Discussion

1. How to recognize a child abuse?
2. ET tube size in child

Child risk factors

- Age: 67% < 1 y/o; 80% < 3 y/o
- Past history of abuse or repeated injuries
  - 50% further abuse; 10% chance of dying
- Speech or learning disabilities, developmental delay
- Psychological disorders
- Congenital anomalies, handicaps
- Hyperactive children, adopted children, and stepchildren

Perpetrators

- Perpetrators:
  - Fathers > mothers' boyfriends > female babysitters > mothers
- Parental risk factors:
  - Young or single parents
  - Lower levels of education
  - Unstable family situations
  - Be abused themselves as children
  - Drug and alcohol abuse
  - Psychiatric illness

History

- Trauma inconsistent with injury mechanism
  - 從沙發掉到地毯上卻頭顱、股骨骨折
- Vague or lacking in detail
- History changes in repeated versions
- Attributed to siblings
- No history is offered
  - 不知道發生什麼事，他的腳就突然斷了!
- Inconsistent with the developmental stage
  - 四個月大嬰兒自己轉開熱水燙傷!

Physical examination

- Injuries not consistent with history
- Multiple injuries in various stages of healing
- Different types of injuries coexisting
  - bruises, burns, fractures
- Pathognomonic, eg: cigarette burns
- Poor caretaking
  - dirty or inadequately clothed
- Behavioral disturbances, pseudomature

Clinical manifestations

- Oro-facial injuries
  - 50%,
  - Face: the most common
- Bruise
- Burn
- Fracture

Orofacial injuries

- Intraoral injuries
- Burns from scalding liquids or caustic materials
- Fractures of the maxilla, mandible
- Oropharyngeal gonorrhea or syphilis
- Basilar skull fractures
- Raccoon eyes & Battle sign
- Nasal septal deviation, ear trauma
- Traumatic alopecia

Raccoon eyes

Traumatic alopecia

Battle`s sign

Torn frenulum

http://www.pediatric-emergency.com/pow10.htm

http://www.cpdt.org.uk/tab02/2_4_1_0.htm

Bruise in child abuse

Table 7. Characteristics Suggestive Of Accidental vs. Non-Accidental Bruises.

Characteristic	Accidental	Non-accidental
General appearance	Irregular, non-uniform	Regular, uniform
Geometric shape or pattern	No recognizable shape (object) or pattern	Distinct pattern or shape (may be recognizable object)
Specific location	Non-protected "exposed" bony prominences (forehead, shins, knees, chin, elbows)	Protected non-exposed areas (chest, neck, axilla, ear pinnae, buttocks, genitalia, oral mucosa, inner aspects of arm, back of hands, inner thighs, small of back, back of knees)
General location	Peripheral distribution (lower extremity, arms, forehead)	More central (trunk)
Severity	Less severe	More severe, more extensive
Number/age	Few in number	Multiple, various ages
Unilateral/bilateral	Usually unilateral (e.g., a child who falls usually lands on one side, producing unilateral bruises)	Bilateral, symmetric (e.g., bilateral orbital contusions)

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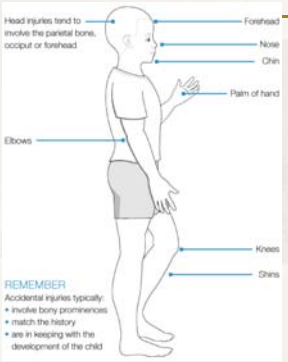
Accidental injuries



Non-accidental injuries

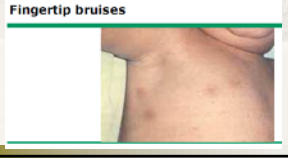
http://www.cpdt.org.uk/tab02/2_4_1_0.htm

Bruising patterns

- Handprints or oval finger marks
- Belt marks with end in a horseshoe-shaped mark
- Loop marks
- Linear bruises

Loop mark

Fingertip bruises



Belt mark

Burn

Table 9. Characteristics Suggestive Of Accidental vs. Non-Accidental Burns.

Characteristic	Accidental	Non-accidental
General appearance	Irregular with variable severity (some areas with blistering, some without)	Regular and more uniform
Geometric shape or pattern	Typically no recognizable patterns, and burns are not circumferential	Recognizable pattern with a high degree of symmetry and regularity. Circumferential "stocking" and "glove" distributions with minimal splash marks are relatively common for immersion burns
Special location	Unprotected areas	Areas that are relatively protected (buttocks, genitalia, thighs)
General location	Flexor and anterior surfaces	Extensor and posterior surfaces
Severity	Varies; predominance of superficial, first-degree burns	Relatively uniform severity with a predominance of deeper second- and third-degree burns
Number and timing	Few in number, all of same apparent age and stage of healing	Multiple, in various stages of healing
Edges	Indistinct, irregular edges	Clear, sharply demarcated edges
Splash marks present	Yes	No

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Brand burn

Immersion burn

Cigarette burn

Dtsch Arztebl Int 2010; 107(13): 231–40

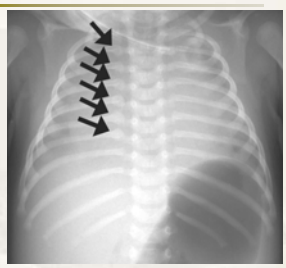
Fractures

- High specificity
  - Meta- und epiphyseal fractures (in children under two years old)
  - Dorsal or lateral rib fractures
  - Medial and lateral clavicular fractures
  - Sternum fractures
  - Scapular and shoulder fractures
  - Vertebral fractures
- Intermediate specificity
  - Multiple fractures in different stages of healing
  - Single fractures (when other evidence of maltreatment is present)
  - Complex skull fractures, particularly when accompanied by intracranial injury (fall from a height of less than 1.5 meters)
  - Pelvic fractures
  - Fractures of the feet, hands, and fingers

Dtsch Arztebl Int 2010; 107(13): 231–40

Corner fracture

Rib fractures



Bucket handle fractures

http://www.radiologyassistant.nl/en/43c63c41ef792

Shaken-Baby Syndrome

- Triad:
  - Severe intracranial injury (SDH)
  - Retinal hemorrhages (70%-90%)
  - Minimal or no external signs of trauma
- Grip the child →
  - Paravertebral serial rib fractures
  - Metaphyseal fractures of the humerus or femur
- Fatal: 12~20%; Vegetation: 5~10% ; Only 22% discharge without any sequelae

Shaken-Baby Syndrome

- A very common explanation given by perpetrators is that the patient fell a short distance

Retinal hemorrhage

- None of children in the accidental group had RH for falls of 4 feet
  - Reece and Sege: 287 children with head injuries
- Bilateral RH: only 1.5% by accidental head trauma (<2 y/o)
  - Bilateral RH → consider SBS
- RH + explanation of accidental head injury → highly suspected child abuse
- Visual & neurological outcome → no obvious association

ET tube size (>1 y/o)

* Size = 4+ Age/4
* Depth = 12+Age/2

TABLE 22-6 RSI Drugs, Doses (mg/kg), Sizes, Distances

Age	2 mo	6 mo	1 yr	3 yr	5 yr	7 yr	9 yr	11 yr	12 yr	14 yr	16 yr	Adult
Average weight(kg)	**5**	**8**	**10**	**15**	**19**	**23**	**29**	**36**	**44**	**50**	**58**	**65**
Preoxygenation												
Adjunctive agents (optional):												
Atropine (0.01–0.02 mg/kg): Use in all children or with ketamine.	0.1	0.15	0.2	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Lidocaine (1.5 mg/kg): Lowers ICP	8	12	15	22	28	35	44	54	66	75	90	100
Sellick maneuver												
Sedative												
Hypotension												
Etomidate (0.3 mg/kg):	1.5	2.4	3.0	4.5	6	7	9	11	13	15	17	20
Head trauma without hypotension												
Etomidate (see above) or												
Thiopental (3–5 mg/kg):	15–25	24–40	30–50	45–75	57–95	70–115	90–145	110–180	130–220	150–250	170–290	195–325
Status asthmaticus:												
Ketamine (1–2mg/kg):	5–7	8–16	10–20	15–30	19–38	23–46	29–58	36–72	44–88	50–100	58–100	65–100
Paralyzing agent:												
Succinylcholine (1.0–1.5 mg/kg):	8	12	15	25	30	40	50	55	60	65	70	80
Rocuronium (0.6–1.0 mg/kg):	4	6	9	12	15	20	25	30	40	45	50	60
Intubate (tube size):	3.5	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.0 female, 8.0 male		
Tube depth at lip (cm):	11	12	13	14	15	16	18	19	20	22	22	22
Laryngoscope blade size:	1	1	1	2	2	2	2	2	3	3	3	3–4

Thanks!