

14-40a  
AP - 8/26/14  
Senate Info - 9/9/14

**Undergraduate Distance Education Review Form**

(Required for all courses taught by distance education for more than one-third of teaching contact hours.)

**Existing and Special Topics Course**

Course: HPED 175 - Prevention and Care of Injuries to the Physically Active

Instructor(s) of Record: Racchini, James J.

Phone: 724-357-2759 Email: racchini@iup.edu

**Step Two: Departmental/Dean Approval**

Recommendation:  Positive (The objectives of this course can be met via distance education)  
 Negative

[Signature] 03/27/2014  
Signature of Department Designee Date

Endorsed: [Signature] 4.21.14  
Signature of College Dean Date

Forward form and supporting materials to Liberal Studies Office for consideration by the University-wide Undergraduate Curriculum Committee. Dual-level courses also require review by the University-wide Graduate Committee for graduate-level section.

**Step Three: University-wide Undergraduate Curriculum Committee Approval**

Recommendation:  Positive (The objectives of this course can be met via distance education)  
 Negative

Gail Spechiet 8/27/14  
Signature of Committee Co-Chair Date

Forward form and supporting materials to the Provost within 30 calendar days after received by committee.

**Step Four: Provost Approval**

Approved as distance education course  Rejected as distance education course

[Signature] 9/8/14  
Signature of Provost Date

Forward form and supporting materials to Associate Provost.



Received  
AUG 27 2014  
Liberal Studies

APR 23 2014

## Undergraduate Distance Education Review Form

(Required for all courses taught by distance education for more than one-third of teaching contact hours.)

### Existing and Special Topics Course

**Course: HPED 175 – Prevention and Care of Injuries to the Physically Active**

**Instructor(s) of Record: Dr. Jim Racchini**

**Phone: 724-357-2759**

**Email: racchini@iup.edu**

Provide a brief narrative rationale for each of the items, A1- A5.

1. How is/are the instructor(s) qualified in the distance education delivery method as well as the discipline?

I have knowledge in the content of this course as evident through background as a Certified Athletic Trainer as well as my experience in teaching this course in the traditional classroom setting every semester over the last nine years. In regards to distance education qualifications, I have experience teaching distance education courses at Frostburg State University as well as at IUP. Furthermore, I currently use D2L for my face-to-face courses as a supplemental resource for students to gain access to course documents, supplemental readings, assignment submissions, and lecture materials.

2. How will each objective in the course be met using distance education technologies?

**Objective 1: The student will be able to describe organizational and administrative considerations related to the field of athletic training/sports medicine.**

The students will receive the materials to address this objective through assigned text readings (Chapter #1 Fitness Professionals, Coaches, and the Sports Medicine Team: Defining Roles; and Chapter #3 Legal Liability and Insurance) and through power point lectures which will be posted under the appropriate chapter modules. The students will practice their ability to identify and define the members and roles of the athletic healthcare team by participating in online forum discussions requiring them to synthesize personal experiences with chapter readings. This objective will be evaluated and the students will receive feedback by completing exam#1 through the online learning management system.

**Objective 2: The student will be able to demonstrate those factors related to injury prevention, including but not limited to training and conditioning techniques and nutritional considerations.**

The students will receive the materials to address this objective through assigned text readings (Chapter #4 Preventing Injuries Through Fitness Training; Chapter #5 Sports Nutrition and Supplements and Chapter #12 Helping the Injured Athlete Psychologically) and through power point lectures which will be posted under the appropriate chapter modules. The students will practice their ability to apply common injury prevention techniques by participating in online forum discussions requiring them to synthesize personal experiences with chapter readings as well as complete nutrition and anxiety self-assessments. This objective will be evaluated and the students will receive feedback by completing exam#1 through the online learning management system.

**Objective 3: The student will be able to explain common mechanisms and characteristics of sports trauma as well as the body's physiological response to injury.**

The students will receive the materials to address this objective through assigned text readings (Chapter #13 Recognizing Different Sports Injuries) and through power point lectures which will be posted under the appropriate chapter modules. The students will practice their ability to identify the

stages of inflammation and healing as well as common interventions by participating in online forum discussions requiring them to synthesize personal experiences with chapter readings . This objective will be evaluated and the students will receive feedback by completing exam#2 through the online learning management system.

**Objective 4: The student will be able to identify the common signs and symptoms of common sports related trauma and illness.**

The students will receive the materials to address this objective through assigned text readings (Chapter #14 The Foot and Toes; Chapter #15 The Ankle and Lower Leg; Chapter #16 The Knee and Related Structures; Chapter #17 the Thigh, Hip, Groin, and Pelvis; Chapter # 18 The Shoulder Complex; Chapter # 19 The Elbow, Forearm, Wrist, and Hand; Chapter # 20 The Spine; Chapter #21 The Thorax and Abdomen and Chapter # 22 The Head, Face, Eyes, Ears, Nose and Throat) and through power point lectures which will be posted under the appropriate chapter modules. The students will demonstrate their ability to identify risk factors for common injuries by participating in online forum discussions requiring them to synthesize personal experiences with chapter readings and viewing online videos of injury mechanisms. This objective will be evaluated and the students will receive feedback by completing exam#3 through the online learning management system.

**Objective 5: The student will be able to describe management techniques for acute care of common sports related trauma and illness.**

The students will receive the materials to address this objective through assigned text readings (Chapter #14 The Foot and Toes; Chapter #15 The Ankle and Lower Leg; Chapter #16 The Knee and Related Structures; Chapter #17 the Thigh, Hip, Groin, and Pelvis; Chapter # 18 The Shoulder Complex; Chapter # 19 The Elbow, Forearm, Wrist, and Hand; Chapter # 20 The Spine; Chapter #21 The Thorax and Abdomen and Chapter # 22 The Head, Face, Eyes, Ears, Nose and Throat) and through power point lectures which will be posted under the appropriate chapter modules. The students will demonstrate their ability to identify management techniques for common injuries by participating in online forum discussions requiring them to synthesize personal experiences with chapter readings. This objective will be evaluated and the students will receive feedback by completing exam#3 through the online learning management system.

**Objective 6: The student will be able to explain those factors related to general medical conditions associated with sports related activity.**

The students will receive the materials to address this objective through assigned text readings (Chapter #7 Understanding Potential the Potential Dangers of Adverse Environmental Conditions and Chapter#23 General Medical Conditions and Additional Health Concerns) and through power point lectures which will be posted under the appropriate chapter modules. The students will demonstrate their ability to identify risk factors associated with environmental conditions and chronic illness by participating in online forum discussions requiring them to synthesize personal experiences with chapter readings as well as viewing online video tutorials designed by sports safety organizations. This objective will be evaluated and the students will receive feedback by completing exam#2 through the online learning management system.

3. How will instructor-student and student-student, if applicable, interaction take place?

The instructor-student and student-student interaction will occur primarily via email, news postings and discussion board threads. Students will be asked to post responses on the discussion board and demonstrate the ability to synthesize course material within their responses to the instructor as well as with peers. Students will be required to respond to peers on a regular basis. Proper “netiquette” will be required in discussion board posts.

4. How will student achievement be evaluated?

**Specific Evaluation**

Exam #1	20 %
Exam #2	20 %
Exam #3	20 %
Quizzes	15 %
Article/Video Summaries	15 %
Discussion Posts	10 %

Grading Scale: A:  $\geq 90\%$       B: 80-89%      C: 70-79%      D: 60-69%      F:  $< 60\%$

**Description of Assessments**

**Examinations:** A total of three examinations will be given during the course of the semester. Each exam will generally consist of multiple choice, true/false, and matching items. Exam material will come from assigned textbook readings, handouts, notes, and power point lectures.

**Quizzes:**

**Internet Assignments:** Students will be given various online tasks that require them to access tutorials, assessment tools, videos and journal articles from reputable websites and professional organizations in the sports medicine community. Activities will consist of, but will not be limited to, reflecting on video presentations, completing an online nutritional analysis and sports safety online tutorials designed for coaches and parents. Assignments will be assessed via discussion posts, online quizzes and/or dropbox submissions.

**Discussion Posts:** There will be a minimum of three graded discussion posts per exam unit. These posts will require students to integrate course readings into questions answers around a particular topic. Additional discussion posts may be added throughout the semester if the instructor deems it necessary and beneficial to the students.

5. How will academic honesty for tests and assignments be addressed?

This course will implement several procedures to encourage academic honesty for tests and assignments. For instance, the examinations will be designed with the use of LMS-based measures, such as timed testing, secure test windows, and time-tracking features. Furthermore, the exams will include random question assignment from a pool of possible items. This ensures that every student has a different exam. Assignments that are assessed via a quiz will follow similar protocols as exams. Completion of online sports safety modules will require the submission of a personally identifiable certificate of completion.

**Indiana University of Pennsylvania  
Distance Education Syllabus**

**Course Title**

HPED 175 – Prevention and Care of Injuries to the Physically Active  
Section 001  
3 credit hours

**Course Times**

To be determined

**Course Location**

To be determined

**Course Instructor**

Jim Racchini, EdD, LAT, ATC, CSCS  
Office Location: 231 Zink Hall  
Office Phone: 724-357-2759  
Email: d.wachob@iup.edu  
Office Hours:

**Textbooks**

Prentice, W.E. (2013). *Essentials of Athletic Injury Management (9<sup>th</sup> ed.)*. New York, NY: McGraw Hill.

**Additional Materials**

In addition to the required textbook reading, students will also have assigned readings in journal articles, position statements and websites. Additionally, a summary of chapter material will be presented in a PowerPoint format. Lastly, students will be required to view streaming video presentations.

**Course Description**

General information is presented related to the prevention, recognition, and care of both acute and chronic injuries common to participants of physical activity/fitness, and athletics. Specific topics to be addressed include prevention techniques, the classification and staging of injury conditions, and basic evaluation techniques, as well as emergency management and follow-up care procedures.

**Course Objectives**

Upon completion of this course, the students will be able to:

1. describe organizational and administrative considerations related to the field of athletic training/sportsmedicine.
2. demonstrate those factors related to injury prevention, including but not limited to training and conditioning techniques and nutritional considerations
3. explain common mechanisms and characteristics of sports trauma as well as the body's physiological response to injury.
4. identify the common signs and symptoms of common sports related trauma and illness.
5. describe management techniques for acute care of common sports related trauma and illness.

6. explain those factors related to general medical conditions associated with sports related activity.

### **Specific Evaluation**

Exam #1	20 %
Exam #2	20 %
Exam #3	20 %
Quizzes	15 %
Article/Video Summaries	15 %
Discussion Posts	10 %

Grading Scale: A:  $\geq 90\%$       B: 80-89%      C: 70-79%      D: 60-69%      F:  $< 60\%$

### **Description of Assessments**

**Examinations:** A total of three examinations will be given during the course of the semester. Each exam will generally consist of multiple choice, true/false, and matching types of questions. Exam material will come from assigned textbook readings, handouts, notes, and power point lectures. Exams will have a specified time limit.

#### **Quizzes:**

**Journal Article and Video Summaries:** Students will be various online tasks that require them to access tutorials, assessment tools, videos and journal articles from reputable websites and professional organizations in the sportsmedicine community. Activities will consist of, but will not be limited to, reflecting on video presentations, completing an online nutritional analysis and sports safety online tutorials designed for coaches and parents. Assignments will be assessed via discussion posts, online quizzes and/or dropbox submissions.

**Discussion Posts:** There will be a minimum of three graded discussion posts per exam unit. These posts will require students to integrate course readings into questions answers around a particular topic. Additional discussion posts may be added throughout the semester if the instructor deems it necessary and beneficial to the students.

### **Class Policies**

**Assignments Due Dates:** All assignments are due by the 11:59pm on the specified date. All assignments turned in past the due date will be deducted 5% for each day late.

**Missed Examination Policy:** Students have a scheduled amount of time to complete the exams. A missed examination may only be made up if prior arrangements are made before the scheduled test.

**Examinations will not be permitted to be made up after the scheduled exam date.**

*Note: A test or quiz can only be opened once and each has a specified amount of time allotted for you to take it. Do not open a test or quiz until you have the time to finish it.*

**Academic Honesty Policy:** Shall be in accordance with the Indiana University of Pennsylvania Honesty Policy (<http://www.iup.edu/registrar/catalog/acapolicy>).

**Provisions for Students with Special Needs:** Students requiring accommodations for special needs should inform the instructor immediately. For disability support services available to eligible IUP students, please see <http://www.iup.edu/advising/testing/dss.html>.

### **Tentative Course Outline**

#### **I. Emergency Management & Injury Prevention**

- Module #1 Athletic Healthcare Team (Ch1)
- Module #2 Legal Liability (Ch3)
- Module #3 Emergency Action Plans (Ch8)
- Module #4 Wound Care (Ch9)
- Module #5 Sports Nutrition (Ch5)
- Module #6 Concepts of Conditioning (Ch4)
- Module #7 Psychological Aspects of Injury and Performance (Ch12)
- Module #8 Exam 1

#### **II. General Medical Conditions and Basic Pathophysiology**

- Module #9 Environmental Conditions (Ch7)
- Module #10 Acute and Chronic Diseases (Ch23)
- Module #11 Skin Infections (Ch23)
- Module #12 Basics of Injury Rehab (Ch11)
- Module #13 Sports Injury Terminology (Ch13)
- Module #14 Exam 2

#### **III. Recognition and Care of Common Injuries**

- Module #15 Lower Extremity Injuries (Ch14-17)
- Module #16 Injuries to the Spine (Ch20)
- Module #17 Thoracic and Abdominal Injuries (Ch21)
- Module #18 Head and Face injuries (Ch 22)
- Module #19 Upper Extremity Injuries (Ch18-19)
- Module #20 Exam 3

### **Bibliography**

- Anderson, M.K., Parr, G.P. & Hall, S.J. (2009). *Foundations of Athletic Training: Prevention, Assessment, and Management (4<sup>th</sup> ed.)*. Baltimore, MD: Lippincott Williams & Wilkins.
- Anderson, M.K. & Parr, G.P. (2011). *Fundamentals of Sports Injury Management (3<sup>rd</sup> ed.)*. Baltimore, MD: Lippincott Williams & Wilkins.
- Diaz, G.D. (2014). *Survey of Athletic Injuries for Exercise Science*. Burlington, MA; Jones & Bartlett.
- Flegel, M.J. (2014). *Sports First Aid (5<sup>th</sup> ed.)*. Champaign, IL: Human Kinetics.
- Pfeiffer, R.P. & Mangus, B.C. (2012). *Concepts of Athletic Training (6<sup>th</sup> ed.)*. Burlington, MA; Jones & Bartlett.

## Sample Lesson One

**Lesson Sample:** Module 9

**Materials:**

Chapter 7 Understanding the Potential Dangers of Adverse Environmental Conditions

NATA Position Statement: Exertional Heat Illness

**Assignments**

Text reading of Chapter 7

Take Chapter 7 Quiz

Read NATA Position Statement: Exertional Heat Illness

Discussion Board Post

**Objective 6: The student will be able explain those factors related to general medical conditions associated with sports related activity.**



## Chapter 7 Understanding the Potential Dangers of Adverse Environmental Conditions

### Environmental Issues

1  
2  
3  
4  
5  
6  
7  
8

The **Weight Change Chart** allows you to estimate your level of hydration. A decrease of 2% body weight is a sign of dehydration. To use this chart, weigh the athlete before and after a session to a scale on the chart. If the weight difference is greater than 2% of the athlete's body weight, the athlete is dehydrated and should consume fluids. See Chapter 7 for details.

This chart is used to determine if an athlete is dehydrated. Normal weight change is less than 2% of the athlete's body weight.

### Dehydration

Minimal dehydration (less than 2% body weight loss) generally does not affect health or performance.

- Signs and symptoms include:
- Dry mouth.
  - Thirst.
  - Irritability or crankiness.
  - Headache.
  - Dizziness.
  - Excessive fatigue.
  - Reduced physical performance.

### Prevention of Exertional Heat Illnesses

Heat-related illness causing death is totally preventable.

- Utilize a weight chart to determine if an athlete is consuming enough fluids.
  - For every pound of weight lost, the athlete should consume 20-24 oz. of fluid.
- The athlete should consume:
  - 17 to 20 oz. of fluids 2 to 3 hours before activity.
  - 7 to 10 oz. 10 to 20 minutes before activity.
  - 7 to 10 oz. of fluids every 10 to 20 min. during the activity.

### Thermal Injuries

- Temperature-related health emergencies sometimes result in death.
  - The majority, if not all, could be prevented.
  - Normal core body temperature ranges from between 98.0°F to 98.6°F (oral).
  - Exercise increases metabolic rate and can elevate body temperature to 104°F.
  - Excess heat **MUST** be eliminated.

### Thermoregulation

Excess body heat is lost through:

- Radiation.
- Conduction.
- Convection.
- Evaporation.
  - Evaporation is most efficient during exercise on dry land.
  - Evaporation can be reduced when humidity is high.
  - Coaches should reduce exercise demands during periods of high humidity and temperature.

### Thermoregulation (continued)

Acclimatization is a process in which the body adjusts to continuous and significant climate change.

- The process can take 1 to 6 weeks.

In hot conditions, athletes need 4 to 10 L of fluids daily to avoid dehydration.

- Athletes can lose 2% to 6% of their body weight during exercise.
- Fluid needs increase as the rate of sweating increases.

### Heat Cramps

Heat cramps generally develop in the muscles being exercised.

- Physiology unclear
- Probably related to water and mineral loss that result from sweating.

Signs and symptoms include:

- Severe muscle cramps in arms or legs.
- Muscle cramps in the abdominal muscles.
- Profuse sweating.

### Heat Exhaustion

- Although heat exhaustion is not a life-threatening condition, it can be a precursor to heatstroke, a true medical emergency.
- Generalized fatigue during exercise when excessive body fluid losses occur.
- Monitor athletes for signs and symptoms of heat exhaustion when they must practice in extreme heat and humidity.

### Dehydration (continued)

#### Management

- Remove athlete from participation and move him or her to cool location.
- Rehydrate with water or sports drink, preferably that is 50°F to 59°F.
- If dehydration is minor (less than 2% body weight lost) and symptoms are relieved, athlete can return to participation.
- If symptoms persist, seek medical attention.

### Heat Cramps (continued)

#### Management

- Athlete should immediately cease exercising.
- Give athlete fluids to consume, either water or commercially prepared sports drinks.
- Have athlete perform static stretching of involved muscles.

### Heat Exhaustion (continued)

The signs and symptoms of heat exhaustion include:

- Moist, clammy skin.
- Profuse sweating.
- General muscle fatigue and/or cramps.
- Nausea or related GI distress.
- Dizziness, and occasionally, loss of consciousness.
- Severe thirst.
- Headache.
- Increased respiratory rate and rapid pulse.
- Body temperature that ranges from 97°F to 100°F.

## Heat Exhaustion (continued)

### Management

- Athlete should immediately cease exercising.
- If athlete is not nauseous, give fluids immediately, preferably cool water or sports drink.
- Move athlete to cool location and place into a supine position with legs elevated 8 to 12 inches.
- Loosen athlete's clothing and cool with wet towels or ice packs.
- If athlete is not fully recovered within 30 minutes, seek medical attention.
- Do NOT allow athlete to return to participation for the remainder of the day.



## Heat Stroke

- Heat stroke occurs when the body is unable to cool itself and a radical elevation of body temperature occurs, sometimes exceeding 106°F.
  - o Classic heatstroke occurs in obese, the chronically ill or elderly, or diabetics.
  - o Exertional heatstroke occurs in athletes exercising in warm, humid conditions.
    - o Usually related to excess body fluid losses combined with inadequate evaporative cooling.

## Heat Stroke (continued)

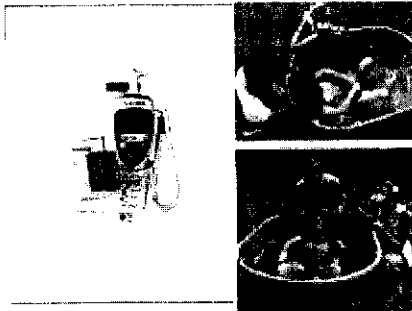
### Signs and symptoms include:

- Breathing may or may not be present.
- Hot, dry skin or clammy skin.
- Mental confusion and possible loss of consciousness.
- GI distress, including nausea and vomiting.
- Severe motor disturbances and loss of coordination.
- Rapid and strong pulse.
- Rectal temperature higher than 104°F.

## Heat Stroke (continued)

### Management

- Heat stroke is a true medical emergency. Death can result if not treated correctly and promptly.
- If EMS personnel, athletic trainer, or physician is present, cool the athlete using cold-water immersion.
- If the above personnel are not on site, summon EMS.
- If cold-water immersion is not possible, move athlete to a cool, humidity-controlled location.

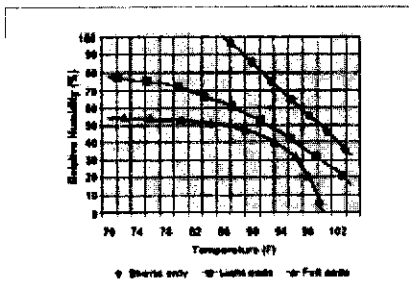
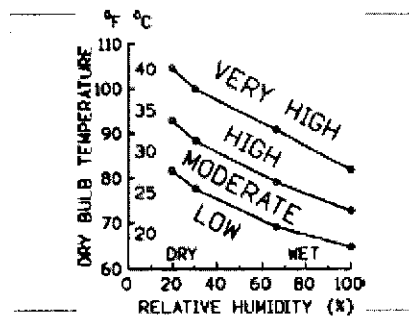
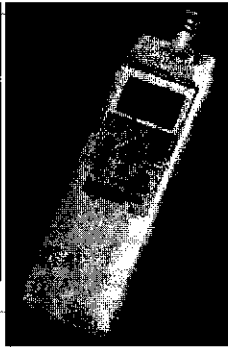


## Heat Stroke (continued)

- o Wrap athlete in wet towels or sheets, and place cold packs on neck, head, groin, or under armpits.
- o Treat for shock and monitor body temperature. Do not allow temperature to drop below 102°F.
- o Keep athlete in semi-seated position.



The wet bulb globe temperature (WBGT) is used to measure the possible evaporation in natural ventilation conditions.



Dry Bulb & Humidity	Flag Color	Level of Risk	Comments
80 to 90 70%	Green	Low	Risk low but still exists on the basis of risk factors
90 to 90 > 70% 90 to 100 < 70%	Yellow	Moderate	Risk level increases as event progresses through the day. Regular rest breaks, clothing modification
90 to 100 > 70%	Red	High	Everyone should be aware of injury potential. Individuals at risk should not compete. Shorten practice
Wet Bulb over 82	Black	Extreme or Hazardous	Consider rescheduling or delaying the event until safer conditions prevail. If the event must take place, be on high alert, cancel event

### Physiologic Responses After Heat Acclimatization Relative to Nonacclimatized

State	Physiologic Variable	After Acclimatization (10-14 Days Exposure)
	Heart rate	Decreases
	Stroke volume	Increases
	Body-core temperature	Decreases
	Skin temperature	Decreases
	Sweat output/rate	Increases
	Onset of sweat	Earlier in training
	Evaporation of sweat	Increases

Table 4. (continued)

Salt in sweat	Decreases
Work output	Increases
Subjective discomfort rating of perceived exertion (RPE)	Decreases
Fatigue	Decreases
Capacity for work	Increases
Mental disturbance	Decreases
Sympathetic response	Decreases
Extracellular fluid volume	Increases
Plasma volume	Increases

### **Discussion Board Post**

After reading Chapter 7 and the NATA Position Statement as well as reviewing the power point under Module 9, you will complete a two part discussion on the content under the Module 9 discussion board titled “Environmental Illness.”

#### **Part 1**

Think about your future profession and how heat illness issues may impact how you perform your job:

1. What are the factors in your job setting (coaching, teaching, fitness, etc) that may contribute to the risk of heat illness?
2. What steps could you take to prevent heat illness in your job setting?
3. What preparations should you make in case heat illness does occur in your job setting?

#### **Part 2**

After reading other students’ posts on their different scenarios, reply to at least two other students in regards to their responses to the three questions from part 1 above. Some ideas that may help you build substance when you reply include;

1. What about their chosen scenario is interesting to you?
2. Can you relate to the scenario that they gave in regards to being an issue in their chosen field? If so how?
3. What do you think about their prevention and treatment methods? Is anything missing? How could their prevention/treatment methods be improved?

#### **Criteria:**

Your initial post must address the 3 points listed under Part 1 of this assignment in order to receive the full amount of points. (2.5 points)

Your reply to two other students must address at least one of the three suggested responses listed under Part 2. (2.5 points)

## Sample Lesson #2

**Lesson Sample:** Module 18

### **Materials:**

Chapter 22 The Head, Face, Eyes, Ears, Nose and Throat  
ConcussionWise for Coaches online education module  
(<http://www.concussionwise.com/pennsylvania>)

You Tube Video – Second Impact Syndrome  
(<https://www.youtube.com/watch?v=f0xJT53SZqQ>)

### **Assignments**

Text reading of Chapter 22

Take Chapter 22 Quiz

View the ConcussionWise online education module and upload completion certificate to  
Dropbox

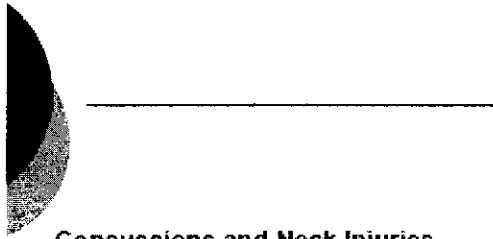
Watch You Tube video

Discussion Board Post

**Objective 4: The student will be identify the common signs and symptoms of common sports related trauma and illness.**

**Objective 5: The student will be able describe management techniques for acute care of common sports related trauma and illness.**

## Chapter 22 The Head, Face, Eyes, Ears, Nose and Throat



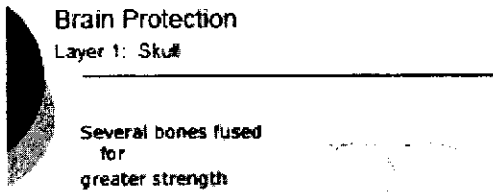
### Concussions and Neck Injuries



### Brain Protection

Three levels of protection

1. Bony
2. Membranous
3. Fluid



### Brain Protection

Layer 1: Skull

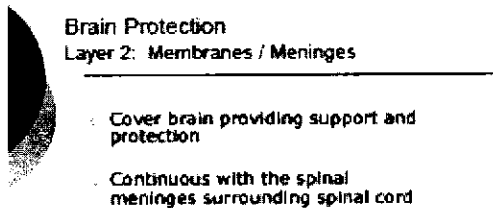
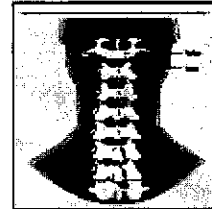
Several bones fused for greater strength



### Anatomy Review (continued)

The Neck (cervical spine)

- The 7 cervical vertebrae provide support for the head and protection for the spinal cord.



### Brain Protection

Layer 2: Membranes / Meninges

- Cover brain providing support and protection
- Continuous with the spinal meninges surrounding spinal cord



### Brain Protection

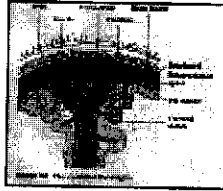
Layer 2: Membranes / Meninges

- Dura Mater - "hard mother"
  - Tough outer layer
  - Highly vascularized
- Arachnoid Mater - "spider" or "spider-like"
  - Middle, thinner layer
  - Avascular
- Pia Mater - "tender mother"
  - Thin, delicate, and highly vascularized.



## Brain Protection Layer 3: CSF

- **Subarachnoid space**
  - Between the layers of the arachnoid and pia mater
  - Cerebrospinal fluid (CSF) circulates there
  - Surrounds the brain and fills the four ventricles (small cavities) within the brain
  - Shock absorption



## Head Injuries in Sports

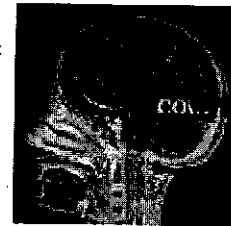
- Even minor head trauma can result in serious injury.
  - Brain tissue is **unable to repair itself**; any tissue loss results in some level of permanent disability.
  - Severe injuries can result in death.
  - Learn to recognize head injuries and render first aid when necessary.

## Mechanisms of Head Injury

- **Direct injury** to the head involves a blow to the head that causes injury at impact site.
  - Contrecoup injury
  - Coup injury
- **Indirect injury** to the head results from damaging forces traveling to the head from other parts of the body.
- Treat every head injury as if there is a neck injury and vice versa.

## Mechanisms of Head Injuries

- **Coup Injury**
  - Stationary skull is hit with an object moving at a high velocity
  - Trauma on the side of the head struck



## Mechanisms of Head Injuries

- **Contrecoup**
  - Skull moving at high velocity and suddenly stops
    - Does not have to be a blow to head
  - Fluid in skull fails to stop brain's momentum
  - Brain strikes skull on opposite side of blow



## Concussions

- Concussion is "a clinical syndrome characterized by immediate and transient impairment of neurologic function secondary to mechanical forces."
- **FUNCTIONAL** disorder
  - Symptoms
    - unconsciousness
    - disorientation
    - headache
    - amnesia
    - dizziness
    - disequilibrium



Point of Emphasis for 2006-07  
Proper Procedures for  
Handling Apparent Concussions

**Action Plan**

If the coach suspects that a player has a concussion, he or she should take the following steps:

1. Remove athlete from play.
2. Ensure athlete is evaluated by an appropriate health care professional. Do not try to judge the seriousness of the injury yourself.
3. Inform athlete's parents or guardians about the known or possible concussion and give them the fact sheet on concussion.
4. Allow the athlete to return to play only with permission from physician (MD or DO).

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Point of Emphasis for 2006-07  
Proper Procedures for  
Handling Apparent Concussions

**Signs and Symptoms**

These signs and symptoms may indicate that a concussion has occurred.

**Signs Observed by Coaching Staff**

- Appears dazed or stunned
- Is confused about assignment
- Forgets plays
- Is unsure of game, score or opponent
- Moves clumsily
- Answers questions slowly
- Loss of consciousness
- Shows irritability or personality change
- Can't recall events prior to hit
- Can't recall events after hit

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**Memory**

- o **Retrograde amnesia**  
Cannot remember events before the onset of injury
- o **Anterograde (posttraumatic) amnesia**  
Cannot remember events after the onset of injury

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**Questions to Ask**

- o **Retrograde Amnesia**
  - What happened?
  - What play were you running?
  - Where are you?
  - Who am I?
  - Who are you playing?
  - What quarter is it?
  - What did you eat today?
  - Who did you play last game?
- o **Anterograde Amnesia**
  - Give a list of words to memorize
  - Ask to immediately recall
  - Ask again every five minutes

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Point of Emphasis for 2006-07  
Proper Procedures for  
Handling Apparent Concussions

**Signs and Symptoms**

These signs and symptoms may indicate that a concussion has occurred.

**Symptoms Reported by Athlete**

- Nausea
- Headache
- Balance problems or dizziness
- Double vision or blurry vision
- Sensitivity to light or noise
- Feeling sluggish
- Feeling foggy or groggy
- Concentration or memory problems
- Confusion

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**Quick Neurological Tests**

**Finger-to-Nose Test**



**Romberg's Test**



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2010-11  
Concussion Procedure Revised  
(2-8-5; 3-3-8)

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- o Concussion language revised in all NFHS rules books.
- o Removed references to "unconscious or apparently unconscious."
- o New procedure requires an athlete *exhibiting signs, symptoms or behaviors consistent with a concussion* be removed from the contest.

Senate Bill 200  
Safety in Youth Sports Act  
Took effect JULY 1, 2012

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1. A student participating in or desiring to participate in an athletic activity and the student's parent or guardian shall each school year, prior to participation by the student in an athletic activity, sign and return to the student's school an acknowledgment of receipt and review of a concussion and traumatic brain injury information sheet

”

Senate Bill 200  
Safety in Youth Sports Act.

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2. A school entity may hold an informational meeting prior to the start of each athletic season for all ages of competitors regarding concussions and other head injuries, the importance of proper concussion management and how preseason baseline assessments can aid in the evaluation, management and recovery process

”

Senate Bill 200  
Safety in Youth Sports Act.

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3. A student who, as determined by a game official, coach from the student's team, certified athletic trainer, licensed physician, licensed physical therapist or other official designated by the student's school entity, exhibits signs or symptoms of a concussion or traumatic brain injury while participating in an athletic activity shall be removed by the coach from participation at that time

”

Senate Bill 200  
Safety in Youth Sports Act.

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4. The coach shall not return a student to participation until the student is evaluated and cleared for return to participation in writing by an appropriate medical professional

”

Senate Bill 200  
Safety in Youth Sports Act.

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5. Once each school year, a coach shall complete the concussion management certification training course offered by the Centers for Disease Control and Prevention, the National Federation of State High School Associations or another provider approved by the Department of Health. A coach shall not coach an athletic activity until the coach completes the training course required under this subsection.

”

Senate Bill 200  
Safety in Youth Sports Act.

Penalties for violating #4 and/or 5:

- **First violation: suspension from coaching any athletic activity for the remainder of the season.**
- **Second violation: suspension from coaching any athletic activity for the remainder of the season and for the next season.**
- **Third violation: permanent suspension from coaching any athletic activity.**

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Head Injuries in Sports  
(continued)

Cantu classification

- Grade 1 involves no amnesia but are difficult to identify.
- Grade 2 involves loss of consciousness for less than 1 minute and/or PTA lasting longer than 30 minutes.
- Grade 3 involves loss of consciousness for more than a minute and PTA lasting more than 24 hours.

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Head Injuries in Sports  
(continued)

Cantu classification

- Grade 1 involves no amnesia but are difficult to identify.
- Grade 2 involves loss of consciousness for less than 1 minute and/or PTA lasting longer than 30 minutes.
- Grade 3 involves loss of consciousness for more than a minute and PTA lasting more than 24 hours.

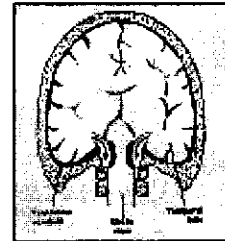
27

Second Impact Syndrome (SIS)

Results when an athlete with a head injury receives another head injury before the symptoms of the first injury have resolved.

- Involves rapid and catastrophic brain swelling.
- SIS can result in death.

Any athlete sustaining a head injury, no matter how minor, should be monitored by a physician before being cleared to return to participation.

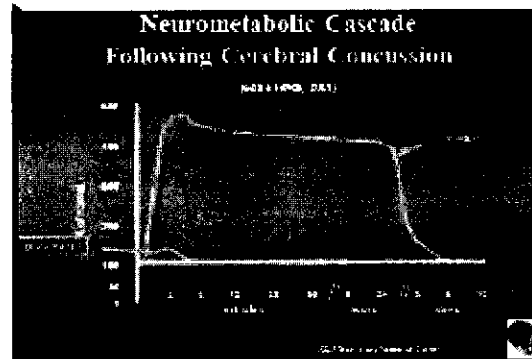


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Long Term Concerns

- Post Concussion Syndrome
- Chronic Traumatic Encephalopathy (CTE)
  - can cause depression and suicide in older athletes

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## Subdural Hematoma

- Venous bleeding between brain and dura mater
  - Causes majority of deaths in athletic head injuries
- Symptoms occur hours, days or weeks after injury
  - Slow venous bleeding and blood collects in fissures
- Often no s/s after injury
  - occur later
- Importance of home instructions

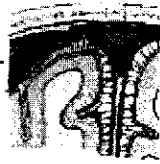


Figure 20-10

## Cervical Spine Injuries

### Neck Injuries

- Majority occur in football, rugby, ice hockey, soccer, diving, and gymnastics. Cervical injuries, however, can occur in almost any sport.
- Catastrophic injuries are rare--less than 2 in 100,000 of all neck injuries reported in the United States.

## Mechanism of Cervical Spine Injuries



- Auto load produces most cervical spine injuries.
- 1975 NCAA enacted the rule banning "spearing."
- Any forced movement of cervical spine can result in injury.
- Coaching personnel must take great care when conducting an examination of an athlete suspected of having a neck injury.

## Management

## Initial Survey



Stabilizing the athlete's head and neck

- Always assume a neck injury has also occurred.
- Check vitals first.
- Note body and limb positions, as well as helmet, face mask, and mouth guard positions.
- If unconscious, attempt to arouse and note approx. time of injury.
- Immobilize head and neck immediately; do not remove athlete's helmet.

## Physical Exam (continued)

### If head injury is suspected:

- Don't remove helmet.
- Don't move.
- Don't arouse someone with ammonia capsules.

## Removal of Athlete's Helmet

- Management of the helmeted player is a major issue.
- In cases involving neck injury, a football helmet provides cervical immobilization.
- If necessary, removal of the helmet must be performed.



- Cut the straps with a sharp knife or utility knife.
- Do not pull the helmet off the player's head.
- Removal of a player's helmet should be done by a qualified person.



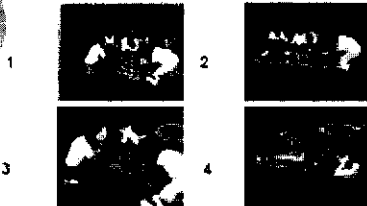
## Initial Treatment of Neck Injury (continued)

- If EMS arrival is delayed, place the injured athlete on a properly constructed spine board.

- This requires the coordinated effort of at least 5 people.



## Spine Boarding an Athlete



## **Discussion Board Post**

After reading Chapter 22, viewing the ConcussionWise and YouTube videos as well as reviewing the power point under Module 18, you will complete a two part discussion on the content under the Module 18 discussion board titled “Concussion and Head Trauma.”

### **Part 1**

Think about your future profession and discuss a scenario in which the risk of concussion may be high for one of your students/athletes/clients/patients.

1. What do you feel that your specific role will be in your future job in regards to concussion management?
2. Based on what you have learned in the various module materials, who will you need to educate regarding concussion risks and what would the most important items for you to share?

### **Part 2**

After reading other students' posts, reply to at least two other students in regards to their responses to the two questions from part 1 above. Some ideas that may help you build substance when you reply include;

1. What about their chosen job setting/scenario is interesting to you?
2. What do you think about their targeted population in regards to concussion education? Is anything missing? How could their educational methods be improved?

### **Criteria:**

Your initial post must address the 2 points listed under Part 1 of this assignment in order to receive the full amount of points. (2.5 points)

Your reply to two other students must address at least one of the two suggested responses listed under Part 2. (2.5 points)