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Protecting infants and toddlers from positional asphyxia: Car seats and sling carriers

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What is positional asphyxia?

Babies who experience positional asphyxia cannot breathe because the position of their body blocks their airway. This can occur in several ways:

- When the mouth and nose are blocked by something covering them.
- When the passage of air from mouth and nose to lungs is blocked because a baby's head is slumped over or a baby's chin is pressing into the baby's chest.

Why do we care about positional asphyxia?

- Reduced oxygen levels can lead to later cognitive or behavioral problems.
- Babies die quickly when they cannot breathe.
- Several hundred infants are estimated to die in sitting devices every year (Liaw et al., 2019).

What products are linked to positional asphyxia?

Car seats and sling carriers are products of particular concern. One study found that out of 47 deaths, 31 (66%) occurred in car seats and five (11%) in slings. The rest occurred in swings, bouncers and strollers (Batra et al., 2015).

Who is at risk for positional asphyxia and why?

Newborns and young infants are at high risk because they cannot move themselves in order to breathe when their airway is blocked. Within this group, premature and low birthweight infants appear to be at the greatest risk for many reasons. Breathing problems, being too small for the seat and an inability to sit in the semi-upright position needed to keep breathing in the car seat are factors (Hoffman et al., 2021).

Older infants and toddlers have also died from positional asphyxia. This has happened when car seats are placed on beds and other furniture and roll over and trap the infant or toddler. Infants and toddlers left to sleep in a car seat have also died when they slump and rest their chin on their chest, restricting or stopping breathing. Infants and toddlers awake but unattended in a car seat or sling have died because their movements may block their nose and mouth, preventing breathing.



Figure 1. An infant being secured into a car seat.

Research findings

- When car seat straps are loose, babies can slump, leading to asphyxiation or being strangled. One 2015 study showed 69% of families with newborns left the car seat straps too loose (Hoffman et al., 2016).
- From 2004 to 2014, 219 infant deaths in car safety seats were recorded by the National Center for Fatality Review and Prevention. Fewer than 10% of these deaths occurred when car seats were used appropriately (Liaw et al., 2019).
- In an earlier study of data from the U.S. Consumer Product Safety Commission (CPSC), 48% of infant deaths from 2004-2008 by asphyxiation in car seats were due to positional asphyxia (Batra et al., 2015).
- The same study reported five infant deaths in slings, 100% due to positional asphyxia (Batra et al., 2015). Car seats are a wonderful product designed to increase child safety. Car seats are safe as long as they are used appropriately. They greatly reduce the risk of injury and death to infants and children from car accidents (Durbin et al., 2018). But car seats are not designed for safe sleeping or for unsupervised awake time. NEVER leave a child unattended.

Car seats: Reduce risk

Be sure to read and follow all other instructions provided by the manufacturer. A certified child passenger safety technician should inspect the car seat to make sure it has been properly installed. People caring for your baby, including grandparents, other relatives, babysitters and childcare providers, should know how to use the seat. All rear-facing car seats for newborns should be installed at a 30- to 45-degree angle depending on the car seat type and adjusted according to manufacturer recommendations (Vanderbilt University Medical Center, n.d.).

Make sure that everyone using the car seat practices how to install the seat and harness the baby. A child passenger safety technician can provide guidance. Call the state or county health department for assistance.

Visit the National Highway Traffic Safety Administration website for more information: <https://www.safercar.gov/vehicle-safety/car-seats-and-booster-seats> (Car Seats and Booster Seats, n.d.).

- Loose straps or harnesses can trap an infant's head or neck; follow manufacturer's instructions to ensure that the straps are properly adjusted.
- Car seats should only be used in a car or other vehicle.
- Infants in a car seat should be able to be observed by a responsible adult.
- Whenever possible, an adult should ride in the back seat with the baby to check baby's head and neck position and breathing.
- Use only straps to position the baby correctly and do not add pillows or blankets.
- Straps should always be completely buckled.
- Make sure baby's chin is always up.



Figure 2. An infant being carried in a wearable baby carrier..

Sling carriers

The U.S. Consumer Product Safety Commission (2017, 2014) states that sling carriers are sewn products designed to hold a child (full-term birth to 35 pounds) upright or in a reclined position while supported by a caregiver's torso. There are three main types of sling carriers. Ring slings are shaped like hammocks. Adjustments are made by tightening or loosening the sling fabric through rings. Pouch slings are similar. Some use buckles to adjust size. Wrap slings are pieces of fabric with no fasteners. The caregiver wraps the fabric around their body and the child for support. For all types of slings, be sure to read and follow all other instructions provided by the manufacturer.

Sling carriers: Reduce risk

The U.S. Consumer Product Safety Commission (2017) approved a new federal safety standard for sling carriers due to 17 fatalities between 2003 and 2016.

- Loose sling carriers can cause infants to slump down – restricting or cutting off their airway. The person wearing the sling should frequently check the baby's position and breathing.
- The sling carrier can cover the infant's mouth and nose, preventing breathing. The baby's face should be visible and kissable.

- After nursing a baby in a sling carrier, the mother should change the baby's position, so that the baby's face is looking up and not blocked by the sling or the mother's body.
- The person wearing the sling should frequently check the baby's position and breathing.

Keep your family safe! Use car seats and sling carriers safely to minimize risk of positional asphyxia.

Remember your acronym TICKS

Tight	Sling should hold the baby tight against your body, upright, facing you and positioned high on your body, with the head supported.
In view at all times	The baby's face, nose and mouth should be uncovered by the sling and your body. You should be able to see the baby's face at all times simply by looking down.
Close enough to kiss	The baby's head should be so close that you can tip your own head down and kiss the top of the baby's head.
Keep chin off of chest	Check the baby frequently to make sure baby's head is up — not resting on the chest. This will block the baby's breathing. If in doubt, gently tilt the baby's chin up.
Supported back	Support the baby's back in a natural position so their tummy and chest are facing you. If you need to bend over, bend from the knees while supporting the baby's back.

(Baby Slings, 2022)

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