# Health and Movement Science Stage 6 – Year 12: Depth study (Sports injury)

**Title:** Sports injury **Duration:** 20 hours/5 weeks

**Description:** This depth study is centred around acase study of an injured athlete. Students will have the opportunity to extend their understanding of content from the Health in an Australian and Global Context, and Training for Improved Performance focus areas. This unit provides students with the opportunity to understand the processes, resources and facilities that will be used from the moment of injury to the moment of return to play. The unit covers the process of classification of injury, assessment of injury, new technologies and treatments in health care, health expenditure, rehabilitation procedures and return to play.

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| Outcomes | Subject-specific requirements |
| A student:   * examines how technology and data can achieve better health for all Australians HM-12-02 * investigates factors that impact movement and performance HM-12-04 * analyses individual and group training programs to improve performance HM-12-05 * critically analyses the relationships and implications of health and movement concepts HM-12-06 * communicates health and movement concepts using modes appropriate to a range of audiences and contexts HM-12-07 * generates and assesses new ideas that are meaningful and relevant to health and movement contexts HM-12-08 * proposes and evaluates solutions to complex health and movement issues HM-12-09 * analyses a range of sources to make conclusions and judgements about health and movement concepts HM-12-10 | This depth study partially fulfills the syllabus requirement for a minimum of 2 depth studies. This depth study also contains an assessment task, one depth study in Year 12 must be assessed as part of the school-based assessment task.  This depth study shows how the Health in an Australian and Global Context and Training for Improved Performance focus areas can be integrated together where a case study drives the focus.  This depth study follows a case study based on an athlete who sustains an injury and provides opportunities for students to consolidate their knowledge and understanding as well as provides opportunities to extend the syllabus. |
| **Assessment** | |
| This depth study contains formative assessment activities that will be combined to form a portfolio. The portfolio will be used to complete the formal summative school-based assessment task. The formative assessment activities provide students with the opportunity to apply the knowledge and skills that they have developed and to give and receive feedback.  The formal summative school-based assessment task for this depth study is the completion of unseen questions with the support of the portfolio that has been gathered throughout the depth study. The portfolio does not form part of the formal summative assessment. The unseen questions will be completed in class time. | |

## Case study: Part A

| Content | Suggested teaching and learning activities | Adjustments |
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| How do individuals train for sustained movement and performance?  Explain the management and prevention of sporting injuries, including: classification of sports injuries, such as direct and indirect, soft and hard tissue or overuse.  How do individuals train for sustained movement and performance?  Explain the management and prevention of sporting injuries, including: assessment of injuries, including the Talk, Observe, Touch, Active movement; Passive movement; and Skill (TOTAPS) test. | Students are introduced to the sport of AFL Women’s (AFLW) by watching an extract of an [AFLW game](https://www.youtube.com/watch?v=qNErlbWDaJk). They participate in a guided discussion with questions that could include:   * What are the differences between AFL and AFLW? * What are the specific sporting movements or actions in this sport? * What are the dominant energy systems for these specific movements or combination of movements?   *Note: This activity can be used to determine prior knowledge and understanding of AFL and specifically AFLW, such as length of season and sport-specific movements or actions.*  Students engage with the case study where an AFLW midfielder is running towards the opposition to make a tackle. She suddenly steps laterally, changes direction fast and tears her right anterior cruciate ligament (ACL).  Students view/listen to and/or read a description of a sports injury sustained by an [AFLW Collingwood Magpies](https://www.collingwoodfc.com.au/news/1045597/davey-sidelined-with-serious-knee-injury) player as well as a [knee ligament anatomy animation](https://www.youtube.com/watch?v=RTV5Yo3E7VQ) and a detailed anatomy image of a knee joint. Students consolidate their understanding by answering questions which could include:   * What is the function of the synovial joint? * What is the function of tendons? * Why are ligaments important for this specific joint?   Students discuss the classification of this injury, explain how the injury occurred and explain why the injury is classified in this way.  Students investigate the function of the ACL, posterior cruciate ligament (PCL), medial collateral ligament (MCL) and lateral collateral ligament (LCL). Students extend their understanding by responding to questions which could include:   * Where are the location and attachment points of these 4 ligaments in a knee joint? * What are the functions of these 4 ligaments? * What movements do these 4 ligaments allow in AFL? * What are the different grades of ligament tears? * Justify which ligament is most crucial for the player. * For which grade of tear would you consider taping and returning to play? Justify your reasoning. * Why are female athletes more susceptible to ACL injuries? * What are some possible preventative strategies to minimise these risks to female athletes?   Students are assigned the role of the AFLW sports trainer. Students are asked to justify how they would assess an ACL injury when they run out on the field. |  |

## Case study: Part B

| Content | Suggested teaching and learning activities | Adjustments |
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| How is the growing and changing use of technology and data impacting Australia’s healthcare system?  Investigate new technologies and treatments in the healthcare system. | *Note: Each case study builds onto the previous case study to develop knowledge and understanding. Students engage in the following extension to the case study.*  Following magnetic resonance imaging (MRI), the radiologist and sports orthopaedic surgeon informs the player that she has ruptured her right ACL and will require hamstring graft surgery and 9 months of rehabilitation. The player wants to get a second opinion, because she needs to be at her peak for the next AFLW season.  The teacher leads discussion on the different advancements in surgical technologies and treatments. This could include, but is not limited to: minimally invasive arthroscopic techniques; 3D printing of joints; robotic surgery; stem cell therapy and allograft.  Students then research and create a timeline of the advancements in surgical technologies and treatments.  Students take on the role of an orthopaedic surgeon where the player has booked an appointment for a second opinion.  In preparation for the appointment with the player, students are directed to investigate as a surgical team and gather evidence on the latest advancements in surgical technologies and treatments. This could include: grafts of the patella tendon, hamstring and quadriceps tendons; allograft; synthetic grafts; ligament advanced reinforcement system (LARS); xenograft; and bridge-enhanced anterior cruciate ligament repair (BEAR). During the investigation the student taking the role of the orthopaedic surgeon should consider the following points:   * cost of the surgery * availability of equipment/other personnel required * length and extent of recovery * diagrams, printed, video or aural materials to support the surgery * specialist surgeon requirements and/or training * benefits * success rates * re-tear rates * known risks or complications.   Students compile their evidence for the player and make a judgement on the surgical approach for the player. Students justify their response and whether they would consider the surgical approach if the player was a 60-year-old female.  Each team presents their recommendation with supporting evidence. |  |

## Case study: Part C

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| Content | Suggested teaching and learning activities | Adjustments |
| How is the growing and changing use of technology and data impacting Australia’s healthcare system?  Investigate new technologies and treatments in the healthcare system. | *Note: Students engage in the following extension to the case study.*  The player is concerned about early onset arthritis as a result of the ACL surgery. They decide to contact several elite athletes from different sports who have sustained a similar ACL injury to discuss their non-surgical approach.  Students are assigned the role of the player to investigate the benefits, disadvantages and success rates for a non-surgical approach.  The student(s) compile their evidence to make a judgement on the most beneficial treatment for the player (surgical or non-surgical approach).  The student(s) present their recommendation with supporting evidence. |  |

## Case study: Part D

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| Content | Suggested teaching and learning activities | Adjustments |
| How does Australia’s healthcare system work towards achieving better health for all Australians?  Discuss health expenditure and its impact on current and future populations, including: Medicare; private health insurance; and related Commonwealth-funded programs. | *Note: Students engage in the following extension to the case study.*  The AFLW club has an official health and wellbeing partner that provides private health insurance for all its players.  Students answer questions which could include:   * Identify the health services and facilities that the player has used or will consider using during the treatment, management and rehabilitation of their ACL injury. * For each of those health services and facilities, determine whether the service or facility will be covered by Medicare, private health insurance, both Medicare and private health insurance, or whether it is not covered. * Describe one Medicare and one private health insurance service or facility that the player has used, or will consider using, during the treatment, management and rehabilitation of this ACL injury. * Determine the benefits of Medicare and private health insurance for this player. * Consider the impact on the player if they, or their club, choose not to pay for private health insurance. |  |

## Case study: Part E

| Content | Suggested teaching and learning activities | Adjustments |
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| How do individuals train for sustained movement and performance?  Explain the management and prevention of sporting injuries, including: rehabilitation procedures, such as progressive mobilisation; graduated exercise; training; and use of heat and cold. | *Note: Students engage in the following extension to the case study.*  The player is still unsure about the best treatment option, so they want to consult with the AFL’s physiotherapist and sports coach on the ACL rehabilitation program should they decide to have surgery. The physiotherapist starts developing the rehabilitation program (see Appendix A) and will meet with the player in the coming days.  Students take on the role of the physiotherapist. Students engage with the proposed rehabilitation program (see Appendix A) and build their understanding by responding to questions to finalise the program and prepare for the appointment with the player. The questions could include:   * What would be the main goals during the stretching and training phases? * Why would heat or cold, or a combination of both, be used throughout the stretching and training phase? * What exercises would be recommended during the stretching phase? * Which combination of total body exercises could benefit the player? * What fitness tests or measures would you conduct during the progressive mobilisation to conditioning phases to monitor the player? * What conditioning exercises would most develop the ACL area? * What sport-specific movements would be most beneficial for the aerial contests and ground ball movements during the training phase?   During the appointment, the player has asked the physiotherapist some questions to help them understand the program. Propose the responses for the possible questions which might include:   * What forms of ice and timings do you recommend at the different phases of recovery? * What would be the impact to my recovery if I am unable to access ice during the total body fitness and training phases? * What are the benefits of conducting anaerobic plyometric training with a weighted vest? |  |

## Case study: Part F

| Content | Suggested teaching and learning activities | Adjustments |
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| How is the growing and changing use of technology and data impacting Australia’s healthcare system?  Investigate new technologies and treatments in the healthcare system.  How does Australia’s healthcare system work towards achieving better health for all Australians?  Discuss health expenditure and its impact on current and future populations, including: Medicare; private health insurance; and related Commonwealth-funded programs.  How do individuals train for sustained movement and performance?  Explain the management and prevention of sporting injuries, including: rehabilitation procedures, such as progressive mobilisation; graduated exercise; training; use of heat and cold. | *Note: Students engage in the following extension to the case study.*  The player is still unsure of the best treatment options and they want to consult with the AFL’s physiotherapist and sports coach on the ACL rehabilitation program if they decide on non-surgical treatment.  Students take on the role of the physiotherapist to research and prepare the rehabilitation program for an appointment with the player.  In your rehabilitation program you could consider your recommendations for the first month, up to 3 months, and up to 6 months and beyond.  Based on the different surgical and non-surgical options, health insurance and rehabilitation programs, propose your final recommendation on the best treatment options.  Students compile their evidence and propose their final recommendation on the most beneficial treatment for the player. Note: this could be a surgical or non-surgical approach.  Students present their recommendation with supporting evidence. |  |

## Case study: Part G

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| Content | Suggested teaching and learning activities | Adjustments |
| How do individuals train for sustained movement and performance?  Explain the management and prevention of sporting injuries, including: return-to-play policy and procedures, including application to different sports; responsibility. | *Note: Students engage in the following extension to the case study.*  The pre-season of the AFLW is starting in the next month. The player is meeting with the AFLW coaching team to plan their return to the field.  Students investigate what return-to-play considerations the AFLW club and the player should consider for this situation. Students propose responses to questions which could include:   * Justify the performance or fitness tests the player would need to undertake? * How would you determine the psychological readiness of the player after they have sustained this injury? Would this be different if this was a re-injury? * What specific exercises or activities should this player undertake during their game warm-up in comparison to their team members? * Explain the policies or procedures specific to AFLW which need to be considered. * Explain whether there are any further recommendations to the policies and procedures within AFLW to support a player to return to the field safely following an injury. * Compare these policies and procedures to another sport. * Why aren't such policies and procedures applied to all sports? * Compare this player’s return-to-play policies and procedures to a player who sustained a concussion in training last week. Discuss this with a rugby sevens player. * Who should have ultimate responsibility for deciding when the player returns to competition?   Students justify how the AFLW player can return safely to the season. |  |

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| Adjustments for students with disability |
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| Reflection and evaluation |
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# Teacher resources

AFL Women’s, ‘Last Two Minutes: Brisbane v Melbourne | 2022 NAB AFLW Grand Final Season Seven’ [video], YouTube, accessed 7 December 2022,

<https://www.youtube.com/watch?v=qNErlbWDaJk>

**Classification of sports injuries**

Collingwood Football Club (10 January 2022) *Davey sidelined with serious knee injury,* Collingwood FC website, accessed 7 December 2022,

<https://www.collingwoodfc.com.au/news/1045597/davey-sidelined-with-serious-knee-injury>

Dr Bertram Zarins MD ‘Knee Ligament Anatomy Animation’ [video], YouTube, accessed 7 December 2022,

<https://www.youtube.com/watch?v=RTV5Yo3E7VQ>

Sydney Orthopaedic Research Institute (SORI) *Ligament injuries,* SORI website,accessed 7 December 2022,

<https://www.sori.org.au/index.php/patient-information/ligament-injuries/>

AFL Coach *Female football resources*, AFL website, accessed 7 December 2022,

<https://www.play.afl/coach/resources/prep-to-play/female-football-resources/>

Cootes I (6 March 2003) *Why have more than 20 top women's footballers torn their ACLs in the last 12 months?,* Optus Sport website,accessed 7 December 2022,

<https://sport.optus.com.au/womens/articles/os50521/acl-injury-beth-mead-fifa-womens-world-cup-2023-wsl-arsenal-research>

**New technologies and treatments in the healthcare system**

McDermott I (2019) *Research Watch – ACL Repair vs Reconstruction,* London Sports Orthopaedics website, accessed 8 December 2022,

<https://sportsortho.co.uk/blog/research-watch-acl-repair-vs-reconstruction/>

Robinson E (7 October 2022) *New technique for ACL repair taps body’s own healing power,* OHSU website,accessed 8 December 2022,

<https://news.ohsu.edu/2022/10/07/new-technique-for-acl-repair-taps-bodys-own-healing-power#:~:text=back%20together%20again.-,Known%20as%20Bridge%2DEnhanced%20ACL%20Restoration%20implant%2C%20or%20BEAR%2C,environment%20within%20the%20knee%20joint>

Billups E (28 September 2022) *New treatment may improve recovery for patients with ACL tears,* Spectrum News website*,* accessed 8 December 2022,

<https://www.ny1.com/nyc/all-boroughs/exploring-your-health/2022/09/28/new-treatment-may-improve-recovery-for-patients-with-acl-tears>

**Rehabilitation procedures**

NoGAPS (National Guidance for Australian Football Partnerships and Safety Project) *Footy First: A training program to prevent leg injuries in community Australian Football*,<https://footyfirstaustralia.wordpress.com/footyfirst-program/>[no longer available].

Netball Australia *The knee program,* Netball Australia website,accessed 6 December 2022, <https://knee.netball.com.au/>