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CLINICAL PRACTICE UPDATE – PAEDIATRIC

# Emergency newborn care: Catch, clamp, & don't...

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When emergency caregivers are asked what type of patients they truly most fear caring for, children and even worse, babies, are the common answers. However, what do we know about what we do everyday? Can it always get worse? Absolutely! Therefore, what is worse than having to care for a child is when a pregnant woman screams those immortal words ... "I've got to push!"

*"In men, nine of ten abdominal tumours are malignant; in women, nine out of ten abdominal swellings are the pregnant uterus."* Rutherford Morison (1853–1939)<sup>1</sup>. p. 49

*"The moment a child is born, the mother is also born. She never existed before. The woman existed, but the mother, never. A mother is something absolutely new."* Rajneesh (Indian philosopher, 1931–1990).<sup>2</sup>

This article will review the initial steps in resuscitating over 90% of babies who are welcomed into this world in the ED until their care can be transferred to those who specialise in, and really like to care for, the newly born.

*"At every delivery, there should be at least one person who can be immediately available to the baby as his or her only responsibility and who is capable of initiating resuscitation. ... When resuscitation is needed, it must be initiated without delay."*<sup>3</sup>

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So... the baby just popped out. What is the first thing I should do?

Catch!

All right, I have caught the baby. Now what do I do? (Neonatology/Paediatrics/Retrieval Team are unfortunately not here yet).

First, gently wipe the mouth, and then the nose, with a towel or gently suction with a 10f suction catheter (Australia) or bulb syringe (USA). Remembering to keep the baby at the level of the mother's hip, or on her belly, to ensure that blood does not drain to/from mum or the baby is essential. Then, clamp the cord in two places and cut in one. A rule taught to carpenters is to "measure twice and cut once". The same rule applies with newborn babies. If you only clamp once and then cut the cord, either the mum or the baby will bleed quite profusely. Therefore, "clamp twice and cut once".

When I cut the cord, how much cord do I leave?

Two point five to five centimeters (1–2 inches). This allows for later placement of umbilical lines if necessary. Neonatology can cut closer if they wish, but a little extra cord to play with is appreciated in the event that umbilical lines are difficult to place. Again, 2.5–5 cm (1–2 inches) is appropriate — 1 m (3 feet) is a bit extreme.<sup>4</sup>

## Apgar Scores

I've caught and suctioned the baby and clamped/cut the cord, don't I have to get an Apgar score?

"These scores (Apgar) should not be used to dictate appropriate resuscitative actions, nor should

Table 1 APGAR Scores

| Sign  | 0              | 1                           | 2                          |
|---|----------------|-----------------------------|----------------------------|
| Appearance                                      | A Blue, pale   | Pink body, blue extremities | Completely pink            |
| Pulse   | P None         | ''Bad'' (<100)              | ''Good'' (>100)            |
| Grimace (catheter in nose, tactile stimulation) | G No response  | Grimace                     | Cough, sneeze, gag, cry    |
| Activity  | A Flaccid/limp | Some flexion                | Well-flexed, active motion |
| Respirations                                    | R None         | Slow, irregular             | Good, crying               |

Adapted from Holleran, R.<sup>6</sup>. p. 563, table 30-1.

53 interventions for depressed infants be delayed until the  
54 1-min assessment.<sup>''3</sup>

55 Simply, resuscitate the baby first and figure out the scores later.  
56 After the baby is either with mum or in the nursery, we recommend you sit down, have some coffee or diazepam,  
57 and calculate the one and five minute Apgar scores with a chart in front of you (Table 1). Remember, there are way  
58 too many numbers for ED nurses to remember as it is; therefore, unless you attend deliveries every day, resuscitate the  
59 baby first, look at your chart, and then calculate the Apgar score.<sup>3,5,6</sup>

### 64 Look at the baby

#### 65 But I am still holding the baby. What should I do now?

66 Lay it down. Either on mum's abdomen, the hopefully pre-warmed radiant overhead warmer, or dry blankets. Look  
67 at the baby. Is it a ''TOT'' (''tiny ol' thing'') or a ''BOB'' (''big ol' baby'') or something between? Is the amniotic fluid  
68 clear or discoloured (green, yellow, brown)? Does the baby look ''sick or not sick?'' These will be discussed in depth  
69 later, but at this moment, use your gut and your experience. Trust your instincts. They are probably quite right.

70 Remember babies have ''big head, little body'' syndrome. Therefore, you should place something (nappy/small  
71 towel roll) under the shoulders or a device such as the Papoose (Ossur, Moorestown, NJ) to offset the big head and  
72 a hat to minimise heat loss. This puts the baby into the 'open airway' position.<sup>7,8</sup>(See Figs. 1 and 2).

#### 80 So after, clamping/cutting, and looking at the baby, what else do I do?

81 It depends. It depends on whether the amniotic fluid was clear or some other colour. Just like insulin, there are only  
82 two types of amniotic fluid, clear or not clear. Simply, when dealing with amniotic fluid, you hope for clear because you  
83 and the baby are stressed if it is cloudy. Babies are supposed to wait to poop meconium until they are outside of mum.  
84 Then all we need are multiple baby wipes and a nappy. However, when mum and/or the baby is stressed, babies poop.  
85 Why is this an issue? When the baby is inside the mother, there is amniotic fluid from the baby's gums to the bottom of  
86 the air sacs. If, before delivery, the baby becomes stressed and poops, then potentially, but not always, there can be  
87 poop in the airway all the way down to the air sacs.<sup>5,7</sup>

#### 88 If the amniotic fluid is clear, what do I do?

89 Celebrate, and continue to suck out the goobers. Ideally, when the head is just delivered, use a 10f suction catheter or  
90 bulb syringe to suction first the mouth, then the nose. Then, after the baby is caught, and the cord is clamped and cut,  
91 lay the baby down. Wipe the face from the forehead down (be careful not to shove more goobers into the nose), suction  
92 the mouth and nose again and continue your assessments.<sup>3,5</sup>

93 Do I suction the mouth or the nose first? Does it matter? How do I remember which to suction first? Suction the mouth  
94 first because:

- 95 (1) The mouth hole is bigger than the nose hole, therefore, it has more room for goobers;
- 96
- 97
- 98
- 99
- 100
- 101
- 102
- 103
- 104
- 105
- 106
- 107



Figure 1 Big head, little body syndrome and chin on chest position. Photo from Comprehensive Pediatric Emergency Care,<sup>9</sup> p. 88 reprinted with permission.



Figure 2 Proper airway positioning with the Papoose Infant Immobilization Device. Photo courtesy of Ossur, [www.ossur.com](http://www.ossur.com).

- 108 (2) “M” comes before “N” in the alphabet; and
- 109 (3) Babies are initially preferential nose breathers (i.e. they
- 110 prefer to breathe through their mouth when their nares
- 111 are clogged up with goobers).

112 Suctioning the nose can cause the baby to gasp and poten-  
113 tially aspirate the oral fluids if the mouth has not been  
114 suctioned first. Remember, repeated suctioning can easily  
115 cause bradycardia in a newborn and should be avoided if  
116 possible. After suctioning, proceed to drying the baby after  
117 laying him or her down.<sup>7,8,10</sup>

**If the amniotic fluid is not clear, what do I do?**

Be stressed —The baby certainly is!

**So beyond being stressed, what do I do?**

121 There are two types of meconium-stained amniotic fluid,  
122 thick and thin. Thin meconium looks like amniotic fluid with  
123 flecks of poop floating in it. Thick meconium resembles  
124 green-pea soup. In the past, clinicians’ treatments were  
125 based upon whether it was “thick or thin” cloudy amni-  
126 otic fluid. However, in the current Neonatal Resuscitation  
127 Program (NRP) guidelines,<sup>11</sup> the treatment for meconium-  
128 stained amniotic fluid is now based not on thick or thin, but  
129 whether the baby is “sick or not sick”.<sup>3,5,8</sup>

**So, if the amniotic fluid is cloudy (thick/thin), but the  
130 baby comes out looking great (i.e. screaming, breathing,  
131 moving), then what do I do?**

132 Celebrate! Suction the mouth first, then the nose and  
133 continue your assessments. Continuing to dry the baby while  
134 gently rubbing the back and extremities will usually elicit as  
135 strong cry. A crying baby is a happy sound immediately after  
136 birth!<sup>5,7,8</sup>

**But what if the amniotic fluid is green (thick/thin) and  
137 the baby looks sick (not breathing, floppy, blue), then  
138 what do I do?**

139 Our recommendation (before actively stimulating/drying  
140 the baby) is to have the person assisting with delivery suction  
141 the mouth and nose upon presentation of the head (as with  
142 any baby). Then once the baby is completely delivered, gen-  
143 tly lay the baby down and before actively stimulating/drying  
144 the baby, suction the trachea at least one time using a meco-  
145 nium aspirator.

146 The idea is that if this sick baby starts to cry (i.e. with  
147 stimulation), the goobers will be sucked down deeper into  
148 the airway. Intubate the trachea normally with a 3.0 or 3.5  
149 endotracheal (ET) tube, but instead of suctioning the ET  
150 tube with a suction catheter, attach a meconium aspirator.  
151 A 5f suction catheter (the smallest currently available) is  
152 about the size of angel hair pasta. Now think about suction-  
153 ing meconium (thick tar) through a tiny piece of pasta and  
154 you get the idea. The meconium aspirator converts the ET  
155 tube into a larger suction catheter and allows one to suc-  
156 tion the “tar” through the larger diameter of the ET tube  
157 versus angel hair pasta. If a meconium aspirator is not avail-  
158 able, a 10–12f suction catheter can also be used to suction  
159 the trachea. Visualising and suctioning the ET tube can be  
160 difficult for those not proficient in intubating small infants.  
161 If an initial attempt is unsuccessful, thoroughly suction the  
162 oropharynx and proceed with bag-mask ventilation.<sup>5,7,8</sup> (See  
163 Figs. 3 and 4).

**How much portable/wall suction should I use?**

164 We believe in the “magic number is 100” rule —  
165 100 mmHg. This is more than enough suction to suck out the  
166



167 **Figure 3** Meconium aspirator.  
168 Photo courtesy of Neotech Products. [www.neotechproducts.com](http://www.neotechproducts.com).

169 most tenacious of baby boogers, but not enough to suck out  
170 the lungs as well (poor form).<sup>7,8</sup>

**How long should I suction?**

171 The Neonatal Resuscitation Program<sup>11</sup> recommends a  
172 maximum of 3–5 s and applying suction while removing the  
173 ET tube. Suctioning for longer than 3–5 s can result in signif-  
174 icant hypoxia and resultant bradycardia. After one time of  
175 suctioning the trachea, whether you should attempt intuba-  
176 tion/tracheal suctioning again depends on two things. First,  
177 if upon the initial suctioning, no meconium was “sucked  
178 out” of the trachea, then you do not need to do it again.  
179 However, if meconium was able to be “sucked out” and  
180 the baby’s condition allows (not bradycardic and requiring  
181 immediate resuscitation), you can attempt to “suck out”  
182 more meconium. A clean endotracheal tube should be used  
183 each time (if a clean tube is not available, quickly rinse  
184 with saline and re-use), until either there is no more meco-  
185 nium recovered or the baby’s condition mandates further  
186 resuscitation without delay.<sup>5,7,8</sup>



187 **Figure 4** Endotracheal suctioning of meconium.  
Photo courtesy of Debbie Andrews, RN.

**What is Next? Remember ‘‘The Mantra’’  
Are they breathing? Yes or no?**

- Yes... Celebrate, then check the heart rate and skin colour.
- No... Do something.

**How’s the heart rate?** Good or bad? (remember the magic number is 100).

- Good (above 100)... Celebrate and check the skin colour.
- Bad (below 100)... Do something.

**How’s the skin colour? Pink or blue?**

- Pink... Celebrate.
- Blue... Do something.

Repeat after me... Are they breathing? Yes or no? How’s the heart rate? Good or bad? How’s the skin colour? Pink or blue? If you remember nothing else, ‘‘The Mantra’’ will not steer you wrong and will guide all ongoing interventions.

**Are they breathing?** Yes — Celebrate. No — Do something! Stimulate the baby by gently (but confidently) rubbing the baby’s back and flicking the soles of the feet. If the baby fails to respond to brief tactile stimulation, give positive pressure ventilation (PPV) with a bag and mask. Create a seal by covering the nose and mouth with the mask and ‘‘bag’’ the baby at a rate of 40–60 per minute. Signs of effective ‘‘bagging’’ are an improvement in colour and tone, a rapid rise in heart rate, and visible chest movement. Frequently, brief PPV of 10–15 s is enough to initiate spontaneous crying.<sup>12</sup>

**How is the heart rate?** Good (above 100) — Celebrate. Bad (below 100) or really bad (below 60) — Do something! Bradycardia in a newborn is almost always respiratory in origin and fixing that, i.e. initiating PPV will correct the bradycardia. The heart rate should be assessed in 30 s after ‘‘bagging’’ is initiated. Positive pressure ventilation should be continued if the heart rate remains less than 100, or if the baby is not breathing. Chest compressions should also be started if the heart rate is less than 60 despite effective PPV. Chest compressions should be administered with two fingers (middle and index) placed just below the nipple line and given at a rate of three compressions to one ventilation (3:1 ratio). The depth should be approximately one-third (1/3) of the anterior-posterior chest diameter. Chest compressions should always be accompanied by PPV and the heart rate should be assessed every 30 s. Chest compressions can be discontinued when the heart rate is above 60.<sup>5,8</sup>

**How is the colour?** Pink — Celebrate. Blue — Do something! (i.e. oxygen and warm them up). Remember, oxygen alone will not make an apneic infant breathe, nor will it cause the baby’s heart rate to rise. Blow-by oxygen at approximately 5 l per minute should be administered if the baby remains centrally blue (look under the baby’s tongue to assess colour) by placing the tubing just under the baby’s nose.<sup>7</sup>

**A Dry Baby is a Happy Baby!**

Delaying drying should only occur if tracheal suctioning is being performed. Remember, the baby has been in a very

toasty oven prior to birth, and loses an incredible amount of heat when its wet body comes into contact with the cold air. So dry the slippery little sucker off and get rid of the wet towels/blankets. Babies come out soaking wet and covered in goo. Remember that newborns get cold much faster when they are wet. Think about playing in the snow, then how you’d feel when your clothes become wet with melting snow. Unbelievably cold! Babies, in addition to all of the common side effects of hypothermia, decide to up the ante and stop breathing, just because they are cold! Replace blankets or towels used for drying with clean, dry, and hopefully warm ones. Do not forget to thoroughly dry the baby’s head and place a blanket or towel over the head to prevent further heat loss (remember ‘big head, little body’ syndrome).<sup>5,8</sup>

*‘‘Although algorithms provide a good cookbook, the patient always requires a thinking cook!’’<sup>13</sup>. p. 5*

**Summary**

Fortunately, most newborns are born healthy and cute and require no advanced resuscitation, other than briefly clearing fluid from their nose and mouth, drying, and keeping them warm. You’ll be there to catch ‘em, clamp ‘em, and not drop ‘em! However, in the event something goes wrong, you now have some tools to provide the needed care and support until specialty help comes to you.

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