PÉCSI TUDOMÁNYEGYETEM
ÁLTALÁNOS ORVOSTUDOMÁNYI KAR

Skull and brain injuries: intervention options

POTECHO:PTE563

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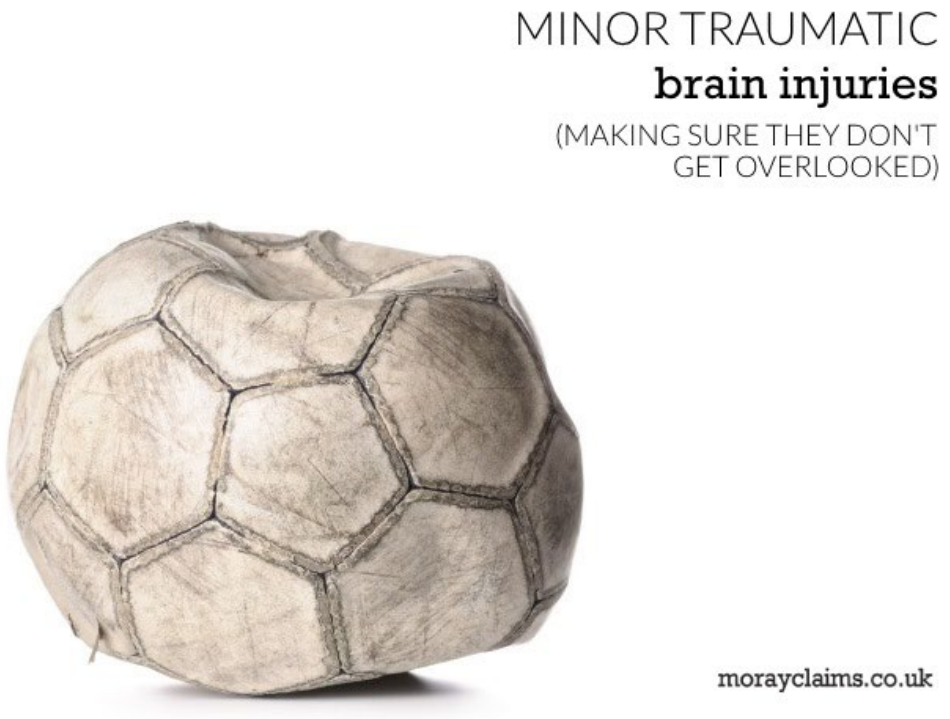
Definition

Definition 1.:

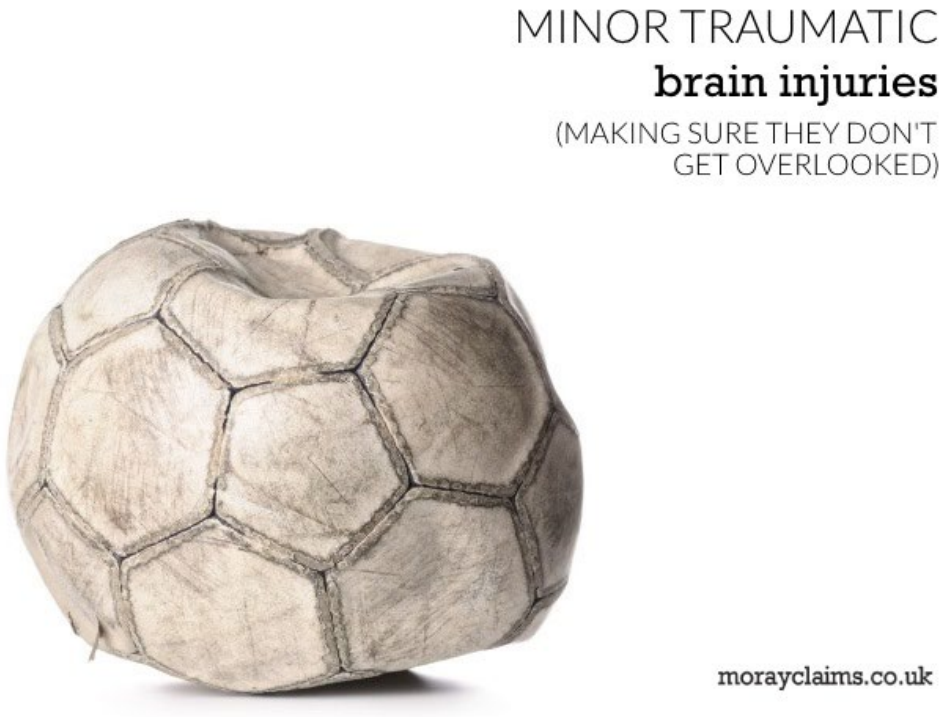
Traumatic brain injury: (TBI) refers to a brain injury that is caused by an outside force.



Definition 1.:

Traumatic brain injury:

- is a global health problem
- high incidence
- common long-term consequences



Definition 2.:

The significance of mild cranial injuries:

- are beginning to recognize its significance
- **involving a much larger population (15-30x)**

Age and gender distribution:

- common in the **young age group**
- **twice as common among men**
- a **high proportion of the elderly** population

Incidence:

- **USA**: approx. 1-2 million people / year
- **United Kingdom**: approx. 1 million people / year
- **Europe**: 2.5 million people / year
- **Hungary:** 20000 people / year (2000 people serious,-10-15% die ons cene)

The most common causes of skull injuries:

- Traffic accidents
- Physical violence, abuse
- falls from a height
- gunshot wounds, stab wounds
- Sports and recreation activities
- Explosions, attacks in war zones

Risk factors for traumatic brain injury:

- Drug and alcohol intoxication
- Violation of traffic rules
- Lack of protective clothing or improper use

Classification of skull injuries

Classification of skull injuries :

1. open or closed (anatomical classification)
2. focal or diffuse or mass lesions (pathological classification)
3. severe, moderate / moderate or mild (severity)
4. Speed of force application
5. Pathobiology: **primary / direct damage, secondary damage**

1. Anatomical Classification:
Open injuries:

- Injuries wich penetrate the skull and meninges
- or skull base fractures:the ligourspace is indirectly in contact with the external environment through the sinuses

1. Anatomical Classification: Open injuries:

- Consequences:
  - impression fracture,
  - foreign body,
  - haematoma,
  - oedema,
  - secondary infection,
  - pneumatocele (air tumor)

1. Anatomical Classification:
Closed injuries (**dura mater intact**):

- **Consequences**:
  - contusion,
  - axon injury,
  - oedema,
  - epidural and subdural haematoma

2. Pathological classification:

- **focal**:
  - subdural bleeding,
  - epidural bleeding,
  - contusion (mainly in the frontal and temporal lobes)
  - **diffuse**

3. Types of head mechanical forces

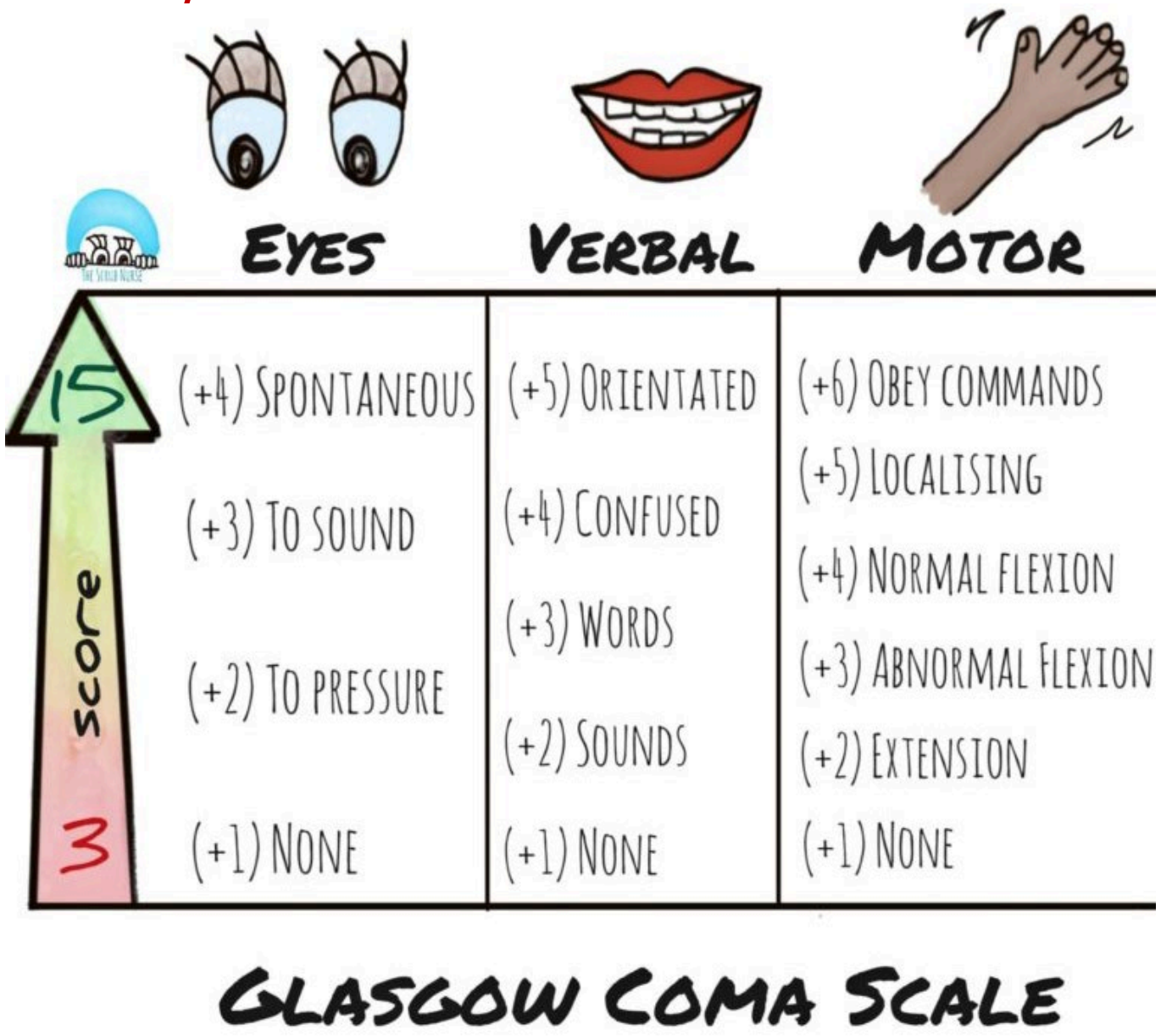
- **static / slow force**: multiple cranial fractures or cerebral compression due to adequate compressive force.
- **dynamic / fast force**:
  - impulsive (sudden movement of the skull due to force on the body)
  - impact (direct impact / impact on the skull)

4. severe, moderate / moderate or mild (severity)

Glasgow Coma Scale(GCS):

- ≤ 8 - severe
- 9-12 - moderate / moderate
- 13-15 - mild

4. severe, moderate / moderate or mild (severity)



4. severe, moderate / moderate or mild (severity)

Glasgow Kóma Skála (GCS):

Vizsgált válasz		Pontszám
Legjobb szemnyitási reakció	Spontán	4
	Felszólításra	3
	Fájdalomra	2
	Nincs szemnyitás	1
Legjobb motoros reakció	Felszólításnak eleget tesz	6
	Lokalizálja a fájdalmat	5
	Védekezik a fájdalom ellen	4
	Fájdalomingerre flexió	3
	Fájdalomingerre extensió	2
	Nincs motoros válasz	1
Legjobb verbalis válasz	Tájékozott	5
	Zavart	4
	Oda nem illő szavak	3
	Érthetetlen hangok	2
	Nincs verbális válasz	1
		Összesen 3–15

5. Pathobiology:

- **primary / direct damage:** damage that occurs at the time of injury;
  - **intracranial haemorrhage,**
  - **cerebral haemorrhage,**
  - **diffuse axonal damage,**
  - **fracture, etc.**

- **secondary damage**: secondary abnormalities occuring **immediately following trauma** as a result of a combination of different complicating processes.

Diagnosis of traumatic brain injuries :

- Laboratory tests:
  - Ongoing research biomarkers, INR

- Imaging tests:
  - Focal lesions, cerebral contusions could relatively easily be identified by CT scan
  - Magnetic resonance (MR) examination

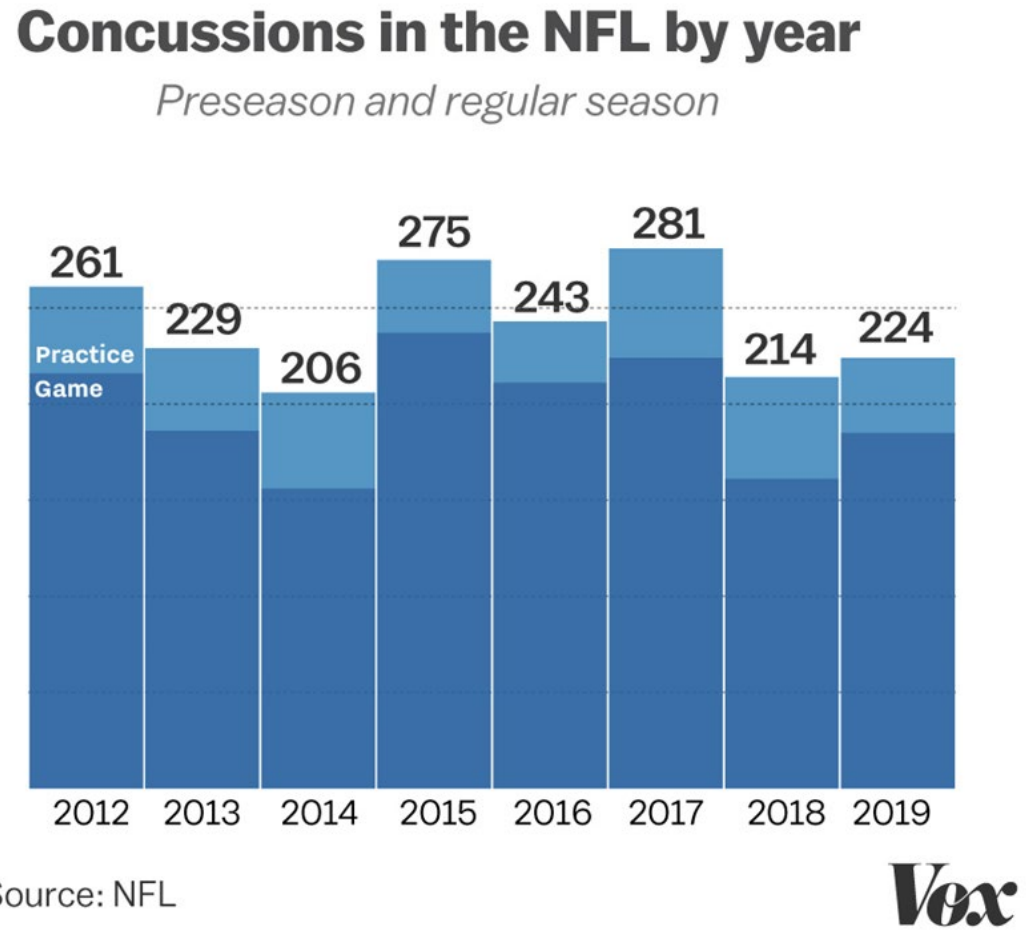
Incidence of traumatic brain injury in sports

- **Concession** is a closed head injury that affects the head as a result of some sudden external force (s), during which the brain hits the inner surface of the skull, leading to its damage and dysfunction.

- Concession may occur
- without visible symptoms (asymptomatic subconcession)
- or accompanied by a number of symptoms (symptomatic concession).

Concession is common in contact sports:

- american football
- rugby
- ice hockey
- boxing / kick-boxing
- lacrosse
- wrestling
- karate



Concession in other sports:

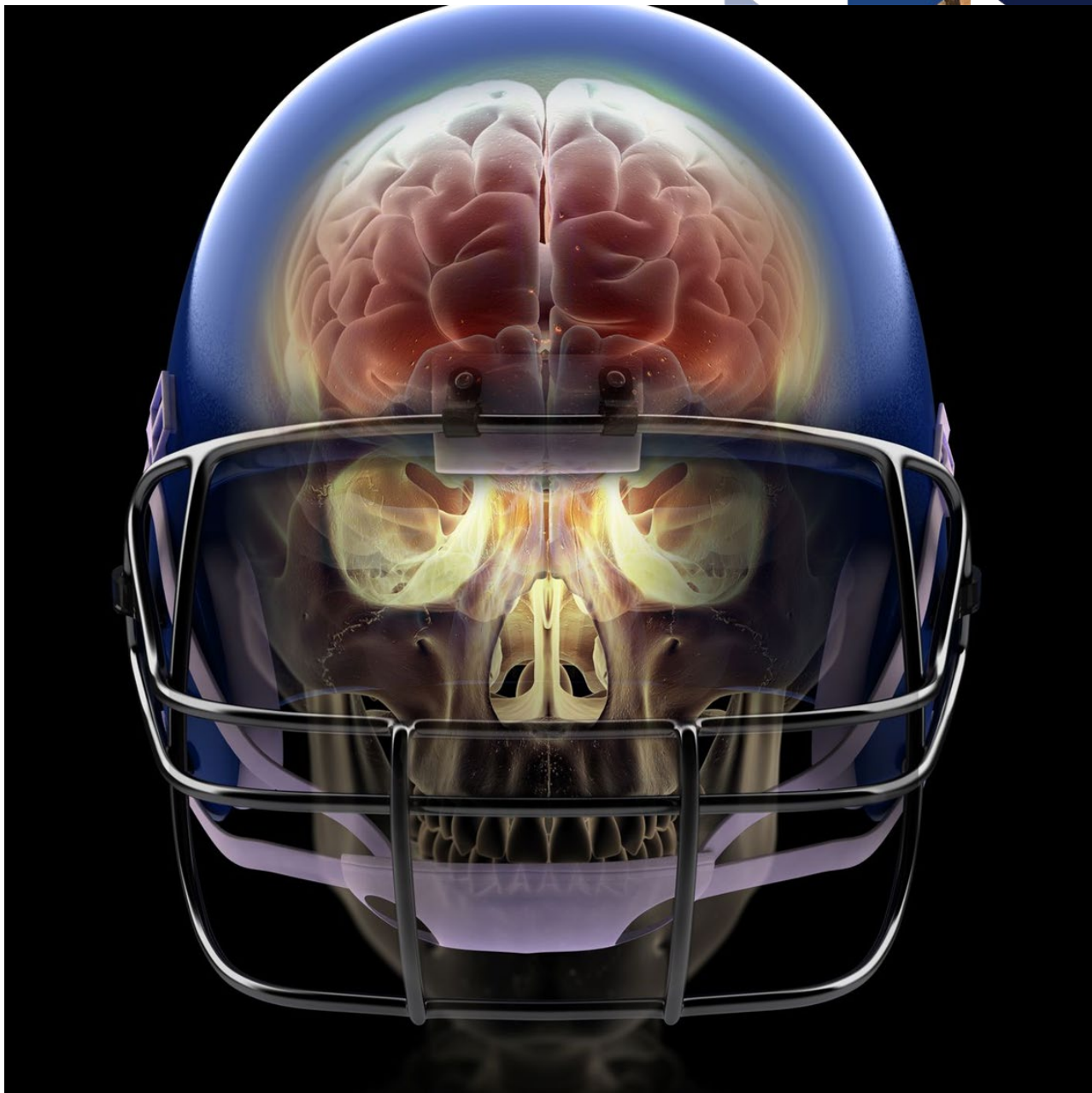
- the horseback riding
- skiing,
- parachuting

Neuropsychological consequences:

- neuro-psychological deficits
- cognitive dysfunction
- concentration disorder
- memorial and attention deficit disorder

Chronic traumatic encephalopathy:

- dementia pugilistica / parkinsonism pugilistica
- punch-drunk syndrome
- chronic traumatic encephalopathy



Progressive neuro-degenerative disease

- **Cognitive deficits** (eg. memory, attention, language impairment)
- **Emotional disorders** (eg. depression, anxiety)
- **Behavioral disorders** (eg. impulse control disorder, aggression)
- **Musculoskeletal disorders** (eg symptoms of parkinsonism: tremor, stiffness, slowness)
- **Personality change**
- **Social difficulties**
- **Suicide** (suicide attempts)

Prevention:

- control and screening
- using appropriate imaging techniques
- emphasizing a multidisciplinary approach
- Protective equipments and clothes

Köszönöm a megtisztelő figyelmet!

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