

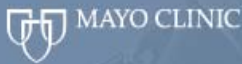
# Concussions in Ice Hockey

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Medical Committee, IIHF

- Sports concussion **risk and/or recognition** is escalating
- **4x** increased risk of a **2nd** concussion
- Repeated concussions = **increased severity & cumulative damage**
- **Youth & women** are at *higher risk*



Mayo Clinic Sports Medicine Center

# ICE HOCKEY SUMMIT: ACTION ON CONCUSSION

October 19-20, 2010



Siebens Medical Education Building, Leighton Auditorium  
Mayo Clinic  
Rochester, Minnesota

Course Directors:  
Michael J. Stuart, MD  
Aynsley M. Smith, RN, PhD

This Program Jointly Sponsored with:



- Reduction of concussion risk, severity & consequences requires a *collaborative effort* from **medicine, psychology, sport science, coaching, engineering, officiating, manufacturing, & community partners**

CONFERENCE BOOKLET



Mayo Clinic Sports Medicine Center

# ICE HOCKEY SUMMIT: ACTION ON CONCUSSION

October 19-20, 2010

## Joint Sponsors

**USA Hockey**

**International Ice Hockey Federation (IIHF)**

**Hockey Equipment Certification Council (HECC)**

**Ontario Neurotrauma Foundation (ONF)**

**Appreciation to Team Wendy**

**&**

**our Johansson-Gund Endowment**

# Outside the Skull Perspective



- **NHL: Video analysis project**
  - ✓ 60% due to direct blows to head
  - ✓ 75% don't have or just released the puck
  - ✓ 78% shoulder and elbow
- **Focus should be on eliminating behaviors**

# Outside the Skull Perspective



- **Translation of Science to Prevention**

- ✓ *Open-ice, unanticipated & illegal* collisions result in higher linear & rotational acceleration

- ✓ Teach youth players technical skills & heighten awareness of imminent collisions

- ✓ Athletes/coaches must conform to rules

- ✓ Officials consistently enforce rules

- **Guide policy change**

# Inside the Skull Perspective



- **The Pediatric Brain**

- ✓ Developmental stage, susceptibility, reporting & recovery differ
- ✓ Adult caretakers must report symptoms & ensure treatment compliance
- ✓ Need *developmentally-specific* approach to assessment & management of the pediatric athlete

➤ Focus on the youth  
*athlete AND student*

# Inside the Skull Perspective



- **Chronic Traumatic Encephalopathy (CTE)**

- ✓ Diffuse neurodegenerative syndrome associated with repeated concussions that affects the brain & spinal cord with distinct pathological changes

- ✓ Begins mid-life, dementia, Parkinsonism, gait & speech disorder

- Can early markers make the diagnosis & facilitate prevention or treatment?

# The Science of Evaluation



- **Sideline Evaluation of Concussion**

- ✓ History, examination, symptom scale, cognitive function, balance & coordination

- ✓ “When in doubt, sit them out”

- ✓ Next day follow- up

- Improving *detection* requires *education* of health care providers, coaches, players & parents

# Neurocognitive Testing



- **Integrating Assessment & Return to Play**

- ✓ 4% repeat concussion- 79% *within 10 days*
- ✓ NO SAME DAY RETURN TO PLAY!
- ✓ Progressive exercise & cognitive challenge = a longer symptom-free waiting period

➤ Return to play decisions are complex → ultimate decision based on *clinical judgment*

# Neurocognitive Testing



- **Neuropsychological Testing in Youth**

- ✓ Players hide symptoms

- (50% experience → only 10% report)

- ✓ Recovery is prolonged- student athlete should be *asymptomatic* after vigorous exertion & have *normal cognitive testing*

- **Athletes/students must be rested: cognitively & physically**

# Equipment and Facilities



- **Evaluation of Hockey Helmets**

- ✓ Difficult to measure their effect in ice hockey
- ✓ Helmets do what they were designed for: reduce skull fracture & hematoma
- ✓ Facial protection: no reduced concussion risk, *but may reduce severity*

➤ Helmets can't prevent  
diffuse axonal injury secondary to  
angular or rotational acceleration

P. David Halstead  
Pat Bishop PhD

# Equipment and Facilities



- **Ice Surface Size & Mouthguards**

- ✓ ↓ injuries & player-player contacts on **larger** ice surfaces
- ✓ Mouthguards: *no evidence* of concussion risk reduction
- ✓ Need to assess newer products that tout efficacious laboratory results

➤ Well designed clinical studies needed to demonstrate the benefits

# Psychosocial Factors



- **Hockey Education Program (HEP)**- behavioral modification program with outcome data
  - ✓ incorporates Fair Play rules
- **Play it Cool**- interactive web-based
  - ✓ injury awareness programs promote skill development, coaching excellence, prevention strategies
- **Implement more broadly**  
**across USA & Canada**

Aynsley Smith RN, PhD  
William Montelpare PhD

# Physical Factors



- **Checking vs. Non-Checking Leagues**

- ✓ **3x** increased risk of concussion & severe concussion in Pee Wee leagues that allow body checking
- ✓ Intensity (*not rate*) of physical contacts greater
- ✓ *No difference* in **practice** injury rates

➤ Delaying body-checking until Bantam has a clear & measurable benefit

# Physical Factors



- **Gender Differences in Concussion**

- ✓ Women's ice hockey has the highest concussion *rate* among NCAA athletes
- ✓ Concussion *outcomes* are worse in women
- ✓ More research required to explain difference
- ✓ Cultural, hormonal, structural?

➤ Prevention strategies & return to play guidelines need to reflect gender-specific factors

# Jim Johnson - NHL Player



**"I am the guy, blinded by flashing lights, who went to school to pick up my daughter & returned home *without her.*"**

- Importance of educating coaches & players can't be overestimated
- Coaches/athletic trainers should set standards, expectations & guidelines with players/parents at beginning of the season
- An educational video from USA Hockey would be a powerful tool

# Kerry Fraser - NHL Referee



- Educate officials- *rules must be black & white*
- Standard of enforcement must be *uniform & consistent*
- Penalty must provide disincentive (suspension/fine)

**Abuse of officials must stop!**

**Rescinding a call** robs officials of confidence, results in self-doubt & a “no call” in the next game

# 6 PRIORITY ACTION AREAS

## FORMULATED AT MAYO CONCUSSION SUMMIT 2010

### DATA BASES AND METRICS

- Develop consistent definition
- Base recommendations on data
- Partner with pending legislation

### EQUIPMENT AND ARENAS

- Communicate protective role equipment plays
- Share pros and cons of all helmets
- Support research for all equipment

### EDUCATION AND PREVENTION

- Mandate concussion education for coaches, officials, players and parents
- Charge hockey organizations with delivering existing educational content
- Educate for behavioral and cultural change



### DIAGNOSE, MANAGE

- Mandate education
- Remove players suspected of concussion
- No return to play until cleared by health care provider

### RULE RECOMMENDATIONS

- Enforce head and body contact rules
- Create curriculum to teach body control for legal checking (No checking until age 13)
- Ban fighting at all levels

### COMMUNICATION

- Mandate pre-season meetings
- Deliver unified, consistent message
- Develop a multi-media package

# What should **USA Hockey** do ?

## Education

- *mandatory* concussion education for **coaches, parents & athletes**
- adapt the new **Smart Hockey** video (*produced by ThinkSmart*) or similar produc

Modify to create a "**USA version**"

- introduction by USA Hockey
- include USA players

# What should **USA Hockey** do ?

## Rule Changes & Enforcement

- eliminate **head contact**

*(incidental & intentional)*

### Proposal #68B

**Minor:** contact to the head, face or neck

**Major/Game:** intentionally or recklessly

**Match:** attempt to injure or deliberate injury

# What should **USA Hockey** do ?

## Rule Changes & Enforcement

- delay legal **body checking** (boys) *in games* **until age 13** (Bantam level)

### Proposal #94B

**Body Checking** is prohibited in the **12 & under youth** age classifications, all Girls' / Women's age classifications and in non-check Adult classifications

# What should **USA Hockey** do ?

## Rule Changes & Enforcement

- establish a progressive, structured **curriculum** to teach *body control, angling, anticipation, body contact & body checking* skills

Body **CONTACT** is allowed !

# What should **USA Hockey** do ?

## Rule Changes & Enforcement

- eliminate **fighting**

### Proposal #64C

**2<sup>nd</sup>** fighting major = **3 game** suspension

**3<sup>rd</sup>** fighting major = suspension

(until a hearing is conducted)

***Together...***  
we can grow the  
sport & reduce  
concussions



### **F-Communication**

1. Require annual in-person meetings for all hockey participants (including parents)
2. Create unified content & messaging
3. Develop a unified multi-media package, including robust social media presence

### **D - Education**

1. Mandatory concussion education for coaches, parents and student-athletes
2. Content development
3. Physician education on concussions to athlete & parent during sports physical

### **E- Rule Changes, Enforcement**

1. Head contact
2. Body checking
3. Eliminate fighting

### **A- Databases**

1. Collect injury (concussion) data from well-controlled sentinel sites
2. Standardization of hockey research
3. Find a way to partner with the pending (i.e. US State legislation initiatives) to collect data

### **B – Diagnosing -RTP**

1. Mandate education (Coaches during certification; Parents; Referee)
2. Remove ALL athletes suspected of having a concussion
3. No athlete with concussion can RTP until cleared by a health care provider

### **C- Player Equipment**

1. Communication strategy to educate the hockey community on the role equipment
2. Helmets are one factor to reduce the risk of concussion- research must continue
3. Support protocols for testing equipment & facilities