

2027-04-22 · 80 minutes

Wk14 CER: Cardiac data CER analysis

Your goal: Analyze EKG and blood-pressure data and write a CER about cardiovascular health.

One product: Written CER comparing EKG and blood-pressure data to normal reference ranges: specific claim, two measurement evidence entries, mechanism-based reasoning, and one factor that could alter readings.

Question: What can the fictional ECG and blood-pressure entries support, and which health claims exceed their evidence?

Start the work

Electrical activation precedes and overlaps the onset of pumping; a trace can support timing claims without measuring blood pressure or proving effective blood flow.

1. Compare the supplied ECG and pulse values with the stated references and compare both blood-pressure numbers. Leave actual-data fields blank without their own observations.
2. Make a bounded claim about the fictional cardiovascular data without diagnosing health.
3. Cite at least two numerical evidence entries, including ECG timing or rate and blood pressure, with units and provenance.
4. Add reasoning connecting electrical timing, cardiac structure and pressure to the quantities reported.
5. Note one factor that could change a reading, explain its missing evidence, then review and revise the full CER.

If access is unavailable, save the dated practice record and tell the teacher. After doing the assigned official work, keep its required screenshot or note for the tracker. After uploading, check that Schoology shows Submitted.

Words you will use

claim

A precise statement supported by the available evidence.

evidence

Information used to support or challenge a claim.

reasoning

An explanation connecting evidence to a claim using a relevant principle.

CER

Claim, evidence and reasoning in a connected response.

mechanism

A process explaining how a structure or system works.

reference range

A stated comparison interval for a specified measurement and context.

category

A group defined by stated comparison rules.

AND

A rule requiring both stated conditions to hold.

OR

A rule met when at least one stated condition holds.

systolic pressure

The higher arterial pressure during the pumping phase.

diastolic pressure

The lower arterial pressure between beats.

blood pressure

Pressure of blood against vessel walls.

mmHg

Millimeters of mercury, a pressure unit.

pulse

A pressure pulse in an artery associated with a heartbeat.

bpm

Beats per minute, a rate unit.

ECG / EKG

Electrocardiogram, a recording of electrical activity at the body surface.

electrical activation

A change in cellular electrical state that precedes the resulting contraction.

R peak

The prominent positive event within the model's QRS complex.

R-R interval

Elapsed time between adjacent R peaks.

QRS complex

The ECG events associated with ventricular electrical activation.

P wave

The ECG wave associated with atrial electrical activation.

T wave

The ECG wave associated with ventricular electrical recovery.

duration

The elapsed time of an event or interval.

rate

The number of events per unit time.

regular timing

Equal intervals in the supplied event sequence.

atrium

A heart chamber that receives returning blood.

ventricle

A heart chamber that pumps blood into an outgoing artery.

valve

A structure that helps prevent backward blood movement.

artery

A vessel carrying blood away from the heart.

cardiovascular

Relating to the heart and blood vessels.

contraction

Muscle activity that develops force and can drive blood movement.

blood flow

Movement of blood through a vessel or system.

stroke volume

Volume ejected by one ventricle in one beat.

cardiac output

Volume pumped by one ventricle per unit time.

resting

A stated condition of rest, which needs a documented method in real measurements.

provenance

The source and history of an input or result.

constructed

Deliberately created as an instructional model rather than observed.

stipulated

Supplied as an assumption or invented input for an exercise.

comparison

An assessment of a value against a stated rule or other value.

diagnosis

A clinical determination of a condition using appropriate evidence.

uncertainty

A limit on what the evidence allows us to conclude.

factor

A condition that could influence a reading or outcome.

posture

The position in which a body is held.

causal claim

A statement that one factor produced an outcome.

limitation

A specific boundary on the conclusion supported by evidence.

peer review

Feedback from another person on the quality of work.

revision

A justified change made to improve a response.

ABI

Ankle-brachial index, a ratio comparing ankle and arm systolic pressures under a defined method.

PAD

Peripheral artery disease, involving reduced blood flow through peripheral arteries.

mL

Milliliter, a unit of volume.

liter

A volume unit equal to 1,000 milliliters.

authentic record

A record of work actually performed, with method and source identified.

H1: original analysis and the missing actual record

This is an original paper analysis of fictional adult Case A. No person was measured. The numbers are invented teaching inputs, not your health results.

Today's objective still requires actual cardiac data analysis. If those records are absent, use this practice and ask for the actual records before analyzing them.

April 21 supplied constructed ECG timing, an unrelated pulse-count exercise and a pressure-notation example. It did not establish that you recorded an ECG or measured blood pressure.

Case A below is a new fictional joint case. Its quantities are supplied together only for this exercise; they are not paired observations from a real body.

Do not import April 21's count exercise or notation example. Keep each source and record label attached to its values.

Actual inputs needed: the teacher-approved ECG with time scale and quality notes, pulse count and duration, blood-pressure readings, methods, conditions and the assigned reference source.

Keep real identities and health values in the teacher-approved private route. Use this public practice record for checks and requests for missing inputs only.

No electrodes, cuff procedure, exercise or caffeine trial is assigned here. A source describing a measurement does not authorize taking it in class.

D1: complete fictional adult Case A inputs

Case A is an invented adult teaching case described as resting. Actual age, medical history, medicines, symptoms and measurement quality are not supplied because there is no participant.

The constructed ECG event record has R peaks at 0.36, 1.16 and 1.96 seconds. Adjacent events are the only timing inputs needed for this comparison.

A P event precedes each QRS event, and a T event follows each QRS event in the model. No calibrated voltage, QRS duration or actual clinical tracing is supplied.

The Case A pulse entry is stipulated as 82 bpm. Its fictional blood-pressure entry is 128/78 mmHg: systolic 128 and diastolic 78.

Compute both adjacent R-R intervals. For equal intervals, model electrical rate equals 60 divided by the interval in seconds, in cycles per minute.

Show both subtractions in seconds: 1.16 minus 0.36, and 1.96 minus 1.16. Then divide 60 by the interval to get the constructed rate in cycles per minute.

Compare the stipulated pulse rate with your calculated model rate.

Use three comparison rows: ECG rate and interval pattern; stipulated pulse; and systolic/diastolic blood pressure. Retain every value, unit and fictional label.

Case A has no repeated BP readings or observations about stress, caffeine or posture. Name such a factor as possible, not as its discovered cause.

E1: reference comparisons with a stated scope

MedlinePlus lists a resting pulse range of 60 to 100 bpm for ages 10 and older and adults. It also lists 40 to 60 bpm for well-trained athletes.

Use the 60 to 100 band for the fictional adult comparison. A value inside that band is not proof of cardiovascular health.

For D1, compare the calculated electrical rate numerically with that band, while stating that it comes from constructed events rather than a measured pulse.

Equal R-R intervals describe regular timing in the supplied short sequence. No universal ECG health test or QRS-duration threshold is supplied.

The following adult BP comparison rows come from MedlinePlus. They are for the ordinary fictional values in this exercise, not an emergency or pediatric decision tool.

Normal: systolic below 120 AND diastolic below 80 mmHg. Elevated: systolic 120 to 129 AND diastolic below 80 mmHg.

Stage 1 range: systolic 130 to 139 OR diastolic 80 to 89 mmHg. Stage 2 range: systolic at least 140 OR diastolic at least 90 mmHg.

When components fall in different listed rows, use the higher applicable row for this paper comparison. A category describes the supplied values; it does not diagnose a person.

MedlinePlus explains that clinicians take multiple BP readings at separate visits before diagnosis. It also identifies a separate comparison context for children and teens.

Apply the AND condition to both Case A numbers. Test systolic and diastolic against each row and name the row where both conditions hold. Then compare the pulse entry with the stated resting band.

E2: connect structure, electrical timing and pressure

The atria receive blood and pass it to the ventricles. Ventricular contraction drives blood toward the lungs or body; valves help prevent backward movement.

NHLBI explains that the electrical system sets heartbeat timing. This links an ECG timing pattern to activation, not directly to the volume pumped.

An ECG records electrical signals. It does not deliver electricity to the body or directly measure cuff blood pressure, valve motion or blood flow.

Systolic pressure is the higher arterial pressure during pumping. Diastolic pressure is the lower pressure between beats. In 128/78, these are different pressure phases, not two heart rates.

OpenStax defines cardiac output for each ventricle separately. Stroke volume can vary, so a timing rate alone does not supply a measured output.

A useful reasoning sentence connects each instrument to its quantity. Equal model intervals support a timing description, while the separate pressure entry supports a BP-table comparison.

The data do not show which mechanism caused the pressure value. Do not claim a blocked vessel, weak heart, conduction lesion or adequate oxygen supply from these inputs.

MedlinePlus notes that further tests may be needed for an ECG diagnosis. A short recording may miss a problem that comes and goes.

Therefore a regular pattern and an in-band pulse cannot establish normal pumping or rule out disease. Case A is a constructed example, so no clinical conclusion is possible.

E3: a possible factor is not a found cause

CDC identifies recent activity, caffeine and measurement posture as factors that can affect a BP reading. It says some recent activities might make the reading higher.

Choose one factor and explain the missing information. For example, posture could influence a reading, but Case A includes no posture record.

A useful next record would document the relevant condition and method under teacher-approved work. This is a proposal to improve evidence, not permission for a new test.

Do not say stress or caffeine caused Case A's 128/78 value. No such exposure was recorded, and no before/after comparison was supplied.

Your reasoning should name the relevant function and its limits. A possible explanation does not become proven merely because it sounds biological.

R1: warmups, full CER and an overclaim check

Warmup 1: a fictional resting adult pulse is 105 bpm. Is it within or above the stated 60 to 100 band? Explain why that answer alone is not a diagnosis.

Warmup 2: what does reasoning add beyond quoting numbers? Answer before using E2 to revise your explanation.

Prerequisite: sort all three D1 comparison rows by quantity, value, unit, reference and limit. Compare both BP components, not just the pulse.

Write a full CER with one bounded claim, at least two numerical evidence entries, mechanism reasoning and one possible factor with its missing information.

The evidence must include D1 ECG timing or calculated rate AND the D1 BP entry. Cite D1 and the relevant E1/E2/E3 source cards.

Use at least one supplied MedlinePlus High Blood Pressure fact from E1 or E2 in the reasoning. A bare source name is not an explanation.

Recovery: start with one claim and one value, then add the second required quantity, references, reasoning and factor. The shorter start does not complete the product.

Self-check critique: a fictional writer says, "My heart is healthy because my pulse is 74 bpm and my ECG is regular." Identify the overclaim and the missing reasoning.

Rewrite it as a bounded statement about a fictional short record. Compare the pulse with the E1 band, then use E2 to state what those inputs cannot establish.

Check: the problem is not solved by adding a sentence claiming that normal numbers prove an efficient heart. Explain what was measured, what was compared and what remains unknown.

Optional extension: constructed Model B has R peaks at 0.20, 1.10 and 2.10 seconds. Compare its two intervals with D1 and state what further information is absent.

Extension check: Model B intervals are 0.90 and 1.00 seconds; they differ by 0.10 seconds. Unequal invented intervals do not identify a disorder or a cause.

No QRS widths, electrode quality or real participant data are supplied for Model B. Do not name a likely clinical conduction problem.

T1: independent review and revision

With an available partner, exchange original fictional CERs and record the actual critique. Keep personal health records out of the exchange.

Without a partner, use the supplied solo critique. It says: your pulse value is inside a band, so your claim that every cardiac measure is normal is justified.

Challenge that critique using both the BP rule and the limit of reference comparisons. A helpful review must inspect the full record, not just one number.

Check whether your CER states a precise claim, cites ECG and BP numbers, explains the instrument/function link, uses a BP source fact and limits its proposed factor.

Record one sentence before revision, the revised sentence and why it changed. If the original was sound, explain a justified retention instead.

Label this route solo when used. It can finish the original writing practice; it does not invent a partner exchange or complete missing actual-data work.

P1: actual coursework, preparation and submission

Today's official task is Activity 3.1.2 Cardiac Calculations; ask the teacher which portion is assigned.

Pump It Up includes journal pages 1 and 2, pulse/BP learning materials and a notebook BP chart with factors. These actual assigned materials remain separate.

Calculating Cardiovascular Health uses measured resting pulse and an assumed 75 mL per beat to estimate volume over several time spans, with final liters.

That assumed stroke volume is not a measured constant across an individual's lifetime. Do not add the two ventricles' outputs or treat volume units as length.

An Arm and a Leg includes journal pages 3 and 4, group Doppler/cuff work or the assigned nonparticipant data route, an ABI worksheet and case interpretation.

ABI work needs its actual arm and ankle pressure inputs and confirmed worksheet rules. None is supplied by this original CER; do not invent an ABI result.

Calculating Conditions includes a PAD model tour, partner discussion, notebook notes, case reasoning and a clinical-empathy video task. These are not completed by this lesson.

Ask for the linked worksheets, journal cases, videos, later conclusions and the assigned stopping point. This CER does not replace any official screen.

Ask for missing materials for the actual 3.1.1 model/flow work and 3.1.3 recording, journal and conclusions. Viewing an automatic badge does not prove performed work.

April 21's Heart structure and cycle preparation is 25 minutes in Lab Notebooks. No homework is due before this class, and no separate asynchronous task is listed.

The weekly absence route requires a teacher-posted data/model packet and teacher-selected Khan/EKG resources. This original practice does not establish access to that packet.

By Friday, the weekly plan requests cardiovascular data evidence through 3.1.3 and a tracker. April 23 lists 25-minute tracker/evidence preparation in Class Records.

Friday, April 23, is the ventilator allocation class, and the weekly tracker and evidence are due the same day.

Submit the CER through the confirmed enrolled April 22 route. Use evidence from actual analysis and the official task only after doing that work.

After genuine official work, preserve a screenshot OR note of completion for the tracker. If access is absent, save the dated original CER without claiming submission.

M1: a different fictional comparison

Model C is a separate fictional adult example. Constructed R peaks occur at 0.25, 1.25 and 2.25 seconds; stipulated pulse is 60 bpm and BP is 118/76 mmHg.

Both R-R intervals are 1.00 second, so the model rate is 60 cycles per minute. The pulse is at the lower edge of the stated resting band.

Both $118 < 120$ and $76 < 80$ hold, so the pressure entry meets the Normal row. This is a category comparison, not proof of healthy pumping.

Worked claim: Model C's pulse and pressure entries meet the stated reference rules, and its constructed R events have equal timing; general cardiovascular health remains undetermined.

Evidence: the 1.00-second intervals give 60 cycles per minute, and the separate 118/76 mmHg entry meets both BP inequalities. These are fictional inputs.

Reasoning: electrical events provide timing information, while systolic and diastolic values describe arterial pressure in different phases. Neither directly supplies blood volume or a disease cause.

Possible factor: posture could influence a real BP reading, but Model C includes no posture record. A future approved record would need that context; no cause is established.

Apply the format to D1's different numbers. Do not copy Model C's category, and do not claim that either model was a real recording.

Try the decision

Which conclusion fits D1 and the supplied adult reference rules?

- Compare the calculated model rate with the pulse band and the fictional 128/78 entry with the adult BP rows; neither comparison establishes a diagnosis or cause.
- Measuring an 82 bpm pulse proves that the heart is healthy, so the pressure entry needs no comparison.
- Reading 128/78 proves a conduction disorder caused by caffeine, and a second exercise trace should confirm it.

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

Your 80-minute flow

0–10 minutes	Read H1/E1, define key terms and answer both warmups.
10–25 minutes	Compute both intervals and rate; complete all three comparison rows.
25–45 minutes	Draft full CER with ECG and BP evidence plus a BP source fact.
45–58 minutes	Add a possible factor and missing information; answer the self-check.
58–70 minutes	Review with a partner or T1 solo critique; record a justified revision.
70–80 minutes	Revise, check and preserve the complete CER and record of checks and next actions.

Your response record

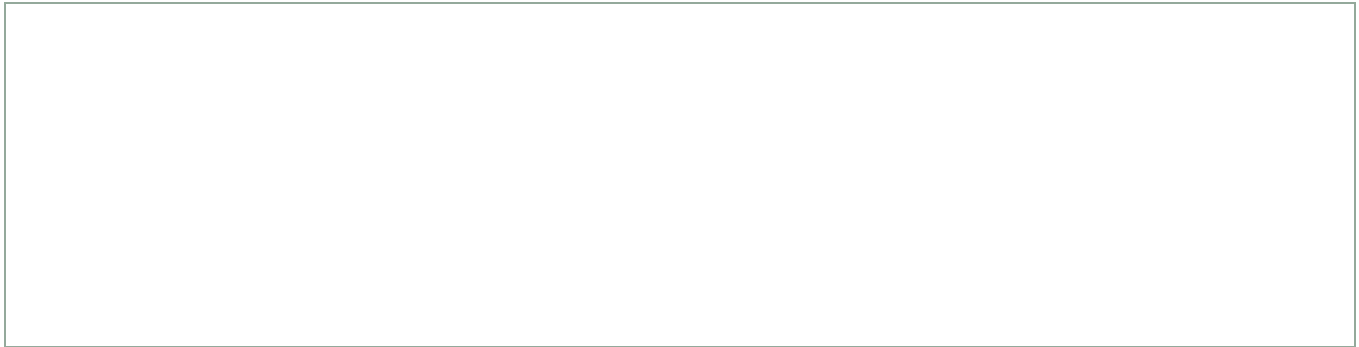
Use these labels on paper or in your document. The space below also works when this page is printed.

Prepare the evidence record

Answer both R1 warmups, list actual missing inputs using H1/P1, then build the three-row D1 quantity/value/unit/reference/limit comparison.

Use E1's explicit scope. Use the full supplied practice case; ask for missing actual values instead of inventing them.

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

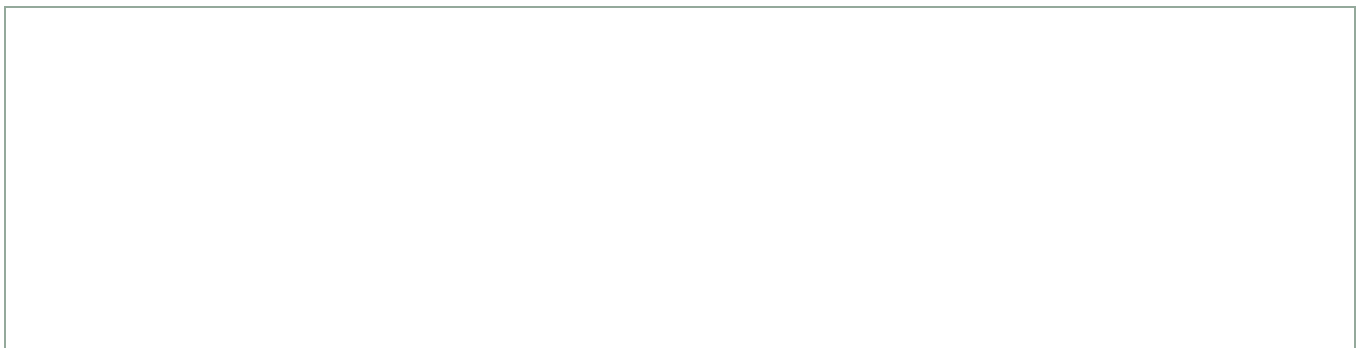


Compute and compare

Show both D1 R-R subtractions and the model rate. Compare the stipulated pulse with the band and both BP components with the adult table.

Use the AND/OR rules. State that regular model timing is not a diagnosis; no QRS-duration inference is possible.

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



Write the complete cardiac CER

Write one bounded claim with at least two numerical entries: ECG timing or rate AND blood pressure. Explain the structure/function links and use one MedlinePlus BP fact from E1/E2.

M1 is a distinct worked example. Use D1's own numbers, labels and limits. A pulse-only paragraph does not meet this product.

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

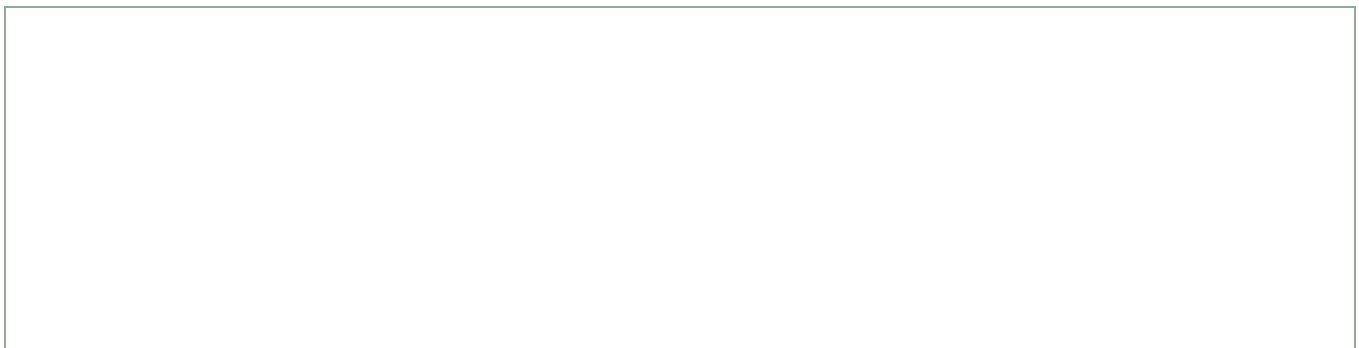


Add a possible factor and its limit

Choose one E3 factor, explain how it could affect a reading and name the missing information. Separate a possible influence from an established cause.

No testing is assigned. Do not say posture, stress or caffeine explains Case A without evidence.

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



Review, correct and revise

Complete the R1 self-check. Use an actual partner's original-case critique or T1's supplied solo route; record before/after wording and the reason for revision or justified retention.

Correct both the healthy-heart overclaim and missing reasoning. Solo work never counts as an actual peer exchange.

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

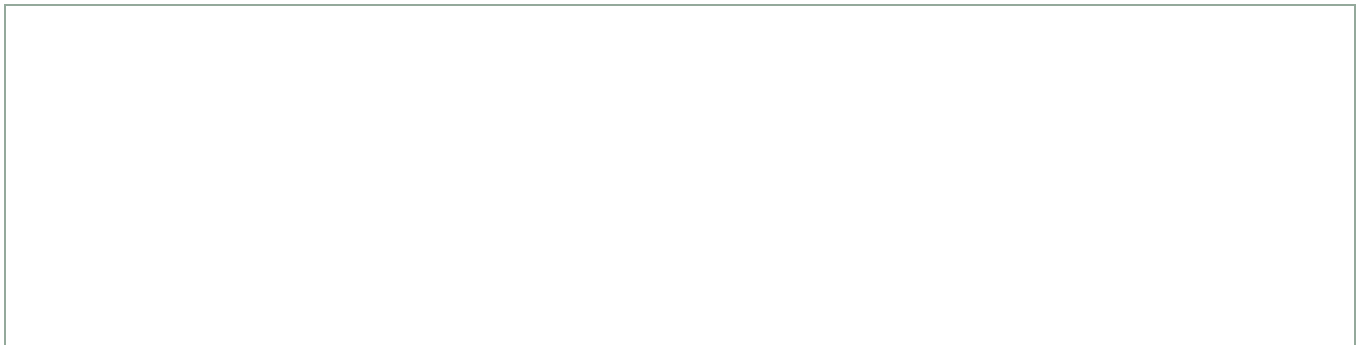


Keep the full product and evidence

Check the full CER, comparison rows, units, BP fact, factor and revision. Identify your data sources and official-task evidence. Check Schoology after uploading; use the R1 extension when ready.

Complete all original work before marking it ready. Ask for the inputs for actual calculations, ABI, journal and model/video work. Use only evidence from the assigned work you actually do.

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



Check your product

- The CER includes a specific bounded claim, two numerical evidence entries and mechanism-based reasoning.
- ECG/pulse and both BP components are compared with supplied references under an explicit fictional adult scope.
- One MedlinePlus BP fact is used in reasoning, and one possible factor is separated from a proven cause.
- Keep sources, units and a justified revision with the full record. Identify your actual and official-task evidence, and check Schoology after uploading.

Keep the limit: The fictional case supports reference comparisons, conditional calculations and bounded mechanism reasoning. It cannot establish participant data, diagnosis, cause, actual cardiac output, ABI, official completion or submission.

Turn in your work

Submit the complete original CER with comparison and revision through the confirmed enrolled route: section 1292 <https://app.schoology.com/assignment/8544592381> or section 6792 <https://app.schoology.com/assignment/8544592417> . Preserve actual cardiac analysis and official completion separately.

If access is unavailable, save the dated practice record and tell the teacher. After doing the assigned official work, keep its required screenshot or note for the tracker. After uploading, check that Schoology shows Submitted.

[Section 1292: Wk14 CER: Cardiac data CER analysis](#)

[Section 6792: Wk14 CER: Cardiac data CER analysis](#)

Carry forward

Reference comparisons describe values in context; they do not identify a cause or prove cardiovascular health.

Carry the complete CER and evidence from your actual work into the weekly evidence record; allocation ethics asks a separate question about fair decisions. How does an evidence claim differ from a fairness judgment about allocation?

Sources and resources

[Open today's page](#)

MP-BP · High Blood Pressure

MedlinePlus, National Library of Medicine

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

MP-PULSE · Pulse

MedlinePlus Medical Encyclopedia

<https://medlineplus.gov/ency/article/003399.htm>

MP-ECG · Electrocardiogram

MedlinePlus, National Library of Medicine

<https://medlineplus.gov/lab-tests/electrocardiogram/>

NHLBI-BEAT · How the Heart Beats

NHLBI

<https://www.nhlbi.nih.gov/health/heart/heart-beats>

CDC-MEASURE · Measuring Your Blood Pressure

CDC

<https://www.cdc.gov/high-blood-pressure/measure/index.html>

OS-CO · Anatomy and Physiology 2e: 19.4 Cardiac Physiology

OpenStax, Rice University

<https://openstax.org/books/anatomy-and-physiology-2e/pages/19-4-cardiac-physiology>