Council of Social Service of NSW
Children’s Services Forum

INFLECTED TRAUMATIC BRAIN INJURY IN CHILDREN

18 February 2011

Nick Rushworth
Executive Officer
Brain Injury Australia
“...peak of peaks”
“...works to ensure that all people living with an ABI have access to supports and resources each person needs to optimise their social and economic participation...”

“...advocacy for Australian Government program allocations and policies that reflect the needs and priorities of people with an ABI and their families...”

“...the provision of effective and timely input into policy, legislation and program development through active contact with Australian Government ministers, parliamentary representatives, Australian Government departments and agencies, and national disability organisations...”
ACQUIRED BRAIN INJURY (ABI)

any damage to the brain that occurs after birth
...causes?

- stroke
- alcohol or other drug abuse
- brain infection
- neurological diseases (Parkinson's disease, Huntington's disease etc.)
- oxygen loss (asthma, near-drowning etc.)
- accident or trauma
PHYSICAL DISABILITY

- paralysis
- poor balance and coordination
- chronic pain
- fatigue
- seizures (1 in 6)
- loss of sense of taste or smell
- vision and hearing disturbance
- speech impairment
COGNITIVE DISABILITY

- reduced ability
  - to learn
  - to plan
  - to solve problems

poor memory and concentration
(2 in every 3)
“...one memorable day I started the taps running, turned around, got distracted (the mailman came) and then spent quite a while mopping up because I had forgotten what I was doing.”
“...new relationships are problematic. I have changed my query from ‘Do I know you?’ to ‘Do you know me?’ (I think I’ve really upset some people when I used the former question.)”
“CHALLENGING BEHAVIOUR”

for 2 out of 3, the *most* disabling

- increased irritability
- poor impulse control
- verbal and physical aggression
- disinhibition
abusive head trauma
non-accidental head injury
shaken baby syndrome
[shaken impact syndrome]
inflicted head injury
inflicted traumatic brain injury

brain injury AUSTRALIA
www.braininjuryaustralia.org.au
inflicted traumatic brain injury – “type 1”

(Queensland Police Service - review of 52 cases fatal ITBI)

“victims were shaken, thrown, punched, head-butted, and attacked with objects such as lumps of wood”
inflicted traumatic brain injury – “type 2”

“a significant amount of [ITBI] is not necessarily deliberately inflicted, that is; premeditated… A lot of it occurs in the heat of the moment, in the middle of the night.”
inflicted traumatic brain injury – “type 2”

crying = “the only child-specific variable consistently identified as important in the cycle of escalation to shaking”

“PURPLE Crying”
“...SBS comes as close as one could imagine to a medical diagnosis of murder: prosecutors use it to prove the mechanism of death, the intent to harm, and the identity of the killer.”
“...defendants have been proven guilty of shaking babies to death based on the presence of retinal hemorrhages [bleeding in the eye], subdural hematomas [bleeding on the brain] and cerebral edemas [brain swelling], then the presence of these symptoms must mean that someone is guilty of shaking a baby to death. All that remains is to identify the last person with the conscious child.
“...the severity of the shaking force required to produce injury is such that it cannot occur in any normal activity such as play, the motions of daily living or a resuscitation attempt. The act of shaking that results in injury to the child is so violent that untrained observers would immediately recognize it as dangerous.”
“contre coup”
### Incidence - Hospitalisations

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Period</th>
<th>#</th>
<th>Average Age (mnths)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>The Children's Hospital at Westmead</em></td>
<td>2001-2008</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td><em>Sydney Children's Hospital</em></td>
<td>2004-2008</td>
<td>34</td>
<td>10</td>
</tr>
<tr>
<td><em>John Hunter Hospital, Newcastle</em></td>
<td>2007-2009</td>
<td>16</td>
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</table>
“...Diagnostic criteria for child maltreatment are...ambiguous. Clinicians report they are inadequately trained to make that decision...”

“...the documentation is often incomplete...clinical coders may not have adequate information to assign codes for abuse...”

“...may result in an under-representation of child maltreatment in both morbidity and mortality data...”
“inflicted”? 

= to cause to bear, to feel, to suffer

*mens rea* - “guilty mind”

“...the decision to bring about a prohibited consequence.”

“I find nothing good about the whole matter of intent: a bit like culpable driving - there is no need to assess intent to drive like an idiot, just the result.”
### hospitalisations – “assault”

<table>
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<tr>
<th>Year</th>
<th>Separations for Infants (&lt; 12 months)</th>
<th>Separations for Children (1-4 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-08</td>
<td>194</td>
<td>218</td>
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</table>

“assault” includes: “injuries inflicted by another person with intent to injure or kill, by any means”; “assault by bodily force”; “assault by unspecified means”; “homicide (attempt)” “manslaughter (non-accidental)” murder “(attempt)” ; “other maltreatment syndromes” (“physical abuse”, “torture”) etc.
- hospitalisations
(“missed cases”)

The Children's Hospital in Denver, Colorado; 1990-1995

- 54 (31.2%) of 173 "abused children with head injuries had been seen by physicians after [ITBI] and the diagnosis was not recognised"
- 15 (27.8%) "reinjured"
- 4/5 "deaths in the group with unrecognised [ITBI] might have been prevented by earlier recognition of abuse"
- ("...Infants with recognized [ITBI] were more likely to be minority children or children whose mothers and fathers were not living together...")
incidence - hospitalisations ("missed cases")

- irritability
- vomiting
- poor appetite
- lethargy

"The fact that 60% of children present to hospital with symptoms that would be consistent with many childhood illnesses seen in this age group suggests that [ITBI] may never be considered in many cases."
the short-term outcome in infants with [ITBI] is poor and the associated mortality ranges from 11% to 36%; in surviving children, long-term morbidity is usual and ranges from mild learning difficulties to severe physical and cognitive impairment.”

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Children’s Hospital at Westmead (1995 and 2002, n=65)

- 4 died
- 7 vegetative state
- 17 discharged with “severe disability”
- 12 “moderate disability”
- 25 “good” outcome

(follow up @ 1-73 months - n=56)

- 17 “severe disability”
- 12 “moderate disability”
- 19 “good” outcome

“...highlights for the first time the frequent occurrence of behavioural (52%) problems in this population of children...included self-injurious and self-stimulatory behaviours, hyperactivity, impulsivity, temper tantrums, and rage reactions...”

“...both adoptive and biological parents reported that they had the most difficulty in dealing with these [behavioural] problems and that they perceived professional help and advice in this area to be limited...”
2002; 1435 households @ North, South Carolinas (US)

incidence – “community”

telephone survey [mothers] of "potentially abusive behaviours used by either themselves or their husbands or partners"

'v' incidence of hospitalised ITBI in North Carolina over 2 years

“...for every 1 child less than 2 years of age who sustains a serious or life-threatening injury, another 152 children may be shaken by their caregivers and sustain sub-clinical brain trauma that goes undetected."
## Incidence – “Community”

### (NSW Community Services, 2005 - 2009)
- 514 “Child Protection Reports relating to shaking of children aged 0-2 years”
- 236 “secondary assessments determined actual harm or risk of harm relating to shaking of children”

### (Families and Communities South Australia, 2004-2009)
- of 7973 “children in Notifications” of child abuse less than 2 years of age, there were 2089 “children in Substantiations”
- 23 “Substantiations involving Shaking”
- 7 “Substantiations involving Skull Fracture”.

brain injury AUSTRALIA
www.braininjuryaustralia.org.au
“habitual, prolonged, casual whiplash shakings may produce an insidious progressive clinical picture...which is often inapparent to both parents and physicians. It usually first becomes evident at school age when minor cerebral motor defects are first detected along with mild mental retardation...The actual number of such cases is incalculable from current evidence but it appears to be substantial.”

- John Caffey
incidence – “community”; outcomes?

(samples; 400 - 1,000 mothers from India, Chile, the Philippines, Egypt, and Brazil)

“the frequency of shaking…of children aged less than 3 years ranged from 6.6% of mothers in the Manila, Philippines, neighbourhood of Paco to 42% of mothers in the urban slums of India.”

TBI: “may be an occult but leading cause of infant mortality and mental retardation in the developing world...”
AUSTRALIAN EARLY DEVELOPMENT INDEX (AEDI)
(261,203 five yr-olds surveyed = 97.5 per cent of the estimated population)

▪ 21,800 “developmentally vulnerable”, 34,300 “developmentally at risk, in the “language and cognitive (school-based) “domain

▪ 21,700 “vulnerable” 37,900 “at risk” in the “emotional maturity” domain

▪ 23,200 “vulnerable” and 37,300 “at risk” in the “social competence” domain

▪ 22,600 “vulnerable” and 38,800 “at risk” in the “communications skills and general knowledge” domain
incidence – “community”; outcomes?

10-18% of cerebral palsy in Australia acquired post-neonatally (n = 60-100 p.a.)

1/10 the result of ITBI

“the non-accidental group is slightly rising”
Attention Deficit Hyperactivity Disorder (ADHD)

1998: 355,600 children/adolescents estimated to have ADHD (11.2% aged @ 4 - 17)

ADHD: occurs in 20%-50% of children following ABI

RACP “guidelines” on ADHD: “a thorough medical history and examination are required to identify any ABI or other neurological condition that may contribute to the presenting symptoms.”
World Health Organisation 2009
“systematic review of reviews” (298 studies)

“small and medium effect sizes”
for parent education in direct measures of the
reduction in child abuse

“...comprehensive hospital-based parent
education programme in New York State.
[“Dias model”] The programme was found to
reduce the incidence of abusive head trauma
by 47%...”
Nurse Family Partnership (US, Professor David Olds)
“…the only home visiting programme whose effectiveness has been unambiguously demonstrated.”
randomised controlled trial - NY state; 48% reduction in the incidence of child abuse @ 15-year follow-up
- 28 states
- 20,000 families enrolled
- 2009; US$2.25 billion in expansion funding

Australian Nurse-Family Partnership Program
Australia = 2nd country to receive approval from program’s originator to run it outside of US
- 1,900 Aboriginal/Torres Strait Islander families, 10 sites
(2008-2009; ATSI children = 7.5X the subject of substantiations of child abuse and neglect as non-ATSI)
ITBI/[SBS] “get ‘lost’ in a general program… SBS is probably different because (1) it is the only form of child abuse for which there is a positive feedback for the abuse (i.e. if you shake hard enough, you get a mild concussion and the crying stops, whereas if you punch the baby, the crying increases) and (2) [the data is only suggestive and not good on this] that it is likely that SBS is not as ‘enmeshed’ in difficult-to-change risk factors (like single parents, depressed, etc.) as other forms of child abuse. Bottom line; in this respect, SBS may be "more" preventable than other forms of child abuse.”

- Professor Ron Barr (Pediatrics), University of British Columbia, (National Center on Shaken Baby Syndrome)