



# Complex Child E-Magazine

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## Solutions for Temperature Regulation Problems by Susan Agrawal

Children with Autonomic Dysfunction typically have problems regulating their temperatures. Certain children must always be kept cool or they will experience rapidly rising fevers. Other children are naturally cold and need to be warmed up, especially at night. The majority of children experience problems in both hot or cold environments. Their temperatures rise in the heat and they experience fevers and other symptoms associated with heat intolerance, while temperatures drop in cold environments, leaving them uncomfortable with freezing cold extremities.

This article will provide a variety of strategies for monitoring body temperature in noninvasive ways and will also suggest products for maintaining a steady temperature.

### **Temperature Monitoring**

Children who have problems regulating their temperatures need to have their body temperatures measured frequently. For some children, temperature checks must be done as often as every two hours or even continuously.

While taking a rectal temperature is the most accurate way to measure core body temperature, it is impractical and invasive to perform repeated rectal temperatures on children who need temperature checks every few hours. Unfortunately, children with autonomic regulation problems also often have skin temperature regulation problems, meaning that typical methods of measuring temperature, such as under the arm or in the ear, can be extraordinarily inaccurate. It is not uncommon for a child with Autonomic Dysfunction to have a rectal temperature of 102F and an axillary (underarm) temperature of 92F.

Using a temporal thermometer is a good compromise for many families. These thermometers use infrared scanning of the temporal artery in the forehead to produce consistent temperature readings closer to those taken by rectal thermometers. A secondary site, behind the ear, also works well for children who sweat or tend to have irregular skin temperatures on their foreheads. Temporal scanners are wonderful for children who need temperature checks while sleeping, since temperatures are taken by scanning the forehead.

These thermometers are not perfect. They require practice to use accurately and still may give inconsistent temperatures. The best choice is a professional model, such as the Exergen Temporal Scanner [<http://www.exergen.com/medical/TAT/5000.htm>], which costs about \$460 and may be covered by insurance for some children. Other models are available for consumers that are not as accurate but are priced much lower, between \$50-80. Options include the Exergen Comfort Scanner or Temporal Scanner [<http://www.exergen.com/medical/TAT/tatconsumerpage.htm>] or the Kidz-Med Thermofocus [<http://www.kidzmed.com/p-13-thermofocus-5-in-1-infrared-thermometer.aspx>].

For children who need to be monitored continuously, a good option is to use disposable forehead thermometers that stick directly on the forehead. These typically cost \$.50-\$2 each and are widely available. Two common choices are the HallCrest FeverScan [[http://www.hallcrest.com/subcat.cfm?cat\\_id=67&sublvl\\_id=2&subcat\\_id=2](http://www.hallcrest.com/subcat.cfm?cat_id=67&sublvl_id=2&subcat_id=2)] or the Respironics disposable [<http://tempindicators.respironics.com/>].

Children with severe temperature regulation problems may need continuous monitoring by a medical grade monitor, usually as part of a full monitor that records oxygenation, heartrate, temperature, and other vital signs. These range in cost from \$1500-\$6000 or more, but may be rented or covered by insurance in some cases. An assortment can be found at Welch Allyn [[http://www.welchallyn.com/apps/products/product\\_category.jsp?catcode=PMS&subcatode=PMS-VSD](http://www.welchallyn.com/apps/products/product_category.jsp?catcode=PMS&subcatode=PMS-VSD)].

## Keeping Cool

Many children with Autonomic Dysfunction have trouble keeping cool in the summer months. Some children cannot keep cool even during cooler weather and must be cooled at all times.

There are a wide variety of products available for cooling. One of the most practical is a cooling vest, which fits under or over clothing and cools the body. There are several different varieties available, including Evaporative, Ice Pack, and Phase Change cooling.

- ❑ **Evaporative cooling vests.** These vests are soaked in water and the water is absorbed into a core inside the vest, providing moderate cooling for 4-6 hours for most children. The vests do not remain wet since the water is trapped in the absorbent core. Once toweled dry, they stay dry. While these are widely available from many manufacturers, Silver Eagle Outfitters [[https://www.silvereagleoutfitters.com/shop/vest/Special\\_Order\\_POV.html](https://www.silvereagleoutfitters.com/shop/vest/Special_Order_POV.html)] has been exceptionally helpful to the special needs community and makes custom-sized vests for children. They will include a pouch for a feeding pump/bag if desired.

- ❑ **Ice Pack Vests.** For children who need greater cooling, a vest that can be filled with ice packs is a good choice. The vest contains pouches that can accommodate ice packs. Gel ice packs, such as these soft ice packs [<http://polarsoftice.com/hcpp2.html>] are recommended since they remain flexible even when completely frozen. While these vests cool really well, they tend to be heavy and require access to a freezer, as well as preparation time to cool the ice packs. Two popular models include The Polar Soft vest [<http://polarsoftice.com/koolmax.html>] for children 50 pounds and up or the Cool Sport model [<http://www.coolsport.net/index2.html>] for children 45 pounds and up.

If you have a smaller child, it may be possible to make your own vest. A simple solution is to buy a preschool-sized life preserver with foam inserts and remove the foam inserts. The pockets can then be filled with ice packs. You can also design and sew one yourself from scratch, making a simple padded vest and adding pockets throughout.

- ❑ **Phase Change Vests.** Finally, Phase Change cooling vests use special cooling inserts that pull heat from the body and remain at a steady temperature of 58-59F while solid. These vests contain pockets like the ice pack ones above. Simply place charged cooling inserts into the pockets to remain cool for approximately two hours at a steady temperature. The cooling inserts are recharged by placing in ice water or the refrigerator for 15-30 minutes. The downside to these vests is that they are somewhat heavy, the cooling inserts are stiff when activated, and they require some preparation before use.

For children six and above, a good option is this Texas Cool Vest [<http://www.texascoolvest.com/cvl.html>] which uses smaller phase change cooling packs for greater comfort. Custom children's sized phase change vests are available from Heat Relief Depot [[http://heatreliefdepot.com/catalog/product\\_info.php?cPath=156&products\\_id=294](http://heatreliefdepot.com/catalog/product_info.php?cPath=156&products_id=294)], who also provides a medical discount to qualifying families. Once again, you can sew your own, using inserts such as these ones from Heat Relief Depot [[http://heatreliefdepot.com/catalog/product\\_info.php?cPath=23\\_119&products\\_id=291](http://heatreliefdepot.com/catalog/product_info.php?cPath=23_119&products_id=291)].

- ❑ **Other Cooling Items.** There are many other cooling options available.
  - ❑ A wide variety of bandanas, sweat bands, caps, and wraps are available, most of which contain an absorbent core activated by water. These are widely available, and a good assortment can be found at Heat Relief Depot [<http://heatreliefdepot.com>].
  - ❑ Other children enjoy **Misters**, which spray a fine mist of water to cool a child down. A good assortment can be found at Misty Mate [<http://www.mistymate.com/>].

- ❑ For children who use a wheelchair, this **Wheelchair Cooling Seat** [[http://heatreliefdepot.com/catalog/index.php?cPath=23\\_158](http://heatreliefdepot.com/catalog/index.php?cPath=23_158)] is a neat choice.
- ❑ At nighttime, a good option is a **Cooling Pillow**, such as this one [[http://heatreliefdepot.com/catalog/index.php?cPath=23\\_150](http://heatreliefdepot.com/catalog/index.php?cPath=23_150)].
- ❑ A **Cold Water Bottle**, such as the World's Longest Hot/Cold Water Bottle [<http://www.longhotwater.com/>], is great for cooling for hours at night when filled with cold water.
- ❑ Children may also enjoy a **Stuffed Animal** that can be cooled in the freezer. These are widely available, but a cute assortment may be found at Grampa's Garden [[http://www.grampasgarden.com/product\\_soft\\_comforts.asp](http://www.grampasgarden.com/product_soft_comforts.asp)].

## Keeping Warm

While keeping warm can often be accomplished by simply layering clothes or blankets, this may be impractical for children who use wheelchairs, wear braces, or who cannot tolerate the weight of many heavy blankets.

Please note that it is often more dangerous to warm a child up quickly than it is to keep the child cold, as long as body temperature remains above 90F. Warming up too quickly can cause acidosis or vasoconstriction and have serious adverse effects.

Another problem with warming up is the likelihood of burning the child's skin. Many children with Autonomic Dysfunction do not sense temperature well within their skin and may not react to heat, even while receiving a second degree burn. In addition, children with limited motor abilities may be unable to indicate they are being burned or push an overly hot item away. Choose products wisely if your child is likely to be burned or has been burned in the past.

- ❑ **Heating Vests.** Unlike cooling vests, very few Heating Vests are available. Most are similar to Ice Pack Vests, except that heat packs, such as these from Heat Relief Depot [[http://heatreliefdepot.com/catalog/product\\_info.php?cPath=155\\_167&products\\_id=327](http://heatreliefdepot.com/catalog/product_info.php?cPath=155_167&products_id=327)], replace the ice packs. The heating packs can be reused and are activated by boiling them for 6-10 minutes. Gel heating packs that are microwaveable are also widely available and may be used in the same way.

Larger children may use this heating vest from the same company [[http://heatreliefdepot.com/catalog/index.php?cPath=155\\_168](http://heatreliefdepot.com/catalog/index.php?cPath=155_168)], while smaller children may use an Ice Pack vest or sew a custom vest. Most other heating vests rely on electrical or battery-powered elements that are unsafe for most children, especially those with Autonomic Dysfunction.

- ❑ **Microwaveable Items.** Many items, ranging from neck wraps, to blankets, scarves, socks, and shawls, can be microwaved to provide warmth. These are widely available and two great merchants include Grampa's Garden

[[http://www.grampasgarden.com/product\\_hot\\_cold\\_natural\\_therapy.asp](http://www.grampasgarden.com/product_hot_cold_natural_therapy.asp)] or Heat Relief Depot [<http://heatreliefdepot.com/catalog/index.php?cPath=155>].

- ❑ **Microwaveable Stuffed Animals.** Children love cuddling with these toasty warm critters once they have been microwaved for a minute or two. These are widely available, but a cute assortment can be found at Grampa's Garden [[http://www.grampasgarden.com/product\\_soft\\_comforts.asp](http://www.grampasgarden.com/product_soft_comforts.asp)]. Many include aromatic herbs and weighted beads for additional comfort.
- ❑ **Hot Water Bottles.** Hot water bottles have been used for warming for centuries. They work especially well at nighttime and for children who may get burned by other items. A favorite is the World's Longest Hot/Cold Water Bottle [<http://www.longhotwater.com/>], which is four feet long and stays warm under a blanket for hours.
- ❑ **Heating Blankets.** While electric blankets are widely available, they are not recommended for children, and especially not for children with Autonomic Dysfunction because they tend to overheat in areas, causing burns. Other options available include Microwaveable blankets (see above) or a Heat-pack Blanket, such as this one from Heat Relief Depot [[http://heatreliefdepot.com/catalog/index.php?cPath=155\\_241](http://heatreliefdepot.com/catalog/index.php?cPath=155_241)].
- ❑ **Electric/Battery Devices.** A wide range of electric and battery-powered options, such as socks, vests, hats, and blankets, are available. These, however, are not recommended for most children with Autonomic Dysfunction because of the risk of burns.
- ❑ **Heat lamps.** Heat lamps, like those used in the hospital, are an option for certain children if they are monitored very closely. These can be dangerous if they are too hot or tip over, but commercially-available products, such as those designed for massage or acupuncture, are less costly and less hot. A simple search for "TDP heat lamp" will result in an abundance of choices.

## **Environmental Control**

For some children, the home environment must be modified to keep them at the appropriate temperature. Typically, installing a window air conditioner works very well for a child who needs extra cooling at night or during the day in the playroom. Electric heaters may also be used in a similar manner, though these are notorious for burning children and causing fires and should not be used in homes with small children or pets.

Another option is to install "Zoned" heating and cooling throughout the house. While costly, splitting the home into separate zones that can be heated or cooled individually can provide an appropriate temperature for your child without heating or cooling the

entire home. The savings on electric and gas bills can be tremendous for children who require a lot of heating or cooling.

### **Walking the Fine Line**

Children with temperature regulation problems are often walking the fine line between too hot and too cold. It often takes a variety of products and some trial and error to find the right choices for your child. Hopefully the above suggestions will be helpful in finding ways to minimize the effect of environmental temperature on your child.