How Can Family Physicians Improve Concussion Management in Collaboration With School and Sport Environments?

Pierre Frémont, MD, PhD,
FCMF (SEM)
Dip Sport Med (CASEM)

FMF 2016
Vancouver

Affiliations / Conflict of interest

* Honorarium from Janssen for conferences on concussion
* Member, Quebec task force on concussions (2014-2015)
* Chair, Canadian Concussion Collaborative (2012-)
* Chair, SEM program committee at the CFPC (2014-)
* Professor, Faculty of Medicine, Laval University
  * Massive Open Online Course (MOOC) on concussion

Let's start with a simple question:

Who in this room has personally suffered a concussion or has a close relative who has suffered a concussion?

Learning objectives:

Following this session, participants will be able to…

* Implement an efficient multidisciplinary concussion management **strategy in a primary care practice**
* Collaborate with parents, schools and sport/leisure environments to optimize concussion care
* Integrate some of the expected updates from the Berlin consensus conference (October 2016).

The focus of this presentation: **office-based care**; not onfield care.

Self-assessment: can you answer these questions?

Following a concussion:

* When can your advance access practice best be used to provide efficient concussion care?
* How long should initial rest be recommended before trying to gradually resume cognitive and physical work?
* When symptoms persist after several days, what should I be looking for during my assessment?

Plan

* Reference framework: The CCC and the notion of protocol
* The faces of concussion
* Developing a strategy about concussion

Plan

* **Reference framework: The CCC and the notion of protocol**
* The faces of concussion
* Developing a strategy about concussion

What is the CCC?

http://casem-acmse.org/education/ccc/

Two recommendations endorsed by 14 organisations

Recommendations for policy development regarding sport-related concussion prevention and management in Canada

Pierre Frémont,[1] Lindsay Bradley,[2] Charles H Tator,[3,4] Jill Skinner,[5] Lisa K Fischer,[6] from the Canadian Concussion Collaborative

Frémont et al, BJSM 2015; 49: 88–89

CCC Recommendation #1

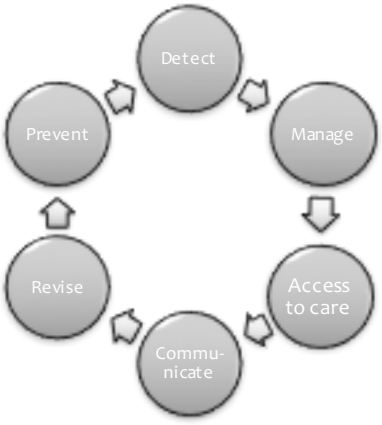
« Organisations responsible for…
sporting events with a risk of concussion
should be required to develop/adapt and implement a concussion management protocol… that is customised for their context and available resources »

CCC Recommendation #2

In situations where timely and sufficient availability of medical resources qualified for concussion management is not available, **multidisciplinary collaborative approaches** should be used to improve concussion management outcomes while facilitating **access to medical resources where appropriate**.

The objectives of concussion management protocols

* To **minimise the incidence**
* To optimise the **early identification**
* To optimised the **management**
* To establish **timely access to expertise**
* To implement:
  * a periodic process for **review**
  * a **communication strategy**



Source: Frémont et al, BJSM 2015; 49: 88–89

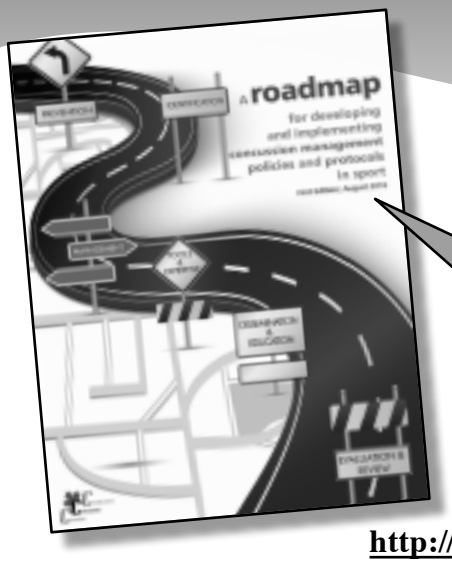
All about specificities…

VS

Team doctor? ***Parent?*** **Family doctor?**

Are you involved with a school?

A « roadmap » is now available!



Just released in August 2016!

http://casem-acmse.org/education/ccc/

ePUB of consensus expected in February 2017

Plan

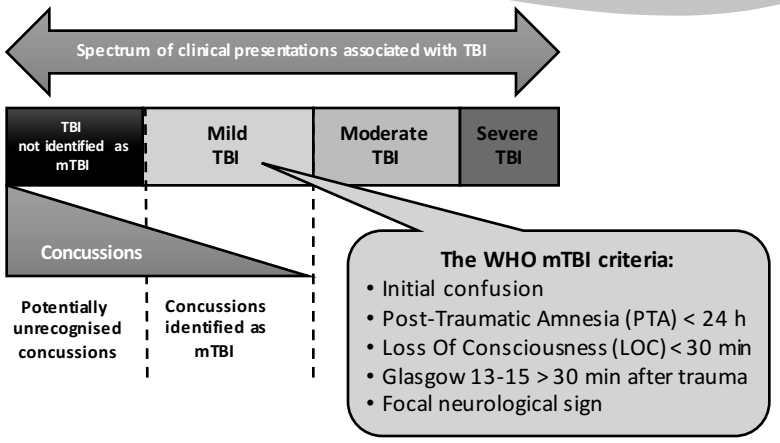
* Reference framework: The CCC and the notion of protocol
* **The faces of concussion**
* Developing a strategy about concussion

What is a concussion?

* A brain injury, induced by biomechanical forces.
* Caused either by a direct blow to the head, face, neck or elsewhere on the body with an ''impulsive' force transmitted to the head.
* Rapid onset of short-lived impairment of neurological function.
* Symptoms and signs may evolve over a number of minutes to hours.
* Functional disturbance rather than a structural injury (ie : normal standard structural neuroimaging studies).
* Most often does not involve loss of consciousness.

Adapted from Zurich 2013

Concussion and mTBI: 2 constructs to define one clinical entity



Most frequent manifestations of a concussion:

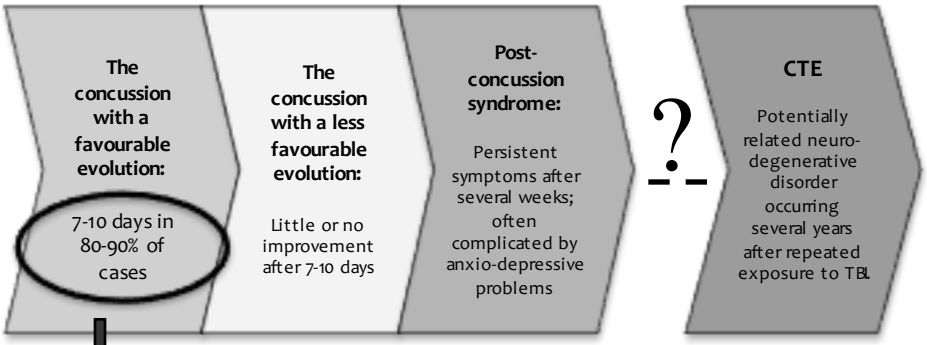
Adapté de Castile et al. BJSM 2012; 46: 603-10

Manifestations	Frequence
Headache or « pressure in the head »	88 %
Dizziness (stability problems)	65 %
Concentration problems	45 %
Confusion / disorientation ★	34 %
Intolerance to noise / light	31 %
Nausea	25 %
Memory problem ★	20 %
Loss of consciousness ★	5 %

★ The 3 elements used for the classification of a TBI

No single element has a good prognostic value!

The faces of concussion



The first 7-10 days will tell you a lot!

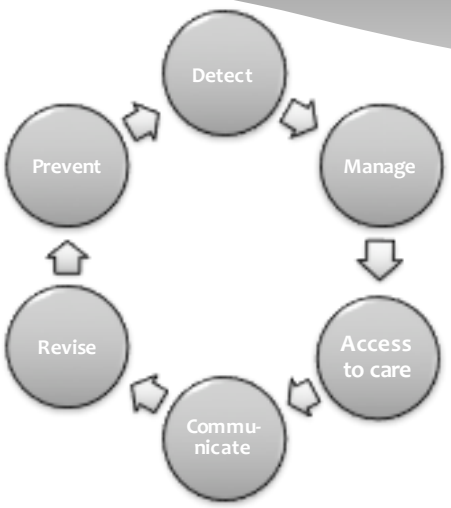
Therefore…

* In the absence of « RED FLAGS »,
  * Basic concussion management principles can be used to safely manage the first 7-10 days following a concussion…
  * Efficient access to care should be accessible for those who have not clearly improved after 7-10 days.
* Now, having that in mind…

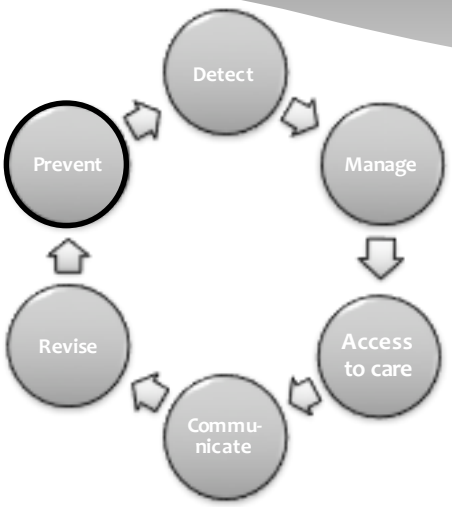
Plan

* Reference framework: The CCC and the notion of protocol
* The faces of concussion
* **Developing a strategy about concussion**

How can I contribute to optimize concussion prevention and management in MY environment?



The prevention of concussion



Concussion prevention: multidimensional considerations…

* **Fair play and respect**
* **Protective equipment**
* **Facilities and safe environment**
* **Rules of play**
* **Age limitations for intentional contact**
* **Any other age appropriate modifications**
* **Reduced contact during training**
* **Education of all potential stakeholders**

The ROADMAP was developed to help sport and school organisations develop a prevention strategy.

Let's see a few succesful examples that prevention can work…

An historical study on body checking in hockey…

	Québec	Alberta
Age of body checking introduction	Bantam (14-15 years)	Pee-Wee (12-13 years)
Part 1 of study: Pee-Wee	**With body checking: 3x more injuries in general 3,8x more concussions**	
Partie 2 of study: Bantam	**Once body checking allowed in both provinces: No significant difference**	

Since these studies, Pee-Wee hockey is played without body checking accross North-America.

Source: Emery et coll., 2010 et 2011

An example of rule change: the interdiction of « spearing » in football (1976):

HEAD AND CERVICAL SPINE FATALITIES

Year	Head Frequency	Head Percent	Cervical Spine Frequency	Cervical Spine Percent
1945-1954	87	17.1	32	27.3
1955-1964	115	22.5	23	19.7
1965-1974	162	31.8	42	35.9
1975-1984	69	13.5	14	12.0
1985-1994	33	6.5	5	4.3
1995-2004	44	8.6	1	0.8
TOTALS	510	100.0	117	100.0

In 1975-1984, a 60% reduction of FATAL injuries was observed

Source: Mueller and Colgate, **Annual survey of football injury research 1931-2008**, 2009

Concussions during training in football…

« Incidence of Concussion During Practice and Games in Youth, High School, and Collegiate American Football Players » :

* 57 % of concussions in college and varsity football happen during training.
* In younger kids, approximately 50% of concussions happen during training.

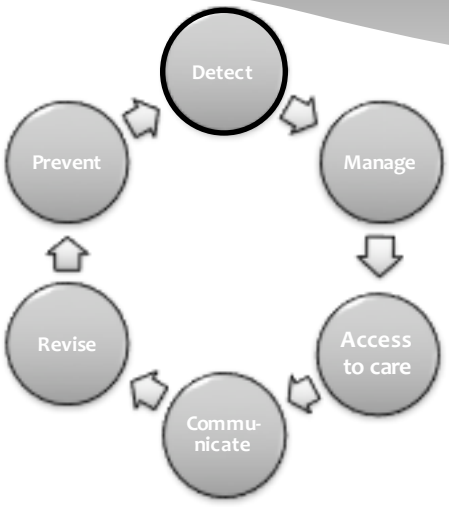
Dompier et al. *JAMA Pediatr*. 2015; 169(7): 659–65

About protective equipment: mouthguards and helmets

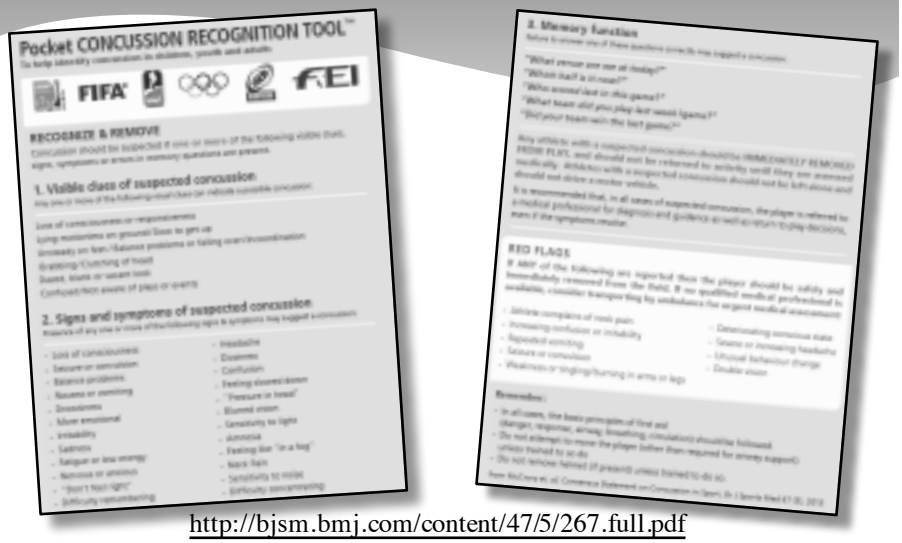
* No evidence that protective equipment can prevent concussion,
* However, helmets and mouthguards prevent cranial, soft tissue, dental and orofacial injury.
* RISK COMPENSATION:
  * Modern protective equipment can results dangerous playing techniques, which increase injury rates.
  * This must be addressed by strict rules of play.

McCrory P, *et al. Br J Sports Med* 2013;**47**:250–258.

The detection of concussions



The « Concussion Recognition Tool » can help raise awareness!



http://bjsm.bmj.com/content/47/5/267.full.pdf

Who must go to the ER immediately?

RED FLAGS

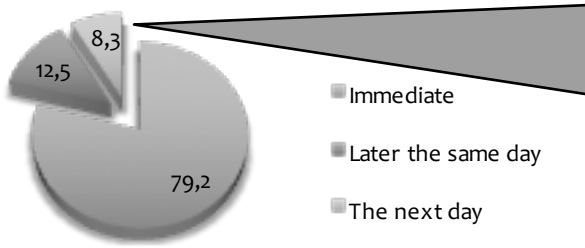
If ANY of the following are reported then the player should be safely and immediately removed from the field. If no qualified medical professional is available, consider transporting by ambulance for urgent medical assessment:

- Athlete complains of neck pain
- Increasing confusion or irritability
- Repeated vomiting
- Seizure or convulsion
- Weakness or tingling/burning in arms or legs
- Deteriorating conscious state
- Severe or increasing headache
- Unusual behaviour change
- Double vision

Concussion Recognition Tool: http://bjsm.bmj.com/content/47/5/267.full.pdf

IMPORTANT: about 20% of concussions are associated with delayed symptoms!!!

Timing of concussion manifestations (%)



This means that ATHLETES, PARENTS, COACHES, TEACHERS and HEALTH PROFESSIONALS can all contribute to detection

Duhaime et coll, J Neurosurgery 2012

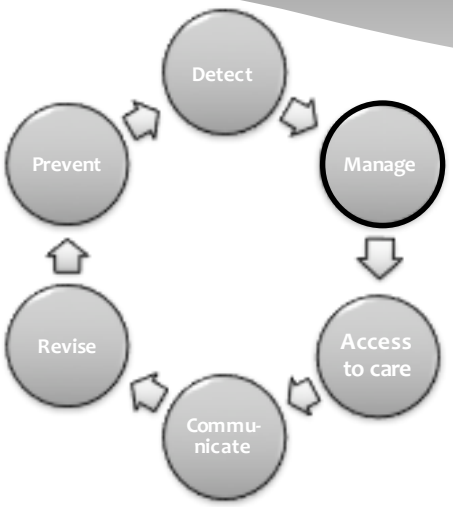
Identification and initial conduct

* **In the presence of one or more clinical feature of a <u>possible</u> concussion:**
  * **<u>Presume</u>** that a concussion has occurred,
  * **<u>Remove</u>** the person from any further risk of injury,
  * **<u>Maintain</u>** that person away from risk (no return to play the same day),
  * **<u>Monitor</u>** signs and symptoms for severity and progression.

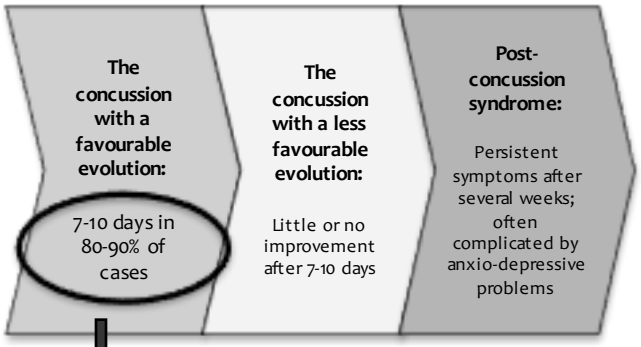
Important messages!

* A second trauma occurring before the complete healing of a concussion can have major and sometimes catastrophic consequences!
* To ignore the signs of a concussion is risking that person's future in sport and in life in general!
* "When in doubt, sit them out!"

The early management of concussions

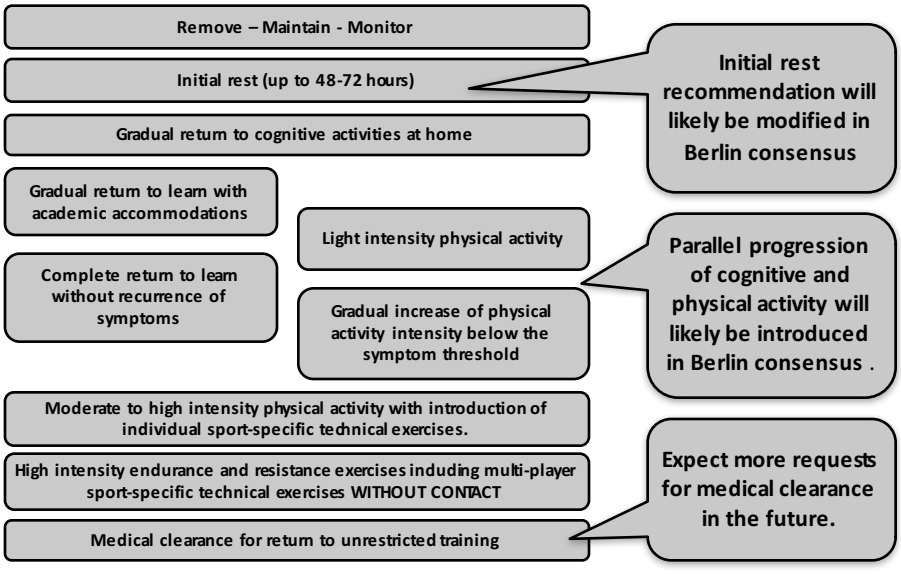


It's time to remember that…



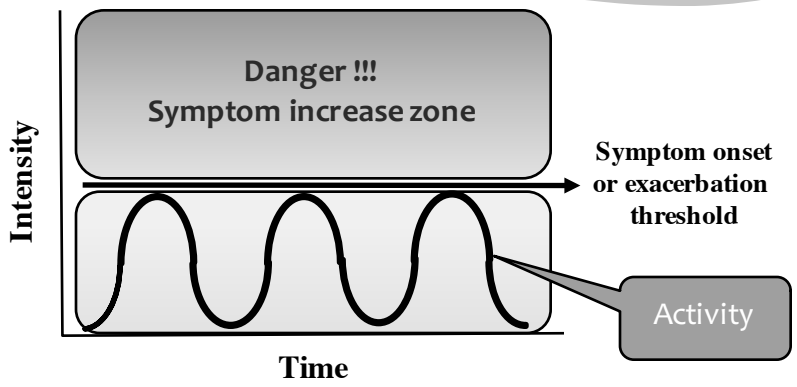
The first 7-10 days will tell you a lot!

Rest and gradual return to cognitive and physical activities



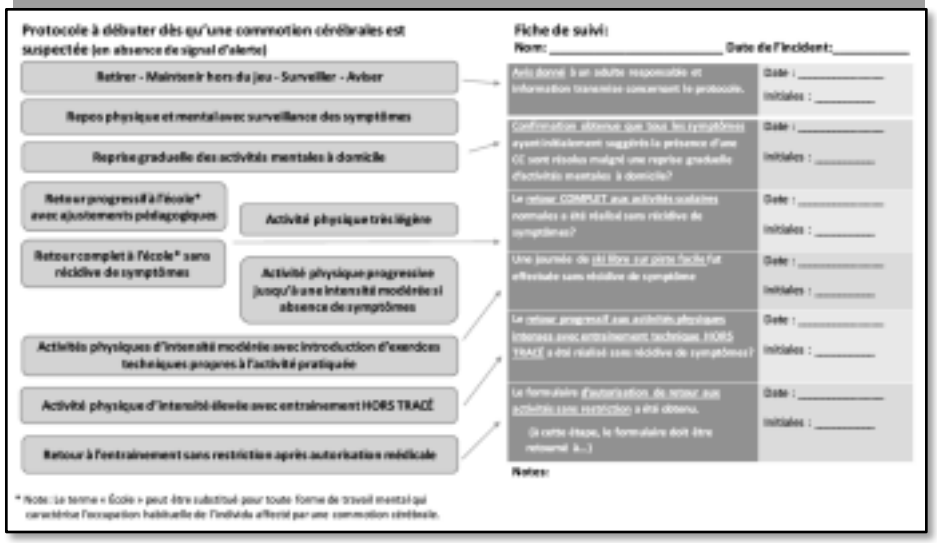
NB: return to learn should be substituted by return to work when applicable

The safe zone principle!



Adapted from: Lisa Fisher, http://fowlerkennedy.com/

A follow-up form should guide the process through home, school and eventually back to sport…



Now, let's talk about return to play decisions…

Remove – Maintain - Monitor

Initial rest (up to 48-72 hours)

Gradual return to cognitive activities at home

Gradual return to learn with academic accomodations

Light intensity physical activity

Complete return to learn without recurrence of symptoms

Gradual increase of physical activity intensity below the symptom threshold

Moderate to high intensity physical activity with introduction of individual sport-specific technical exercises.

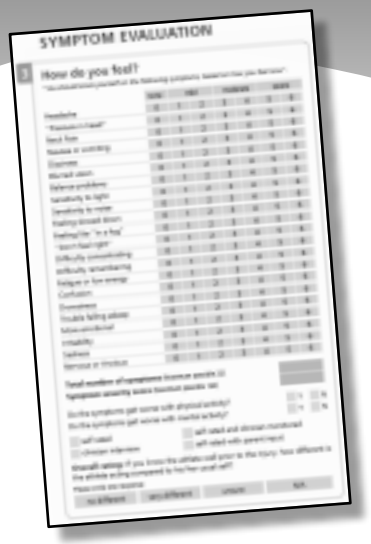
High intensity endurance and resistance exercises induding multi-player sport-specific technical exercises WITHOUT CONTACT

Medical clearance for return to unrestricted training

How can I make that decision?

NB: return to learn should be substituted by return to work when applicable

Step 1: formally document the personal history and the evolution of symptoms



http://bjsm.bmj.com/content/47/5/259.full.pdf

SUGGESTION:
Use the SYMPTOM EVALUATION and BACKGROUND sections of the SCAT 3

Step 2: Verify successful acheivement of the protocol!

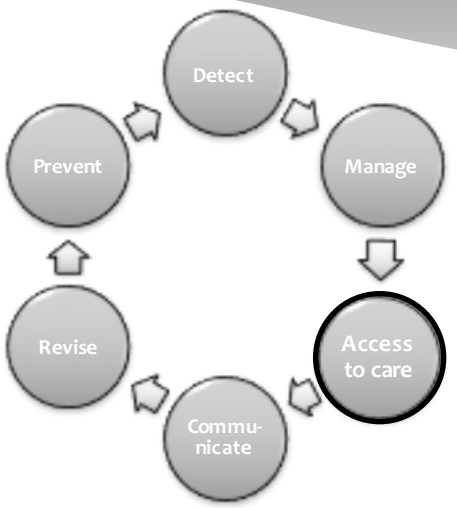
- ✓ Did all the symptoms that initially suggested the presence of a concussion completely resolve?
- ✓ Was a complete and unrestricted return to a full day of school achieved without recurrence of symptoms?
- ✓ Were vigorous endurance and resistance physical activities performed without recurrence of symptoms?

Consider RTP only if the answer to these 3 basic questions is YES

Step 3: Consider possible MODIFYING FACTORS

Temporal	• Frequency (repeated concussions over time) • Timing (injuries close together in time) • 'Recency' (recent concussion)
Threshold	• Repeated concussions occurring with progressively less impact force • Slower recovery after each successive concussion
Comorbidities	• Migraine • Depression or other mental health disorders • ADD / ADHD or Learning disabilities • Sleep disorders
Sport and behaviour	• High-risk activity (combat sport) • Dangerous style of play
Medication:	• Psychoactive drugs, anticoagulants
Age:	• Child and adolescent (<18 years old)

Timely access to expert care for concussions that fail to improve within 7-10 days



If you don't feel competent about concussion, you are not alone!

Stoller et al. (2014) Can. Fam. Physician 60: 548-552

Research

Do family physicians, emergency department physicians, and pediatricians give consistent sport-related concussion management advice?

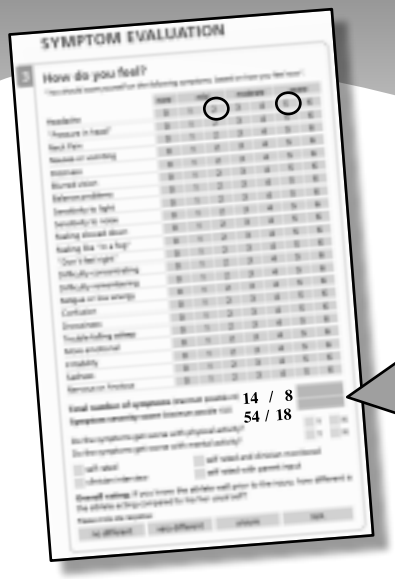
49% of FP, 52% of EDP, et 27% PED reported no knowledge of any consensus statements

Concussion expertise is a question of professional development and experience

Step 1:

* Confirm absence of RED FLAG:
  * Organise immediate assessment in the event of worsening symptoms!
* Provide counseling and documentation about early management.
* Make yourself rapidly available if things do not improve after 7-10 days!
  * ASAP in the presence of modifying factors

Step 2: formally document the evolution of symptoms



SUGGESTION: use the SCAT3 « Symptom Evaluation » section to document **MAXIMAL and CURRENT** symptoms. Calculate symptom **number and score.**

http://bjsm.bmj.com/content/47/5/259.full.pdf

Step 3: look for…

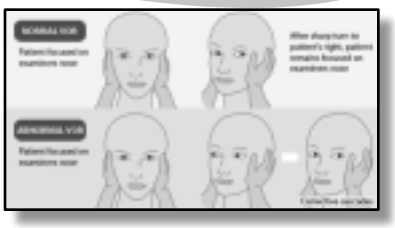
* Normal neurological status
* Compliance with protocol and DANGER ZONE principle
* Anxious or depressive signs or symptoms.
  * Early anxious components are often present
  * Simple education can go a long way
* Cervical spine problem
  * Cervicogenic headache or other symptoms.
* Oculo-vestibular problems…

Oculo-vestibular screening

* Look for potential oculo-vestibular cluster of symptoms:
  * Typical increase of symptoms in 3D visual analysis (ex: driving, riding a bike)
* Signs:
  * You can integrate some simple screening tests in your assessment.

Examples of oculo-vestibular screening tests with good sensitivity

* **Saccade test:**
  * Doctor generates sudden mouvement.
  * Positive if a correction saccade is present.



* **Active horizontal oculo-vestibular test:**
  * Active R and L rotations (20-30°) fixing a static target about 1 meter away.
  * Positive if symptoms increase.

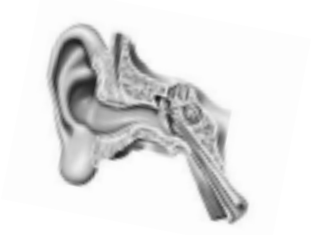
One key study about cervical and vestibular rehabilitation following concussions.

BJSM

Cervicovestibular rehabilitation in sport-related concussion: a randomised controlled trial

Kathryn J Schneider, Willem H Meeuwisse, Alberto Nettel-Aguirre, Karen Barlow, Lara Boyd, Jian Kang and Carolyn A Emery

Br J Sports Med 2014 48: 1294-1298 originally published online May 22, 2014



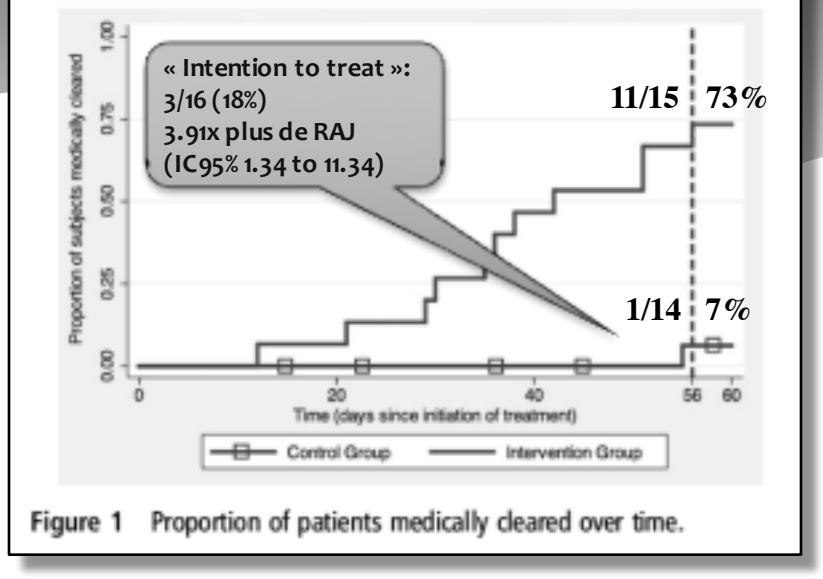
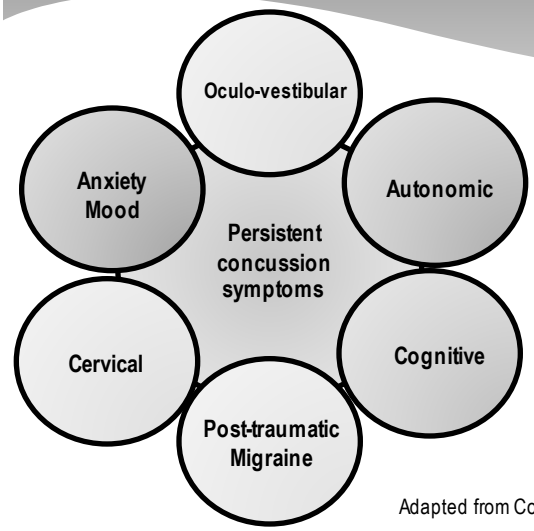


Figure 1 Proportion of patients medically cleared over time.

Schneider et coll. BJSM 2014; 48 (17): 1294-8

About individualised multidisciplinary concussion management…



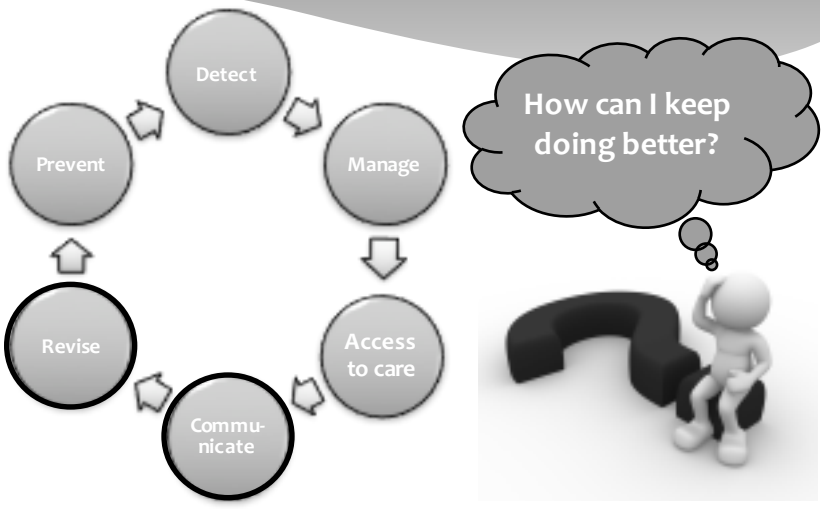
- Athletic therapy
- Chiropractice
- Kinesiology
- Neuropsychology
- Occupational therapy
- Physiotherapy
- Psychology
- Sport medicine

Adapted from Collins et al. 2014

Step 4: individualise management

* **Educate** to improve compliance with protocol and respect of the « danger zone » principle.
* **Address** anxiety early!
  * Complete healing often takes several weeks!
* **Initiate** pain management as needed
* **Refer** for rehabilitation if cervical or oculo-vestibular problem is suspected.
* **Consider** referral to muldidisciplinary assessment and treatment.

Learn from your experience and Integrate new recommendations!



A periodic process for protocol review

* It should be an explicit part of your protocol!
* Based on:
  * The evolution of recommendations
  * The experience acquired using the protocol
* Use the CCC resources webpage:

http://casem-acmse.org/concussion-related-position-statements-tools/

How will you organise communication?

* Select or design tools for communication about early concussion management.
* Consider multidisciplinary approach within your clinical environment.
* How can you bring your colleagues up-to-date about concussion management?

Final conclusions…

* There is a great potential to optimise concussion management through education of every stakeholder:
    - Organisations / Coaches / Teachers
    - Parents
    - Athletes
    - **Health professionals**
* We need to implement strategies that will optimise management through home, school and sport environments during the recovery process.
* Just do it and then learn from your experience!

THANK YOU! ANY QUESTIONS?
pierre.fremont@fmed.ulaval.ca

For more information about the **SEM program committee**, or to find out how you can participate, visit our webpage at **www.cfpc.ca/cpfm** or contact us at **cpfm@cfpc.ca**

The committee:

- Dr Pierre Frémont, *Chair, QC*
- Dr Marni Wesner, *BC/AB*
- Dr Megan Dash, *MB/SK*
- Dr Jack Ceaser, *ON*
- Dr Wade Elliott, ON
- Dr Ean Parsons, *Atlantic Canada*
- Dr Tatiana Jevremovic, *CASEM Observer Rep*

THE COLLEGE OF FAMILY PHYSICIANS OF CANADA | LE COLLÈGE DES MÉDECINS DE FAMILLE DU CANADA

60