



EMORY
UNIVERSITY

Campus Life

Project Name: Concussions: Providing Comprehensive, Collaborative, Team-based Care for All Emory Students

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Project Sponsors

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Executive Summary

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2. *Project Goals*

- a. Improve the on campus health care of students with concussions/mild traumatic brain injuries (mTBIs) and address the concern of increasing number of mTBIs on Emory's campus as documented by Emory University Student Health Services' (EUSHS) self-study from 2010-2015
- b. Introduce the use of neurocognitive testing (ImpACT) to all students with mTBIs (not just Emory athletes), to help better evaluate and treat these students.
- c. Introduce static and dynamic balance testing using the Biodex Balance System SD into the plan of care for all students with mTBIs.
- d. Increase patient contacts through the addition of athletic trainers into a more collaborative approach of mTBI healthcare.
- e. Educate students on the negative effects of mTBIs on learning and exercise participation, as well as safely guide them back into the classroom and desired exercise activities

3. *Project Guidelines*

- a. Coordinated Collaboration- The overall goal is to help improve the on campus quality of care for an increasing number of mTBIs seen on Emory's campus as well as help educate and decrease the amount of mTBIs through a joint effort of EUSHS, Emory University Sports Medicine/Athletic Training, the Office of Health Promotion (OHP), the Emory Safety Alliance and Department of Orthopedics and Sports Medicine/School of Medicine/Emory Healthcare.
- b. Stewardship of Resources- These funds will help purchase equipment needed to start a process of billing through medical insurance and will allow us to develop revenue that will ultimately sustain this program.
- c. Assessment- Objective measures we will be looking at to determine success of this program include:
 - 1. determining sustainability of this improved care system through billing of insurance
 - 2. increasing patient contacts with our physicians and athletic training staff
 - 3. assessing patient satisfaction with mTBI care for Emory students
- d. Innovation- We hope this program will be a model for other universities to consider when discussing the need for more comprehensive care for their students with mTBIs. We are planning to submit a manuscript on this project to a peer-reviewed journal of college health (e.g. the Journal of American College Health) showing that the level of

mTBI care delivered to intercollegiate student-athletes can be delivered to all students across campus.

- e. *Engagement*- This project is student-focused and is geared to help better support our entire student population on campus who suffer from mTBIs.

4. *Current Initiative*

- a. Some students/non-athletes with mTBIs are referred by EUSHS providers to the athletic training staff for ImPACT testing along with guidance for return to physical activity
- b. ImPACT Testing is a computer-based tool which helps assess the patient’s neurocognitive abilities including verbal memory, visual memory, reaction time, and visual speed.
 - i. This objective measure can help us guide these students and allow us to better assess when they are ready to return to the classroom and/or exercise
 - ii. We currently use this tool on all of our varsity/intercollegiate student-athletes

5. *Primary Stakeholders*

- a. This initiative will help all students on campus who sustain mTBIs.
- b. This initiative will improve the safe and healthy return of Emory students with mTBIs to club sports, intramurals and recreational athletic activities.
- c. This initiative will further the academic mission of the university by improving the safe and healthy return of Emory students with mTBIs to academic activities and the classroom.
- d. Via improved care of all Emory students with mTBIs, Emory will take an important step forward in the risk management concerns attached to these high risk injuries on college campuses.

Project Description

The primary goal of this project is to improve the care for all Emory students who sustain mild traumatic brain injuries (mTBI) on our campus. An mTBI is a traumatically-induced alteration in mental status with or without associated loss of consciousness and is commonly referred to as a concussion.

Over the past several years, an increasing number of mTBIs are being seen at Emory Student Health Services (EUSHS):

Concussion (850.9 and S06.0X) (ICD-9 and ICD-10 codes*)			
Year	Total visits	Total patients	Ave. Visits/Patient
2015-16	98	62	1.58
2014-15	74	51	1.45
2013-14	87	63	1.38
2012-13	29	22	1.32
2011-12	38	30	1.27
2010-11	27	26	1.04

* Revised ICD-10 diagnostic coding was introduced nationally in October 2015.

As can be seen, EUSHS mTBI visits have nearly quadrupled, and total unique mTBI patients have more than doubled (2.3x) in the past 6 years. It is our impression that these increases are due to both enhanced recognition of concussion in the University community and likely increasing frequency in our

active student population. Due to this increasing recognition and reporting of mTBI to health care providers, we believe we have an opportunity and a need to improve our system of care for these students.

We would like to take the current level of care that we deliver to our Emory student-athletes and create a model by which this care can be provided for all students on campus. To implement this project, EUSHS and Emory Sports Medicine/Athletic Training would collaborate with the OHP and Residence Life to educate their RA and SA staff on the resources available to their students. With the help of OHP we would also like to develop a plan to provide more resources and educational handouts on the effects of concussion, specifically their negative effects on learning and exercise.

Another goal of this project is to increase the number of patient contacts of individuals diagnosed with mTBI through the addition of Athletic Trainers into the system of care. Currently, EUSHS sees these patients on an average of 1.58 visits per sustained injury. Our goal would be 2.0 or more physician visits, along with an additional 2.0 patient contacts with the athletic trainers. With the increase in patient contacts, we will be able to monitor these students more closely, replicating the model of care provided within the Athletics Department. Athletic trainers are heavily involved with the care of mTBIs for intercollegiate student-athletes at Emory. We believe those experiences could greatly benefit and improve the healthcare provided for all students.

Often students do not understand the negative effects an mTBI can have on academic performance. If these effects are ignored, students will suffer in the classroom. Athletic trainers monitor our student-athletes' symptoms regularly and counsel them on the potential effects on their academic performance. With the addition of athletic trainers into the system of care for all students, we can apply this strategy to the general Emory student population to enable all students suffering an mTBI to successfully return to the classroom in the safest and most time-efficient manner possible.

The program will be modeled upon the healthcare plan we currently use for our Emory student-athletes. Our athlete protocol is based upon NCAA recommendations, Zurich guidelines, and other sports medicine healthcare best practices, including protocols used at Children's Healthcare of Atlanta (CHOA). The protocol for all students will be as follows:

1. Injured student sees a physician/clinical provider at EUSHS and the diagnosis of concussion/mTBI is made. Concussion handout (to be updated as part of this project) is given and plan of care is established. Follow-up visit is scheduled at an interval determined by the severity of the injury and level of clinical concern.
2. As appropriate, a letter for academic accommodation is sent to the student's Emory school/college (Office of Undergraduate Education or other).
3. Student is referred to the Sports Medicine staff/Athletic Trainer and is placed in our "Concussion Protocol".
4. Student undergoes neurocognitive ImPACT testing and balance testing using the Biodex Balance System SD and these results are sent back to the overseeing physician/clinical provider through "Point-n-Click," the electronic medical record system at EUSHS.
5. The student/patient is given a Concussion Protocol instructional handout. Athletic Trainer will reiterate the information the physician/clinical provider discussed with the patient about the negative effects on learning from this injury and how to combat those effects through effective studying strategies and/or needed rest before returning to those tasks.
6. Student is monitored by the Athletic Trainer throughout the ensuing week(s) with self-reported symptoms (via the use of either an in-person or online questionnaire). Updates are provided to the EUSHS physician/clinical provider.

7. Once a student has no more self-reported symptoms, he/she will undergo additional ImPACT neurocognitive testing and Biodex testing to ensure there are improvements objectively. The overseeing physician/clinical provider will interpret those results and begin the return to physical activity/"return to learn" process if the student deemed ready.
8. Athletic Trainer will take the patient through a set protocol of supervised biking, running, body weight exercise, and other activities based upon student's academic and exercise goals to make sure they are ready to return to their normal level of academic and physical activity.

We believe this type standardized concussion protocol will improve the care provided to all Emory students with mTBIs and will reduce many of negative physical and cognitive effects that this type of injury can have on a student.

In order to make students aware of this program, the Office of Health Promotion, EUSHS and the Emory Sports Medicine/Athletic Training staff will collaboratively educate the Residence Life staff through annual training sessions and promote this program through educational flyers in the campus residence halls.

This project is closely connected with strategic plan goals within the involved departments:

- The Department of Athletics strategic plan calls for Athletics/Sports Medicine to partner with Student Health Services to develop this mTBI/concussion project.
- EUSHS has a goal to reduce preventable concussions in Emory students and improved mTBI care by summer of 2018.
- The Emory Safety Alliance listed concussion/mTBI prevention as one of its three (3) goals for 2015-16.

The departments to be involved in the implementation of this project will be Emory University Student Health Services, Department of Athletics, Residence Life, the Office of Health Promotion, the Emory Safety Alliance, Emory Recreation Services and the Department of Orthopedics and Sports Medicine/School of Medicine/Emory Healthcare.

Implementation Timeline

1. Summer 2017
 - a. Set up Concussion Clinic at Woodruff PE Center in Athletic Training Room
 - i. Installation of computers into office along with necessary software
 - ii. Training in the use of Biodex Balance System SD
 - b. Educational meeting with Residence Life staff
 - c. Training of EUSHS physicians/clinical providers in the interpretation of ImPACT and Biodex testing results
 - d. Educational/promotional handouts distributed across campus facilities
2. Fall & Spring Semesters 2017-18
 - a. Implement Program
 - i. Increase average patient visits to 2.0 with physicians/clinical providers and at least 2.0 with athletic training staff
 - ii. Enter all Emory students seen at EUSHS with mTBIs into the Concussion Protocol
3. Summer 2018
 - a. Evaluate First Year
 - i. Evaluate reimbursement/revenue generated
4. Fall Semester & Spring Semester 2018-19
 - a. Continue program

5. Summer 2019
 - a. Evaluate Second Year
 - i. Evaluate reimbursement/revenue generated
 - ii. Determine if further bridge funds needed
6. Fall and Spring 2019-20
 - a. Continue program

Assessment Plan

Goals for this project are:

1. Increase average patient mTBI visits per injury at Student Health Services to 2.0 and visits with the Athletic Training staff to 2.0 or greater contacts per injury.
 - a. Collect data on annual patient visits at the end of each academic year
 - b. Steve Klein will be in charge for collecting this data
 - c. Dr. Huey and Steve Klein will review program, and if goals are not met, devise plans to better reach our goals
2. Evaluate number of mTBIs seen on our campus compared to a new survey that will begin in 2017 by the Center for Disease Control and Prevention’s (CDC) “National Concussion Surveillance System”
 - a. Determine if there is an increased risk of mTBI on our campus; if determined discuss potential plans to reduce our students risk of injury
 - b. Assist CDC’s initiative with our annual data collection
3. Achieve sustainability through billing medical insurance for neurocognitive (CPT code 96120) ImpACT testing, Biodex Balance Testing (CPT code 97750) and athletic trainer-supervised return-to-participation protocol (Therapeutic Exercise billed in 15-minute increments)
 - a. Collect total reimbursement of services rendered
 - b. Collect this data annually and determine cost-effectiveness of program
 - c. Steve Klein will be in charge for this data collection

Funding Request and Cost Elements

1. Total Request: \$16,054.74
2. Direct Labor: None
3. Equipment and Materials: These items will need to be purchased in order to provide Neurocognitive testing (ImpACT), Biodex Balance testing and create an office space in which to see these patients. We will also need a license in order to create Point-n-Click (electronic medical record system) stations in the Woodruff PE Center/Athletic Training Room.

Initial Start-Up Costs:

Item Description	Quantity	Unit Price(\$)	Total(\$)
Computer with 27” monitor & keyboard/mouse	1	1054.74	1054.74
“Point and Click” EMR computer-station Licenses – Annual License	1	1500.00	1500.00
Biodex Balance SD	1	7000.00	7000.00
Remodel existing office	1	3500.00	3500.00
		Total:	13,054.74

Year 2 Costs:

Item Description	Quantity	Unit Price(\$)	Total(\$)
“Point and Click” EMR Annual License Fee	1	1500.00	1500.00
		Total:	1500.00

Year 3 Costs:

Item Description	Quantity	Unit Price(\$)	Total(\$)
"Point and Click" EMR Annual License Fee	1	1500.00	1500.00
		Total:	1500.00

4. Cost Summary:

Cost Element	Total Estimated Cost
Direct Labor	\$0.00
Equipment & Materials	\$8,054.74
Travel & Misc.	\$8000.00
Total	\$16,054.74

5. Departmental Contribution :

a. There are multiple aspects of this project being supported through the Department of Athletics, Student Health Services, Office of Health Promotion and Department of Orthopedics and Sports Medicine/Emory Healthcare:

- Department of Athletics will contribute athletic trainers to provide direct patient care, supervise ImPACT testing, supervise return-to-exercise, and documentation/charting in support of this initiative along with office space and internet set-up fees
 1. Athletic trainers will spend approximately 2.0 hours of work per patient for the various aspects of care.
 2. If the average number of patients stay at the same level that has been seen over the past 3 years there will be approximately 58 patients a year, which will total approximately 145 additional hours of work for the athletic training staff
- Athletic trainers will collect data and facilitate the project's annual assessment.
- Student Health Services physicians/clinical providers will provide direct patient care and medical oversight of athletic trainer services; billing department employees to do insurance billing and collections; IT staff will support the electronic medical record and Point and Click stations; and Medical Records staff will coordinate the processing of medical records generated and scan testing results into the EMR.
- Office of Health Promotion will provide staff time and supplies needed to create educational literature, participate in RA training.
- Emory Orthopedics and Sports Medicine will provide physicians/clinical providers will provide direct patient care and medical oversight of athletic trainer services to Blue Cross/Blue Shield patients; and billing department employees to do insurance billing and collections.

6. Future Funding:

This program will be funded long-term through appropriately billing medical insurance for neurocognitive testing (i.e. ImPACT) (CPT code 96120), Biodex Balance Testing (CPT code 97750) and athletic trainer-supervised return-to-participation protocol (Therapeutic Exercise (CPT code 97110) billed in 15-minute increments).

Checklist:

Did you list the name of the sponsors and their departments? Yes.

Did your unit heads review and approve the proposal? Yes.

Have you demonstrated that the project innovates, steward's resources, engages collaboration, and uses assessment to foster a culture of informed decision making? Yes.

Is your project timeline realistic and attainable? Yes.

If your project last 3+ years, did you demonstrate how the program will be sustained? Yes.

Did you clearly state how your funds will be used? Yes.

Did you discuss your proposal with your strategic plan departmental contact? Yes.

Did you discuss your assessment plans with your department assessment coordinator? Yes.

ECL Bridge Fund Committee Feedback Response:

We believe that this project will help “engage” the entire student-population not in the sense that all students will sustain an mTBI, rather these services will be available for all students. This program should be instated at Emory University to help reduce the negative effects that this type of injury can have on a students academic capabilities, social engagement, and physical well being. Imagine being a student with an mTBI who can have symptoms that include headaches, dizziness, nausea, vomiting, blurred vision, sensitivity to light/noises, feeling slowed down, mental fogginess, difficulty concentrating and remembering, fatigue, confusion, trouble falling asleep, emotional distress, and more. These array of symptoms can have an effect on all aspects of your daily life. With the addition of athletic trainers into the system of care we can deliever a collaborative approach of healthcare for our students. This will allow us to monitor our students on a more frequent basis and help deliver the continuation of care that is needed to ensure the health and wellbeing of these students. For these reasons listed above we believe instating this program will directly support the Emory Campus Life goal of “Academic Engagement and Student Success”.

Another way this proposal will affect the campus at large is through the help of our partners at the Office of Health Promotion. We will develop educational posters that will help our students recognize the signs and symptoms of a concussion along with where to go to get proper medical care. For example, we would like to place these flyers through out the Woodruff PE Center, SAAC, Resident Halls, DUC and other common community areas. Besides educational flyers we are going to help educate our resident hall directors, club/intramural sport coordinators, and other recreational groups to the services that are available to their students and how to appropriately direct them into this program. We believe that the current number of concussions that are happening on this campus are not being fully “captured” by our student health services. With the increased recognition on campus we will see an increase in the number of cases therefore more support to our student health providers is essential in delivering the highest level of care. This project along with the support of the bridge fund gives us an opportunity to better deliever this type of service to our students directly on campus.

This proposal is being developed to help support the Emory Campus Life’s strategic plan goal to “Create a Safe, Healthy, and Sustainable Environment”. With the support of the bridge fund we have an opportunity to uphold that goal by taking the quality of care that we deliever to our student-athletes and bringing it to all of our students. We believe that taking these “best practices” from our governing health organizations and developing this system of care we will be providing a much needed service for our students and be a model for other universities.