

Wk4 CER: Bioethics: bone donation and 3D parts

Your goal: Debate whether 3D-printed and donor bone implants should be prioritized by ability to pay, then post a CER.

One product: One-paragraph CER defending a specific allocation principle for scarce bone-graft material.

Question: When suitable bone-graft material is scarce, should ability to pay affect priority?

Start the work

The earlier anatomy map separated location evidence from diagnosis. Use the same claim-limit discipline today; that map is not required here.

1. Read S1, vocabulary and E1–E3.
2. List two fair allocation rules and one risk of each.
3. Choose a principle and test it against a strong counterpoint.
4. Write and check one CER paragraph.
5. Use the confirmed board and one final Schoology PDF route; record any access hold honestly.

If the board or assignment is unavailable, save the CER and tell the teacher. Ask for the posting route. When access works, post your work, capture your own screenshot and check that Schoology shows Submitted.

Words you will use

core decompression

A procedure that drills into affected bone to relieve pressure and create channels for new blood vessels.

spinal fusion

Surgery intended to join two or more vertebrae into one solid bone.

bone graft

Bone tissue placed where repair or reconstruction is needed.

autograft

A graft moved from one location to another in the same person.

allograft

A graft transferred from another person.

alloplast

A synthetic substitute material; in this lesson, a manufactured bone-graft substitute.

3D printing

A manufacturing process, not a single graft material or proof of suitability.

osteonecrosis

Death of bone tissue linked to disrupted blood supply; also called avascular necrosis.

scarcity

A situation in which the available suitable resource cannot meet current demand.

allocation principle

A stated rule for deciding priority when a resource is scarce.

urgency

How strongly the consequences of delay support earlier access.

likelihood of benefit

An estimate of whether an intervention will provide a useful outcome.

counterargument

The strongest relevant objection to a claim.

CER

Claim, source evidence and reasoning that connects the evidence to the claim.

S1: scarcity and ability to pay

S1 is a hypothetical program, not a hospital report. Three fictional patients, A, B and C, seek bone reconstruction. Assume this program has limited donor-graft supply and limited production capacity for suitable printed implants. Clinical teams must first assess which option, if any, suits each person. No urgency findings, benefit estimates, waiting times or financial details are supplied. A proposal would prioritize people who can pay more. Recommend a rule for access when a medically suitable resource is scarce. Address ability to pay and explain how your rule would apply to donor material and suitable printed options. Do not assign a winner or assume that all three need the same material.

E1: Living bone and function

MedlinePlus describes bone as living tissue that continually rebuilds and helps support the body and movement. This fact explains why protecting bone function matters. It does not identify a fair allocation rule. Use this source fact in your CER, including on the independent route.

E2: Graft sources and a real clinical example

AAOS distinguishes an autograft from the same person and an allograft from another person. In hip osteonecrosis, disrupted blood supply damages bone. Core decompression can be combined with bone grafting; the stage of disease matters. This is a documented treatment context, not a claim that every affected person needs a donor graft.

E3: Synthetic does not mean printed or interchangeable

AAOS describes synthetic ceramic graft materials used in spinal fusion. FDA describes printing as a way to manufacture devices, including implants. Some printed devices match a patient's anatomy. These sources do not show that a printed implant replaces every donor graft. They supply no cost comparison or local inventory.

R: allocation principles

Urgency gives priority to harm that delay could cause; its risk is repeatedly delaying less urgent needs. Likelihood of benefit favors an expected useful outcome; its risk is disadvantaging people whose outcomes are uncertain. Waiting order respects time already spent waiting; its risk is overlooking a more urgent new need. Ability to pay favors people who can cover more cost; its risk is excluding people with less money despite medical need. These are discussion principles and possible tradeoffs, not established hospital policies or measured findings. A rule may combine principles, but state which takes priority and how ties would be handled.

Scope of this lesson

The source cards supply the reading needed for this original CER. Follow the separate Project 1.1.6 Break a Leg introductory imaging task when the teacher supplies it. Do not mark that activity complete from this paragraph.

Worked argument: repair-bench priority

Parallel example: a fictional school has one repair bench and two broken classroom models. Both are safe to repair. One is needed for tomorrow's lesson; the other has waited longer. No money changes hands.

Claim: use tomorrow's lesson need first, then waiting order for equal needs. Evidence: the supplied example says only one model is needed tomorrow. Reasoning: this rule preserves the next lesson while giving waiting time a defined role. Counterpoint: the older request keeps waiting. Response: schedule it

next if no earlier need appears, and review repeated delays.

Check: the deadline supports urgency in this model example. It does not prove a medical outcome or settle the role of payment in S1. Transfer the claim, evidence, reasoning and response structure; choose your own bone-allocation principle.

Try the decision

Which practice statement stays within S1 and the source cards? This checks evidence boundaries, not your preferred ethical rule.

- Choose an allocation principle, explain its tradeoff and the role of payment, and leave patient ranking open.
- Give every patient a printed implant because printing proves donor material is unnecessary.
- Rank A, B and C by survival benefit because the source cards establish their outcomes.

Explain your choice using the reading. Discuss it or say it to yourself. This practice does not add another submission.

Your 80-minute flow

0–5 minutes	Read S1 and identify the proposed payment rule.
5–20 minutes	Read, compare two rules and record each risk.
20–40 minutes	Defend a rule and record the strongest objection and reply.
40–55 minutes	Choose a claim, E1's fact, E2's pathology example and E3's printing distinction; outline reasoning.
55–75 minutes	Write the paragraph; post and capture own post only if access is confirmed. Prepare the final PDF or save the draft if access fails.
75–80 minutes	Share one tradeoff; check the paragraph and your own post.

Your response record

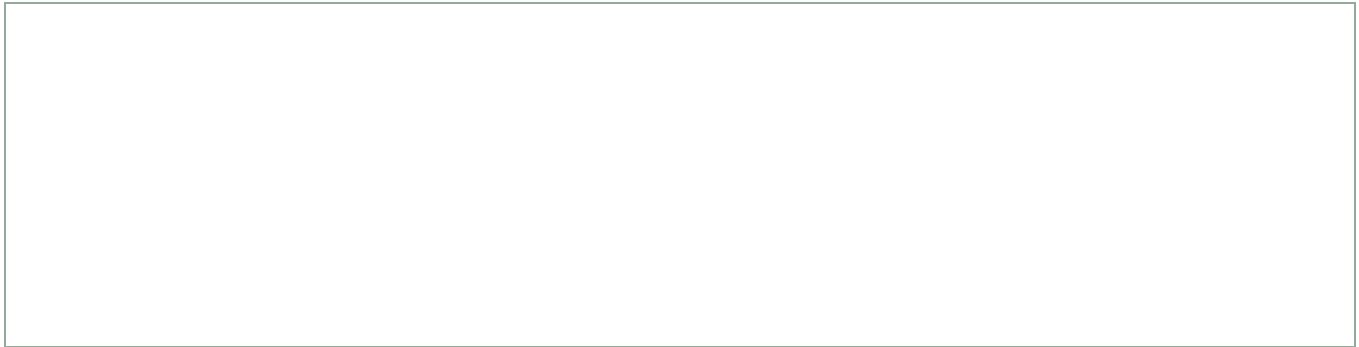
Use these labels on paper or in your document. The space below also works when this page is printed.

Compare two rules

Write two allocation rules you consider fair. For each, name who gains priority and one person or need that could move back. State one risk of each rule.

Use the supplied principles. Explain fairness rather than calling a rule fair without a reason.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

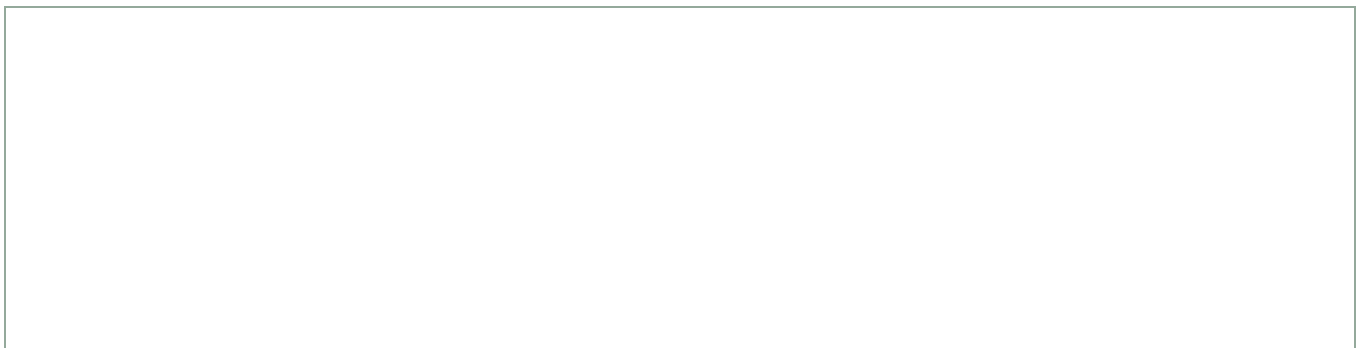


Separate facts from values

Record E1's linked-resource fact, E2's osteonecrosis graft-use example and E3's printing distinction. Explain what each supports. Name one missing fact that prevents ranking A, B and C.

Anatomical suitability, urgency or expected benefit could be missing. Payment is not a measured medical benefit.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.



Debate or work independently

State your proposed rule. In a group, record the strongest actual counterpoint and your reply. Alone, choose one supplied objection and label it “solo counterpoint.”

Objections: Waiting order may delay someone with a more urgent need. Benefit-based priority may exclude uncertain cases. Excluding payment from priority may leave the program’s costs unresolved. Select the objection that challenges your rule; do not invent peer speech.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.



Write one paragraph

Defend a specific principle for scarce bone-graft material. Address ability to pay, donor and suitable printed options, E1, E2's osteonecrosis example, E3's printing distinction, reasoning, and the strongest counterargument with your response.

Sentence route: My rule is ___. E1 says ___; E2's real graft-use example is ___; E3 limits printing claims by ___. These facts matter because ___; my fairness value is ___. An objection is ___. I answer ___, while ___ remains unknown.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

Check, revise and prepare submission

Check source IDs, distinguish your values from source facts, and remove any unsupported patient ranking. Revise a claim or explain why it already fits. Prepare the paragraph for the board and final PDF.

Board posting needs the teacher's confirmed board. If access is unavailable, save your paragraph and tell the teacher. Capture only your own real post when the board opens.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

A large, empty rectangular box with a thin black border, intended for the user to provide a submission, such as a paragraph, table, graph, or drawing.

Check your product

- I state a specific allocation rule and address ability to pay.
- I compare two rules and their risks, then answer a strong counterpoint.
- My CER includes E1, E2's osteonecrosis graft-use example and E3's printing distinction, with reasoning and a limit.
- I distinguish donor grafts, synthetic substitutes and printing; I do not rank patients from missing facts.
- Check your own post and, after uploading, check that Schoology shows Submitted.

Keep the limit: S1 assumes scarcity. Sources cannot rank patients, compare all products, establish prices, or prescribe an allocation rule. This original CER cannot complete official PLTW work.

Turn in your work

Use your own section's assignment. After the teacher identifies the class board, post the paragraph and place the CER plus a screenshot of your own post in one final PDF. Check the PDF preview and posted due date.

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[Section 1292: Wk4 CER: Bioethics: bone donation and 3D parts](#)

[Section 6792: Wk4 CER: Bioethics: bone donation and 3D parts](#)

Carry forward

Keep the CER and its source IDs. Save any posting or submission issue for teacher resolution.

The allocation argument leads into studying bone structure and repair; it does not supply a treatment decision. How could bone structure affect the functions a repair method must support?

Sources and resources

[Open today's page](#)

medlineplus-bone · Bone Diseases

MedlinePlus, National Library of Medicine

<https://medlineplus.gov/bonediseases.html>

aaos-grafts · Bone and Tissue Transplantation

AAOS and American Association of Tissue Banks

<https://www.orthoinfo.org/treatment/bone-and-tissue-transplantation/>

aaos-avascular · Osteonecrosis of the Hip

American Academy of Orthopaedic Surgeons

<https://www.orthoinfo.org/diseases--conditions/osteonecrosis-of-the-hip/>

aaos-synthetic · Bone Grafts in Spine Surgery

American Academy of Orthopaedic Surgeons

<https://www.orthoinfo.org/treatment/bone-grafts-in-spine-surgery/>

fda-printing · Medical Applications of 3D Printing

US Food and Drug Administration

<https://www.fda.gov/medical-devices/3d-printing-medical-devices/medical-applications-3d-printing>