



# Birth asphyxia and cerebral palsy

By David Hirsch

Cerebral palsy litigation on behalf of children harmed at birth can be among the most rewarding work done by plaintiff lawyers. A successful claim can be highly remunerative to the lawyer but, more importantly, it can significantly improve the life of the child and of the child's family forever.

**M**any lawyers avoid cerebral palsy claims thinking they are too difficult, too expensive and too risky to run. Some spend a great deal of time and money pursuing claims that are ultimately abandoned or lost. More disturbing still are the many cases that lawyers were prepared to abandon as 'losers' that were ultimately settled for millions of dollars.

This article aims to provide some basic information to help lawyers choose good cerebral palsy claims and reject the bad ones.

### GET THE RECORDS

To properly evaluate a cerebral palsy claim, you must first get the hospital records for both mother and baby. The details of the labour and delivery will be in the mother's records; and those regarding the condition of the baby will be in the baby's records.

The mother's hospital records should include copies of her antenatal card, ultrasound reports, nursing progress notes, the partogram, cardiographic (CTG) strips, and any operation record in the case of a caesarean delivery. The baby's hospital records should include APGAR scores and, where birth asphyxia is suspected, the results of umbilical cord blood analysis and head ultrasound or CT imaging, as well as the usual nursing progress notes. If the baby was transferred to another hospital, then documents of that transfer (usually from a specialised neonatal care transfer service) should be included in the baby's records.

You should also obtain the records from the child's paediatrician or general practitioner, and any other documents that describe the nature and extent of the child's injuries. If the baby was transferred to another hospital immediately after birth, the records from that hospital should be obtained as well.

### START WITH CAUSATION

The first thing you should do is determine what is wrong with the child.

If the child has dysmorphic facial features or is missing limbs or organs, then you are dealing with a genetic or developmental abnormality and not a birth asphyxia case. If the child is mentally retarded or deaf, there is a good chance that intrauterine infection was involved. If the child has motor problems affecting only one side of the body (hemiplegia) you should consider a stroke, which could be caused by maternal fever during labour, a blood disorder, or perhaps direct trauma to the head by forceps. If the child has epilepsy or some other seizure disorder, but no other problems, this is more likely to be of developmental or intrauterine origin.

Cerebral palsy is a specific kind of brain injury. It is characterised by a *movement disorder*. If it is due to birth asphyxia, it is most likely going to be of the spastic or the athetoid type. Spastic cerebral palsy is characterised by stiff, permanently contracted muscles. It is either diplegic (affecting either the arms or the legs) or quadriplegic (affecting all four limbs). In more severe cases of spastic quadriplegic

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cerebral palsy, the trunk, mouth and tongue are affected. Athetoid cerebral palsy is characterised by fluctuating muscle tone with unintentional and uncontrolled movements.

A child with cerebral palsy caused by birth asphyxia may also have other problems like epilepsy, and cognitive and behavioural problems as well. The important thing to remember is that a child may have numerous problems that, standing alone, can occur without birth asphyxia. As a general rule, it is only when these problems are found together with the movement disorders of spastic or athetoid type that they might properly be ascribed to birth asphyxia.

### HYPOXIC/ISCHAEMIC ENCEPHALOPATHY

The typical diagnosis given to a child with cerebral palsy caused by birth asphyxia is hypoxic/ischaemic encephalopathy (HIE).

'Hypoxia' refers to inadequate amounts of oxygen. 'Ischaemia' refers to inadequate blood flow. HIE is simply brain damage caused by the effects of hypoxia and ischaemia. The term 'birth asphyxia' refers to lack of oxygen due to the effects of hypoxia and/or ischaemia.

The usual cause of HIE is not hypoxia but rather ischaemia. The kinds of catastrophic events that could cause HIE include interruption of blood flow due to uterine rupture, placental abruption or prolapse of the umbilical cord. But HIE can also be caused by intermittent, partial interference with blood flow as well.

### METABOLIC ACIDOSIS

In the severely asphyxiated foetus, lack of oxygen to the brain can cause cell death and tissue necrosis. This leads to a build up of lactic acid in the blood and the condition of 'metabolic acidosis'.

When a baby is born in a compromised condition, a sample of umbilical cord blood should be taken for analysis. The analysis should reveal the acidity (pH level) of the blood and the 'base excess' (BE). These results will show whether metabolic acidosis has occurred. If it has, this is a strong indicator of HIE.

### RADIOGRAPHIC EVIDENCE

In many (but not all) cases of HIE, brain swelling occurs. This can be detected by an ultrasound or CT scan of the head. It can take several days for this brain swelling to appear. A normal ultrasound or CT scan does not prove that HIE did not occur, but it can strongly support the argument that it did. >>

Magnetic resonance imaging (MRI) is probably the most useful tool in determining whether cerebral palsy is due to HIE or something else. An MRI can be done at any age.

If the MRI discloses damage to the basal ganglia or brain stem (grey matter damage), it is very likely that this was due to asphyxia that occurred very late in the labour. Children with a diagnosis of severe spastic quadriplegia secondary to HIE typically have MRIs showing basal ganglia or brain stem damage.

If the MRI discloses diffuse white matter or cortical damage, but no clear damage to the basal ganglia or brain stem, then the cause is less clear. It could be due to intermittent, partial asphyxia during the labour rather than an acute event later on. It could also be due to prematurity and have nothing to do with birth events. It is important, therefore, to consider the gestational age of the baby when born when interpreting the MRI results.

#### THE PROBLEM OF TIMING

Determining the time of the asphyxial insult that causes a child's cerebral palsy is often the most critical part of the case.

If the adverse event occurred late in the labour, the opportunities to intervene and prevent the injury increase. For example, if the labour took 12 hours and the injury took place in the last hour before delivery, then there were potentially 11 hours of labour (not to mention possibly days before that) when delivery would have avoided the outcome. If, however, the injury occurred early in the labour, or was due to intermittent and partial asphyxia that took place over many hours or even days, then the opportunities to intervene and avoid the outcome can be severely limited.

Obviously, the strongest cases are those in which there was an asphyxial insult late in the labour, there is MRI evidence of basal ganglia or brain stem injury, the child was not premature, and has severe, spastic quadriplegia.

#### THE CONSENSUS STATEMENT

In 1995, the first Consensus Statement on the causes of cerebral palsy was published in the *Medical Journal of Australia*.<sup>1</sup> A subsequent article, listing the criteria said to be needed to establish a causal relationship, was published in the *British Medical Journal* in 1999.<sup>2</sup>

The Consensus Statement is often criticised for being an attempt by doctors (especially obstetricians) to curtail litigation by making it harder for plaintiffs to prove a causal connection between birth events and cerebral palsy. The fact that the Statement was developed during the years of the so-called 'medical indemnity crisis', and was strongly supported by certain doctors with disdain for the legal system generally and plaintiff lawyers in particular, lends considerable force to this criticism.<sup>3</sup>

But there may also be some truth in the assertion that many negligence claims were pursued by plaintiff lawyers

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who had minimal understanding of the complex and multiple contributing causes of cerebral palsy. It would be very wrong to assume, as some lawyers did, that any child with a learning disorder and some evidence of foetal distress at birth had a good claim

against an obstetrician.

The Consensus Statement aims to identify those cases where cerebral palsy was caused by a severe, acute period of asphyxia. As noted above, these are the strongest cerebral palsy cases to run: if your case meets the criteria of the Consensus Statement then, if negligence can be proven, you probably have a pretty strong case.

The basic problem with the Consensus Statement is that some doctors want to read it like a code rather than as a guideline. The fact is that there are cases of birth asphyxia leading to cerebral palsy that do not fall easily within the rather restricted criteria of that document.

The Consensus Statement lists three 'essential criteria' for cerebral palsy caused by birth asphyxia:

1. **Metabolic acidosis:** The umbilical cord or very early neonatal blood samples should have a pH < 7.0 and base deficit  $\geq$  -12.
2. **Neurological signs:** Early onset of severe or moderate encephalopathy (like seizures) in infants of  $\geq$  34 weeks' gestation.
3. **Cerebral palsy:** This must be either of the spastic or athetoid (dyskinetic) type.<sup>4</sup>

There are five further, non-specific criteria that suggest birth asphyxia:

1. **A sentinel hypoxic event:** For example, uterine rupture, placental abruption or cord prolapse.
2. **Severe bradycardia:** A sudden, rapid and sustained deterioration in foetal heart rate (commonly seen with a sentinel event).
3. **Low APGAR score:** Scores of 6 or less for more than 5 minutes.
4. **Early multi-system involvement:** Usually cardiac, renal or respiratory complications.
5. **Early imaging evidence:** Ultrasound or CT imaging showing brain swelling.

The Consensus Statement is tailored to the kind of catastrophic events that are usually difficult to predict and which require very quick delivery if HIE and cerebral palsy is to be avoided. Most legal claims, however, do not involve these 'sentinel' events. Rather, they involve abnormal or prolonged labours with foetal heart rate abnormalities that are ignored or not recognised. For this reason, it is important for lawyers to know when a labour is progressing normally and when it is not.

#### NORMAL LABOUR

Most women come into labour at 'term'. This is any time

between 37 and 42 weeks' gestation. The 'due date' (also called the EDC – estimated date of confinement, or EDD – estimated date of delivery) is at 40 weeks' gestation.

A term baby should be strong enough to withstand the stresses of labour and delivery, stresses which naturally involve a degree of hypoxia and ischaemia. No pregnancy should be allowed to continue past 42 weeks because the risk of a number of problems (including birth asphyxia) increases. Babies born earlier than 37 weeks are considered 'premature' and the more premature they are, the less able they are to withstand the normal stresses of labour and delivery. Special vigilance is necessary, therefore, when managing the delivery of a premature baby.

### PROGRESS IN LABOUR

Most babies are in the vertex (head down) position. If the baby is in the breech position (feet or bottom first) or lying sideways (transverse) special considerations apply. In a normal, vertex delivery, the mother's cervix should dilate to its full size (10cm) and the baby's head should, with the force of contractions, descend past the narrowest point of the mother's pelvis (the pelvic brim). When this occurs the baby is ready for a normal, vaginal delivery.

The first stage of labour (from established, regular contractions to full 10cm dilatation of the cervix) normally takes 8-12 hours for first-time mothers and 4-6 hours for those who have delivered before. The dilatation of the cervix up to 4cm can take quite a while but thereafter progress should be at least 1.5cm per hour up to the full 10cm. If progress is slower than this, it could be an early sign of trouble. While the cervix is dilating, the foetal head should be descending. Lack of regular descent of the head, despite strong contractions, can be another sign of trouble.

The second stage of labour begins when the cervix is fully dilated and ends with delivery of the baby. It normally lasts 1-2 hours for first-time mothers and 0.5 to 1 hour for mothers who have delivered before.

Many cerebral palsy cases involve abnormal progress in labour, sometimes due to undiagnosed obstruction. Early recognition of the warning signs of obstruction can and should lead to earlier delivery, in order to avoid foetal distress resulting in a collapse of the heart rate, metabolic acidosis, HIE and cerebral palsy.

### CTG MONITORING

Most women have CTG monitoring at some point in the labour. High-risk situations (for example, premature babies, induced labour and where the drug Syntocinon is given) require continuous CTG monitoring.

Examination of the CTG strips will show whether the baby's heart rate is normal (120-160 beats per minute), or whether it is too fast (tachycardic) or too slow (bradycardic). They also show whether the baby's neurological system is intact by assessing the fluctuations (beat-to-beat variability) in the heart-rate trace. The CTG strips can also show how the baby's heart rate responds to the mother's contractions. Careful CTG monitoring can pick up early signs of problems

with blood flow that can herald serious problems later on. If those problems are detected (usually persistent 'late' or 'type 2' decelerations), assisted delivery may be needed.<sup>5</sup>

Many cerebral palsy cases involve the failure to perform continuous CTG monitoring or the failure to recognise significant abnormalities and act accordingly – either by summoning help or by arranging urgent, assisted delivery.

### SYNTOCINON

Syntocinon is an artificial hormone that stimulates uterine contractions. It is sometimes given to induce labour, but more often to augment labour where contractions have for some reason decreased. Women can be very sensitive to Syntocinon and small amounts can provoke severe reactions. The drug must be given slowly and adjusted to the mother's response.

Where contractions have been established or re-established, the Syntocinon should be stopped. If the uterus contracts too hard and too fast without allowing the baby time to recover between contractions, the result can be intermittent, partial asphyxia leading to metabolic acidosis, HIE and cerebral palsy. Syntocinon should not be given to mothers who have had a previous caesarean delivery because of the risk that strong uterine contractions can lead to uterine rupture.

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## DECISION-TO-DELIVERY TIME FOR CAESAREAN SECTION

Plaintiffs commonly allege that there was a negligent delay in delivery by caesarean section of a compromised baby. Two observations can be made on this point.

First, if most catastrophic or 'sentinel' events (uterine rupture, placental abruption or cord prolapse) are unpredictable and result in rapid asphyxia, then the amount of time available to save the baby's life, let alone avoid permanent brain damage, can be very short.

Second, even if the progress of labour was abnormal or the CTG strips non-reassuring, the point at which these 'abnormalities' crossed the line into 'danger' – necessitating urgent caesarean delivery – can be vigorously contested.

Unsurprisingly, doctors will argue that in the case of 'sentinel' events, even the fastest possible response would not have avoided damage to the baby; and in the case of abnormal signs in labour, they will argue that it was not negligent to delay the decision to deliver until very late in the labour.

Both of these 'defences' capitalise on the fact that there is an unavoidable delay between the decision to deliver the baby and the delivery itself. For obvious reasons, it is in the interests of doctors to extend that unavoidable delay as long as possible, which is precisely what some recent studies have aimed to establish: that the unavoidable 'decision-to-delivery time' is longer than one might expect.

In one South Australian study, often cited by defence experts, it was found that the decision-to-delivery time for an urgent caesarean delivery was between 42 and 69 minutes, depending on the level of hospital involved<sup>16</sup>. This offends what obstetricians have, in the past, set as their own benchmark of best practice: 30 minutes for decision-to-delivery time. This study, in particular, needs to be approached with caution, and it is not consistent with the findings of other studies.<sup>7</sup>

All the same, lawyers must appreciate that there is bound to be some unavoidable delay between the decision to deliver and the actual delivery by caesarean section, while arrangements are made for the operation to take place. It is impossible to be dogmatic and say that a 30-minute delay is, in all cases, acceptable (it may not be) and a 45-minute delay in all cases is not (it may be). Each case must be examined in the context of the location and level of hospital involved, and on the reasons for needing a caesarean.

The strongest medico-legal cases are not those that challenge the decision-to-delivery time, but rather the delay in making the decision to deliver in the first place. It may well be argued, for example, that in a small country hospital where it is foreseeable that arranging a caesarean might take up to an hour, the decision to prepare for such a delivery should be made as soon as there are indications of poor progress or non-reassuring foetal heart rates. This may be earlier than in a metropolitan teaching hospital, where the necessary staff is readily available.

## CONCLUSION

There are many good cases where medical negligence is

implicated in a child's cerebral palsy, but probably many more bad cases where it is not. The skill is in picking which is which.

If you begin your analysis by carefully assessing the child's injuries, and can establish that the child has cerebral palsy secondary to an asphyxial event late in labour, you are well on the way to developing a good case. If the facts satisfy the restrictive criteria of the Consensus Statement, so much the better.

It is important to be familiar with the progress of a normal pregnancy, labour and delivery in order to determine where things may have gone wrong. Unless you are dealing with a catastrophic 'sentinel' event case, the key is to examine the progress of labour and the CTG strips to see whether there was a time when the doctor, acting reasonably, ought to have foreseen trouble and taken steps to avoid it.

As for the problem of the foreseeable and unavoidable delay between decision and delivery, doctors need to be even more aware of this than plaintiff lawyers do. If it really does take nearly an hour to deliver a baby by urgent caesarean section in a particular hospital, then this is all the more reason for vigilance during the labour and erring on the side of caution by making the decision to deliver earlier rather than later.

Finally, it should not be assumed that the only good medical negligence cases involving birth trauma and brain damage concern cerebral palsy caused by birth asphyxia. There may be many other causes of a brain damage (for example, maternal infection, stroke and trauma by forceps) that were avoidable with reasonable care and skill on the part of doctors and hospitals. Just because the facts do not support cerebral palsy caused by birth asphyxia does not mean that the case should be rejected. ■

**Notes:** **1** The Australia and New Zealand Perinatal Societies, 'The origins of cerebral palsy – a consensus statement', *Medical Journal of Australia*, Vol 162, 16 January 1995, 85-90. **2** MacLennan, 'A template for defining a causal relation between acute intrapartum events and cerebral palsy: international consensus statement', *British Medical Journal*, 1999, 319: 1054-9. **3** See David Hirsch, 'Newsflash! Cerebral Palsy Is Not Preventable!', in *Precedent*, 77, November/December 2006, p50. **4** In the American version of the Consensus Statement, the spastic cerebral palsy must be quadriplegic rather than either quadriplegic or diplegic and there is a fourth essential criteria: 'Exclusion of other identifiable etiologies such as trauma, coagulation disorders, infectious conditions, or genetic disorders' [http://www.acog.org/from\\_home/Misc/neonatalEncephalopathy.cfm](http://www.acog.org/from_home/Misc/neonatalEncephalopathy.cfm). **5** 'Assisted delivery' includes vacuum extraction, forceps or caesarean section. A vacuum extraction or forceps delivery should not be attempted unless the mother is fully dilated and the baby's head has passed the mother's 'pelvic brim'. **6** MacLennan et al, 'How long does it take to deliver a baby by emergency caesarean section?' *Aust NZ J Obstet Gynaecol*, 2001; 41: 7-11. **7** Tuffnell et al, 'Interval between decision and delivery by caesarean section – are current standards achievable?' *Brit Med J* 2001; vol 322 (7298): 1330-3, found that 478 of 721 (66.3%) women were delivered within 30 minutes and 637 (88.3%) within 40 minutes; 29 (4.0%) were undelivered at 50 minutes. If the woman was taken to theatre in 10 minutes, 409 of 500 (81.8%) were delivered in 30 minutes and 495 (97%) in 40 minutes.

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