CentraCare PHYSICIANS ORTHOPEDICS

Concussion Management Guidelines
CentraCare M Physicians Orthopedics
Concussion Clinic

The following guidelines have been developed to aid the CentraCare M Physicians staff in the evaluation and management of a high school or collegiate student-athlete who has sustained a concussion. These guidelines are derived from current evidence-based practice and are recommended as a minimum standard of care, allowing the Sports Medicine staff to manage concussions individually as the situation warrants, and currently the guidelines at Vanderbilt University Medical Center. The progression of a student-athlete with a diagnosed concussion will include cognitive and physical exertion in a stepwise process to ensure a safe return to full participation in academics and athletics.

Concussion Management Healthcare Providers

- The following healthcare professionals will be utilized in the management of concussion: Team Physician, Certified Athletic Trainer, Physical Therapist
  *other healthcare providers may be consulted on a case by case basis at the discretion of the Team Physician

Baseline Testing and Procedures

Concussion Baseline [recommended BIENNIALLY, but at the discretion of the high school or college]

- Concussion Yearly Baseline Report Form [Appendix A]
- Modified Balance Error Scoring System (M-BESS) (Riemann & Guskiewicz 2000) [Appendix B]
- ImPACT® Baseline Neurocognitive Testing
- *A new baseline will be obtained every two years. If a concussion is sustained during season; a new baseline will be obtained prior to the next playing season, traditional or non-traditional.

Concussion Education *[recommended ANNUALLY, but at the discretion of the high school or college]*

- NCAA Educational Material for Student-Athletes [Appendix C]
- Concussion Acknowledgement and Signature Form: Student-Athlete [Appendix D]
- NCAA Educational Material for Coaches/Support Staff [Appendix E]
- Concussion Acknowledgement and Signature Form: Coaches/Support Staff [Appendix F]
- Concussion Acknowledgement and Signature Form: Medical Provider [Appendix G]

Time of Injury

- Concussion Injury Report Form [Appendix H]

Recommendations

- If the student-athlete is diagnosed with a concussion they will be withheld from competition or practice and not return to activity for the remainder of that day (NCAA and MSHSL Policy).
- If the student-athlete is asymptomatic under normal conditions and following functional exertion testing the following day, they should be re-evaluated for return to participation.
- If the student-athlete is still symptomatic under normal conditions and/or following functional exertion testing, they should not return to participation until cleared through the subsequent outlined procedures.
- Cognitive and physical rest are essential components of the recovery process. Academic accommodations may be necessary as part of the treatment plan.

Post-Concussion Follow-Up [within 24 hours post-injury]

- Medical assessment with Team Physician or the physician's designee (Certified Athletic Trainer)
- New Patient Concussion Assessment [Appendix I]
- Post-Concussion Symptom Scale (PCSS) [Appendix J]

- Sideline Concussion Assessment Test (SCAT-5) (completed by physician or ATC)
- Determination of the student-athlete's ability to attend class is contingent on symptom evaluation during the post-acute phase. Notify academic advisor if accommodations are warranted.
- Completion of Return to Learn and Return to Play Form [Appendix K]

Post-Concussion ImPACT® Test Guidelines

- The decision of which phase to ImPACT® test a student-athlete will be at the discretion of the Team Physician on a case by case basis to evaluate neurocognitive function.
- Student-athletes must have completed an ImPACT® test that is reviewed by the Team Physician before being released to Phase 5 full practice participation with contact.
- Generally, ImPACT® testing would be completed after post-concussion symptom score is back to baseline and the student-athlete has completed Phase 0.

Phase 0 - Cognitive Exertion

- The student-athlete will follow a supervised return-to-learn process to allow proper cognitive recovery and integration back into their full academic work load. This process will include a team-based approach involving the Team Physician, Athletic Trainer, and academic representatives.
    - Student-athletes who demonstrate a trending decrease in symptomology may be returned to class on an individual basis.
    - Student-athletes that have an increase in symptoms upon returning to class may require adjustments as needed based on symptom exacerbation.
    - For those student-athletes who experience continued symptoms and or prolonged academic difficulties, academic accommodations will be made available on an individual basis. [Appendix K]
- Stepwise return to sport progression can occur simultaneously with return to learn.

Phase 1 - Aerobic Exertion

- Post-Concussion Symptom Scale (PCSS) [Appendix J]
- Functional exertion test
    - Bike 20 minutes at seventy percent (70%) of predicted maximum heart rate (PMHR)
    - Rest for 15 minutes
    - Monitor symptoms
    - May alternatively consider Incremental Treadmill Test for 20 minutes (Leddy et al 2010)
- Stepwise return to sport progression will proceed to Phase 2 if student-athlete is asymptomatic at the current level. If any post concussive symptoms occur, reassess the following day and repeat phase.

Phase 2 - Functional Testing Progression

- Monitor symptoms
- Initial Functional Exertion: duration approximately 10- 15 minutes with 5 minutes rest post session
    - Scissor step/quick step
    - Jogs
    - Lateral shuffle
    - Backpedal
    - Sprints

- Advanced Functional Exertion: duration approximately 10- 15 minutes with 5 minutes rest post session
    - Sit-ups
    - Burpees
    - Push-ups
    - Sprints
    - Sprints with intermittent push-ups
    - Four corners with 90 degree spin
- Stepwise return to sport progression will proceed to Phase 3 if student-athlete is asymptomatic at the current level. If any post concussive symptoms occur, reassess the following day and repeat phase.
- ** Student-athlete may begin limited weight lifting if asymptomatic depending on the sport requirements

Phase 3 - Sport Specific Exertion

- Monitor symptoms
- Initial Sport-Specific Exertion: duration approximately 10-15 minutes with 5 minutes rest post session
    - Moderate aerobic exercises specific to sport
    - Monitor symptoms
    - Progression depends on student-athlete remaining asymptomatic
- Intermediate Sport-Specific Exertion: duration approximately 10-15 minutes with 5 minutes rest post session
    - Progressively difficult aerobic exercises specific to sport
    - Monitor symptoms
    - Progression depends on student-athlete remaining asymptomatic
- Advanced: duration approximately 10-15 minutes with 5 minutes rest post session
    - Demanding aerobic exercises specific to sport
    - Monitor symptoms
    - Progression depends on student-athlete remaining asymptomatic
- Sport-Specific Exertion Guidelines

    Appendix L - Baseball
    Appendix M - Basketball
    Appendix N - Bowling
    Appendix O - Football OL/DL
    Appendix P - Football RB/TE/LB/WR/DB
    Appendix Q - Football QB/Special Teams
    Appendix R - Golf
    Appendix S - Lacrosse
    Appendix T - Soccer
    Appendix U - Softball
    Appendix V - Swimming
    Appendix W - Tennis
    Appendix X - Track & Cross Country
    Appendix Y - Volleyball
    Appendix Z - Wrestling
- Stepwise return to sport progression will proceed to Phase 4 if student-athlete is asymptomatic at the current level. If any post concussive symptoms occur, reassess the following day and repeat phase.

Phase 4 - Return to Limited Drills and Non-Contact Practice

- Monitor symptoms
- Non-contact training drills dependent upon sport

- Stepwise return to sport progression will proceed to Phase 5 if student-athlete is asymptomatic at the current level. If any post concussive symptoms occur, reassess the following day and repeat phase.
- Consult Team physician for full clearance

Phase 5 - Return to Full Practice Participation with Contact

- Post-Concussion Symptom Scale (PCSS) [Appendix E]
- Completion of Phase 5 without the recurrence of symptoms would result in release to full contact participation without restriction

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APPENDIX A

CentraCare PHYSICIANS ORTHOPEDICS

Yearly Baseline Report Form
CentraCare M Physicians Orthopedics
Concussion Clinic

Name: _____

Please list any other diagnosed concussions you have had:
Date _____ Did you lose consciousness? _____ Did you have memory loss? _____
Date _____ Did you lose consciousness? _____ Did you have memory loss? _____
Date _____ Did you lose consciousness? _____ Did you have memory loss? _____

What were your major symptoms with the previous diagnosed concussions and how long did they last?
Symptoms _____ How long? _____
Symptoms _____ How long? _____
Symptoms _____ How long? _____

Have you ever been diagnosed with or treated for:

_____ headaches	_____ ADHD	_____ learning disability	_____ migraines
_____ meningitis	_____ brain surgery	_____ alcohol / drug use	_____ seizures
_____ dyslexia	_____ autism	_____ anxiety / depression	

Have you ever:
Had speech therapy? _____ Taken special education classes? _____ Repeated a grade? _____

Has anyone in your family had:
Alzheimer's dementia? _____ Dementia? _____ Migraine headache? _____

Print Name of Patient / Legal Representative: _____

Signature of Patient / Legal Representative: _____ Date: _____ Time: _____

Relationship to Patient: _____

APPENDIX B

CentraCare PHYSICIANS ORTHOPEDICS

Concussion mBESS Testing
CentraCare M Physicians Orthopedics
Concussion Clinic

Name: _____

Modified Balance Error Scoring System (m-BESS)

Significantly higher postural instability in Mild Head Injury subjects revealed through the clinical test battery with 3 stances on firm surface elicited significant differences through day 3 post injury, and may be a useful clinical procedure to assist in return to play decisions (Bell et al 2011,Riemann & Guskiewicz 2000).

- **Athlete Position**
  - Shoes off
  - Roll pant legs above ankles
  - Feet narrowly together
  - Hands on the iliac crests
  - Eyes closed
- **Test Procedures / Patient Instructions**
  - Test begins when the patient closes his/her eyes
  - Patient is instructed to make any necessary adjustments in the event that they lost their balance and to return to the testing position as quickly as possible
- **Test #1- Double Leg Stance (feet together)**
- **Test #2- Single Leg Stance (non-dominant foot; free leg should be bent to 90 degrees)**
- **Test #3- Tandem Stance (non-dominant foot in the rear; weight evenly distributed)**
  - 20 seconds per test
  - Each test is performed on a firm surface
- **Balance Errors**
  - Hands lifted off of iliac crests
  - Opening eyes
  - Step, stumble, or fall
  - Moving hip into more than 30 degrees of flexion or abduction
  - Lifting forefoot or heel
  - Remaining out of testing position for more than five (5) seconds
- **BESS Scoring**
  - The number of balance errors (1 point per error) on each of the three (3) tests is added together for a total BESS Score.
  - If a subject commits multiple errors simultaneously, only one error is recorded.
  - Maximum number of errors for any single condition is ten (10).
  - If subject cannot maintain testing procedure for a minimum of five (5) seconds, they are assigned the highest possible score, ten (10), for the testing condition.

Balance Error Scoring System (BESS) *(To be completed by evaluator)*

Errors:	**Scorecard (#errors):**
1. Moving the hands off of the iliac crest 2. Opening eyes 3. Step, stumble, or fall 4. Abduction or flexion of the hip beyond 30 degrees 5. Lifting the forefoot or heel off of the testing surface 6. Remaining out of the proper testing position > 5 sec Each of the 20 second trials is scored by counting the errors accumulated by the subject. Maximum number of errors for any single condition = 10. (Guskiewicz)	Double Leg Stance (feet together): _____ Single Leg Stance (non-dominant foot): _____ Tandem Stance (non-dominant foot in back): _____ Which foot was tested: ☐ **Left** ☐ **Right** **TOTAL** _____

Evaluator: _____ Date: _____ Time: _____



What is a concussion?

A concussion is a type of traumatic brain injury. It follows a force to the head or body and leads to a change in brain function. It is not typically accompanied by loss of consciousness.

How can I keep myself safe?

1. Know the symptoms.

You may experience ...

- Headache or head pressure
- Nausea
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light or noise
- Feeling sluggish, hazy or foggy
- Confusion, concentration or memory problems

2. Speak up.

- If you think you have a concussion, stop playing and talk to your coach, athletic trainer or team physician immediately.

3. Take time to recover.

- Follow your team physician and athletic trainer's directions during concussion recovery. If left unmanaged, there may be serious consequences.
- Once you've recovered from a concussion, talk with your physician about the risks and benefits of continuing to participate in your sport.

How can I be a good teammate?

1. Know the symptoms.

You may notice that a teammate ...

- Appears dazed or stunned
- Forgets an instruction
- Is confused about an assignment or position
- Is unsure of the game, score or opponent
- Appears less coordinated
- Answers questions slowly
- Loses consciousness

2. Encourage teammates to be safe.

- If you think one of your teammates has a concussion, tell your coach, athletic trainer or team physician immediately.
- Help create a culture of safety by encouraging your teammates to report any concussion symptoms.

3. Support your injured teammates.

- If one of your teammates has a concussion, let him or her know you and the team support playing it safe and following medical advice during recovery.
- Being unable to practice or join team activities can be isolating. Make sure your teammates know they're not alone.

No two concussions are the same. New symptoms can appear hours or days after the initial impact.
If you are unsure if you have a concussion, talk to your athletic trainer or team physician immediately.

NCAA | SPORT SCIENCE INSTITUTE | CONCUSSION SAFETY | WHAT STUDENT-ATHLETES NEED TO KNOW

What happens if I get a concussion and keep practicing or competing?

- Due to brain vulnerability after a concussion, an athlete may be more likely to suffer another concussion while symptomatic from the first one.
- In rare cases, repeat head trauma can result in brain swelling, permanent brain damage or even death.
- Continuing to play after a concussion increases the chance of sustaining other injuries too, not just concussion.
- Athletes with concussion have reduced concentration and slowed reaction time. This means that you won't be performing at your best.
- Athletes who delay reporting concussion take longer to recover fully.

What are the long-term effects of a concussion?

- We don't fully understand the long-term effects of a concussion, but ongoing studies raise concerns.
- Athletes who have had multiple concussions *may* have an increased risk of degenerative brain disease and cognitive and emotional difficulties later in life.

What do I need to know about repetitive head impacts?

- Repetitive head impacts mean that an individual has been exposed to repeated impact forces to the head. These forces may or may not meet the threshold of a concussion.
- Research is ongoing but emerging data suggest that repetitive head impact also may be harmful and place a student-athlete at an increased risk of neurological complications later in life.

Did you know?

- NCAA rules require that team physicians and athletic trainers manage your concussion and injury recovery independent of coaching staff, or other non-medical, influence.
- We're learning more about concussion every day. To find out more about the largest concussion study ever conducted, which is being led by the NCAA and U.S. Department of Defense, visit ncaa.org/concussion.

CONCUSSION TIMELINE

Baseline Testing
Balance, cognitive and neurological tests that help medical staff manage and diagnose a concussion.

Concussion
If you show signs of a concussion, NCAA rules require that you be removed from play and medically evaluated.

Recovery
Your school has a concussion management plan, and team physicians and athletic trainers are required to follow that plan during your recovery.

Return to Learn
Return to school should be done in a step-by-step progression in which adjustments are made as needed to manage your symptoms.

Return to Play
Return to play only happens after you have returned to your preconcussion baseline and you've gone through a step-by-step progression of increasing activity.

For more information, visit ncaa.org/concussion.

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CentraCare PHYSICIANS ORTHOPEDICS

Student Concussion Acknowledgement Form
CentraCare M Physicians Orthopedics
Concussion Clinic

As a student athlete, I acknowledge that I have a direct responsibility to be honest and forthcoming by reporting all injuries or illness to my athletic trainer and medical doctor. I further understand and acknowledge that participation in my sport may result in a head injury or concussion. The Sports Medicine staff has provided me with educational materials regarding concussions and I have read them.

Specifically, I agree the following to be true:

Specifically, I agree the following to be true:

____ Initial I have read and understand the Concussion Fact Sheet provided to me and have been given an opportunity to ask questions about concussions and anything I'm not clear about regarding this issue.

____ Initial A concussion is a brain injury, which I am responsible for immediately reporting to my athletic trainer or team physician.

____ Initial A concussion can affect my ability to perform everyday activities, and affect reaction time, balance, sleep, and classroom performance.

____ Initial If I suspect a teammate has a concussion, I am responsible for reporting it to my athletic trainer or team physician.

_____
Student Athlete Printed Name

_____ _____
Student Athlete Signature Date

_____ _____
Witness Date



What is a concussion?

A concussion is a type of traumatic brain injury. It follows a force to the head or body and leads to a change in brain function. It is not typically accompanied by loss of consciousness.

How can I tell if an athlete has a concussion?

You may notice the athlete …

- Appears dazed or stunned
- Forgets an instruction
- Is confused about an assignment or position
- Is unsure of the game, score or opponent
- Appears less coordinated
- Answers questions slowly
- Loses consciousness

Note that no two concussions are the same. All possible concussions must be evaluated by an athletic trainer or team physician.

The athlete may tell you he or she is experiencing …

- A headache, head pressure or that he or she doesn't feel right following a blow to the head
- Nausea
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light or noise
- Feeling sluggish, hazy or foggy
- Confusion, concentration or memory problems

What can I do to keep student-athletes safe?

	Preseason	In-Season	Time of Injury	Recovery
What can I do?	Create a culture in which concussion reporting is encouraged and promoted.	Know the signs and symptoms of concussions.	Remove athletes from play immediately if you think they have a concussion and refer them to the team physician or athletic trainer.	Follow the recovery and return-to-play protocol established by team physicians and athletic trainers.
Why does it matter?	Athletes who don't immediately seek care for a suspected concussion take longer to recover.	The more people who know what to look for in a concussed athlete, the more likely a concussion will be identified.	Early removal from play can mean a quicker recovery and help avoid serious consequences.	Team physicians and athletic trainers have the training to follow best practices related to the concussion recovery process.
Tips and strategies	Be present when your team physician or athletic trainer provides concussion education material to your team. Tell your team that this matters to you.	Check in with your team physician or athletic trainer if you want to learn more about concussion safety.	Provide positive reinforcement when an athlete reports a suspected concussion.	Tell athletes that decisions related to their return to play and health are entirely in the hands of the team physician and athletic trainer.

You play a powerful role in setting the tone for concussion safety on your team. Let your team know that you take concussion seriously and reporting the symptoms of a suspected concussion is an important part of your team's values.

NCAA | SPORT SCIENCE INSTITUTE | CONCUSSION SAFETY | WHAT COACHES NEED TO KNOW

What happens if an athlete gets a concussion and keeps practicing or competing?

- Due to brain vulnerability after a concussion, an athlete may be more likely to suffer another concussion while symptomatic from the first one.
- In rare cases, repeat head trauma can result in brain swelling, permanent brain damage or even death.
- Continuing to play after a concussion increases the chance of sustaining other injuries too, not just concussion.
- Athletes with a concussion have reduced concentration and slowed reaction time. This means they won't be performing at their best.
- Athletes who delay reporting concussion may take longer to recover fully.

What are the long-term effects of a concussion?

- We don't fully understand the long-term effects of a concussion, but ongoing studies raise concerns.
- Athletes who have had multiple concussions *may* have an increased risk of degenerative brain disease, and cognitive and emotional difficulties later in life.

What do I need to know about repetitive head impacts?

- Repetitive head impacts mean that an individual has been exposed to repeated impact forces to the head. These forces may or may not meet the threshold of a concussion.
- Research is ongoing but emerging data suggest that repetitive head impact also may be harmful and place a student-athlete at an increased risk of neurological complications later in life.

Did you know?

- Most contact or collision teams have at least one student-athlete diagnosed with a concussion every season.
- Your school has a concussion management plan, and team physicians and athletic trainers are expected to follow that plan during a student-athlete's recovery.
- NCAA rules require that team physicians and athletic trainers have the unchallengeable authority to make all medical management and return-to-play decisions for student-athletes.
- We're learning more about concussion every day. To find out more about the largest concussion study ever conducted, which is being led by the NCAA and U.S. Department of Defense, visit ncaa.org/concussion.



For more information, visit ncaa.org/concussion.

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CentraCare PHYSICIANS ORTHOPEDICS

Coach/Staff Concussion Acknowledgement
CentraCare M Physicians Orthopedics
Concussion Clinic

In addition to the Concussion Fact Sheet for Coaches, the following information will provide educational insight into the Concussion Management Guidelines utilized for our student athletes. These guidelines are recommended a minimum standard of care, allowing the Sports Medicine staff to manage concussions individually as the situation warrants. The progression of a student-athlete with a diagnosed concussion will include cognitive and physical exertion in a stepwise process to ensure a safe return to full participation in academics and athletics.

Baseline Testing

Concussion Baseline[Biennially]

- Concussion Baseline Report Form
- Post-Concussion Symptom Scale (PCSS)
- Modified Balance Error Scoring System (m-BESS)
- ImPACT® Baseline Neurocognitive Testing

Concussion Education[Annually]

- NCAA Educational Material for Student-Athletes
  - Concussion Acknowledgement and Signature Form
- NCAA & Vanderbilt Educational Material for Coaches/Support Staff
  - Concussion Acknowledgement and Signature Form

Return to Play Protocol

Phase 0 – Cognitive Exertion

- Cognitive rest is an essential component of the recovery process; Academic adjustments and accommodations may be necessary
- The time frame for rest and continuation of cognitive activities are dependent upon symptoms
- Each individual will respond uniquely and therefore must be managed on an individual case basis
- Once the student-athlete is asymptomatic for 24 hours while fulfilling full academic work load they proceed to Phase 1

Phase 1 – Aerobic Exertion

- Stationary Bike testing
- Incremental Treadmill Test

Phase 2 – Functional Testing Progression

- Initial Functional Exertion- Linear movements only
- Advanced Functional Exertion- Linear and Elevation change incorporated movements
- Weight lifting may resume

Phase 3 – Sport Specific Exertion

- Increasing aerobic demand during each stage of this phase of exercises specific to sport and position
- Initial Sport-Specific Exertion
- Intermediate Sport-Specific Exertion
- Advanced Sport-Specific Exertion

Phase 4 – Return to Limited Drills and Non-Contact Practice

- Non-contact training drills dependent upon sport
- Team Physician consultation

Phase 5 – Return to Full Practice Participation with Contact

- Completion of Phase 5 without symptom recurrence results in release to full participation without restriction

CentraCare PHYSICIANS ORTHOPEDICS

Coach/Staff Concussion Acknowledgement
CentraCare M Physicians Orthopedics
Concussion Clinic

(Initial)

____ I have read and understand the Concussion Fact Sheet and accompanying concussion education sheet for coaches provided to me and have been given an opportunity to ask questions about concussions and anything I'm not clear about regarding this issue.

After reading the concussion fact sheet, I agree the following to be true:

(Initial)

____ A concussion is a brain injury.

____ I realize I cannot see a concussion, but I might notice some of the signs in the student-athlete right away. Other signs and symptoms can show up hours or day after the injury.

____ If I suspect a student-athlete has a concussion, I am responsible for removing him/her from activity and reporting it to my team's athletic trainer.

____ I will not allow any student-athlete to return to play or practice if I suspect that he/she has received a blow to the head or body that resulted in signs or symptoms consistent with concussion.

____ I will encourage my student-athletes to report any suspected injuries and illnesses to the medical staff, including signs or symptoms of concussions.

____ Following a concussion the brain needs time to heal. I understand that student-athletes are much more likely to sustain another concussion or more serious brain injury if they return to play or practice before symptoms resolve.

____ I have read the signs and symptoms listed on the concussion Fact Sheet.

Print Name: _____

Signature: _____ Date: _____

CentraCare PHYSICIANS ORTHOPEDICS

APPENDIX G - Medical Providers

Medical Provider Concussion Acknowledgement Form

CentraCare M Physicians Orthopedics Concussion Clinic

(Initial)

____ I have read and understand the Concussion Fact Sheet and CentraCare M Physicians Orthopedics Sports Medicine Management Guidelines

After reading the Concussion Fact Sheet and Vanderbilt Concussion Management Guidelines, I agree the following to be true:

____ Initial A concussion is a brain injury.

____ Initial I realize I cannot see a concussion, but I might notice some of the signs in the student-athlete right away. Other signs and symptoms can show up hours or day after the injury.

____ Initial If I suspect a student-athlete has a concussion, I am responsible for removing him/her from activity and reporting it to the appropriate medical staff.

____ Initial I will not allow any student-athlete to return to play or practice if I suspect that he/she has received a blow to the head or body that resulted in signs or symptoms consistent with concussion.

____ Initial I will encourage my student-athletes to report any suspected injuries and illnesses to the medical staff, including signs or symptoms of concussions.

____ Initial Following a concussion the brain needs time to heal. I understand that student-athletes are much more likely to sustain another concussion or more serious brain injury if they return to play or practice before symptoms resolve.

____ Initial I am aware that every freshman/transfer student athlete must be baseline tested prior to participation in sport. Re-baseline assessments will be performed biennially or prior to the next season, traditional or non-traditional, if the student athlete is diagnosed with a concussion during the previous season.

_____
Printed Name of Medical Provider

_____ _____
Signature of Medical Provider Date

APPENDIX H

CentraCare PHYSICIANS ORTHOPEDICS

Concussion Injury Report Form
CentraCare M Physicians Orthopedics Concussion Clinic

Name: _____ Date: _____
Sport or Activity: _____ Date of Injury: _____
How did it happen: _____
_____
Did you lose consciousness? Yes No If Yes, how long? _____
At the time of INJURY did you have any of the following symptoms?

_____ headache _____ numbness/tingling _____ confusion _____ dizziness
_____ vomiting _____ sensitivity to noise _____ weakness _____ vision problems
_____ nausea _____ sensitivity to light _____ personality change

Symptoms Checklist (*To be completed by patient*)
(*Please circle the number that best describes your CURRENT symptoms*)

Symptom	None	Mild		Moderate		Severe	
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Trouble falling asleep	0	1	2	3	4	5	6

Balance Error Scoring System (BESS) *(To be completed by evaluator)*

Errors:
1. Moving the hands off of the iliac crest
2. Opening eyes
3. Step, stumble, or fall
4. Abduction or flexion of the hip beyond 30 degrees
5. Lifting the forefoot or heel off of the testing surface
6. Remaining out of the proper testing position > 5 sec

Each of the 20 second trials is scored by counting the errors accumulated by the subject. Maximum number of errors for any single condition = 10. (Guskiewicz)

Scorecard (#errors):
Double Leg Stance (feet together): _____
Single Leg Stance (non-dominant foot): _____
Tandem Stance (non-dominant foot in back): _____
Which foot was tested: ☐ **Left** ☐ **Right** **TOTAL** _____

Evaluator: _____ Date: _____ Tim

APPENDIX I

CentraCare PHYSICIANS ORTHOPEDICS

New Patient Concussion Assessment
CentraCare M Physicians Orthopedics
Concussion Clinic

Name: _____ Date of Injury: _____

Sport or Activity: _____ Game or Practice: _____

How did it happen: _____
_____
_____

Did you lose consciousness? Yes No If Yes, how long? _____

At the time of INJURY did you have any of the following symptoms?

_____ headache	_____ numbness/tingling	_____ confusion	_____ dizziness
_____ vomiting	_____ sensitivity to noise	_____ weakness	_____ vision problems
_____ nausea	_____ sensitivity to light	_____ personality change	

Are you still having symptoms now? Yes No If No, how many days did you have symptoms? _____

Did you lose memory of events before _____ or after _____ the injury?

Did you miss any games / practices / days of school? Yes No If Yes, how many? _____

Were you evaluated onsite by an athletic trainer or doctor? Yes No

Were you evaluated in an emergency room? Yes No

Did you get an MRI or CT scan? Yes No If Yes, where? _____

Please list any other diagnosed concussions you have had:

Date _____	Did you lose consciousness? _____	Did you have memory loss? _____
Date _____	Did you lose consciousness? _____	Did you have memory loss? _____
Date _____	Did you lose consciousness? _____	Did you have memory loss? _____

What were your major symptoms with the previous diagnosed concussions and how long did they last?
Symptoms _____ How long? _____
Symptoms _____ How long? _____
Symptoms _____ How long? _____

Have you ever been diagnosed with or treated for:

_____ headaches	_____ ADHD	_____ learning disability	_____ migraines
_____ meningitis	_____ brain surgery	_____ alcohol / drug use	_____ seizures
_____ dyslexia	_____ autism	_____ anxiety / depression	

Have you ever:
Had speech therapy? _____ Taken special education classes? _____ Repeated a grade? _____

Has anyone in your family had:
Alzheimer's dementia? _____ Dementia? _____ Migraine headache? _____

Print Name of Patient / Legal Representative: _____

Signature of Patient / Legal Representative: _____ Date: _____ Time: _____

Relationship to Patient: _____

APPENDIX J

CentraCare PHYSICIANS ORTHOPEDICS

Post-Concussion Symptom Scale
CentraCare M Physicians Orthopedics Concussion Clinic

Name: _____ Date: _____
Sport or Activity: _____ Date of Injury: _____

Symptom	None	Mild		Moderate		Severe	
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Trouble falling asleep	0	1	2	3	4	5	6

Evaluator: _____ Date: _____ Time: _____

APPENDIX K

CentraCare PHYSICIANS ORTHOPEDICS

Return to Learn & Return to Play
CentraCare M Physicians Orthopedics
Concussion Clinic

Minnesota law requires that athletes with concussions be removed from play until they are symptom-free or medically cleared. During this time, students often require assistance at school. (Minnesota Statutes §121A.37 & §121A.38)

Name: _____ Date of Birth: _____ Date of Injury: _____

Please excuse the above patient from school today due to a medical appointment.

____ This student did not sustain a concussion and may resume regular activity.

____ The student has sustained a concussion and is not permitted to participate in any sport activity until medically cleared. Prior to returning to full activity, most students will complete a **Return to Learn** protocol and all students must complete a **Return to Play** protocol. **The two protocols may run simultaneously**. The academic team should progress RTL as directed below. Final RTP clearance must come from a provider trained in concussion management.

*Typical post-concussion symptoms can include but are not limited to: headache, dizziness, visual changes, difficulty concentrating, feeling foggy, increased irritability, or difficulty falling or staying asleep.

RETURN TO LEARN PROTOCOL

____ The student has been cleared to initiate the **Return to Learn** protocol, which generally begins after a 24-48 hour period of relative rest.

☐ **Step 1** – Daily activities (reading) that do not result in more than a mild exacerbation of symptoms. Start with 5-15 min and increase gradually.

☐ **Step 2** – Part-time school may be needed for a short time with essential learning-significant supports, focus on core classes with modified grading. (Pass/fail.) Activities such as homework, reading, and other cognitive activities outside of the classroom, slowly increase tolerance. Academic Team should progress to next level when able to tolerate 30 minutes.

☐ **Step 3** – Part-time school: Consider: Full day with continued modifications and academic supports with gradual increase in academic demand. Emphasis on Core Classes with Elective classes as an option with rest breaks through out day. Support learning through accommodations rather than postpone academics. Academic Team should progress to the next level when able to complete 60 minutes or more of mental exertion with symptom stability.

☐ **Step 4** – Full-time school: Minimal accommodations: Gradually progress in school activities until a full day can be tolerated without more than mild exacerbation. Academic Team should progress when able to handle all class periods in succession without an increase in symptoms. (Student may require academic support based on course load)

Please consider the following Return to Learn Supports:
- Grading modified for short period of time.
- Frequent rest breaks as needed in classrooms and quiet environment.
- Modified/reduced academic assignments-essential learning only.
- Modified and/or shortened test.
- Extended time to complete tests, and/ or test in a quiet environment.
- Audio options for reading material.
- Prior to class, provide teacher notes or PowerPoint.
- Consider natural lighting, reduce classroom lights.

____ The student has completed **Return to Learn** Protocol or does not require this protocol.

RETURN TO PLAY PROTOCOL

____ The Student has been cleared to initiate the Return to Play Protocol. Progress to the next step can happen even if their symptoms are mild. It is similar to the return to learn where some mild symptoms can be tolerated as people progress through their return to play criteria and directed activity.

☐ **Step 1** – Symptom-limited activity (i.e., daily activities that do not exacerbate symptoms).

☐ **Step 2a** – Light aerobic exercise, up to 55% maxHR (stationary bike, slow-paced walking, light resistance training).

☐ **Step 2b** – Moderate aerobic exercise, up to 70% maxHR (stationary bike, medium pace walking, light resistance training).

☐ **Step 3** – Individual sport-specific exercise away from the team.
- No activities with a chance of head impact. This includes running, change of direction, and training drills away from the team.
- Add head movement.

☐ **Step 4** – Non-contact training drills. Exercise to the maximum intensity with more challenging training drills (passing drills, multiplayer training) and can integrate into the team.

Generally, a student should be reevaluated by a health care provider before contact resumes at Step 5.

☐ **Step 5** – Full contact practice.
- Restore confidence and allow for functional assessment.

☐ **Step 6** – Return to competition

____ The student did sustain a concussion at the time of injury. The student has successfully completed all the Return to Learn and Return to Play steps as listed above and may resume regular activity without restrictions.

Signature: _____
Paul Meirick, MD, CentraCare M Physicians

Date: _____

CentraCare PHYSICIANS ORTHOPEDICS

Baseball
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES – BASEBALL

- Initial
  - 4 Jogging poles
  - Throwing 60-90 feet
  - Ground Balls/Defensive Work
  - Swings Off a Tee in Cages
- Intermediate
  - Running Bases
  - Long Toss 90-150 feet
  - Defensive Specific Drills – Catchers Drills, Infield Drills, Outfield Drills,
  - Front Toss or Side Toss in Cages
- Advanced
  - Defense Diving, Catchers Blocking
  - Live Batting Practice

CentraCare PHYSICIANS ORTHOPEDICS

Basketball
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - BASKETBALL

- Initial
  - 10 laps around floor—sprint straight away/slide baseline
  - Sprints full court
  - Start and stops
  - Backpedal
  - Lateral Shuffle
  - Power skips
- Intermediate
  - Sprints
  - Defensive zigzag
  - Speed Hurdles
  - Square drill
  - Shooting/post drills—timed
- Advanced
  - Mican drill with weighted ball
  - Intervals 10 x 40 sec duration w/minute rest
  - Each interval contains various movements
  - Lateral shuffle
  - Sprints
  - Change of direction
  - Jumping
  - Backpedal

CentraCare PHYSICIANS ORTHOPEDICS

Bowling
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - BOWLING

- Initial
  - Floor throws without ball
  - Floor throws with ball
- Intermediate
  - End position throws with ball
  - Half speed approach
- Advanced
  - ¾ speed approach with ball
  - Approach with throw
  - Progress from bowling frames to entire game

CentraCare PHYSICIANS ORTHOPEDICS

Football OL/DL
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - FOOTBALL OL/DL

- Initial
  - Stance/Starts
  - Run Blocking/Run Rush Sets
  - Pass Blocking/Pass Rush Sets
  - Boards/Bags – Footwork and Handwork
- Intermediate
  - Cone Drill
  - Run Block/Run Rush vs. Dummies
  - Pass Block/Pass Rush vs. Dummies
  - OL Sandbags/ DL handwork with swims and rips
- Advanced
  - Pass Set to Run block on Sled
  - Bag Drill Read – Pass or Run
  - 4-pt Stance vs. Sled
  - Dummy weaves out of stance with hip flips (DL)
  - Push Pull Power Hops (OL)

CentraCare PHYSICIANS ORTHOPEDICS

Football RB/TE/LB
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - FOOTBALL RB/TE/LB

- Initial
  - Stance/Starts
  - Pass Routes – Check Down/Flats OR Pass Reads
  - Run Drills/Run Blocking/Run Reads
  - Boards/Bags – Footwork and Handwork
- Intermediate
  - Cone Drill
  - Pass Routes w/ Ball OR Pass Read w/Ball
  - Pass Block/Pass Rush vs. Dummies
- Advanced
  - Run Block vs. Sled
  - Bag Drills – Step-over/Shuffle
  - Stance vs. Sled

CentraCare PHYSICIANS ORTHOPEDICS

Football WR/DB
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - FOOTBALL WR/DB

- Initial
  - Stance/Starts/Reads
  - Run/Pass Block – Footwork (WR)
  - Short Route/ Short Route Read
- Intermediate
  - Cone Drill
  - Short Routes w/ Ball
  - Pass Read w/ Ball
  - Long Route Read (DB)
- Advanced
  - Long Routes w/ Ball
  - Run Block vs. Dummy (WR)
  - Run Read/Shed Dummy (DB)
  - Pass Block vs. Dummy (WR)
  - Pass Read Block vs. Dummy (DB)

CentraCare PHYSICIANS ORTHOPEDICS

Football QB/Special Teams
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - FOOTBALL QB/SPECIAL TEAMS

- Initial
  - Quarterbacks
    - Stationary Throwing
    - Run Play Footwork
    - Pass Drop Footwork
  - Specialists
    - Stance and Approach
    - Approach w/ Dry Kick
- Intermediate
  - Cone Drill
  - Quarterbacks
    - Rollout Footwork
    - Pass Drop w/ Throws
    - Throws from Knees
  - Specialists
    - Catch and Run
    - Kick without Pressure
- Advanced
  - Quarterbacks
    - Pressure Pass Drop w/ Throws
    - Knees to Upright Throws
    - Bucket Throws
  - Specialists
    - Fake Kick/Punt and Run
    - Running Punt
    - Dropped Ball Grab and Punt

CentraCare PHYSICIANS ORTHOPEDICS

Golf
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - GOLF

- Initial
  - Putting stroke without ball contact
  - Short game stroke without ball contact
- Intermediate
  - Putting stroke with ball contact (short to long)
  - Short game with ball contact (short to long)
  - Dry swings with irons and drivers without ball contact
- Advanced
  - Practice range with irons and driver
  - Follow with putting green scenarios
  - Progress from holes to rounds

CentraCare PHYSICIANS ORTHOPEDICS

Lacrosse
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - LACROSSE

- Initial
  - 2 laps around the field (jog sideling, sprint end line)
  - From end line to restraining line (~30 yards):
  - High knees down, butt kicks back
  - Lateral shuffle down and back
  - Forward power skips down, backward skips back
  - Carioca down and back
- Intermediate
  - From end line to restraining line (~30 yards):
  - Sprint down and back, 10 jumping jacks
  - Shuffled down and back, 10 push ups
  - Carioca down and back, 10 burpees
- Advanced
  - Box drill
  - Sprint 10 yards, side shuffle left 10 yards, back pedal 10 yards, side shuffle right 10 yards
  - Sprint 10 yards, drop step shuffle left 10 yards, sprint 10 yards, drop step shuffle right 10 yards
  - Sprint 10 yards and rotate to the right 270 degrees in place (will end up making a left hand turn), repeat for completion of 1 box. Progress to 2 boxes in series
  - 1 vs. 1's
  - Attacker
    - Start at the top of the 12m arc, drive to goal and shoot
    - Add use of defender, no bump or contact made
    - Gradually defender can add more pressure
  - Defender
    - Start at the 8m arc and follow an attacker as they drive to goal and shoot
    - Gradually defender can add more pressure as they become comfortable with footwork
    - Allow attacker to incorporate some type of dodge move
  - Midfielder: Both Attacker and Defender 1 vs. 1's simulations

CentraCare PHYSICIANS ORTHOPEDICS

Soccer
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - SOCCER

- Initial
  - Jog-sprint-jog width of field (60yds) x4
  - Run-change directions to a backpedal-run width of field x2
  - Agility warm-up (toe touches, skips, carioca, etc.)
  - Covers (passing drills but no headers)
  - Goalkeeper
    - 10 yard lateral shuffles for time
    - Goalkeeper power jumps
    - Kneeling dives one side at a time
    - Stationary catches
    - Punts
    - Lay down dive stops
- Intermediate
  - T-drills
  - (Constant movement) partner passing – inside foot, top foot, thigh-foot, chest-foot
  - Backpedal – sprint 10yds & pass (utilize different passing styles)
  - 5yd headers / 10yd headers
  - Goalkeeper
    - T-drills (starting from ground)
    - Repetitive kneeling dives back and forth to each side
    - Corner kick clearances
    - Goal kicks with placement
    - Shuffle catches continuously side to side
- Advanced
  - Direction drill (large and small grid)
  - T-drills (increase complexity)
  - Cone drill with dribbling, making a move to a sprint (and shoot if forward)
  - Step back and sprint drill with variety of passing (incorporate headers)
  - Forwards: 10 ball repetitive shooting w/ continuous running
  - Midfielders & Defenders: head long ball clearances while sprint & cut back
  - Goalkeeper
    - Timed Illinois test
    - Pole agilities with reaction catches
    - Hurdle agilities with reaction catches
    - Standing dives
    - Mix up saves (tips, diving, catching, punching)

CentraCare PHYSICIANS ORTHOPEDICS

Softball
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES – SOFTBALL

- Initial
  - 4 Jogging poles
  - Throwing 45-60 feet
  - Ground Balls/Defensive Work
  - Swings Off a Tee in Cages
- Intermediate
  - Running Bases
  - Long Toss 60-90 feet
  - Defensive Specific Drills – Catchers Drills, Infield Drills, Outfield Drills,
  - Front Toss or Side Toss in Cages
- Advanced
  - Defense Diving, Catchers Blocking
  - Live Batting Practice

CentraCare PHYSICIANS ORTHOPEDICS

Swimming
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - SWIMMING

- Initial
  - 1000 yards w/ in-pool starts
  - 5-100 yard swims using front crawl, 5 – 100 yard swims using preferred stroke
  - If swimmer's preferred stroke is front crawl, then 500 yards should be swum using butterfly and/or breast stroke.
  - Have swimmer focus on breathing during right and left strokes rather than unilateral breathing
  - Use open turns; do not have swimmer use flip turns
- Intermediate
  - 1500 yards w/ in-pool starts
  - 500 yards front crawl and 800 yards preferred stroke
  - If swimmers preferred stroke is front crawl, 500 yards should be swum using 1 or more of the following strokes: butterfly, breast, and back stroke
  - 200 yard IM should be swam at end of practice regardless of preferred stroke
  - Incorporate flip turns
- Advanced
  - 2000 yards w/ starting block starts
  - 600 yards front crawl and 1000 yards preferred stroke
  - If swimmers preferred stroke is front crawl, 600 yards should be swum using 1 or more of the following strokes: butterfly, breast, and back stroke
  - 400 yard IM should be swam at end of practice regardless of preferred stroke

CentraCare PHYSICIANS ORTHOPEDICS

Tennis
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - TENNIS

- Initial
  - 3 laps around 3 Courts – sprint straight-away, slide baselines
  - Sprints from baseline to net at angles (back left, center, back right)
  - Backpedal from net at angles (front left, front center, front right)
  - Lateral Shuffles across court
  - Line hops (back/forth, side/side, alternating back/forth)
- Intermediate
  - Sprints to net for volley
  - Defensive back pedal for overhead
  - Squat Jumps
  - Timed serves (5 in 15 seconds)
- Advanced
  - Court zippers w/ line touch
  - Ball-fed backhand, forehand, sprint for volley x 5
  - Defensive position from ground – service returns

CentraCare PHYSICIANS ORTHOPEDICS

Track & Field, Cross Country
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - TRACK & FIELD, CROSS COUNTRY

- Begin with a normal warm up for specific event
- Sprints:
    - Goals – Rapid acceleration/deceleration; Rapid vertical level change; Plyometric power; Increased exertion over short distance.
    - In's/Out's
    - 3pt./2pt. Stance Starts Æ Block Starts
    - Weighted Jumps
    - Progressive Running
- Hurdles:
    - Goals – Incorporate forward flexion/trunk rotation
    - Same as sprints
    - Active hurdle stretch drill
- Jumps [Long, Triple]:
    - Goals – Incorporate aerial/landing impact component
    - Same as sprints
    - Double leg Æ Single leg jumping progression
- Jumps [High, Pole-vault]:
    - Goals – Incorporate Inversion (Upside Down)
    - Same as sprints
    - Bridge ups
    - Walk overs
    - Bar Hangs
    - Mat Drills (Tumbling/Landing)
- Throws:
    - Goals – Incorporate Strength/Power Component and Valsalva
    - Medball Thrust
    - One Arm Toss
    - Serratus Punches
- Distance Track, Cross Country:
    - Goals – Running Progression
    - Lower intensity exertion over long distance
    - Progress Endurance/Time/Intensity of Exertion

CentraCare PHYSICIANS ORTHOPEDICS

Volleyball
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES – VOLLEYBALL

- Initial
  - Jog 4 laps around the court
  - 4 laps of forward sprint, lateral shuffle, backward run, lateral shuffle
  - Agility warm up (skips, carioca, etc)
  - Ground serving
  - Front row players (outsides, middles, setters)
    - Block moves and approaches without a ball
    - Hitting while standing on a box
  - Back row players (defensive specialists, liberos, serve receivers, all-around players)
    - Passing to setter target from a toss, down ball and free ball in a small radius
  - Setters
    - Setting against the wall
- Intermediate
  - Peppering with a partner
  - Jump serving, if applicable
  - Front row players
    - Blocking drills with a ball
    - Hitting drills with a ball from full approach at the 10 ft line
  - Back row players
    - Run throughs, no diving
    - Passing from serve receive, no diving
  - Setters
    - Setting from a toss to target spots for hitters
- Advanced
  - Front row players
    - Blocking against live hitting
    - Attacking against blockers
    - Block with transition to attack
  - Back row players
    - Defense with diving
    - Serve receive with diving
  - Setters
    - Setting from a pass to targets
    - Transitions from serve to defensive position to digging a ball

CentraCare PHYSICIANS ORTHOPEDICS

Wrestling
CentraCare M Physicians Orthopedics
Concussion Clinic

SPORTS SPECIFIC EXERCISES - WRESTLING

- Initial
  - Jogging 5-10 minutes around mats alternating 1 minute clockwise 1 minute counter clockwise
  - Walk through stand up drill w/o partner
  - Shadow Drilling (slow paced- emphasize proper technique)
  - Takedowns, escapes, carries, sweeps
  - Utilize stationary bike interval sprints for 1-2 minutes to increase/simulate aerobic activity
  - No Throws
  - Push-ups
  - Crunches
  - Burpees
- Intermediate
  - CW/CCW jogging w/ 10 intermittent 10 second sprints
  - Explosive stand up drill w/ partner applying minimal resistance
  - Utilize stationary bike interval sprints for 1-2 minutes to increase/simulate aerobic activity
  - Sprawl Drill
  - Shadow Drilling (fast paced)
- Advanced
  - CW/CCW jogging w/ 10 intermittent 15 second sprints
  - Explosive stand up drill w/ partner applying moderate resistance
  - 5 hand fight drills for 20 seconds (avoid head contact)
  - Pummel Drill (moderate intensity, avoid head contact)
  - Partner Drills (moderate intensity, no throws)
  - 5 Dummy throws onto soft mat (if available)