5 Pre-hospital emergencies hypothetically speaking

Hypotheticals

7 Managing the airway
17 Respiratory assessment
25 Anaphylaxis
31 Asthma
41 Conscious state assessment
49 Hypoglycaemia
55 The hypothermic patient
63 The child with croup
71 Managing cardiac pain
79 Pre-hospital anti-emetics
89 Left heart failure
99 The narcotic drug overdose
107 The car ‘accident’
115 The penetrating trauma
123 The burnt patient
133 Seizures and convulsions
141 Hypertensive emergencies
147 The patient with hyperglycaemia
153 Beware the syncope
161 Obstetric emergencies

170 glossary of abbreviations
Pre-hospital emergencies
*hypothetically speaking*

The role of pre-hospital emergency responder is a lot of things. It is challenging. It is daunting. It is tiring. It is incredibly satisfying. It is unique in many ways. It is a bit first aid, a bit doctor, a bit social worker and almost always jack of all trades. The call outs never stop coming and you never quite get to that point where you have seen it all. University education is common in the modern pre-hospital era but that only prepares you to start your learning. When you finally start you would once have been an ambulance driver or officer but now more likely a paramedic or emergency medical technician. Whatever you get called there is one certainty – you will be a novice in this working world that is like few others. You have precious few diagnostic tools, language barriers, extremes of emotion, the elements against you with uncertainty your constant companion.

There is an expression that says experience is something you get just after you need it. Experience is something every pre-hospital responder needs. You will gain a lot of it over the years of a career. Much of it will come under duress and the hard way through error or your partner putting you right just before. But what if you could learn through sharing the experience of others? You might avoid some of those errors or close call moments. You would certainly be much better prepared for the differing situations as they arise.

These hypotheticals are all based on real call outs, real patients and real situations. These are the cases where experience came just after it was needed the first time. It doesn’t have to be this way for others though. They encompass typical medical and traumatic emergencies as confront pre-hospital responders and look beyond the simple written guidelines and protocols provided. They are not based on the practices of any one organisation and reference to the applicable specific guidelines should be sought before putting these experiences into action.
The penetrating trauma
hypothetical

You have just endured an hour with four other paramedics, all in the one room, and all telling ambo stories. Each one of these stories, as usual, telling a tale bigger and more eventful and unbelievable than the one before. Alone now, you lament in a moment of aside honesty that there are still quite a few cases you have never attended to. Interrupting your ruminations, you simultaneously hear the pager go off and your partner banging on the bathroom door.

You have been dispatched to a brawl at a nightclub where one person is reported to have been stabbed. Your partner scoffs that this will be nothing more than a slash wound like so many others. Interestingly and incongruously though, you note that he still almost puts the ambulance sideways through the first corner in his haste to get there.
On arrival, and after parking behind five police cars, you are led to a young man lying supine on a dance floor. There is a small pool of blood around his chest area both on the floor and on his clothes. He is conscious but quite lethargic. Apparently, after a short argument, another man lunged at him with a knife and then ran off. There are enough police to manage a small riot already in attendance so you feel the question of ‘dangers’ can be ticked as okay on this occasion.

You know that you have to examine the patient all over for other injuries and not be distracted by the visibly obvious one. However you cannot help yourself and you look closely at the stab wound. You can see a two to three centimetre wound to his right chest at about the fourth intercostal space. His pulse is 130 beats per minute taken at the carotid site being his only palpable pulse.

The penetrating trauma hypothetical

(1) What would you estimate his blood pressure to be? How would you describe his perfusion status?

As you might expect, the patient is very drowsy and slow to respond to you. He is breathing slowly and with some clear increase in effort. You auscultate his chest and can discern no respiratory sounds on the right side. With his pattern of injury and his poor perfusion it is not too difficult to consider that he has either had a fairly major blood vessel lacerated or he may alternatively have a tension pneumothorax. If he is really unlucky he may have both!

(2) What is the next most important action that should occur?

As your partner moves to the ambulance you continue to manage the patient. You quickly remove his upper body clothing and roll him gently to one side and examine his whole body for further injuries. Finding none, you decide to treat him for his open penetrating chest wound.

Penetrating trauma is far less common than blunt trauma in most civilian environments. The usual causes of penetrating trauma are either some form of ballistic object such as a bullet or shrapnel from a blast or an impaling object including knives or spears.
Not all will be intentional as many paramedic penetrating trauma calls involve people that have slipped climbing over fences or been impaled in car crashes on gear sticks or foreign objects from outside the vehicle. Just as with blunt trauma, penetrating trauma can involve any part of the body. However the fact that it can enter deeply within the body increases the chance of even limb injuries involving major blood vessels or nerves. In the pre-hospital setting there is no such thing as a harmless penetrating injury until it is cleared to be so.

(3) You have located a major injury in this patient. Is it appropriate to spend valuable time in further examination that may prove fruitless?

You need to know what you are up against in all patients and so a thorough secondary examination is important. That said, it is just as important to not waste time when you have such a time urgent patient in your care. Multi tasking is imperative and you need to assess the patient whilst you are making urgent tasks such as preparing for transport happen at the same time.

(4) There are compelling signs of tension pneumothorax. Will you be treating this patient as if he has one?

So yes, this person should have the chest decompressed to rule out the possibility of tension pneumothorax. A 14 gauge intravenous cannula can be used as long as it is at least four and a half centimetres. Most adult chest walls will require that length needle though as many as twenty per cent will need an even longer needle. Even if this isn’t within your guidelines and skill set you still confirm the need for intensive care support to assist. Unsure how you will bring your ALS treatments to bear on the case, you wisely decide that rapid transport to a major public hospital has to be a good idea. You decide to insert a large bore IV cannula for intravenous access when you get into the car so as not to delay transport. He already has an oxygen mask applied and you tape plastic over the wound on three sides.

(5) What is the purpose of sealing the stab wound to the chest?

Be wary of the coughing patient, or if at any time you have to apply positive pressure ventilation. Both increase the likelihood of air being pushed into the pleural space with the change from negative to positive inspiration pressure.

On return your partner, now feeling that you should be more aggressively managing this patient, suggests that you start run in crystalloid fluid as soon as possible. Your chest injuries guideline doesn’t discuss fluid therapy, but he
suggests that the hypovolemic hypotension guideline does. Arguing that the patient has an unrecordable blood pressure he suggests an urgent large bolus 20 ml/kg push.

(6) Do you agree? Are there any modifying features here?

Penetrating trauma and blunt trauma patterns are perceived, and treated, quite differently. Blunt trauma more often involves more diffuse, contusion type bleeding involving smaller blood vessels that are under less pressure. This will not always be the case though as blunt trauma can produce rupture and tears to organs and to major blood vessels with the shearing forces that can be applied. Blunt trauma can involve a diversity of underlying injury presentations. Penetrating trauma in contrast more likely involves a relatively large hole in a significant blood vessel or organ and carries a greater certainty of the seriousness of what you are getting.

To lose more blood from blunt trauma you either need to be unlucky and tear something particularly important or involve a larger contusion site, that is involve more of the smaller bleeds. To lose a larger amount of blood from penetrating trauma requires only a badly placed hole. The resultant bleeding is different. The former is more oozing, the latter spurting and gushing.

(7) Why is penetrating trauma a modifying factor when administering intravenous fluid therapy?

Picture the typical garden hose at home. Connect the hose to the tap. With the nozzle turned off, turn on the tap. The hose becomes stiffer and pressurised with the water pressure within it. Imagine now that the hose is a blood vessel. Grab a knife and punch a hole in the hose. What happens? Water spurts out of the hole and probably a good distance away. It is under pressure. The more you turn on the tap, that is, increase the fluid pressure, the more and further fluid will spray from the hole. Now turn the tap back to almost off. The pressure drops away now to very little and the fluid spurting from the hole now starts to simply ooze out. The fluid is under lower pressure with the result that less fluid escapes. Lower blood pressure means the blood remaining will last a lot longer. For a short time, this is the best place for the penetrating trauma victim to be managed until that hole is repaired or closed.

Most penetrating trauma patients should ideally not be given any fluid at all. As long as a pulse can be felt somewhere, that will, in the pre-hospital setting at least, be adequate. Transport as quickly as practicable to a surgical facility.

(8) Are there any exceptions to this approach?

You do need to use a little common sense here though. Clearly a conscious or responsive patient in whom you simply cannot feel a pulse must have some blood
pressure and so shouldn’t be resuscitated with intravenous fluid at this point. The patient’s brain is working and that takes a reasonable blood pressure to support. The inability to palpate a pulse must be because there isn’t one to be found and not because it is simply difficult to feel one on this patient. Try feeling for a pulse in other sites. Also consider the other signs of life that suggest that there must be a blood pressure in support such as normal respiration or controlled motor responses. A patient with a GCS of 15 very likely does have both a pulse and a blood pressure.

(9) Whilst accepting that delaying at the scene is bad, is it okay to administer a smaller ‘modified’ volume of fluid?

Any penetrating injury to the thorax should be considered life threatening, and at the very least emergent time critical based on the pattern of injury. This simply translates to ‘if it isn’t urgent now, things probably soon will be’. Never assume any wound may ‘not have gone all the way in’ or is only superficial. It is important too to always have a good look for other wounds on other parts of the body.

The level of perfusion found on examination should not be taken as the sole and accurate indicator of the seriousness of injury. The patient may deteriorate quickly or may be able to compensate for a period of time before cardiovascular collapse becomes evident. There are many significant blood vessels and organs in the thorax and none of them mix well with knives.
Suggested Answers

(1) To have the patient’s carotid site the only palpable pulse would probably mean the systolic blood pressure is at best around 60-70mmHg. If this were the case then the perfusion would be considered inadequate. However, as we do not know the actual blood pressure, it would not be a bad thing to err on the side of caution and consider this patient to be extremely poorly perfused.

(2) Most would likely say to manage the suspected tension pneumothorax and this may indeed be a very valuable early strategy. This man is suffering penetrating trauma to the chest. The only real saviour for a patient with penetrating trauma this sick, if there is to be one, will be a surgeon who can repair the damage as quickly as possible. So the very next action should be to instruct your partner to move quickly to bring back the ambulance bed and prepare everything for expeditious transport. Early warning notification to the nearest suitable trauma receiving centre would be highly desirable.

(3) It is very important to complete a good primary, vital sign and secondary examination in every patient. Distracting injuries are just that – distracting. A scalp laceration may bleed profusely causing you to miss the more serious truncal injury. A painful and distorted fractured femur will take your full attention causing you to miss the more serious abdominal bruising accompanying the lacerated liver or ruptured spleen. Get the full picture even if you have found something serious – in fact, particularly if you find something serious early. Even ignoring small fractures and dislocations can lead to permanent injury and disablement when the patient recovers.

(4) Certainly signs including respiratory difficulty, poor perfusion and any altered level of consciousness with a pneumothorax present should suggest tensioning. It is still highly likely that the presentation could be due to a simple pneumothorax and hypovolemia together. Look for signs that assist assessment such as a chest hyperinflated on one side or decreasing oxygen saturation despite supplemental oxygen therapy. Severe, gasping respiratory distress was always considered a reliable sign though it is not absolute. Not all patients look in that much respiratory distress even though some still will and it isn’t a very helpful sign in patients in any altered conscious state.

In previous pre-hospital practise it was advocated to insert a smaller needle into the intercostal space to ‘test’ for the presence of air in the pleural space. This has been largely discredited now with the belief that only a longer decompression needle will actually reliably reach the pleural space. This alternative is likely to result in false readings.
Any opening through the chest wall into the pleura creates the likelihood of a pneumothorax. Air can then be dragged through the hole due to the relatively negative pressure created on inspiration. This accumulation of air in the pleural space can then increase until it compromises the functioning of the heart and the large blood vessels becoming a life threatening tension pneumothorax. The plastic cover taped on three sides allows air to escape outward but not inward. All chest puncture wounds, sometimes known as ‘sucking chest wounds’ should be treated in this way. There are purpose made seals for this or the plastic cover from another piece of disposable equipment such as an oxygen mask can be used in improvisation. Ideally the cover should be applied on expiration when the chest is at its smallest. As it expands on inhalation the plastic will be pulled into the chest instead of the air you are trying to keep out. And with any penetrating trauma, it no attempt should be made to try to pull out any impaled object.

Hypovolaemic hypotension guidelines typically suggest treating any patient with penetrating trunk injury as an exception to standard intravenous fluid resuscitation. Instead the rescuer should accept a palpable pulse irrespective of actual blood pressure and hypotension and even altered consciousness. Whilst the debate rages over the optimal level of fluid resuscitation and vital sign targets in other types of trauma, there is little such controversy with penetrating trauma.

For bleeding to stop, the blood loss opening needs to be occluded. In an emergency this may be via direct pressure or even using a device such as an arterial clamp. It may even require some form of surgical intervention. From within, the body will try to form a clot and internally repair the opening. A lower blood pressure may actually help the body during this attempt. In the penetrating trauma setting a low blood pressure can lead to less blood escaping from the punctured vessel. In some cases, a clot will also start to form. As you increase blood pressure, blood loss also increases and you must then correspondingly pour in more intravenous fluid to assist. This can lead to increased complications in clotting and observed patient outcomes. An unwinnable cycle will be entered into. The ultimate fix is to stop this cycle and repair the hole. This is not nearly so much the case in blunt trauma where the blood pressure increase often has differing levels of this effect.

Yes there is where a patient who does not have any palpable pulse at all. If the patient was unconscious and pulseless, there is a very real need to aggressively resuscitate until you feel a return of pulse. The absence of a palpable pulse may be how you find the patient. They are in effect in a state of cardiac arrest if they are unresponsive. The pulse may be lost after you commence management of the patient as the bleeding from the injury continues unabated even by low blood pressure within. In any case action is required when it is encountered. Whilst no detectable blood pressure at all may produce minimal bleeding, this up side is more than balanced by the inability of any patient to endure cardiac arrest for very long without it becoming terminal.
No, no intravenous fluid resuscitation is indicated at all! This may prove difficult to do as sometimes the rescuer finds it much easier to ‘do’ rather than ‘not do’. That isn’t what we trained for and it isn’t the rescuers instinct. Avoid attempting to increase blood pressure whilst a pulse is palpable. This includes autoinfusing the patient by placing them supine and with the feel elevated. The patient may wish to sit semi upright to facilitate breathing or may wish to remain supine. Watch out for who you are treating. Are you treating the patient with a therapy that is urgently advocated and needed? Or are you providing a therapy to appease your own urgent need to do something. It is incredibly difficult to see a patient in distress and not be able to do anything. Remember, rapid assessment and expeditious transport to the right hospital is sometimes the very best pre-hospital care of all. As is often repeated by paramedics, an injection of diesel through the ambulance fuel lines may be the most beneficial therapy of all.
Obstetric emergencies

hypothetical

The sound of your siren wails through the night as you proceed to the next case. It has moved from late at night now to deep into the early morning. Your microwaved leftovers and the restful doze in the recliner are now but a short sweet memory. The dispatcher updates your case and you look grimly at your partner as you slowly exhale. A mother in premature labour is about to give birth to her impatient baby.

Arriving at the given address you have no trouble knowing just where to find the lady as you easily follow the very clear sounds of a woman in labour. She is kneeling on the floor leaning across her bed. She says that a contraction has just passed but she has been having them now for over an hour. This is her first pregnancy and she has been receiving good antenatal care through a major obstetric hospital. The history telling comes to an end for the moment though as she grimaces again with the onset of another contraction. Apparently they are coming every few minutes now.
Obstetric emergencies hypothetical

(1) What would be your priority questions at this point?

The answers you get back on this occasion do little to make you feel any happier. Normal child birth is exciting but not really a medical emergency as such. The overwhelming majority of babies come into the world without any difficulty with the list of ‘midwives’ full of fathers, neighbours, best friends and even police officers. Most babies come when they are ready with or without the hired help. Paramedics typically attend more births a few minutes after arrival than before.

However when the soon to be mum tells you that she is only twenty nine weeks in gestation and that she feels the baby is about to arrive then this does qualify as an emergency.

(2) What should be your very next action if not done already?

Premature labour has a number of predisposing risk factors including previous premature birth, illicit drug use, multiple babies expected, early membrane rupture or incompetent cervix. Vaginal bleeding at any time may suggest some problem with either the placenta or the cervix. Premature labour is defined as being between 20 and less than 37 weeks gestation. Realistically around 24 weeks is when survival becomes a realistic outcome though occasional examples exist for babies in the few preceding weeks. Once 37 weeks is reached this is considered close enough to considered full term.

Twenty nine weeks gestation is concerning. There is certainly a high risk of the baby requiring resuscitation. There is also a high risk of other complications as if that were not enough. The risk of a pre-term birth to the baby is that the lungs and other organs are not fully developed. This can lead to both short and longer term complications including in particular respiratory and neurological. There is high risk that it may not be the baby’s head that wants to come out first.

The lady has been complaining of classic early labour signs including lower back pains, abdominal cramping and pelvic pressure. Her membranes have ruptured a short time before the call was made for the ambulance. There is suggestion the liquor may have been stained with meconium. The contractions have little more than two minutes between them and are lasting more than thirty seconds.
**Can the progression of this early labour be delayed or even halted?**

Tocolytic therapy aims to suppress uterine contractions to delay progress of the pre-term delivery. It is unrealistic to expect that delivery can be delayed for a period of weeks and reach through to full term. Rather the usual target may be as little as one or two extra days. The intent is to delay delivery until the patient can be relocated to a major obstetric hospital and to allow time for steroid administration for the baby. The latter may prove significant particularly for encouraging surfactant production in the undeveloped lungs of the unborn child. The importance of this action will vary with the number of weeks of gestation. The chance of significant disability increases the earlier the prematurity.

Some pre-hospital guidelines include use of drugs such as magnesium sulphate or salbutamol as a tocolytic. The evidence that these drugs actually have an appreciable effect and contribute to the improvement in the outcome of the unborn child is very limited. Though salbutamol was once commonly used nifedipine is now a more common tocolytic drug. The main effect is to provide smooth muscle relaxant with the ambition of temporarily slowing and postponing contractions.

These drugs are more commonly encountered in transfers between hospitals. They are far less commonly thought of as pre-hospital options. Though also having limited evidence support, another common pre-hospital drug that can be sometimes employed as a tocolytic is the humble glyceryl trinitrate patch (GTN). Used in just the same way as it may be for a patient with acute coronary syndrome, the GTN patch may be useful in some circumstances for temporarily delaying premature labour.

**What might these circumstances be?**

Tocolysis has other contraindications as well including anything that will not benefit from sudden the associated cardiovascular affects of the drugs involved. This would include any hypotensive emergency such as severe ante-partum haemorrhage or any hypertensive emergency particularly pre-eclampsia. Nifedipine is sometimes used for the latter as it allows some controlled reduction of the blood pressure whilst still offering significant advantage in delaying labour progression.

Whatever the circumstances, it would be exceptionally unwise to initiate any such pre-hospital therapy without consultation with a major obstetric facility. You have noted in this case that the lady concerned is well in advanced labour and delivery appears imminent. There is little point in trying to stop progress now and so you prepare instead for delivery.

An intensive care paramedic crew have arrived and they begin to prepare for resuscitation of the newborn. Your plan was to commence movement for the nearest obstetric receiving hospital but the mother is giving every indication
that birth is close. Drawing a deep breath inward to try to steady your nerves you watch as the lady lies down now in anticipation of birth. She says she thinks the baby is coming. Well she doesn’t say it as such she more curses the words at you in the middle of a contraction.

You externally examine for signs of the baby and what you see causes you to hold your breath. It isn’t the top of a baby’s head that is for sure. You have only seen a couple of baby’s crowning and this isn’t that. What you see is more of a tubular shape beginning to protrude.

(5) What might you be looking at if not the top of the baby’s head?

The significantly premature foetus is small. It won’t yet have turned itself head first and dropped down into the pelvis in readiness for birth. There is a high risk of the umbilical cord coming out before the baby. This is prolapsed umbilical cord. There is great risk to the baby if this happens. Firstly the cord can be compressed as the baby moves down for delivery leading to circulation compromise. Secondly, the exposure of the cord to the air or to being handled can lead to spasm of the cord and it ceasing its normal action. After all, this is what is supposed to happen after birth. In either case the prognosis for the unborn baby is not good.

(6) What is the pre-hospital management for a prolapsed cord?

You look closely at the baby and can see clearly now that it isn’t cord at all. Well you did know there were two choices. Instead you can see now that it is actually the buttocks of the baby. The pre-term baby being smaller and not yet engaged into the pelvis has an increased chance of being delivered other than head first as normal. As the pregnancy advances toward term the baby best fits into the uterus head downward.

It is good news in one way that it isn’t umbilical cord on view but it is bad news the baby is coming into the world breech. The baby is supposed to be born head first. Failing that, there are a number of breech options that are possible. The buttocks appearing first is one option and the legs may be either flexed at the hip straight back toward the head or partly bending back up but with knees bent. The former is more common.

Of course the buttocks may not be the first visible part. A footling breech is where one or both legs appear first.

The breech delivery is in theory straight forward. The first part of the plan is to get both legs to deliver and have the baby’s back facing up toward you. If the legs are
delivered you will only have to gently rotate the baby’s body if it is face up. If the legs are not delivered then gentle slight rotation left and right and a little manipulation under each leg should see them escape as well. If the arms don’t follow soon after then rotation will need to again be employed. First left ninety degrees then right each time freeing an arm.

The most challenging and perhaps nerve racking part of the delivery is to deliver the head. The rule with the breech baby is to have as little contact as possible with it during the birthing process as you can get away with. Continued contact may cause the baby to extend its head making it more difficult to birth. Contact should only be to reduce or remove reasons for why spontaneous progress cannot quickly occur. It is important during any rotation no effort is made to pull on the baby to avoid causing any injury.

The head is delivered when the baby is ready. To deliver the head provide support by holding one arm along the underside of the baby with one finger gently placed into the baby’s mouth. The fingers on the other hand are gently pushed against the back of the baby’s head. Together delivery is completed in an almost circular fashion bringing the baby’s feet over toward the mother’s abdomen.

**(7) What complications exist with delivery of the breech baby’s head?**

The premature baby is born now and is predictably very small. Whatever else must happen after birth, protection of every bit of the premature newborn’s body heat is essential. Warming the place where birth takes place is important as is wrapping up the baby and its comparatively large sized head. The smallest and most premature baby's before 28 weeks gestation may need to have their tiny body's placed immediately into a plastic bag to help maintain warmth.

Also critical will be resuscitation based on physical stimulation and ventilation that will vary with initial presentation and response to therapy. In all cases expeditious transfer to a neonatal intensive care unit will be necessary. Birth of the baby where that intensive care unit was located would be ideal.

**(8) Can any breech baby not be safely delivered by pre-hospital responders?**

It is easy enough to imagine that a baby trying to be born head last might easily become caught by one or more poorly positioned limbs. But there are occasions when the baby may not be able to pass easily in delivery when coming head first. Once the head has been born, the rest of the baby generally follows quickly after. The head is typically the largest diameter part of the baby. Though it is capable of some moulding to help pass through the birth canal, it remains less compressible than the rest of the body.
There remains a very uncommon circumstance where the baby may still not be able to progress even once the head has been born. Remember that the pelvis is a hard ringed bone that the child must pass through. As such, it is possible for the shoulder to be caught on the pelvis during the birth process. If the baby is not born soon after the head it is possible the cord can become compressed between its body and the pelvis. Any delay in delivery of the body more than about one minute after the head should be considered a real hypoxic emergency for the baby.

**How is this situation managed?**

Given that most deliveries occur with the mother supine, the McRoberts manoeuvre is a very simple intervention to promote birthing of the trapped shoulder. Simply, the mother is asked to pull her knees up toward her abdomen while she lies on her back. If she keeps her knees as close together as possible, which is a challenge in itself with the half born baby present, the pelvis can effectively be widened. Further, the angle that the rim of the pelvis contacts the shoulder is changed. This combination is typically sufficient to allow the shoulder to be freed and birth to continue. During this control of the baby must continue to be maintained as birth of the body may immediately follow. This position may also promote a more forceful uterine contraction whilst it is held. How long should this procedure last? If the birth is not immediate then you will know after about thirty seconds that it isn’t going to work.

When the first method doesn’t prove fruitful, then the second addition is equally as simple. Suprapubic pressure is the simple pushing downward on the mother’s abdomen just above the pelvis whilst the mother remains in the McRoberts position. You will look like you are about to commence very low down CPR. With the shape of the pelvis changed you are now simply pushing the baby downward compressing the shoulder width and encouraging its freedom. Again, this should prove effective almost immediately if it does work and so should not be persisted with past another thirty seconds. If there is still no delivery, then whilst still pushing down begin to gently rock from left to ride for another thirty seconds. You are still trying to change the location of the shoulder beneath and have it slip off the pelvis.

Finally, if this combination does not prove effective, the only remaining option is to try to completely change the angles involved. To do this the Gaskin manoeuvre is employed. Again this is simple and non invasive with the mother now being asked to turn onto her hands and knees in the so called ‘all fours’ position. If necessary the baby’s head may be very gently manipulated down and up to encourage shoulder release. Remember though that even though hypoxia is a major threat, any handling of the baby’s head must be at all times gently and no forceful traction ever applied.

**But what if delivery still does not occur?**
Suggested Answers

(1) Arguably the very first question would be to ask if the mother feels that she is about to deliver the baby. There are a lot of things you want to know but right at this moment you want to know if a baby is about to appear. Does she feel an urge to deliver the baby or use her bowels? Can any part of the baby be seen? If birth is not immediate, how far off might it be? Has there been any vaginal bleeding? Have the membranes ruptured and fluid lost? How far apart are the contractions and how long do they last? How long ago did they commence? The longer and closer the contractions the closer the main event. A few minutes apart and short lasting there is probably time to drive quietly to the obstetric hospital. A minute or less apart with the mother crying she thinks the baby is coming probably means you should stop the car or even wait at home for the main event. Trends are important. The next thing you want to know is will there be any particular surprises with this baby. What is the pregnancy duration now? Are there any problems anticipated? How many babies are anticipated? Sometimes comparison to previous pregnancies can be made but if this is the first presentation the uncertainties will be the greater.

(2) You are likely to be involved very soon in the delivery of a premature birth. Even if there are no complications with the mother, you will very likely have to provide some resuscitation to the baby. To best do this you should assemble the necessary people while you have the chance. Ideally this should be another paramedic crew or preferably an intensive care paramedic crew. Call sooner rather than later. You don’t want to be calling for help when you are up to your elbows in post birth complications.

(3) Certainly it is possible to delay birth in premature labour in some cases. However there are no miracles here with in fact very little evidence that some options make much difference at all. Tocolysis is the inhibition of contractions of the uterus and options have been used for many years in obstetric practice.

(4) First, the mother to be has to be a candidate for delaying labour in the first place. If delivery is imminent and inevitable there is no point in trying to delay this. Advanced labour with regular contractions, ruptured membranes or the signs that delivery is not that far off preclude any attempt at tocolysis. You cannot avoid the inevitable. Also there is little reason to attempt to delay premature labour when it isn’t that premature. Though up to the 37 week mark is technically ‘pre-term’ labour between 34 and 37 weeks is unlikely to bring problems of too much concern so are usually allowed to run as nature has in mind.

(5) There are probably two choices here and neither of them you want. The first is that you can see umbilical cord coming out first. The second is arguably worse. You might be seeing a limb of a baby not coming out head first.
(6) There is very little to be done other than for the doctor who performs the emergency caesarean section. Typically the mother is placed into the knee – chest position where she has her head on the pillow, her body resting on her knees tucked under her and her hips elevated. This allows the baby to fall forward and hopefully reduce compression of the cord. The cord itself should be handled minimally. It can be pushed back inside the vagina if only a small amount protrudes. If it is more is visible, a moistened pad can be placed over the cord and held by hand in an attempt to keep it warm. Fortunately this is a rare presentation. So what happens if the birth becomes inevitable and that doctor is still not yet at hand? You have no other choice but to attempt vaginal delivery. You cannot stop nature at this point.

(7) Firstly the head is meant to come through first. By coming through last there is the chance an arm may come through at the same time causing the child to become jammed in the pelvis. The cord will certainly be coming through at the same time as it is still attached to baby and placenta. This can lead to cord compression and possible anoxia of the baby. It is important for the head to be delivered soon after the body. When the head is delivered the normal path is for the head to mould its shape to fit the birth canal. This not only makes it easier to deliver but also stops any sudden shape changes that could lead to haemorrhage within the baby’s skull. When born breech the head may be compressed during delivery then suddenly released at birth.

(8) The baby with only one limb presenting is a very high risk delivery and often not able to be normally birthed. One arm or one leg only suggests a very poor position, even poorer than any other breech. One arm could mean a shoulder first presentation with the baby lying partially across the pelvis. The presenting arm is all that can be delivered with no further progress possible from that position. One leg presenting (footling breech) suggests that the other leg may be flexed and unable to be delivered through the pelvis either. One or both arms presenting is referred to as a compound breech delivery. It is also possible that an arm or leg may present with the baby in a normal head down position. This of course may be corrected if the baby can move the limb itself. If an arm or leg comes out first alongside the head this will likely cause the baby to become wedged in the pelvis. It is a tight enough fit for the head alone without a limb filling the same space.

(9) There are a few options to quickly consider and implement. Essentially the aim of these is to change the shape of the pelvic opening, change the shape of the baby’s shoulders or to move the baby within the pelvis. Any of these options may result in enough movement to allow the caught shoulder to slip off the pelvic bone and continue. These methods are known as the McRoberts manoeuvre, suprapubic pressure and the Gaskin manoeuvre. Each is non invasive and extremely simple to implement. The critical factor is in recognition that the birthing process is not progressing to completion as expected and immediate intervention is required.
So often guidelines are written with the clear intent that they will be successful. That optimism is usually well founded. What to do next when the guideline or procedure does not work is often silent. If the baby still cannot be fully birthed in this setting there is no other non invasive option. Expeditious transport to a major obstetric facility is the only remaining option. The mother will have to be safely conveyed and either the McRoberts or the Gaskin position would be suitable with the former probably being safer. If the mother is transported supine it is of course important to ensure that she is tilted toward the left to keep the baby from lying on the aorta and vena cava causing major hypotension.