ADVICE ON SHAKE BABY SYNDROME

What is Shaken Baby Syndrome
"Shaken baby syndrome" describes a range of signs and symptoms resulting from violent shaking and/or impacting the head of an infant or small child. The degree of brain damage depends on the amount and duration of the shaking and the forces involved in impact of the head. Signs and symptoms range from minor effects such as irritability, lethargy, tremors and vomiting to major effects such as seizures (fits), coma and death.

These changes are due to destruction of brain cells as a result of damage, lack of oxygen to the brain cells, and swelling of the brain. Extensive haemorrhages in one or both eyes are also found in the vast majority of these cases. The classic triad (3 symptoms) of subdural haematoma, brain swelling and retinal haemorrhages are accompanied in some, but not all, cases by bruising of the part of the body used as a "handle" for shaking. Fractures of the long bones and/or of the ribs may also be seen in some cases. In many cases, however, there is no external evidence of trauma either to the head or the body. (Definition provided by Robert Reece, M.D, clinical professor of Paediatrics at the Tufts University School of Medicine.)

Approximately 20% of cases are fatal in the first few days after injury and the majority of the survivors are left with handicaps ranging from mild - learning disorders, behavioural changes - to moderate and severe, such as profound mental and developmental retardation, paralysis, blindness, inability to eat or life in a permanent vegetative state.

Another definition of shaken baby syndrome is a constellation of non-accidental intracranial and ocular haemorrhages occurring in infants and young children. Other injuries, including bruises showing on the skin, lacerations, burns, brain injuries, rib fractures, extremity fractures, and injuries to various internal organs may be seen in the setting of shaken baby syndrome, but are not required for diagnosis. Some experts have suggested changing the name of the syndrome to shaken impact syndrome to emphasize the importance of skull impact in the severe brain injury seen in some victims of shaken baby syndrome.

<table>
<thead>
<tr>
<th>Immediate Consequences</th>
<th>Long-Term Consequences</th>
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<tr>
<td>♥ Breathing may stop or be compromised</td>
<td>♥ Learning disabilities</td>
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<tr>
<td>♥ Extreme irritability</td>
<td>♥ Physical disabilities</td>
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<td>♥ Seizures or fits</td>
<td>♥ Visual disabilities or blindness</td>
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<td>♥ Limp arms and legs or rigidity/posturing</td>
<td>♥ Hearing impairment</td>
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<td>♥ Speech disabilities</td>
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<td>Decreased level of consciousness</td>
<td>Cerebral Palsy</td>
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<td>Vomiting; poor feeding</td>
<td>Seizures</td>
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<td>Inability to suck or swallow</td>
<td>Behaviour disorders</td>
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<tr>
<td>Heart may stop</td>
<td>Cognitive impairment</td>
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<tr>
<td>Death</td>
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Why Does Shaking a baby have this effect?

- Babies' heads are relatively large and heavy, making up about 25% of their total body weight. Their neck muscles are too weak to support such a disproportionately large head.

- Babies' brains are immature and more easily injured by shaking.

- Babies' blood vessels around the brain are more susceptible to tearing than older children or adults.

When is this likely to happen?

- Often, perpetrators shake an infant or child out of frustration or anger. This most often occurs when the baby won't stop crying. Other triggering events include toilet training difficulties and feeding problems.

THE SCENARIO FOR SHAKEN BABY / SHAKEN IMPACT SYNDROME

The usual trigger for shaking a baby is inconsolable crying in the infant. Frustrated by their attempts to console the baby and stop the crying, the perpetrator loses control and grabs the infant, either by the chest, under the arms, or by the arms and violently shakes the baby. The time of shaking can vary, usually ranging from around 5 seconds to 15 or 20 seconds. It has been estimated by video recordings of a person shaking a doll of approximate size and weight that the number of shakes ranges between 2 to 4 per second. During shaking, the head rotates wildly on the axis of the neck creating multiple forces within the head. The infant stops crying and stops breathing, causing decreased oxygen supply to the body, particularly to the brain. The infant brain, has a much higher water content that the adult brain and is therefore much softer. The absence of nerve cell "insulation" in young children contributes to this relative softness. These factors make the brain more gelatinous and during shaking it is more easily distorted and compressed within the skull.

Shaking and impacting the head does several things:

1. The veins from the brain to the membrane fixed to the inside of the skull, are
stretched and tear open and bleed, creating a subdural haematoma or subarachnoid haemorrhages characteristic of the syndrome.

2. The brain strikes the inner surfaces of the skull, causing direct injury to the brain itself.

3. The deeper nerve structures of the brain can be broken off.

4. The lack of oxygen during shaking causes further irreversible damage to the brain.

5. Damaged nerve cells release chemicals which add to oxygen deprivation to the brain and also cause direct further damage to brain cells.

The overall effect is massive traumatic destruction of the brain tissue, leading to immediate brain swelling and enormous increase in the pressure within the skull. This swelling makes the problem worse as it compresses the blood vessels and reduces oxygen supply to the brain.

It is these injuries to the brain, not the bleeding inside the skull or membranes that cause the signs, symptoms, and outcome from Shaken Baby/Shaken Impact Syndrome.

There may also be other injuries, the most significant of which are bleeding to the retina at the back of the eyes. Other injuries can include skull fractures when the infant is thrown against a hard or soft surface; rib fractures near the spine due to the levering of the fingers of the perpetrator while holding the baby during shaking; fractures of the collarbone; and fractures of the long bones. Long bone fractures are due to the flailing of the arms and legs during shaking. Bruising of the skin of the head, face and body may also occur.

SYMPTOMS AND PHYSICAL FINDINGS
Symptoms and physical findings vary depending on the length and severity of the shaking and whether the infant was thrown onto a surface. The syndrome can be seen as a continuum from a short duration of shaking with little or no impact, to severe, prolonged shaking and major impact. The resulting signs and symptoms range from:
- decreased responsiveness, irritability, lethargy and limpness
- convulsions, vomiting from increased pressure within the skull, increased breathing rate, low body temperature and low heart rate
- coma with fixed and dilated pupils
- death.

All of these symptoms, caused by generalised brain swelling, begin immediately after the shaking and reach their peak within 4-6 hours. There is no evidence that such symptoms can be caused by accidental falls, including falls downstairs, off beds or tables, or from the arms of a parent or carer.

Shaken Baby Syndrome results from a violent inflicted injury producing immediate signs and symptoms.
OTHER FACTS ABOUT SHAKEN BABY SYNDROME
- 50% to 75% of adults and teenagers do not know that shaking a baby could be dangerous.
- The number of shaken baby survivors has not been documented.
- Shaken baby syndrome accounts for an estimated 10-12% of all deaths due to abuse or neglect.
- 41% of victims are under the age of one.
- A baby can fall 3 storeys and not get as seriously injured as a shaken baby. When a child is shaken in anger and frustration, the force is multiplied by 5 to 10 times more than it would be if the child had simply tripped or fallen.
- A shaken baby should be taken to hospital immediately. Tell the doctor the baby was shaken so proper medical attention may be given

THE MOST TYPICAL VICTIM:
- Is aged 4 to 6 months
- 63% are male.
- 59% have no previous record of being abused
- 30% die as a result of shaking.
- 15% escape long term damage.
- Toddlers as old as 4 years are at risk of serious injury.
- Most survivors suffer long term disabilities

THE MOST TYPICAL PERPETRATOR:
- Has an average age of 22 years with 75% being male.
- 81% have no history of child abuse.
- 75% have no history of substance abuse.
- 50% are natural parents of the victims.
- 37% are the biological father
- 21% are boyfriends of the mother.
- 17% are female carers; 12% are mothers and 13% others.

ADVICE
If you find yourself becoming frustrated or angry with a crying baby make sure it is safe e.g. in a cot then leave the room to calm down. Seek help from another responsible person.

Consider whether the reasons why baby might be crying. Could it be ill, too cold or hot or hungry? Seek advice if you're not sure.

REMEMBER: DON'T SHAKE THE BABY!