SIDS PREVENTION

Many SIDS deaths can be avoided by simply making sure that the infant always has access to fresh air.

Everyone who cares for infants should know these simple steps:

1. Don't confine the baby so that it can't move its arms, legs and head.
2. Don't place the baby in a "protective" valley of pillows, blankets or clothing that might cause an ‘air dam’.
3. Don't raise the heat in the baby’s room (cool is just fine).
4. Check the baby often, and don't be afraid of entering baby’s room in order to avoid waking him or her.
5. Introduce air currents in baby’s room. A fan blowing up to the ceiling or against a wall can create gentle air currents in an open crib.
6. Have a source of fresh air that can enter the room -- open a window, or keep the door partially open.
7. Make sure window treatments don't obstruct the inflow of air. Always leave shades or blinds up a bit to let air in.
8. If bumpers are used, make sure there is space for the flow of air.
9. Bumpers should never be used in playpens.
10. Don’t place baby in the middle of a multitude of toys and stuffed animals that might cause an ‘air dam’.
11. Carriages and portable cribs with raised sides should never be used indoors.
12. Consider placing baby in an inclined sleeping position. Having the head in the up position lets exhaled air slide down to the feet.
13. Keep infants off the floor and at least two feet above the floor. Heavy gases can concentrate in the bottom of a room.
14. Be very cautious if you cook with gas, heat with gas, or use fireplaces, kerosene heaters, or when using a barbecue indoors. (Heating an apartment or house with a gas oven is very dangerous to everyone in the house.)
15. Homes with attached garages can be a source of harmful fumes in adjacent rooms when cars are left running.
16. Painting the inside of a house produces harmful fumes, as do cleaning solvents and furniture polishers.
17. Put off having rugs and furniture cleaned until the infant is at least 6 months old. Some carpet cleaning chemicals use carbon dioxide as the cleaning agent.
18. Postpone any home improvements until the infant is 6 months old to avoid large amounts of airborne dust.
19. Try to avoid having baby sleep in a basement. Heavy fumes tend to collect in them without an easy escape route.
20. New carpeting is another source of fumes that could be harmful to an infant.

Be sure to check www.sidsprevention.com periodically for update sto this list

The danger period for SIDS is primarily between two and four months. For the first two months of a baby’s life, baby doesn't sleep long enough to reach a dangerous condition. After four months the baby is much larger and more animated during sleep. The 5 month old baby has then "grown out of" the danger zone for SIDS; however, we know of cases as old as eleven months. During the first six months it is a good idea to always travel with a fan in or with the diaper bag, and never let down your guard.

About Carbon Dioxide Poisoning and SIDS

SIDS (Sudden Infant Death Syndrome) is neither SUDDEN nor a DISEASE.

Read further to discover how much evidence points in one direction: healthy babies can easily die of carbon dioxide poisoning. They die from a lack of oxygen that is caused by the simple act of breathing.

A healthy baby can easily be placed in a situation where they are breathing in a confined space that traps their breath. They are essentially breathing the same air over and over - almost like being in a plastic bag. With every breath, the oxygen content drops and the carbon dioxide content increases. Gradually, there isn't enough oxygen in that air to sustain them and they die without as much as a whimper. The process is slow and this pamphlet includes a mathematical model that shows what can happen.

Contributing Factors

Parents who take special precautions to protect their newborn infants may make matters worse by being so careful. Their special precautions sometimes inadvertently create the very conditions that could injure and actually kill their infants. Infants that suffer near-SIDS events may suffer some form of brain damage from a lack of oxygen. Although the death of a healthy infant is the most noticeable effect of a stagnant air space, other less drastic effects may be widespread.

It is not obvious that infants can be so vulnerable that their own breathing can kill them. We all take for granted that there is always enough oxygen in the air we breathe. This is why adults sometimes suffer the same consequences when they enter a confined space such as a tank. One family suffered the loss of a husband and two grown sons when the father collapsed while cleaning a septic tank. When the father was overcome the oldest son went in to rescue him and was also affected. His younger brother then went into that tank to rescue the other two. This kind of tragedy happens all too often.

The best way to prevent a pool of carbon dioxide (CO2) from forming around a baby is by providing air currents and eliminating any possible "dam" conditions.

Blankets, pillows, clothing, or even hats can create shallow "dams". Wide-open space around the baby is the best situation. Well meaning and caring people inadvertently create the "dams" as a means of protecting the precious infant that they so dearly love. It is unfortunate that this special care and concern can create the very conditions that can lead to the death of that infant.

There are usually air currents around every person. These are caused by body movements and by differences in temperature. When we are sleeping we breathe in air at ambient temperature, our bodies process that air, and because of our normal body heat (98.7 F) we exhale it at a slightly higher temperature. We all know that hot air rises; so our exhaled breath will tend to do the same. When the warm air that we exhale rises it is replaced with fresh air. So, under normal conditions the air around us is always being replaced.

Small infants are often wrapped in a blanket when they are put to sleep. This restricts their ability to create air currents by body movements. That leaves only the buoyant effect of their exhaled breath as a means of bringing fresh air to them. When they are put to sleep, they are often placed in quiet out of the way rooms. These rooms are often kept warmer than the rest of the house. All of these things set up a potential SIDS situation. If a room is warm then there is less of a buoyant force on the exhaled air. Carbon Dioxide is heavier than air and needs to be warmed to rise and be replaced. Being quiet and careful around the baby's room will also cut down on natural house air currents. The opening and closing of a door and walking into a room create air currents. Staying out of the baby's room when they are sleeping can be a fatal error.

Having a fan operating in the room when the baby is sleeping is a good way to create air currents. Frequently going into the room to check on the baby will also create air currents. Incubators are designed to provide laminar flow over the infants in them. Therefore it would be best to have similar situations wherever the baby is sleeping. **So having a fan blowing directly onto a baby is not recommended**. This could cause problems by itself. If a fan is used, it should be provide gentle air currents in the vicinity of the baby. Also, make sure that the baby is able to move, and not in a "nice warm and safe" hole that can create a stagnant air condition (an air dam). Frequent checking on the child during the first year may be an arduous task; however, the alternative can be devastating.

A child in a carriage out in the park on a winter day is perfectly safe. However, that same child placed in that carriage in a warm enclosed room is at risk. Outdoors, air currents and temperature differences circulate fresh air around the baby. Indoors, the lack of air currents and reduced temperature differences create a potentially dangerous situation for a baby.

Bumpers on the sides of a crib must be installed so that there is a gap between the bottom of the bumper and the top of the mattress. There have been cases where an infant has scooted into a corner of a crib and created a stagnant dam between their head and shoulder and a bumper. Two of these cases were for infants that were older than 4-months. One was nine months and the other was eleven months. The ultimate tragedy is that both of these infants were in the same family.

Loose blankets, cute stuffed animals, and toys should never be placed in a crib with an infant. It is all too easy for these items to work together with the geometry of the child to create a stagnant breathing volume. The smaller this volume is the quicker the infant slides away without a sound.

An overabundance of items in a playpen can also create a dangerous condition.

There is a lot of confusion about ventilation. Consider the case of a crew working in a manhole. Taking a fan and having it blow into the top of the manhole does NOT put any fresh air into that space. To replace air it is necessary to have a path for the air in the space to flow out of that space. This is why utility workers always shove that yellow hose into the hole they are going to enter. Fresh air goes in through the hose and the stagnant air comes out through the space around the outside of the hose.

Placing a fan inside the space to be refreshed is also a mistake. Such a fan will not blow any air out of that space unless there is a path for replacement air. Sometimes, even when there is a path, the stagnant air is not fully removed. This is why it is so important that an infant never be placed into a stagnant air space, or able to create one with their bodies and objects within their grasp. If you use a fan to circulate air, be sure there is a way for fresh air to enter the room and exhausted air to escape.

Mathematical Model Of SIDS

Every infant has their own set of particular capabilities that vary greatly over the period of concern (ages 2 to 4 months). The geometry of each particular case of stagnant air is also dependent on a host of variables. Therefore, this model will use a theoretical infant breathing oxygen from a specific stagnant volume without any mixing of the oxygen and carbon dioxide. The results are then analyzed with respect to the various parameters to see how they affect the results. This is called a sensitivity analysis.

Theoretical Conditions:

A theoretical infant with a lung capacity of 5 cubic inches and a breathing rate of 20 breaths per minute is placed so that it is inhaling and exhaling into a 12"x12"x4" stagnant volume. The lung conversion efficiency for oxygen to carbon dioxide is 3%.

The Problem:

How long does it take this infant to convert all of the oxygen to carbon dioxide?

Solution:

Time = Breathing Volume / Conversion Rate

Conversion Rate = Breathing Rate x Volume per Breath x Conversion Efficiency
= 20 breaths/min. x 5 cu. in./breath x 0.03
= 3 cu. in./min.

Time = (12x12x4) cu. in. / (3 cu. in./min)
= 576 cu. in. / (3 cu. in./min)
= 192 min. or 3.2 hours

Sensitivity Analysis:

1. Breathing Volume - the larger the volume that the infant is breathing from the longer it takes to convert that volume of oxygen into carbon dioxide.
2. Respiration Rate - if this rate changes (either between individuals, with age, or over the event) then the time is inversely proportional; i.e. an increase produces a decrease in time; and a decrease produces an increase in time.
3. Respiration Volume - as this increases the time decreases (as the infant grows over this period of time a safe situation can worsen by having a reduction in time).
4. Conversion Efficiency - as this increases the time decreases (the physical health of the infant and the growth over time can cause this to change).

What does all this mean?

It means that in a very short period of time the theoretical infant consumed all of the oxygen in the volume it was breathing out of. It also means that over time conditions with the infant can change. If they happen to change in the wrong direction a tragedy could be the outcome. Never assume that things are totally safe because nothing has happened yet.

What happens in real life?

In real life nothing is constant and pure. Here are some examples:

1. The air we breathe is mostly nitrogen.
2. Respiration and breathing volumes are not constant.
3. Conversion efficiency can vary as the amount of oxygen is decreasing in the breathing volume.
4. The exhaled air mixes with the breathing volume so that each breath inhaled has less oxygen in it.

5. As the oxygen level in the inhaled volume decreases the respiration rate and volume may increase for a period of time, then they may slow down as the body tries to conserve oxygen.

This analysis simply shows that the oxygen level in the air being breathed by an infant trapped in a stagnant air pool can quickly drop to fatal levels. Every effort must be made to recognize and dismantle any stagnant pools before placing an infant in one.

There are enough tragedies in the world. This is one that is easily avoidable simply by education and a cheap fan. Insuring that the infant always has an adequate supply of fresh air is all that is needed to prevent the tragedy of SIDS.

Note: A "groggy" baby that was just awakened may actually be one that is simply recovering from a near-SIDS event. Such a baby may even be suffering some brain damage due to that event.

About Creative and Myriad Ideas, Inc.

Robert Lemire, owner of Creative And Myriad Ideas - CAMI, and holder of five US Patents, has designed several devices to overcome the possibility of a baby experiencing a SIDS event. One is called the "downdraft sleeping pad". This pad is connected to an air pump that pulls the air away form the head area of a reclining baby. This pad then provides a positive path for the removal of the carbon dioxide in the vicinity of the baby. Another device is the "pulsation pad". This device uses an air pump to create gentle pulsations in the breathing area. These pulsations create a periodic flow of fresh air into the breathing area. *(pat. # 5,876,339)*

These devices, like all medical devices, would have to be approved by the FDA before introduction to the public. Gaining such approval, and incorporating safety features and alarms into these devices would make them very expensive and delay their introduction for several years. Mr. Lemire has decided that saving lives **right now** by simple and readily available means would be better than waiting and using specialized devices, regardless of possible loss of revenue. “This information can save lives – some things are more important than money”, says Mr. Lemire.

This pamphlet is offered as a means of providing this "SIDS Prevention" information to you or to someone you know who is caring for an infant. You may make a voluntary payment for this valuable pamphlet and information to at the website www.sidsprevention.com. Proceeds from this project will be used to develop these SIDS related products, and to build a prototype of the laser breast cancer imaging device patented by Mr. Lemire. (*pat # 5,876,339)*

In addition to the laser imaging patent Mr. Lemire has patents on adjustable and locking picture hangers (*www.888hangman.com)*

Mr. Lemire may be contacted though Creative and Myriad Ideas at info@888hangman.com, or (631)-979-1939.