



MedTech: Orthopaedic Implants and Regenerative Medicine

Explore regenerative medicine and learn how MedTech is revolutionising orthopaedics.

If your students are completing the whole of this course online and are not participating in the teacher-led lessons based on it, then they can complete useful and engaging activities based on the content covered. You can choose for your students to complete individual tasks by themselves or encourage group work. Though you may have your own ideas about what your students can do with the course content, we've made things easy for you by suggesting some activities that you can submit to your students below. Instructions for the students can be found later in this document.

Individual student tasks taken from the course

Reflection: Students write a 500 word reflection on what they learned from the course, including anything they might do differently now as a result of their learning, and anything additional they found out from their own reading around the topic. They will submit this reflection as a written essay, podcast or video.

Activity: Students watch the video in Step 1.3 (What joints can be replaced?) and then work through the exercise in Step 1.3. They can self-assess or submit their exercises to the teacher.

Research task: Students research and produce a discursive piece of writing which examines the benefits and drawbacks of orthopaedic implants and regenerative medicine. In the assignment, students should attempt to give a balanced and detailed view of each based on their learning and research. At the end of the assignment, they should summarise and give their personal opinion, answering this question:

- Is regenerative medicine a better treatment option than orthopaedic implants?

Group tasks based on the course

Research task: Groups research regenerative medicine and stem cell treatment. Each group will create an engaging poster, using creative materials (either digitally online or physically and then shared online to form a group presentation) to create diagrams and present information. Posters should include:

- Information on the different types of stem cell and their functions.
- Applications of stem cells.
- Information on the stem cell therapy process.
- Benefits of stem cell therapy.

Groups submit their poster to the teacher, with a brief account on their experience of group work: did the group work well together? How did they decide to allocate tasks?

Discussion task: In groups, discuss the following:

- Is regenerative medicine a better treatment option than orthopaedic implants?

This could be framed as a debate, in which half the group can argue for regenerative medicine, half argue for orthopaedic implants. They should submit their arguments to the teacher.

Collaborative task: Groups create an information leaflet to be given to a hypothetical joint replacement patient. Leaflets should include a definition of biocompatibility, considerations in designing implants, and information on at least four different types of materials used in replacements. Information in Step 1.4 will be useful.

Additional support

You can use the [How to use FutureLearn guide](#) with your students to get them started. There is also a school-facing [Guide to safeguarding and security on FutureLearn](#) if you need it.

Test

You can use the test questions listed in the student instructions below as a short assessment to enable your students to demonstrate what they have learned on the course. The assessment has 15 marks in total.

The questions have been designed to be flexible and open. The questions indicate which steps the answers can be found on. The marks available reflect the likely length and complexity of the answer expected, and how many points they are likely to make. For example, a 5-mark question might reflect a longer, more complex question, or one where they have asked to describe or explain a number of elements. Depending on the level and ability of your students, you can decide how you wish to award the marks so they are appropriate for your class.

Each question suggests which steps the students may wish to return to answer the questions. **You can decide if you want to include this information when you share the assessment with your students.**

Student instructions

Reflection

Write a 500 word reflection of what you have learned from the course. It should include anything you might do differently now because of what you learned, and anything additional you found out in your reading around the topic. Submit this reflection to your teacher as a written essay, podcast or video.

Activity

Watch the video in Step 1.3 (What joints can be replaced?) and then work through the exercise in Step 1.3. You can self-assess or submit your exercise to your teacher (your teacher will specify).

Research task

Research and produce a discursive piece of writing which examines the benefits and drawbacks of orthopaedic implants and regenerative medicine. In the assignment, you should attempt to give a balanced and detailed view of each based on your course learning and research. At the end of the assignment, you should summarise and give your personal opinion, answering this question:

- Is regenerative medicine a better treatment option than orthopaedic implants?

Group discussion

In your group, discuss/debate the following:

- Is regenerative medicine a better treatment option than orthopaedic implants?

Note down some of the arguments in support of regenerative medicine, and some of the arguments in support of orthopaedic implants. Submit these to your teacher.

Group research task

As a group, research regenerative medicine and stem cell treatment. Your group will create an engaging poster, using creative materials to create diagrams and present information. Posters should include:

- Information on the different types of stem cell and their functions.
- Applications of stem cells
- Information on the stem cell therapy process
- Benefits of stem cell therapy

Submit your group's poster to your teacher, with a brief account on your experience of group work: did your group work well together? How did you decide to allocate tasks?

Group collaborative task

Create an information leaflet to be given to a hypothetical joint replacement patient. Leaflets should include a definition of biocompatibility, considerations in designing implants, and you should

provide information on at least four different types of materials used in replacements. Information in Step 1.4 will be useful.

Test

Complete the assessment questions below to demonstrate your understanding of the course. You can refer back to the course to find the answers or more detail as you need to. You should not however share your answers with other students.

Your answers should be written in full sentences and be appropriately detailed. Make sure you read the questions carefully before starting to answer. Each question shows how many marks are available – use this to guide how much detail or how many points you need to include.

[The questions also indicate where you can start to look to find the answer. You can also include information from other steps if that is relevant.]

1. Name three different areas in the body where a joint may be replaced. Identify the most commonly replaced joint. (3 marks) [Step 1.3]
2. Explain what the term 'biocompatibility' means. (1 mark) [Step 1.4]
3. List two different kinds of material which can be used in replacements, and explain why they are used. (4 marks) [Step 1.4]
4. Name two types of stem cell and explain what they do. (4 marks) [Step 2.2]
5. Give three of the benefits of stem cell therapy. (3 marks) [Step 2.2.]