

Don't Become Unglued by Pediatric Stabilization

*Ella Scott, RN, MA, and
Scott DeBoer, RN, MSN*

It's Saturday night in a community hospital's ED. A mother, cradling her heavily bundled infant (in July, mind you), cries out, "There's something wrong with my baby!" After ascertaining there really is a child buried deep within the blankets, you find she is quite cool, cyanotic, and not breathing.

The baby is rapidly intubated, and an intraosseus line is placed. As resuscitation continues, your thoughts trail to all those things you might not know about pediatric cases— and it scares you.

Take heart: A simple mnemonic summarizes the treatment priorities in such cases. When it comes to initial resuscitation and stabilization of critically ill or injured children, remember to keep them "pink, warm, sweet, and safe."

Keep 'Em Pink

A medical phenomenon surrounds children. It's called big head, little body syndrome. Until about the age of six years, children's proportionately large heads must be taken into account when addressing their airway management. For example, if one lays two-year-old children supine on stretchers, the chil-

dren's airways can be occluded just by their "big heads" pushing their chins onto their chests. Simply placing a diaper under the shoulders of an infant or a small, rolled towel under the shoulders of an older child can offset this anatomical difference and allow (hopefully) the maintenance of an open airway.¹

We know adults suffer cardiac arrests, principally due to the well-established B+B+B=B phenomenon (burgers + beer + big people = the big one). But why do kids code? Children can suffer primary cardiac events, but they're rare.² For the most part, codes in children stem from a respiratory etiology. Administration of as much or as little oxygen as they require should be your standard. Fears of "stopping breathing" from too much supplemental oxygen, as with adults with chronic obstructive pulmonary disease, are simply not warranted in most children.³

Oxygen may be delivered to children via nasal cannula, masks, head hood s/boxes, or intubation. A word of caution, however: With children, the method of oxygen delivery you would prefer to use won't necessarily match the method they'll tolerate. A mask might be your easiest tool, but tell that to a squirming eight-month-old

Consider nasal cannulas, a frequently underutilized, noninvasive method of oxygen

delivery that are nevertheless appropriate devices for children. Up until about six months of age, children are preferential nose-breathers; they generally don't breathe through their mouths. Also, they, like many adults, tend to hate those confining, face-bothering oxygen masks. Nasal cannulas can be the "face-saving" tricks you need.

If intubation is warranted, it should only be accomplished after the administration of a combination of medications, including atropine, sedatives/analgesics, and possibly chemical paralytics.⁴ Indications for intubation in children are similar to those in adults: Respiratory failure, arrest states, altered levels of consciousness, and the like are common reasons for intubation.

Also as in adults, a little preparation goes a long way with intubation in children. Although most nurses aren't responsible for placing endotracheal tubes (ETTs), they'll often find themselves needing to maintain those tubes in the right place. Two factors will greatly aid their efforts: using the right kind of tape and taping the tubes the right way.

You won't get far with a tape that won't stay put. Look for those that stay sticky, despite saliva or "goobers." Durapore® (silk tape) and Transpore® (clear tape) seemingly stick for only a few seconds when confronted with saliva. To remember these tapes are not your best bet, think, "DuraPORE and TransPORE are 'PORE' choices for ETTs." Consider Elastoplast® or WetPruF cloth tape instead.

When paired with Benzoin, these tapes appear to have the ability to stay sticky though a hurricane.³

Having the right tape is one thing; knowing where to put it is another. Consider affixing the tape to a stationary target near the mouth, such as the maxilla. When cut into an "H" shape, the top part of the tape can be placed on a child's maxilla (where a mustache would be). It's an area that tends to stay relatively still on a face that might otherwise have many moving, goober-covered parts. The bottom part of the "H" can then be wrapped around the tube.

Several tools are available to help select the correct EIT size, including formulas such as $16 + \text{age}/4$, as well as the Broselow/Rainbow tapes.³ Once the EIT is placed, however, other tubes are commonly added. To remember the appropriate size of tubes to use, consider the rule of "IX/2X/3X," as in —

IX (multiplied by) the EIT = the EIT (that was easy!)

2X the ETT = the suction catheter for the ETT, nasogastric, and urinary catheter sizes

3X the EIT = how many em at the lipline the EIT should be placed

Here's an example:

1X EIT = 4.0 EIT

2X EIT = suction catheter for the nasogastric tube/urinary catheter (in our example, 8.0)

3X EIT = number of em marked at the lipline to guide where the tape should be placed (in this case, 12em)

Keep 'Em Warm

Make sure critically ill or injured children are warm and they stay that way. That big head, little body syndrome comes into play again here: Children will lose the majority of their heat from those oversized heads. Cover up their bodies, but don't forget their noggins, too (wooly bonnets work well with babies). Be sure to check their temperatures before they're transported. Blankets and warming devices, including overhead warmers, forced air warmers, and wrapped hot packs, will help maintain normothermia. •

Keep 'Em Sweet

Seemingly all children are sweet, but some are more so than others—particularly when it comes to their blood sugars. When infants and children feel stress, their blood sugars can drop dramatically. Before transport, find out how sweet they really are—or aren't—by performing a finger- or heel-stick blood sugar test. Low sugar levels suggest a slow IV bolus of 10% to 25% dextrose. Maintain appropriate levels with a continuous supply of IV glucose.⁵

Keeping children sweet also means acknowledging their hurts and fears. Just like adults, children can't escape pain or anxiety. The administration of appropriate sedatives and analgesics is not only crucial for hemodynamic stability, it's humane patient care."

Keep 'Em Safe

Sick or injured children should be transported by people who like to care for kids to facilities that like them just as well. Emergency medical services personnel can appropriately transport noncritically ill children; but when children are taken to pediatric ICUs or trauma center settings, specialized transport teams should be used.

One study highlighted the dangers of the transport of children by nonspecialized teams.' Three-quarters of the transferred pediatric patients studied suffered serious clinical complications, nearly a quarter of which were considered life-threatening. Such figures are alarming, but not surprising, considering no monitoring of the patients' blood pressures, temperatures, or blood sugars occurred during transport. Neither did non-specialized transport personnel monitor oxygen saturation or electrocardiography in 27% of the in-route patients. Upon arrival in the pediatric ICU, 11% of the patients required immediate endotracheal intubation, and 9% were significantly hypotensive.

Resuscitation and stabilization of critically ill or injured children may seem like a scary business, but they're nothing you can't handle. Remember to keep a young one pink, warm, sweet, and safe, and you'll likely see a rosy outcome.

Ella Scott, RN, MA, is a clinical nurse consultant in emergency pediatrics at Royal North Shore Hospital, Sydney, Australia. Scott DeBoer, RN, MSN, is a flight nurse educator for the University of Chicago Aeromedical Network, University of Chicago Medical Center, and founder of Peds-R-US Medical Education.

References

1. Wheeler M, Cote C, Todres D. Pediatric airway. In *A Practice of Anesthesia for Infants and Children*. Philadelphia: W. B. Saunders; 2001:79-120.
2. Schlei C, Tadres D. Cardiopulmonary resuscitation. In *A Practice of Anesthesia for Infants and Children*. Philadelphia: W. B. Saunders; 2001:265-293.
3. Ragosta K, Kanter R. Airway management. In *Pediatric Transport Medicine*. St. Louis, MO: Mosby-Year Book; 1995:167-185.
4. Bissonette B, Ryan J. Temperature regulation. In *A Practice of Anesthesia for Infants and Children*. Philadelphia: W. B. Saunders; 2001:610-635.
5. Buser-Gills M, Whitfield J. Neonatal transport: Resuscitation and documentation. In *Pediatric Transport Medicine*. St. Louis, MO: Mosby-Year Book; 1995:404-413.
6. Cote C, Lugo R, Ward R. Pharmacokinetics and pharmacology of drugs in children. In *A Practice of Anesthesia for Infants and Children*. Philadelphia: W. B. Saunders; 2001:121-171.
7. Bary P, Ralston C. Adverse events occurring during interhospital transfer of the critically ill. *Arch Disease Childhood*. 1994;71:8-11.