm for small babies, 38mm if obese
- Position limb so muscle being injected into is relaxed
  - Buttock — standing bent forward with hands on bed or lying on stomach (prone), foot turned inwards
    - If person large or tall — suggest lying down, won't hurt themselves or you if they faint
  - Ventrogluteal — lying on side with upper leg flexed and forward
  - Outside thigh — lying on back (supine) with toes pointing midline
  - Upper arm — sitting with elbow bent and forearm supported
- If repeat injection — use different site to last time
- Clean site with alcohol swab, let air dry
- Pull skin tight, or use Z-track method (*p349*) — insert needle quickly at 90° to skin
- Pull back plunger to check for blood (to make sure you are not in blood vessel). Change site if needed
- Slow steady injection
- Remove needle quickly, apply pressure to injection site

### To lessen pain of thick injections, eg benzathine penicillin, procaine penicillin

- Mix well by shaking
- *OR* Warm and mix by rolling syringe in your hands for 1 minute
- Use needle provided with pre-loaded syringe
  - **Do not** change to smaller bore needle, more likely to get blocked
  - **Do not** pre-load needle — leave hollow of needle empty
- Before injecting
  - Put ice pack on site
  - Press **hard** on site with thumb and count to thirty (30–60 seconds)
- This medicine very painful. Best to have helper, patient may try to grab syringe

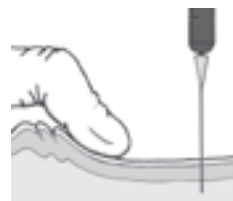
## Z-track injections

### Attention

- Use for
  - Thick fluid injections, eg benzathine penicillin. Can leak out through large bore needle track
  - Iron injections — can permanently stain skin if solution leaks out

### What you do

- Choose site
  - Larger/older children and adults — IM into
    - Buttocks — F 12.15 (p345)
    - *OR* Ventrogluteal — F 12.16 (p345)
  - Small children — IM into
    - Outside (anterolateral) thigh — F 12.12, F 12.13 (p345)
    - *OR* Ventrogluteal — F 12.16 (p345)
- Pull skin down from chosen site, hold in this spot — F 12.19
- Put needle into muscle and give injection slowly
- When finished, leave needle in place for about 10 seconds. This stops leaking of medicine solution onto skin surface
- Take needle out, let go of skin. This will make Z-track — F 12.20



12.19



12.20

## Long-acting (depot) antipsychotic injections

Medicine	Storage	Dilute	Needle	Injection method	Comments
<b>Risperidone long-acting</b>	Refrigerate (2–8°C).	Must use diluent in syringe in dose pack.	Must use right needle in dose pack. Gluteal – 50mm 20G. Deltoid – 25mm 21G.	Deep IM injection into gluteal or deltoid muscle. Z-track (p349).	To make sure correct dose given, full contents of vial must be used. <b>Do not</b> give part of vial. Give straight after mixing. Only prime to syringe barrel, <b>do not</b> prime needle.
<b>Flupenthixol decanoate</b>	Shelf (below 25°C). Protect from light.	<b>Do not</b> dilute.	21G	Deep IM injection into gluteal muscle. Z-track (p349).	If dose more than 40mg – give at different sites or use 100mg/ml solution. <b>Do not</b> mix with depot that uses sesame oil, changes how medicine is absorbed.
<b>Fluphenazine decanoate</b>	Shelf (below 25°C). Protect from light.	<b>Do not</b> dilute.	21G	Deep IM injection into gluteal muscle. Z-track (p349).	Check for particles or discolouration before giving. Avoid contact with skin, may cause dermatitis.
<b>Zuclopenthixol decanoate</b>	Shelf (below 25°C). Protect from light, heat. <b>Do not</b> refrigerate, freeze.	<b>Do not</b> dilute.	21G	Deep IM injection into gluteal muscle. Z-track (p349).	<b>Do not</b> mix with depot that uses sesame oil, changes how medicine is absorbed. Can mix with zuclopenthixol acetate (short-acting).
<b>Paliperidone palmitate</b>	Shelf (below 25°C). Protect from light.	<b>Do not</b> dilute.	Deltoid – weight less than 90kg, 50mm 23G. Deltoid – weight 90kg or more, 38mm 22G. Gluteal – 38mm 22G.	Deep IM injection into gluteal or deltoid muscle. Z-track (p349).	Shake syringe vigorously for at least 10 seconds before giving. Use deltoid muscle for first 2 injections.

# Giving intravenous medicines



Many different plastic connections used to give IV medicines through cannula bung. These instructions are general principles only.

## Attention

- **Do not** give medicine if cannula site painful, red, swollen
- Some IV medicines should be given very slowly — check before use
- Check IV line not blocked

## What you need

- Injection tray with 2 syringes
  - One with medicine to be given (drawn up ready)
  - One with IV flush (usually **normal saline**)
- Needles *OR* connections that go into IV bung, if needed
- Alcohol swabs
- Medicine label — to be put on paediatric chamber or in-line burette

## What you do

- Find IV bung — under bandage or on IV line
- Clean injection bung well with alcohol wipe, allow to dry
- If IV running — stop flow using plastic clamp
- If using IV cannula — use some of flush to make sure cannula is clear
- Pierce IV bung with medicine syringe and connection
- Give medicine at right speed
  - If using paediatric chamber — set drip rate you need, put medicine label onto chamber
- **Watch person closely** for signs of reaction to medicine or pain around cannula. If either happen — **stop immediately**
- When finished — take out connection from cannula bung
- If using IV cannula — use IV flush to clear cannula of medicine
- If using IV line — restart IV slowly to flush, then return to drip rate needed
- Stay with person for a few minutes to make sure they feel alright. Check temp, pulse, RR, BP

# Calculating medicine doses and drip rates

## Medicine doses and drip rates

<b>Dose calculations</b> Doses often written as dose/kg of body weight, eg 25mg/kg (25mg for every kg of weight)	<b>Dose needed = amount/kg x weight of person in kg</b> <b>Example:</b> Amount in mg/kg is 25mg/kg, weight of person is 12kg Dose needed = $25 \times 12 = 300\text{mg}$
<b>Tablets</b>	<b>Number of tablets needed = dose needed ÷ strength of tablet</b> <b>Example:</b> Dose needed is 15mg, strength of tablet is 10mg Number of tablets = $15 \div 10 = 1.5 = 1\frac{1}{2}$ tablets
<b>Mixtures OR Injections</b> — small volume IM or IV push	<b>Volume needed (ml) = [dose needed ÷ strength of mixture or injection] x volume this strength is in (ml)</b> <b>Example 1:</b> Dose needed is 300mg, strength is 250mg/5ml Volume needed = $[300 \div 250] \times 5 = 1.25 \times 5 = 6\text{ml}$ <b>Example 2:</b> Dose needed is 20mg, strength is 30mg/ml Volume needed = $[20 \div 30] \times 1 = 0.67 \times 1 = 0.67\text{ml}$
<b>Infusions</b> To calculate infusion rates (drip rates) for IV fluids	<b>For gravity administration sets</b> <b>Remember:</b> Check drop rate on infusion set packet, eg 20 drops/ml or 60 drops/ml. <b>Rate (drops/min) = [total volume of solution (ml) x number of drops/ml] ÷ time in minutes</b> <b>Example:</b> Volume of fluid to give is 1000ml (1L) Time to give is 5 hours = $5 \times 60 = 300$ minutes Set delivers 20 drops/ml Rate (drops/min) = $[1000 \times 20] \div 300 = 67$ drops/min <b>To set dials on infusion pumps</b> <b>Remember:</b> Always check instructions for your machine. <b>Rate (ml/hr) = volume of solution (ml) ÷ time (hr)</b> <b>Example:</b> Volume of medicine is 5ml, volume of fluid is 1000ml (1L). Total volume of solution to give is 1005ml Time to give is 5 hours Rate (ml/hr) = $1005 \div 5 = 201\text{ml/hr}$

**Note:** Dose examples given in mg, but same formulas can be used for other strengths, eg mcg. Must use same unit for strength and for dose needed (eg mg and mg, mcg and mcg).

**Quick calculations**

- **Dose needed** = amount of medicine per kg x body weight (kg)
- **Number of tablets needed** = dose needed ÷ strength of tablet
- **Volume of mixture or injection needed (ml)** =

$$\frac{\text{dose needed}}{\text{strength of mixture or injection}} \times \text{volume this strength is in (ml)}$$

**Units and concentrations**

- 1 litre (L) = 1000 millilitres (ml)
- 1 milligram (mg) = 1000 micrograms (mcg)
- 1 gram (g) = 1000 milligrams (mg)
- **1% solution** = 1g of solute dissolved in 100ml of solution
- **1:1000** = 1g solute dissolved in 1000ml of solution = 1mg solute dissolved in 1ml of solution

**Converting units**

- Grams (g) to milligrams (mg) = g x 1000
  - OR Move decimal point 3 numbers to right
- Milligrams (mg) to grams (g) = mg/1000
  - OR mg ÷ 1000
  - OR Move decimal point 3 numbers to left
- Milligrams (mg) to micrograms (mcg) = mg x 1000
  - OR Move decimal point 3 numbers to right
- Micrograms (mcg) to milligrams (mg) = mcg/1000
  - OR mcg ÷ 1000
  - OR Move decimal point 3 numbers to left
- Litres (L) to millilitres (ml) = L x 1000
  - OR Move decimal point 3 numbers to right

# Spacer devices for respiratory medicines



Helps person using puffer (metered dose inhaler/MDI) (p356) to get correct dose of medicine. Encourage for all users, especially children and the elderly. Reduces side effects, eg oral thrush, hoarse voice.

- Puffer and spacer effective as nebuliser for reliever medicines

## Attention

Everyone using spacer needs to know how to make bush spacer (p355) — may save a life.

- If inhaler won't fit spacer — use mouthpiece adaptor (ask pharmacist), or different spacer
- Keep spacers of each size in clinic for people to practise with

**Remember:** Only spray 1 puff into spacer at any time

All spacers (including bush spacers) should be

- **Primed before use** — reduces static charge on inside so medicine won't stick, works more effectively
  - Wash spacer in warm water with a little dishwashing detergent
  - **Do not** rinse
  - Leave to air dry
- **Maintained**
  - Wipe mouthpiece/mask with damp cloth — daily or after each use
  - Wash in warm soapy water, don't rinse, leave to air dry — monthly

## What you need

- Spacer — check best size for person, one they will use/carry with them
- Person's puffer/metered dose inhaler with prescribed medicine
- Mouthpiece adaptor if needed

## To make bush spacer

- 2 x 1–1.25L plastic soft drink bottles
- Scissors
- Tape

OR

- 1 x 500–600ml plastic water or soft drink bottle
- Scissors or soldering iron

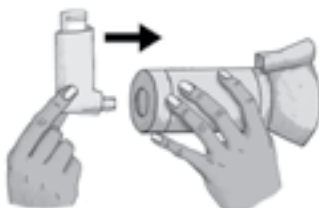


## What you do

- Take mouthpiece cap off puffer, shake puffer for 10 seconds — F 12.21
- Put puffer mouthpiece into hole in spacer opposite spacer mask or mouthpiece — F 12.22
- Hold spacer long ways (horizontally) with one hand and puffer with other hand — F 12.23



12.21



12.22



12.23

- Seal lips around spacer mouthpiece or fit mask, press puffer canister once only — F 12.24
- Take a few breaths — F 12.25
- Do this for as many puffs as prescription says
- Take puffer off spacer, put cap back on puffer mouthpiece



12.24



12.25

## To make bush spacer



12.26



12.27



12.28



12.29

- Cut 2 x 1L or 1.25L soft drink bottles in half — F 12.26, F 12.27
- Join 2 top halves together by putting one edge just inside the other, seal with tape — F 12.28
- Put inhaler onto of one end of spacer — F 12.29. Use as above

OR

- Soften bottom of 500ml or 600ml plastic soft drink/water bottle in hot water — F 12.30
- Cut or melt hole the same size and shape as inhaler mouthpiece into bottom of bottle
- Fit inhaler into hole — F 12.31
- Use as above



12.30



12.31

# Inhalation devices for respiratory medicines



National Asthma Council website ([www.nationalasthma.org.au](http://www.nationalasthma.org.au)) has videos and guides demonstrating correct use of commonly used delivery devices.

## Attention

- Help person become familiar with their own medicine
- Always check package insert for specific instructions about person's device
- Make sure your clinic always has extra, emergency supply of inhalation devices for people living and travelling in remote and rural communities
- If person's condition doesn't improve with normal medicine — follow **asthma or COPD action plan**
  - If they don't have plan — talk with health team about developing one

## Puffer (metered dose inhaler [MDI]) — F 12.32

Aerosol inhaler that gives medicine straight to airways as fine mist. Many different medicines in aerosol form.



12.32

## Attention

- Best if used with spacer (*p354*)
- To clean — take metal canister out. Wash plastic holder/mouthpiece in warm soapy water, rinse, air dry. Put canister back
  - Some inhalers (eg *Intal*, *Tilade*) need daily washing to stop them clogging
- Tell person — when device empty, throw away carefully in sealed rubbish bag or container

## What you do

### If using without spacer

- Take cap off mouthpiece, shake inhaler for 10 seconds
- Breathe out completely, tilt head back slightly, put mouthpiece between teeth without biting, close lips to form good seal
- Put finger on top of canister, press once firmly **and at same time** take a slow deep breath all the way in
- Hold for 10 seconds, while taking mouthpiece out of mouth
- Breathe out slowly away from mouthpiece
- If another dose needed — wait 1 minute then do this again
- Put mouthpiece cap back on, store inhaler in cool place

**Turbuhaler — F 12.33****Attention**

- **Do not** get *Turbuhaler* wet
- **Do not** blow into *Turbuhaler*. Breathe out away from mouthpiece
- To clean — use dry clean cloth to wipe device and mouthpiece



12.33

**What you do**

- Remove cover, check dose counter
- Hold *Turbuhaler* upright while priming — twist grip right around and then back until click heard
- Breathe out away from mouthpiece, put mouthpiece between teeth without biting, close lips to feel good seal
- Breathe in strongly and deeply, remove inhaler from mouth
- Breathe out gently away from mouthpiece, replace cover

**Nebuliser — F 12.34**

Used in clinic with oxygen for severe and life threatening asthma.

**Attention**

- Relievers (bronchodilators) work as well with puffer and spacer as with nebuliser. Only use nebuliser for severe cases
  - 12 puffs **salbutamol** = 5mg **salbutamol**



12.34

**What you do**

- Check strength of nebule for use in nebuliser — most come in more than one strength
- Different nebuliser solutions can be mixed in bowl, eg **salbutamol** and **ipratropium**
- Dilute with **normal saline** if needed

**HandiHaler — F 12.35**

Used to deliver tiotropium powder (eg *Spiriva*) from capsule.

**Attention**

- **Do not** swallow capsules. Breathe in contents using *HandiHaler*
- **Do not** breathe into device
- To clean — wipe daily with clean dry cloth, wash complete device as needed, allow to air dry



12.35

## What you do

- Open cap, open mouthpiece, put fresh capsule in chamber
- Close mouthpiece until it clicks, pierce the capsule
- Breathe out gently away from mouthpiece, put mouthpiece between teeth without biting and close lips to form good seal
- Breathe in slowly and deeply, so capsule vibrates
- While holding breath, remove inhaler from mouth
- Breathe out gently away from mouthpiece
- Put mouthpiece back into mouth and repeat process
- Open mouthpiece, remove used capsule, close mouthpiece and cap

## Accuhaler — F 12.36

### Attention

- Hold accuhaler horizontally when loading and taking dose, or medicine may be dislodged
- **Do not** breathe into device or leave cover open — moisture will get in



12.36

## What you do

- Check dose counter, open using thumb grip
- Holding horizontally, load dose by sliding lever until it clicks
- Breathe out gently away from mouthpiece, put mouthpiece in mouth and seal lips, breathe in steadily and deeply
- Hold breath for about 10 seconds or as long as comfortable
- While holding breath, remove inhaler from mouth
- Breathe out gently away from mouthpiece, close cover to click shut
- See National Asthma Council website ([www.nationalasthma.org.au](http://www.nationalasthma.org.au)) for more information and videos