

Feasibility

Can the sensor survive impact of 95Gs?

- Placement of sensor
 - Somewhere on or in the helmet will help protect it from a direct impact

Can the sensor be secured to the player with a low risk of being displaced?

- Ear Clip can easily be dislodged. If tight enough to not be easily dislodged it will likely be uncomfortable for the player
- Mouth guards are easy to dislodge and are kept loose enough the sensor may not accurately detect impacts.
- Embed in helmet would likely be secure.
- Must prove secure attachment method with ASTM 1405 Shock Test

Sensor location allows for accuracy

- Ear Clip can easily be dislodged, but if secure could be accurate
- Mouth guard may be held too loosely for accurate results
- Chin Strap would likely have background noise and will not feel the same impact as the head
- Helmet feels about 10% of the impact sustained by the head.
 - Could do experimental calculations to determine general equations for calculations
 - May be due to improper helmet use
- Testing can be done to prove this once testing bed is built

Accurately alert personal

- LEDs – May not always be seen on sidelines
- Vibration – only alerts player, if unresponsive or uncooperative he will not inform medical personal/coaches
- Device breaks on impact – only usable once
- Audio – can only inform player unless very loud which could hurt players ears
- UI/App/Bluetooth – As long as transmitter is okay, this will keep sideline personal informed

Power entire season

- Must research power consumption requirements
- Disposable – if they run out they will have to be replaced
- Rechargeable – avoids removable parts and can allow for charging if power doesn't last whole season
- Solar/body heat/movement – keep battery charged as it loses energy
 - May require more space than form factor allows
 - May be too difficult to implement by May

Information Display

- May require some survey analysis/research on best ways to display information
- Want to be able to fully inform medical team without information overload
- A simple view screen with an option to click on a player for more detailed information seems the most promising option

Continual Monitoring

- Need to be able to have the sensor able to detect a concussion at any point during the match
- Must weigh power options to ensure the battery lasts the required amount while still having the possibility of sending data the entire time
- Majority of power options allow for the power time needed
- Failsafe must be in place to prevent loss of data incase of communication issue.

Communication Method

- Way of getting the data from the sensor to the medical team
- Need to ensure no connection losses between sensor and collector
- Needs to work in open field without wireless network
- Needs to have offline mode to still be able to monitor players if there is no cellular coverage.

Data Transmission

- A way to compress the data to send to the database
- Calculations must be done to determine G-force and direction of impact from sensor
- If other sensors are used (mouth guard) they will need a method to communicate to the collector