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(Plenary)

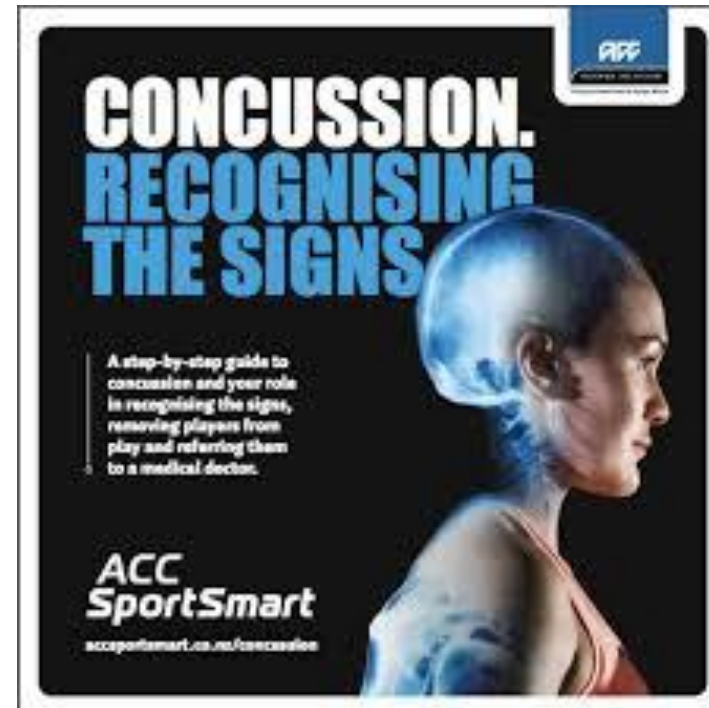
8:20 - 8:35 Repetitive Head Trauma - So What?

Repetitive Head Trauma– so what?

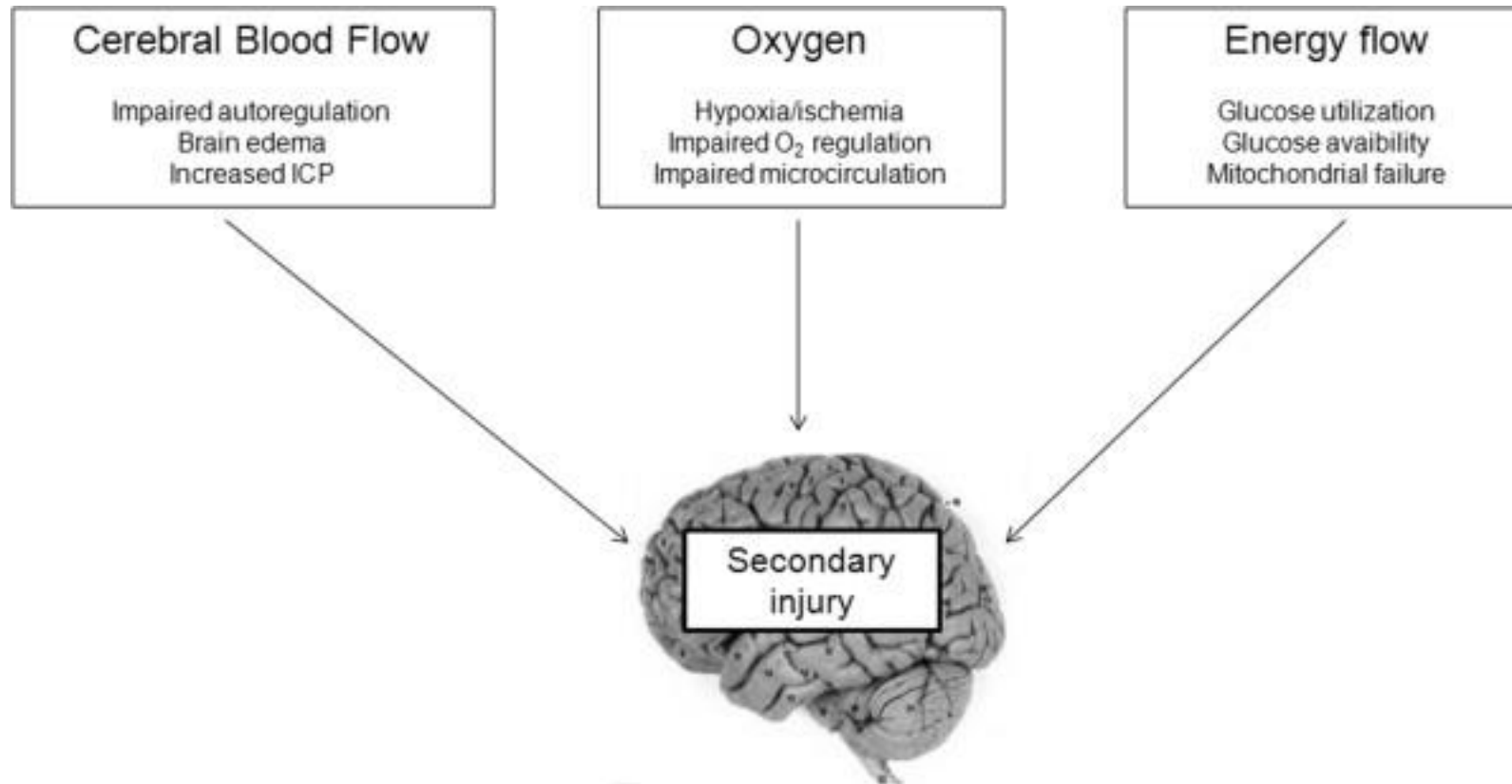
Dr Chris Milne
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August 2019

Outline of presentation

- ▶ Pathophysiology of head injury
- ▶ Historical aspects
- ▶ Current state of knowledge
- ▶ Clinical approach
- ▶ Recent initiatives



Pathophysiology of head injury



Historical background

- ▶ Earliest description– Macdonald Critchley
- ▶ He identified problems in boxers
- ▶ Described as ‘dementia pugilistica’ or the ‘punch drunk’ syndrome
- ▶ Various sporting organisations developed their own guidelines



Concussion Consensus Statements– background

- ▶ Pre 2000–Lack of consistency in concussion diagnosis and management
- ▶ Post 2000–collaboration between experts from many countries, codes, organisations

2001–Vienna

2004–Prague

2008–Zurich

2012–Zurich

2016–Berlin



Result–progressive refinement of guidelines

Current state of knowledge– the Berlin Guidelines

- ▶ Expert panel– 30 members
- ▶ Consensus questions developed
- ▶ Review of 60 000 articles– screened to provide evidence for best answer to these questions



What's new?

- ▶ Definition– Traumatic Brain Injury induced by biomechanical forces– does not require a direct blow to the head
 - ▶ Symptoms/signs reflect a functional disturbance rather than structural injury [imaging normal]
 - ▶ Symptoms/signs cannot be explained by other cause eg:
 - 1–drugs/alcohol/medication
 - 2–other injury
 - 3–other medical condition eg peripheral vestibular dysfunction
- 

Helmet based systems to measure impact forces

- ▶ Do not indicate injury to the brain itself
- ▶ Capture only direct trauma, not transmitted forces from other areas of the body

Concussions can be caused by a direct blow to the

- Head
- Face
- Neck

But direct impact to the head is NOT REQUIRED.

Less than 10% of concussive injuries result in a loss of consciousness.

You do not need to be "knocked-out" to get a concussion.



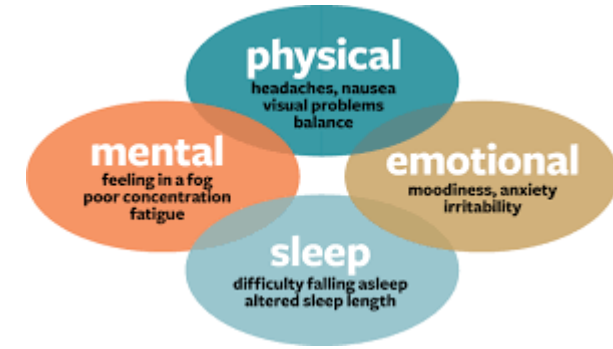
Sideline evaluation

- ▶ SCAT 5 evaluation immediately post injury can differentiate the concussed from the non concussed athlete
- ▶ Maddock's questions– eg which team scored last
- ▶ If in doubt– pull them out of the game
- ▶ NO same day return to play



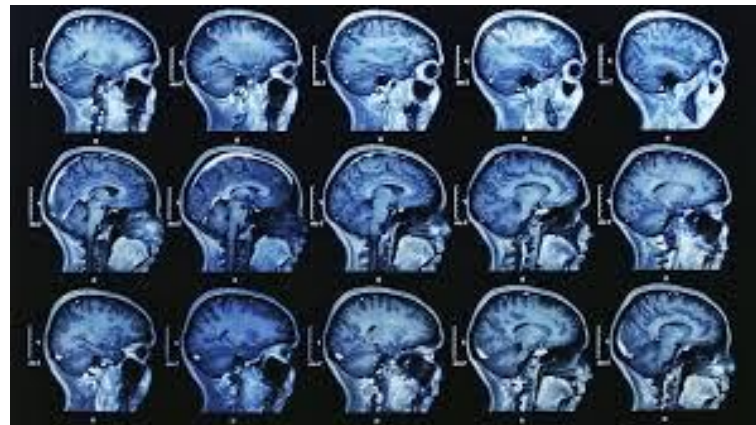
Re-evaluation– medical assessment by a doctor

- ▶ History–SCAT symptoms
 - cognitive
 - sleep/wake symptoms
- ▶ Examination–cognition
 - ocular function
 - vestibular function
 - gait/balance



Neuropsychological/ Imaging

- ▶ Neuropsychological– in selected cases only
- ▶ Imaging– rarely required
 - 1–C spine x-ray inc flex/extension views if history suggests segmental instability
 - 2–CT/MRI scan only if severe head injury is likely



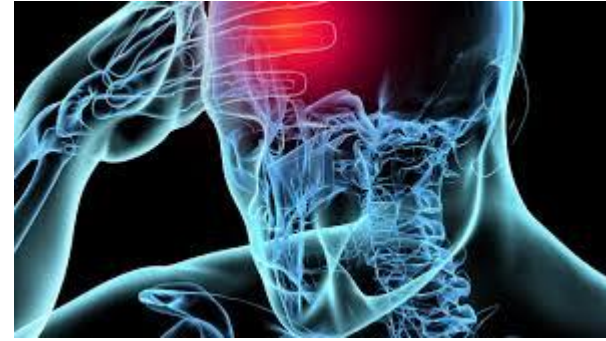
Rest, from work/study/screen/driving

- ▶ First 24–48 hrs
- ▶ After that– progressive activity guided by symptoms



Recovery

- ▶ Natural history
- ▶ Simple concussion
 - Adults– 10–14 days
 - Children– within 4 weeks
- ▶ Strongest predictor of slow recovery is the severity of symptoms in the first few days



Return to sport

- ▶ After 48 hrs– stepwise increase in activity, dependent on symptoms
- ▶ Gentle aerobic
- ▶ Higher level aerobic
- ▶ Skill based
- ▶ Contact/collision
- ▶ Team training– coach assessment of function
- ▶ Medical clearance
- ▶ Return to play



Repetitive head injury

- ▶ May cause cumulative damage
 - ▶ Need complete resolution of symptoms before return to sport
 - ▶ Some players appear to be more vulnerable than their peers
 - ▶ A genetic basis in some cases – eg Apolipoprotein E (Apo E)
 - ▶ Much more research needed before accurate prediction of prognosis is possible
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Repetitive head injury– when to refer

- ▶ Slow to recover [over 4 weeks]
- ▶ Initial improvement, then regression
- ▶ 2 concussions in a season
- ▶ When the clinical picture is outside your ‘comfort zone’– eg if you are under pressure to pass a player ‘fit to return’



Specific subgroups– children/adolescents

- ▶ Limited data on children under age 13
- ▶ Teenage years may be most vulnerable age for developing persistent symptoms
- ▶ Return to school
- ▶ Progressive return to sport
- ▶ Pre-existing ADHD may complicate symptom analysis



Specific subgroups– professional athletes

- ▶ Often additional pressures, as it is their work
- ▶ Get a specialist assessment if outside your comfort zone



Residual effects of concussion

- ▶ Inconsistent literature on these
- ▶ Cognitive impairment
- ▶ Depression
- ▶ CTE– Chronic Traumatic Encephalopathy– a distinct tauopathy. Distinct cause and effect relationship with preceding concussion has yet to be demonstrated conclusively



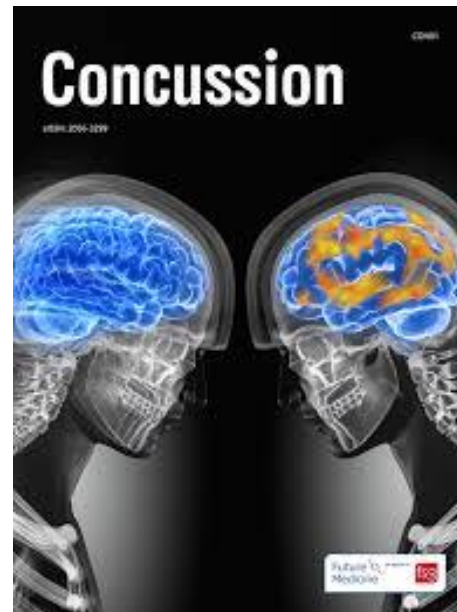
Prevention

- ▶ Headgear/helmets– useful in skiing and snowboarding
- ▶ Mouth guards– prevent dental injury, not concussion
- ▶ Rule changes– eliminate body checking [charging] in youth ice hockey
- ▶ Limited contact/collision in very young players eg ripper rugby



Summary of consensus statements

- ▶ Work in evolution
- ▶ Nothing's perfect, but it is the best evidence we have to guide treatment
- ▶ Beware of vested interests



Blue Card in NZ rugby

- ▶ Background
- ▶ Response to growing concern re concussion
- ▶ Referee is in control of the game and has no vested interest in the result [unlike the coach]
- ▶ If the referee misses a concussion, the coach retains the power to remove that player from the field



Blue Card timeline

- ▶ 2014– first trialled in Northland– 17 players Blue Carded
- ▶ 2017–extended to all Mitre 10 provincial unions
- ▶ 2017–Auckland expands criteria to include schoolboy rugby



Process

- ▶ Training of referees to recognise symptoms of concussion
- ▶ First year referees not eligible for training
- ▶ Player is identified, issued a Blue Card and must leave the field
- ▶ Data lodged with NZRU to monitor return to play



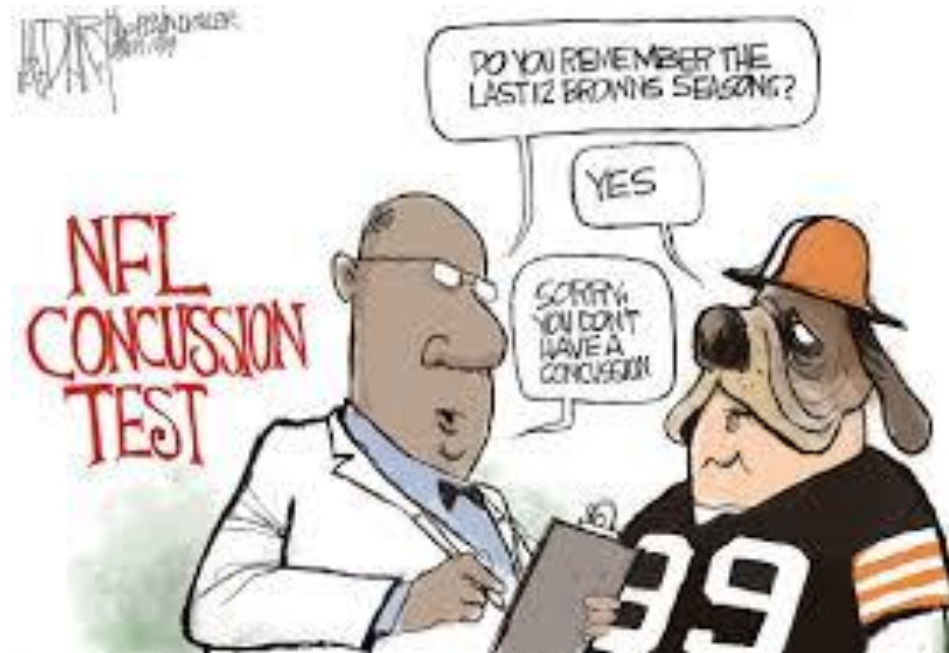
Process– continued

- ▶ Rest until symptoms resolve
- ▶ Complete mandatory stand down period
21 days for adults
23 days for Under 19 age group players
- ▶ Undertake Graduated Return To Play protocol
- ▶ Obtain medical clearance to play



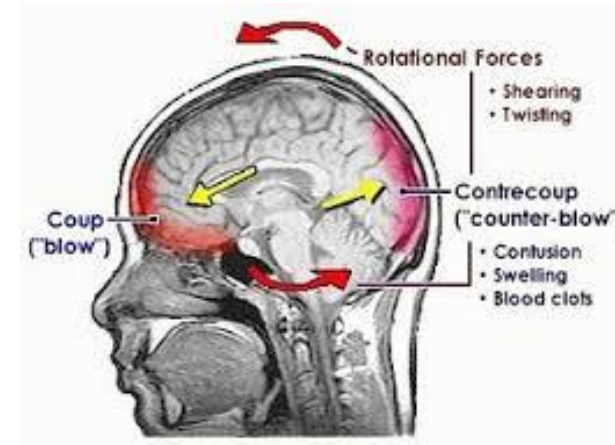
Appeals

- ▶ If players wish to contest the Blue Card, they must be assessed by an independent doctor with concussion expertise appointed by NZ Rugby



Procedure for GPs

- ▶ Use the SCAT 5 system
- ▶ Symptoms
- ▶ Signs
- ▶ Conclusion– fit/unfit
- ▶ Sign off accordingly



Issues for GPs

- ▶ Time
- ▶ Philosophy– some GPs will resent doing these
- ▶ Options– need to refer to another GP who has the time/interest [as for ToP cases]
- ▶ Or– refer to a Sports Physician– who will have the time to evaluate these cases



Blue card initiative– conclusion

- ▶ Nothing's perfect, but this is a worthwhile initiative by NZ rugby



Repetitive head injury–so what?

- ▶ A challenge for GPs
- ▶ Increased public awareness of the issues
- ▶ GPs have background knowledge of their patients– helps in evaluating changes in personality etc
- ▶ Collaboration with relevant specialists is the best approach

