Alternative Drug Administration Route — Intra-osseous Injection

Intraosseous Route (IO)

- The use of the IO route is justified in all groups in circumstances where lifesaving drugs and/or fluid are required and intravenous access is delayed or not possible including:
  - Where ETT is indicated and sedation/ paralysis pre or post ETT is required and timely intravenous access is not possible.
  - Cardiac arrest where there will be delay in gaining IV access.
- In these circumstances, a delay in insertion of IO needle should not be accepted where IV access proves difficult or unlikely. The nominated sites for use in AV practice are the distal and proximal tibia. AAV can also use the proximal humerus.

Contraindications

- If any part of the limb is traumatised or infected
- The proposed site cannot be adequately cleansed
- Osteogenesis Imperfecta

Distal attempts into the same limb where an attempt has already been made should not occur

Precautions

- Follow relevant clinical work instruction for IO device
- Care should be taken not to inject air
- Beware of extravasation

Complications

- Necrosis of surrounding soft tissue due to extravasation
- Infection of bony tissue
- IO insertion is usually not painful in the conscious Pt. It may on occasion be painful though to administer drugs/fluids through an IO cannula

Local Anaesthesia

- If pt conscious, administer IO Lignocaine 1% anaesthesia prior to infusing drugs/fluid once confirmed patent.
  - Adult (>30kg): **0.5mg/kg (maximum 40mg IO)**
  - Child (<30kg): **0.5mg/kg (maximum 20mg IO)**

Alternative Drug Administration Route | Endotracheal Route

Endotracheal Route (ETT)

- The use of the ETT route is justified in all groups in circumstances where lifesaving drugs are required and intravenous access is not possible or delayed.
- The ETT route is not considered to be as effective as the IV or IO routes. Consequently, drug doses and volumes are modified accordingly. It is also not suitable for all pre-hospital drugs or fluid therapy. A more suitable drug administration route should be sought as soon as practicable. The IO route should be considered a first preference alternative option to the ETT route.

Contraindications

- Do not administer any other drugs via this route other than those listed below.

Precautions

- Administer as per relevant clinical work instruction. Where ETT size permits, drugs should be administered via a suction catheter inserted into the ETT and flushed with air to ensure drug delivery.
- Ensure dilution of drug appropriate for age

Age	Individual dose volume
Newborn and infants	Up to 1ml
Small child	Up to 5ml
Large child	Up to 10ml
Adult	= 10ml

Drugs via ETT route	Adult	Paediatric
Adrenaline	2 x IV dose (=2 mg)	10 x IV dose (=0.1 mg/kg)
Salbutamol	2 x IV dose (=500mcg / =250mcg/kg subsequent)	2 x IV (=10mcg/kg initial / = 5mcg/kg subsequent)

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Reference Material

Oro/nasogastric tube

- The oro/nasogastric tube may be inserted to relieve gastric distension into Pts from all age groups
- It is particularly important in the paediatric age group where endotracheal tubes are often uncuffed and air entering the stomach during ventilation may have a greater adverse effect on diaphragm movement.
- < 4 years of age 12 FG

  ≥ 4 years of age 14 FG

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Reference Material

1. Interhospital Transfers Introduction

An interhospital transfer (secondary transport) involves Pt transport to a major centre or a specialised unit, which usually requires a timely response for best Pt outcome. The decision to transfer should be based on clinical assessment and clinical condition; availability of expertise and resources required in transit and consideration of the risk involved in transferring the Pt. The specific level of resources will vary according to Pt condition and other factors.

Use of Non-Emergency Pt Transport (NEPT) Providers - The NEPT service is not an emergency Ambulance service. There is now regulation of the NEPT providers and further information is available on http://www.health.vic.gov.au/nept

Emergency transfers - This Guideline is written from the perspective of emergency transfers. In more complex situations the Pt must be evaluated and determined to be stable by an appropriate retrieval/referral service Medical Practitioner in consultation with the Ambulance Service. The decision for appropriateness of transfer and escort requirements should entail a medically shared decision made between the Ambulance Service, Retrieval/Referral Service and the referring Medical Practitioner.

Escorts - Accompanying practitioners (e.g. Midwife/Medical Practitioner) and services may be required. The accompanying staff is to continue the maintenance of Pt care and responsibility as appropriate and work collaboratively with the paramedic. The paramedic crew is to coordinate the transport and is to be actively involved in the overall management of the Pt.

For unstable Pts and/or those with complex medical needs that may require a medical escort where an escort is not available the sending Medical Practitioner is to contact the AV Metro Clinician or AV Rural Control Room, one of the specialist retrieval coordination services. In some instances, where a suitable medical escort is not available within a reasonable timeframe, and the Pt's condition may measurably deteriorate by a delay in transfer, a shared medical decision may be made by the Ambulance Service in conjunction with the sending facility/Medical Practitioner and (if appropriate) the retrieval/referral service as to the suitability of transfer with a paramedic/MICA paramedic. The Medical Practitioner or Retrieval/Referral Service remains accountable for the final decision made.

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1. Interhospital transfers introduction (continued)

Restraint of equipment and personnel - All personnel travelling in the Ambulance must be capable of being seated and restrained by seatbelts in designated passenger seats.

All items of equipment transported must be adequately restrained. The Paramedic is to ensure familiarity with the operation of the equipment they are to use prior to departure.

Pharmacological agents/infusions - Although the sending facility may have initiated medication(s), Paramedics must be briefed and familiar with the pharmacological agent that the Pt is receiving at the time of transfer and will be receiving en route, including delivery devices. In general, interfacility medications that are outside the paramedic's scope of practice are not to be initiated enroute.

Responsibility and accountability - The referring hospital or Medical Practitioner is accountable for ensuring

- the appropriate level of care is provided, e.g. if a medial escort is required
- a full handover on the Pt's clinical status, current management and the potential events which may occur during transport and their management; and
- prescription of the dose and/or rate of an IV infusion and the relevant treatment guideline, including potential side effects, and actions to instigate if a medical escort is not provided. Such prescription is to be written and signed by the Medical Practitioner on the Ambulance Service PCR.

The Ambulance/MICA Paramedic is to ensure that they are adequately briefed and prepared for the transfer and able to manage the Pt's clinical condition appropriately. If it is the judgement of the transferring paramedic crew that the Pt's requirements are outside of their scope of practice/level of expertise the referrer must be informed. A suitably trained paramedic, (e.g. MICA or flight MICA Paramedic), or provision of an escort should be sought.

1. Interhospital transfers introduction (continued)

In any cases of doubt consultation and advice should be obtained from:

Metro: Clinician

Rural: Via the Operations Centre to ARV 1300 368 661

2. Interhospital transfer of the patient with Acute Coronary Syndrome

Pts with acute coronary syndromes, most commonly unstable angina, STEMI or non-STEMI may be receiving drug infusion/s as part of their treatment regime such as **Glyceryl Trinitrate and/or Heparin** and/or **Tirofiban Hydrochloride**. These infusions are to be administered by a controlled delivery infusion system. If the Pt is not classified as high risk these infusions can be managed by an Ambulance paramedic.

Maintenance of pharmacological treatment for some Pts may include inotropic, vasopressor, and/or antiarrhythmic agents via an IV infusion as a part of their management. Some of these Pts may be safely transferred without a medical escort in the direct care of a MICA Paramedic (in the context of **emergency transfers** as specified in Part 1. Interhospital transfers introduction).

As a general principle Pts receiving **thrombolytic therapy** should not be transferred until the full dose/s are completed due to the potential for significant adverse side effects. Once the thrombolytic therapy has been completed and the Pt is stable they may then undertake transfer. The level of care required in transit will be determined by the Pt's condition.

3. Interhospital transfer of obstetric patient

Refer to specific obstetric emergency guideline

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4. Interhospital transfer of other patients

Pts may require IV fluids as part of their management during transport. Some infusions may also contain additives. These infusions and additives must be seen in the context of the Pt's total clinical status and management at that time.

Many Pts can be safely transported without a MICA or medical escort in the direct care of an Ambulance paramedic. For example, Pt's who are receiving infusions of crystalloid solutions, blood, narcotics, chemotherapy drugs or additives (such as antibiotics or potassium chloride).

These drugs must be delivered by a controlled delivery system and the infusion is to have been commenced prior to transfer.

Pts with more complex drug therapy may be safely transferred without medical escort in the direct care of a MICA paramedic in the context of emergency transfers (as specified in Part 1. Interhospital transfers introduction).

For other Pt's, such as those who are intubated and **ventilated** and/or have **invasive monitoring devices**, the transfer is to be discussed with:

Metro: Clinician

Rural: Via the Operations Centre to ARV 1300 368 661

taking into account emergency transfers (as specified in Part 1).

Contacts

Newborn Emergency Transport Service (NETS)	PH 1300 137 650
Paediatric Emergency Transport Service (PETS)	PH (03) 9345 7007
Perinatal Emergency Referral Service (PERS)	PH 1300 137650
Adult Retrieval Victoria (ARV)	PH 1300 368 661

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Reference Material

SIDS and Kids Victoria provides bereavement support to families following the sudden and unexpected death of a child from 20 weeks gestation to 6 years of age (up to 18 years of age in some country regions). SIDS and Kids Victoria has a 24-hour telephone service. Phone (03) 9822 9611 or 1300 308 307

Initial Response

- Attempt resuscitation and other life saving procedures if appropriate. Parents need to feel that everything possible was done for their child.
- Depending on where you are in Victoria, notify the AV Metro duty team manager (DTM) or Ambulance Victoria Operations Centre Rural Communications Officer who will log the event and notify the Police to attend the scene.
- Explain to the parents that the Police will attend to gather information for the Coroner and that this is necessary for all sudden and unexpected deaths, regardless of age.
- Be generous with your time. Most parents wish to spend time with their child. If one parent is not present at the scene, consider waiting for him or her to arrive.
- Other children in the family may need time with their brother or sister. Even very young children can be included in the family's grieving process right from the start.
- Offer to telephone another family member, a friend or a doctor. It is helpful for the family to have the support of familiar and loving people.
- Once the Police have completed their investigation, allow the parents to carry their child to the Ambulance and to nurse him or her during the journey to the hospital. This is an agreed protocol in cases of possible SIDS.
- In the metropolitan area, transport the child and the parents to the Emergency Department of the Royal Children's Hospital, Monash Medical Centre or Frankston Hospital. This is an agreed protocol in cases of possible SIDS.
- If you are attending the sudden and unexpected death of a baby or young child from a cause other than SIDS, consider providing the same opportunity to parents to be transported with their child to the emergency department of a major hospital. You may need to gain permission from the State Coroner's Office or from a member of the Victoria Police with the rank of Sergeant or above.

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- Outside Melbourne, families' needs should be treated individually. Consult with the State Coroner's Office on (03) 9684 4444 (24 hours). Where possible the parents and infant should be taken to the nearest base hospital with an emergency department. Notify hospital to assist with reception.
- Encourage parents and the other children to accompany the child to hospital where they can spend time, with the support of nursing or social work staff, before taking leave of their child. Most hospital emergency departments have a private room for this purpose.
- Some parents may request to go to a different hospital, or stay at home or at the scene with the child until the arrival of the Coroner's contract funeral director. The individual needs and requests of the parents should be respected wherever possible, but the State Coroner's Office must approve of these requests.

Caring for Parents

- Always use the child's name unless parents indicate otherwise.
- Avoid using clichés such as "At least you have your other children." It is better to simply say "I'm so sorry your child has died" or "It must be awful for you."
- There is no right way of grieving. Acknowledge and accept the feelings expressed by the parents.
- Respect cultural mourning customs.
- Do not take personally any anger expressed.
- Do not be afraid to show your own emotions, but do not allow them to overwhelm the parents or detract from your ability to help.
- Having gained the parent's permission, please notify SIDS and Kids Victoria (03) 9822 9611 or 1300 308 307) of the child's death.

Remember to take care of yourself

- The death of a baby or young child is extremely distressing for all involved. Do take a break if possible before returning to other duties.
- You may need to talk about what you heard and saw, what you did and said, and how you felt. If so, find a colleague or friend who is a good listener.
- Make use of workplace arrangements for support.

Reproduced from Emergency Responder's Manual 3rd Edition. SIDS and Kids Victoria 2005. www.sidsandkids.org

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Reference Material

Generic Name	Trade Name
Beta Blockers	
Alprenolol Hydrochloride	Aptin
Atenolol	Anselol, Tenormin, Tenlol, Noten
Labetalol	Presolol, Trandate
Metoprolol Tartrate	Betaloc, Minax, Lopresor
Oxprenolol Hydrochloride	Corbeton
Pindolol	Visken, Barbloc
Propranolol Hydrochloride	Inderal, Deralin
Sotalol	Cardol, Sotacor
Timolol Maleate	Blocadren, Timoptol, Temopt, Timpilo
Benzodiazepines	
Temazepam	Normison, Temaze, Temtabs
Flunitrazepam	Hypnodorm
Midazolam	Hypnovel
Nitrazepam	Alodorm, Mogadon
Triazolam	Halcion

Generic Name	Trade Name
Benzodiazepines	
Diazepam	Valium, Ducene, Atenex, Valpam
Oxapam	Alepam, Murelax, Serapax
Clonazepam	Rivotril, Paxam
Lorazepam	
Calcium Antagonists	
Diltiazem Hydrochloride	Cardcal, Cardizem, Coras, Dilzem
Felodipine	Agon, Plendil
Nifedipine	Adalat, Nyefax, Nifecard
Verapamil Hydrochloride	Anpec, Cordilox, Isoptin, Veracaps
Cephalosporin Antibiotics	
Cefaclor Monohydrate	Aclor, Ceclor, Ceclor CD, Cefaclor, Cefaclor CD, Keflor
Cefepime Hydrochloride	Maxipine
Cefotaxime Sodium	Cefotaxime, Mefoxin

Reference Material

Generic Name	Trade Name
Cephalosporin Antibiotics	
Cefoxitan Sodium	Cefoxitan
Ceftazidime Pentahydrate	Fortrum
Ceftriaxone Sodium	Rocephin, Ceftriaxone
Cephalexin	Cefalexin BC, Cephalexin, Cilex, Sporahexal, Ibilex, Ialex, Keflex
Cephalothin	Cephalothin, Keflin
Cephazolin Sodium	Cefazolin
Cephamandole Nafate	Mandol
Cephazolin Sodium	Cephazolin
Cefpirome Sulfate	Cefrom
Cefuroxime Axetil	Zinnat
Monoamine Oxidase Inhibitors	
Moclobemide	Aurorix
Phenelzine Sulphate	Nardil
Tranylcypromine Sulphate	Parnate, Parstelin

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Generic Name	Trade Name
Penicillin Antibiotics	
Amoxycillin	Amoxycillin, Moxacin, Maxamox, Ibiamox, Curam, Clavulin, Clamoxyl, Clamohexal, Cilamox, Augmentin, Aspen Fisamox, Amoxil, Amohexal, Alphamox
Ampicillin	Ibimicyn, Austrapen, Aspen Ampicyn, Alphacin
Benzathine Penicillin	Bicillin
Benzylpenicillin	Benpen
Dicloxacillin	Distaph, Dicloxsig, Diclocil
Flucloxacillin	Staphylex, Flucloxacillin, Flubiclox, Floxsig, Floxapen, Flopen, Bgramin, Aspen Flucil
Penomethylpenicillin	Abbocillin V, Penhexal VK, LPV, Cilopen VK, Cilicaine
Procaine Penicillin	Cilicaine
Piperacillin	Piperacillin, Tazocin
Ticarcillin	Timentin

Reference Material

Generic Name	Trade Name
Tetracycline Antibiotics	
Demeclocycline HCL	Ledermycin
Doxycycline HCL	Doryx, Doxig, Doxy Tablets, Doxycycline-BC, Doxyhexal Tabs, Doxyline, Genrx Doxycycline, Vibratabs-50, Vibramycin
Minocycline HCL	Akamin, Minomycin
Tetracycline HCL	Achromycin, Mysteclin, Tetrex
Tricyclic Antidepressants	
Amitriptyline HCL	Amitrip, Endep, Laroxyl, Amitrol, Saroten, Mutabon D, Tryptanol, Tryptine
Clomipramine HCL	Anafranil, Placil
Desipramine HCL	Pertofran
Dothiapin HCL	Prothiaden, Dothep
Doxepin	Deptran, Sinequan
Imipramine HCL	Tofranil, Melipramine
Nortriptyline HCL	Allegron
Trimipramine	Surmontal

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Organophosphates

There are a vast number of organophosphates which are used not only for spraying in orchards but also for many household uses. Given potential contamination by a possible organophosphate, the container identifying trade and generic names should be identified and the Poisons Information Centre contacted for confirmation and advice.

Verbal De-escalation Strategies

- Listening to the Pt
- Using the Pt name to personalise the interaction
- Calm, open-ended questioning
- Consistent, even tone of voice, even if Pt's communication style becomes hostile or aggressive
- Avoidance of 'No' language which may prompt an aggressive response, e.g. "I'm sorry, our policy doesn't allow me to do that but I can offer you other assistance."
- Allow the Pt as much personal space as possible whilse still maintaining control of the scene
- Avoid too much eye contact as this can increase fear in some paranoid Pts

Formulae

Standard giving set: 20 drops = 1ml

Microdrip set: 60 microdrops = 1ml

$$\text{Drops per minute} = \frac{\text{Drops per ml} \times \text{volume}}{\text{time}}$$

$$\text{Volume to give} = \frac{\text{Strength required} \times \text{volume}}{\text{Strength in stock}}$$

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Drug Dilutions

CPG	Dilution	Description
A0401 A0202 P0501	**Morphine Increments**	Dilute **Morphine Sulphate 10mg** to 10ml with **9ml Normal Saline**
A0501	**IN Fentanyl**	To administer **IN Fentanyl** each dose is to be drawn up in 2 syringes for atomisation - one into each nostril. A further **0.1ml Fentanyl** is to be drawn up in each syringe to account for the dead space in each syringe. Doses printed in the CPGs and Paediatric chart include this 0.1ml for each nostril dose.
A0404	**Amiodarone Infusion**	**Syringe Pump** - Add **Amiodarone 5mg/kg** (up to a max. 300mg) to D5W to make up 50ml. Run at a rate of 150ml/hr (i.e. to be delivered over 20 min.) **Spring Loaded Infusion Device** - Add **Amiodarone 5mg/kg** up to 300mg (max. 6ml of solution) to **D5W** to make up 10ml. Use either "10ml in 30 min." or "10ml in 15 min." infusion device administration set depending on availability. (This runs over 30 or 15 min. as closest available infusion rate option) **Adult Giving Set** - Add **Amiodarone 5mg/kg** (Maximum 300mg) to **D5W** (100ml) and run at 100 drops/min (delivered over 20min)
A0402 A0407 A0705	**Adrenaline Infusion**	Dilute **Adrenaline 3mg** to 50ml with **D5W/Normal Saline** (i.e. each 1ml of resultant solution contains **Adrenaline 60mcg**) **Adrenaline Infusions** must be clearly labelled with the name and dose of the additive drug and time of commencement
A0402 A0407 A0705	**Adrenaline Increments (10mcg/ml)**	Dilute **Adrenaline 1ml** of 1:10,000 to 10ml with **9ml Normal Saline** (i.e. each 1ml of resultant solution contains **Adrenaline 10mcg**)

Drug Dilutions

CPG	Dilution	Description
A0403	**Verapamil**	Dilute **Verapamil 10mg** to 10ml with **6ml Normal Saline**
A0403 **A0408**	**Metaraminol**	Dilute **Metaraminol 10mg** diluted to 10ml with **9ml Normal Saline**
A0407 **A0705**	**Adrenaline Increments (100mcg/ml)**	Dilute 1ml **Adrenaline 1:1000 solution** to 10ml with **9ml Normal Saline** (i.e. each 1ml of resultant solution contains **Adrenaline 100 mcg/ml**)
A0302	**Morphine and Midazolam Infusion**	Dilute **Morphine 30mg** and **Midazolam 30mg** diluted to 30ml with **Normal Saline** (i.e. each 1ml contains 1mg of **Morphine** and 1mg of **Midazolam**)
A0601	**Salbutamol Infusion**	**Syringe Pump** Add **Salbutamol 1mg** to **D5W/Normal Saline** solution to make 50ml (i.e. each 1ml of resultant solution contains 20mcg of Salbutamol) and run at 15mcg/min. (45ml/hr.). **Standard Adult Giving Set** Add **Salbutamol 2mg** to **D5W/Normal Saline 100ml** (i.e. each 1ml of resultant solution contains **20mcg of Salbutamol**) and run at 15mcg/min (45ml/hr. or 15drops/min) **Spring Loaded Infusion Device** Add **Salbutamol 500mcg** (1ml) to **D5W/Normal Saline** to make up 11ml (45mcg/ml) and run at a rate of 15mcg/min (20ml/hr.) using a “10ml in 30 min.” infusion device administration set

Drug Dilutions – Paediatric

CPG	Dilution	Description
P0602	**Salbutamol Infusion (Paed)**	**Syringe Pump** Add **Salbutamol 100mcg/kg** to **D5W/Normal Saline** solution to make 50ml and run at 2mcg/kg/min (60ml/hr.) **Standard Adult Giving Set** Add **Salbutamol 200mcg**/kg to **D5W**/**Normal Saline 100ml** and run at 2mcg/kg/min (60ml/hr. or 20drops/min)
P0201 **P0709**	**Atropine (Paed)**	Dilute **600mcg Atropine** in 1ml to 5ml of **Normal Saline** (i.e. each 1ml contains 100mcg)
P0201	**Amiodarone (Paed)**	≤ 6yrs: Add 2ml (100mg) **Amiodarone** (from 150ml in 3ml ampoule) to **8ml D5W** in a 10ml syringe. ≥ 6yrs: draw up 150mg in 3ml as required, no dilution
P0301	**Fentanyl Bolus (Paed)**	Dilute **Fentanyl 100mcg** to 10ml with 8ml of **Normal Saline** to make a solution of 10mcg/ml in one syringe
P0301	**Midazolam Bolus (Paed)**	Draw up **Midazolam 15mg** and dilute with 12ml **Normal Saline/D5W** to make 15ml (i.e. each 1ml contains 1mg)
P0301	**Morphine and Midazolam Infusion (Paed)**	Dilute **Morphine 15mg** and **Midazolam 15mg** to 15ml with **Normal Saline** (i.e. each 1ml contains **1mg of Morphine** and **1mg of Midazolam**)

Crisis Counselling – Peer Support Service

Where staff are exposed to critical incidents or require psychological/emotional support, the following avenues are available within Ambulance Victoria.

Nominated peer support personnel are available for contact in the field. All staff are encouraged to provide notification of critical incidents.

- via email **peer.support@ambulance.vic.gov.au**
- telephone **1800 MANERS** (1800 626 377)
- contact can be for peer support, VACU counselling line, emergency services chaplain, health safety and wellbeing including workcover) and police statements/court attendance
- Available to all employees, including CERT/ACO, and immediate family members

- Road Trauma Support Team: telephone 1300 367 797 (for members of the public)
- Support after suicide (03) 9427 9899
- Bereavement Counselling and Support Service (03) 9265 2111
- SIDS and Kids 1800 240 400 or 1300 308 307
- Life Line 13 11 14
- Kids Help Line 1800 551 800
- Nurse-On-Call 1300 60 60 24

TIS – Interpreter Service

Paramedics can access the Telephone Interpreting Service (TIS) directly on the phone number below and by quoting client codes for AV. An English-speaking operator will request the language and dialect and connect the appropriate interpreter. This is no charge to the Pt.

The service can be used to improve communication with people who have little or no grasp of the English language in order to make it easier to determine an appropriate course of action for Pt's. It allows paramedics to provide a more culturally appropriate service to people from diverse backgrounds.

Ambulance Priority Line **1300 655 010**

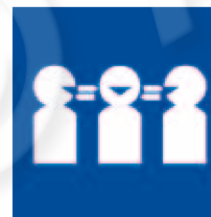
Metro Paramedics to quote the Client Code number of **C503484**

Rural Paramedics to quote the Client Code number of **C504815**

Name of Paramedic may be requested by interpreter service operator

Interpreter Symbol

The new national interpreter symbol helps people from non-English-speaking backgrounds identify where they can get language assistance, including interpreters, when using government services.



Launched in May 2006, the symbol makes it easier for Victorians with limited English skills to access a whole range of services including medical services, Police and emergency services.

The interpreter symbol is displayed by government and government-funded services at places such as public hospitals, community health centres, local councils, Police stations, employment offices, migrant resource centres and housing offices.

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