

Big Head, Little Body Syndrome: What EMS Providers Need to Know

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From the first EMS classes we attended, we were taught that “children are not small adults.” This is true in many ways: physically, psychologically and emotionally. One of the most significant differences between children and adults can be termed “Big Head, Little Body Syndrome.” Compared to the adult population, children have big heads and little bodies. Our ability to provide optimal care during pediatric emergencies, whether medical or traumatic, often hinges on how well we understand the importance of those anatomical proportion differences. This article will review unique ABCDE factors that are impacted by this “syndrome” and their implications for EMS providers.

A Is for Airway

The basis for all emergency resuscitation treatment begins with establishing an adequate airway. If you lay a young child flat on a stretcher or spine board, his/her big head can cause potentially serious airway problems by forcing the chin onto the chest in an exaggerated downward-facing position. This is especially true for children under age eight, due to the prominent occiput.¹⁻³

Basic resuscitation courses teach that after asking the patient if he is okay, the next action is to open the airway by gently tilting the head back and/or performing a jaw thrust. Until recently, it was commonly taught that extremes of head position (flexion or extension) actually closed or crimped the trachea.^{1,4,5} Subsequent studies have shown that this is not necessarily the case, demonstrating that airway compromise may not be due to a “squished” trachea. The problem probably arises from the way the relaxed tongue and hypopharynx can obstruct the airway.⁶⁻⁹ A simple remedy for this situation is to provide adequate padding, such as a folded diaper (for infants) or a small towel roll (for older kids) under the shoulders to place the airway in a more neutral position (see *Figures 1-2*). **Scott:** Figure 2 shows a product being used not a diaoer or towel. Should we add a sentence saying such products can also be used?

B Is for Burns

Big head, little body makes a difference



Figure 1



Figure 2

Photos courtesy of Jerome Medical

when treating burns. Scalds resulting from sudden immersion into too-hot water, or from pulling things down from stove tops, constitute a high percentage of pediatric burn injuries.¹⁰⁻¹² Much like the ABCs of resuscitation, EMS providers are taught the “Rule of 9s” for emergency burn care. Often described as distinguishing the big parts from the little parts, the Rule of 9s (see *Figure*

3) says that little parts of the body represent 9% of the body surface area (BSA) while the big parts are twice that, or 18%. In an adult, the entire head is a “little part” and therefore accounts for just 9% of BSA. In young children, the big head is proportionally larger and therefore it is a “big part” that represents 18% of the body.¹⁰⁻¹²

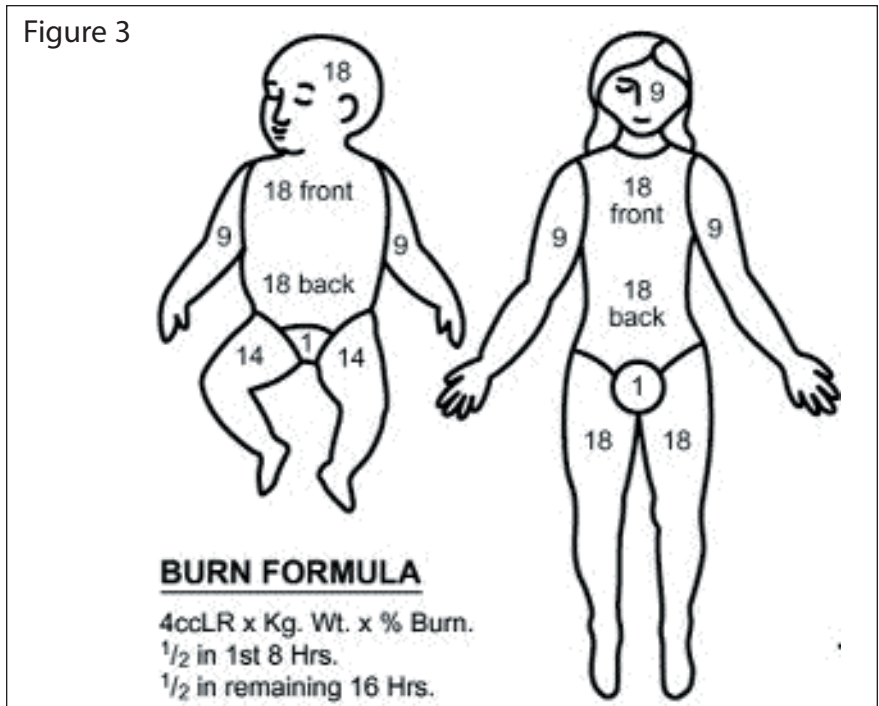


Illustration courtesy of Skyward Promotions

Figure 4



Photo courtesy of Jerome Medical

Figure 5



Photo courtesy of Iron Duck

C Is for Cervical Spine and Car Seats

Just as all resuscitation efforts begin with ABC, all trauma efforts should include recognizing the commonly held EMS precept that “everyone has a broken neck until proven differently.” Placing a young child who requires spinal immobilization on a traditional spine board is not a pretty picture. Despite the fact that we usually don’t want anything on the board “but their butt,” there are special interventions to consider for spinal immobilization of patients with “big head, little body syndrome.”^{3,13,14}

As described earlier, placing a towel roll or diaper under the shoulders of the pediatric patient can better position the head and airway. This applies to spinal immobilization as well.^{1,7,11,13,15,16} There is a new pediatric pad in development that can be placed on a conventional spine board to help with big head positioning.^{16,17–19} In addition, this new pad is color-coded to match the popular Broselow-Luten tape, which makes it of great value in managing initial resuscitation of the child (see *Figure 4*).

Another possible consideration involves utilizing specially designed pediatric spine boards (see *Figure 5*). These specialized boards are easily identified for pediatric patients, as they are only about one-half the size of a standard, “big-person” board. Unlike short boards or extrication devices, some boards even have a “head drop” built into the board to offset the big head that accompanies the little bodies. Though helpful in many instances, an unfortunate disadvantage of the “head drop” part of the pediatric spine board is that one size does not fit all. While the drop may be too much or too little for any individual child, in general, it can be a great asset for stabilizing and safely transporting pediatric trauma patients.^{3,7,15,17–19}

What about cervical collars? In addition to spine boards and the ever-popular towels and tape, cervical collars are an integral part of spinal immobilization.^{3,14,20} However, experienced EMS providers say that many pediatric collars simply don’t fit kids. The trick is selecting a collar that not only limits cervical motion, but also properly fits the patient. This is essential to avoid undesired flexion or extension.^{3,11,15,16,18,21–23}

There are now collars for EMS-use specifically designed to fit children. Taking this concept one step further, many pediatric EMS/ED systems are integrating “color-coding kids” with the Broselow-Luten tape and resuscitation system. Spinal immobilization can be part of this program, as selected pediatric cervical collars are now “color-coded” to make appropriate sizing easier for EMS professionals.

EMS practitioners often ask about immobilizing children in car seats. Should we take the children out or leave them in? Both approaches are described in the literature.^{1,3,7,11,20,24–26} Some experts recommend leaving a pediatric patient in the intact, undamaged car seat if the child does not appear to be acutely ill or injured. Adequate, appropriate immobilization, including an appropriate-size cervical collar, tape and towels in a “horseshoe” fashion, can be implemented while the patient remains in the car seat. In addition, many car seats

are radiolucent, permitting an x-ray to be obtained without removing the patient from the seat. Children breathe better sitting up, and they are quite often very comfortable with the support and security of the car seat.

These same experts also recommend taking the child out of the car seat under different circumstances: a critically ill child requiring medical interventions, the fact that car seats were not made to immobilize children, and the possibility that unseen damage may affect the structural integrity of the car seat after a motor vehicle crash (MVC). Assessing a fully immobilized child in a car seat is limited at best. Properly installed car safety seats can definitely reduce the amount and nature of pediatric injuries that result from MVCs; however, when the car stops, the child and his/her big head keeps moving. As a result, cervical spine injuries, though rare, can occur, with subsequent devastating effects in children.^{1,3,7,11,20,24–26}

D Is for Drowning

It might come as a surprise that the majority of toddler drownings are not at beaches, but at home in pools, buckets and bathtubs.^{27,28} Why? Once again, the answer lies in the “big head, little body syndrome.” Toddlers are perpetually curious creatures. Combining this fact with their big heads is an invitation for disaster. Bucket drownings occur as children find a bucket, look curiously inside, and then fall in because of the way their big heads affect their center of gravity. The child can’t get out because he/she does not have the strength or coordination to pull out the head and torso.^{15,28}

Tub drownings are often attributed to lack of supervision. Inadequate safety planning and poor supervision are often the contributing factors to pool drownings. Part of our jobs as EMS providers should be to provide potential lifesaving education to our community, including the importance of providing continuous supervision for children in or near water and placing fences and other safety features around swimming pools. Pool safety devices include items like the Safety Turtle (a bracelet that alarms when submerged) (Terrapin, Ontario, Canada), floating pool alarms (Allweather, Boucherville, Quebec, Canada) and hard, noncompressible pool covers (Loop-Loc Ltd., Hauppauge, NY). These and other similar products are essential components in the “layers of protection” strategy for drowning prevention.^{12,29}

E Is for Environment (and Everything Else)

Children should be kept “pink and warm.” Keeping children pink means giving them supplemental oxygen as needed. Warm means exactly that—keeping them warm and avoiding heat loss. Where do children lose the most heat from? The answer is simple—everywhere, but primarily from their big heads. To prevent heat loss, cover their bodies, and especially their heads, with a hat, towel or whatever is immediately available. It is very important to remember that bad things happen when children get cold. They can stop breathing, just due to cold!^{11,24,30–32} Keeping children sweet means providing adequate analgesia, as well as maintaining a normal blood sugar. These things

will help them act and stay sweet.³³

Summary

Because of normal physiological development, children have “big head, little body syndrome.” In order to provide optimal care for these patients, EMS professionals should remember the implications for **A**irway management, **B**urns, **C**ervical spine stabilization and **C**ar seats, **D**rowning prevention and **E**nvironmental concerns. ■

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