Question: 1

Use this passage for the next 7 questions:

Exercising elicits an acute hormonal response. The magnitude of this response is dependent on the mode and intensity of exercise. Figure 1 shows the concentration of two hormones in response to exercise as measured by researchers in pmol/l and nmol/l (1 pmol/l = .001 nmol/l). Measurements were taken at multiple timestamps before beginning the workout, after the completion of each exercise in the workout, 15 minutes after completing the workout, and 30 minutes after completing the workout. Changes in these hormones were tracked across two different exercise conditions, or modes, defined as MR and FR.

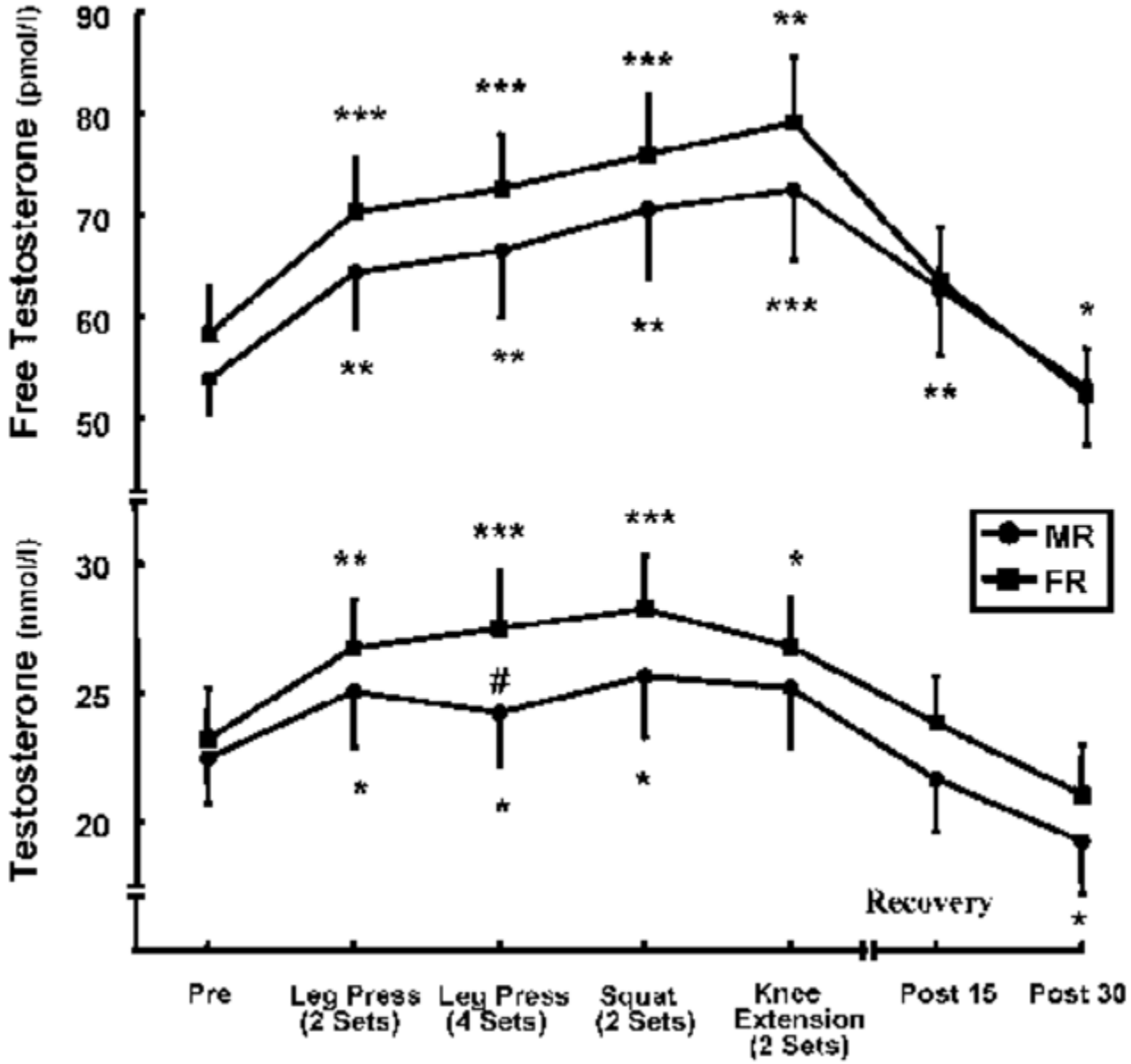

Figure adapted from Acute hormonal and neuromuscular responses and recovery to forced vs. Maximum repetitions multiple resistance exercises by Ahtianinen et al.

1. In both the MR and FR conditions, Free Testosterone concentration exhibits a trend during the duration of the workout. What is that trend?

- Free Testosterone concentration increases at each timestamp during the workout.
- Free Testosterone concentration decreases at each timestamp during the workout.
- Free Testosterone concentration steadily increases before decreasing during the later portion of the workout.
- Free Testosterone concentration alternates between increasing and decreasing at each timestamp

Question: 2

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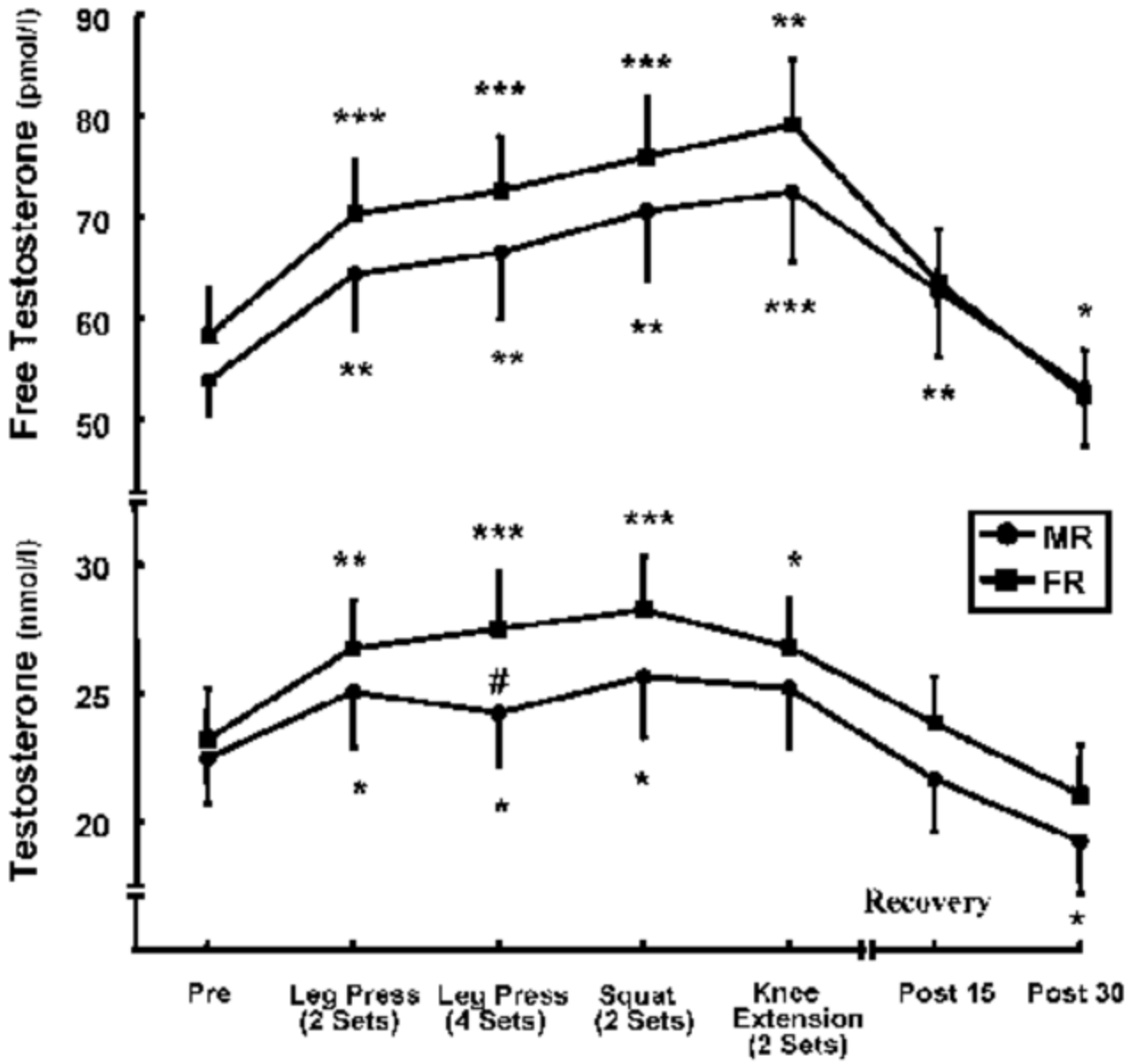

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2. In both the MR and FR conditions, Testosterone concentration is implied to peak by a certain time stamp. What is that timestamp?

- Knee Extension (2 Sets)
- Post 30
- Squat (2 Sets)
- Leg Press (4 Sets)

Question: 3

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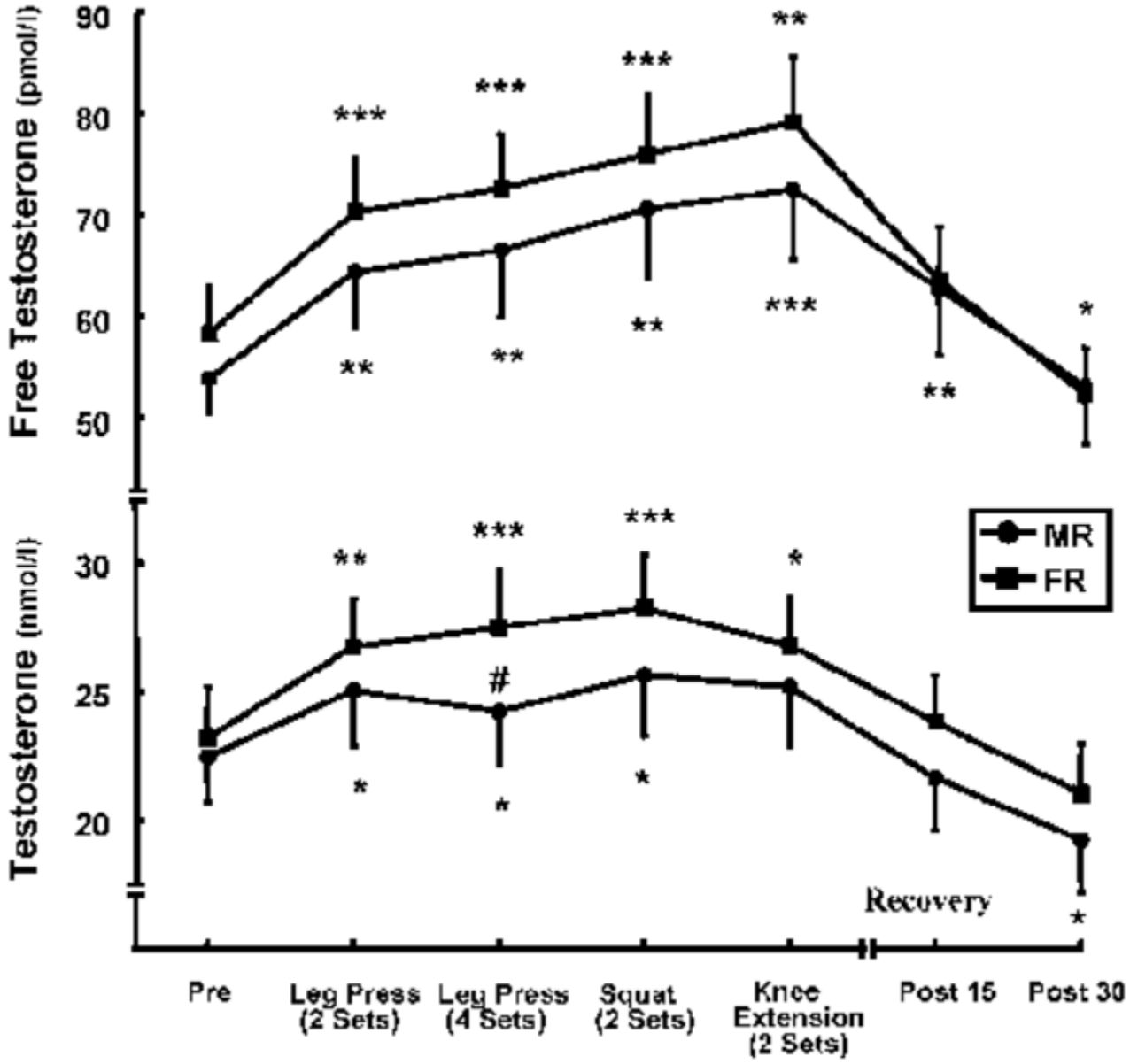

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3. At the Pre timestamp, is there a higher concentration of Free Testosterone in the FR condition or Testosterone in the MR condition?

There is a higher concentration of Free Testosterone in the FR condition than Testosterone in the MR condition at the Pre timestamp.

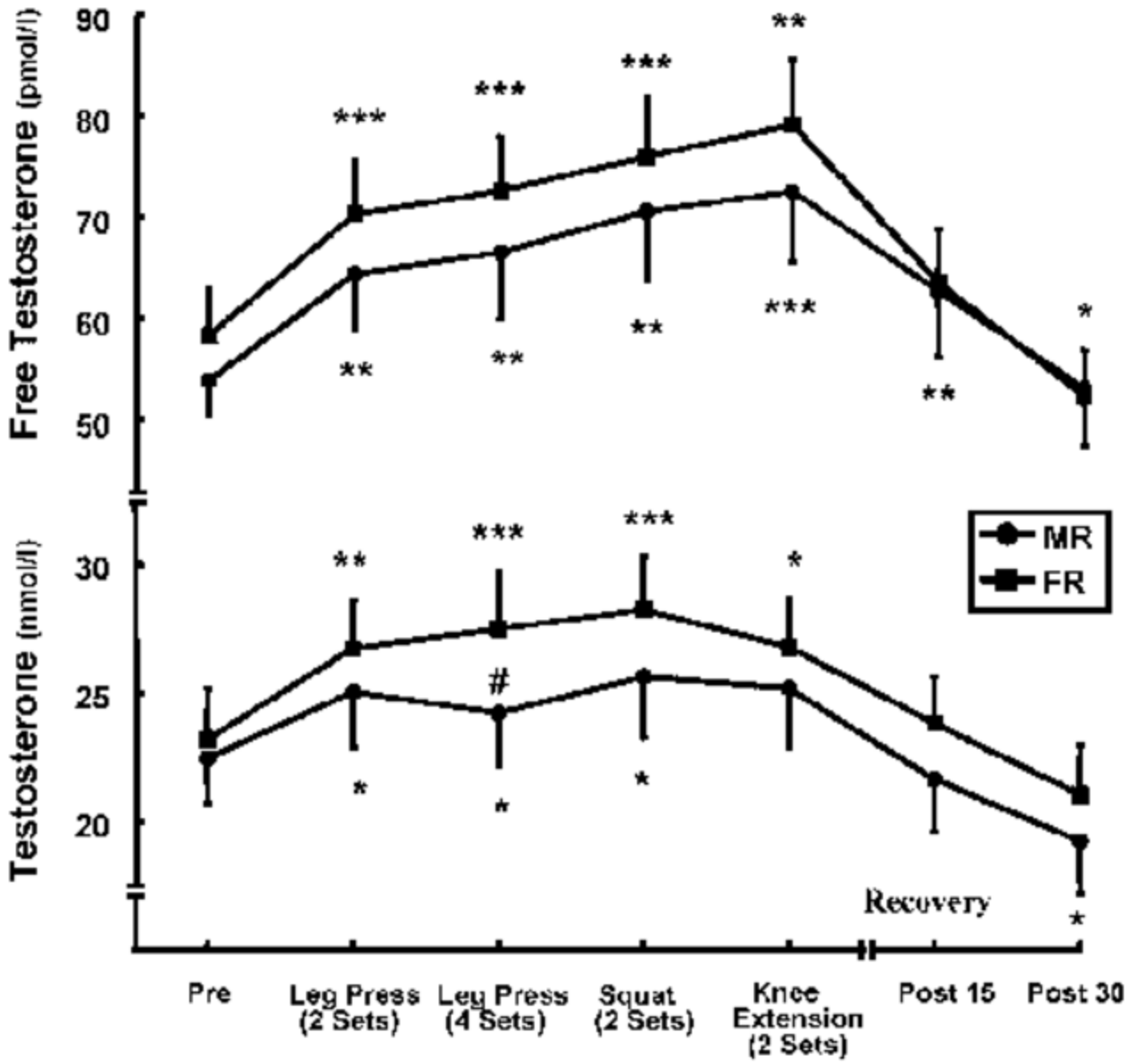
There is a higher concentration of Testosterone in the MR condition than Free Testosterone in the FR condition at the Pre timestamp.

There is an equal concentration of Testosterone in the MR condition and Free Testosterone in the FR condition at the Pre timestamp.

It is impossible to answer this question correctly with the information provided.

Question: 4

Exercising elicits an acute hormonal response. The magnitude of this response is dependent on the mode and intensity of exercise. Figure 1 shows the concentration of two hormones in response to exercise as measured by researchers in pmol/l and nmol/l (1 pmol/l = .001 nmol/l). Measurements were taken at multiple timestamps before beginning the workout, after the completion of each exercise in the workout, 15 minutes after completing the workout, and 30 minutes after completing the workout. Changes in these hormones were tracked across two different exercise conditions, or modes, defined as MR and FR.



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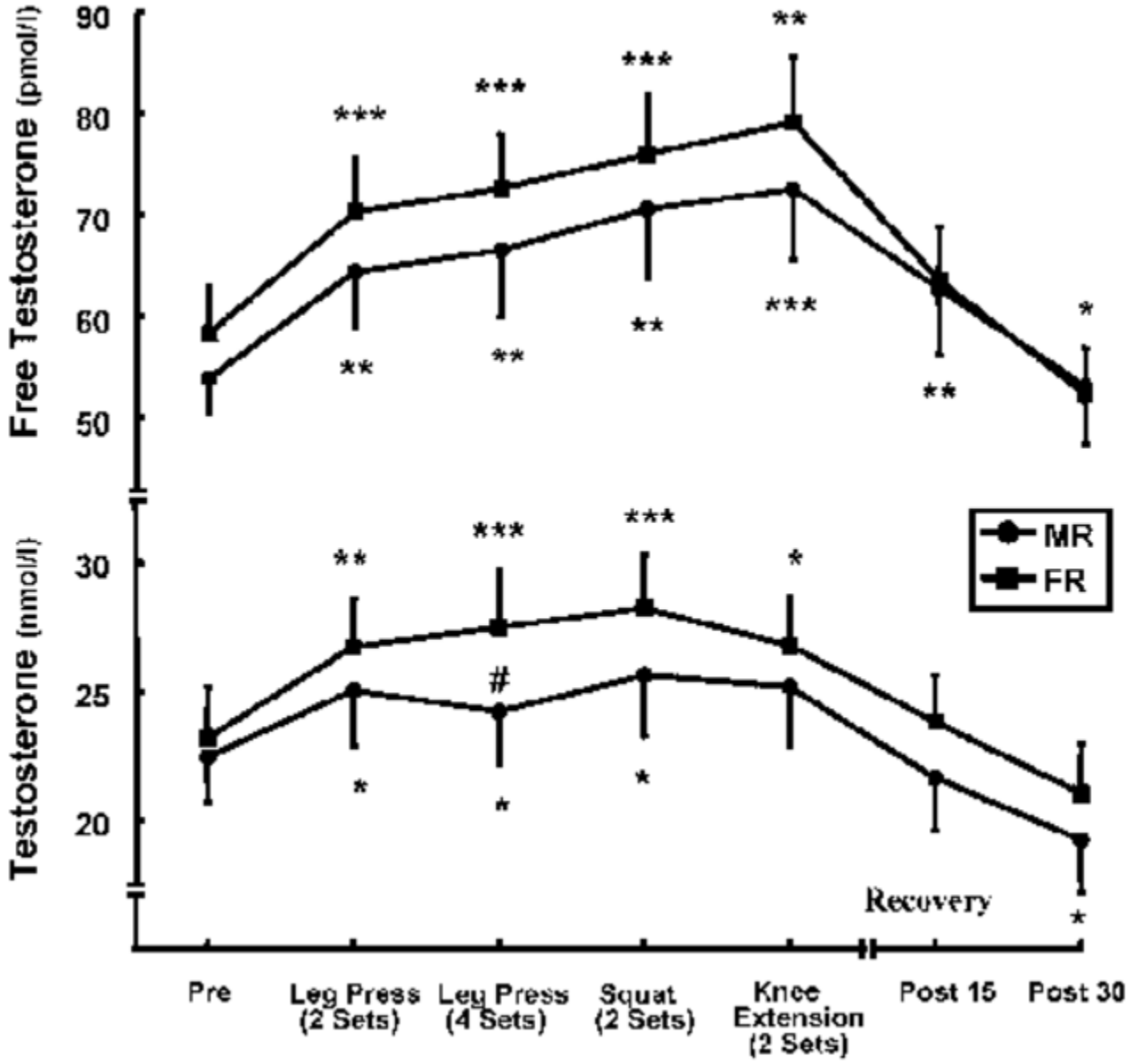
4. At which timestamp is there the greatest difference in Testosterone concentration between the MR and FR conditions?

- Leg Press (4 Sets)
- Leg Press (2 Sets)
- Post 30
- Pre

Question: 5

Exercising elicits an acute hormonal response. The magnitude of this response is dependent on the mode and intensity of exercise. Figure 1 shows the concentration of two hormones in response to exercise as measured by researchers in pmol/l and nmol/l (1 pmol/l = .001 nmol/l). Measurements were taken at multiple timestamps before beginning the workout, after the completion of each exercise in the workout, 15 minutes after completing the workout, and 30 minutes after completing the workout. Changes in these hormones were tracked across two different exercise conditions, or modes, defined as MR and FR.



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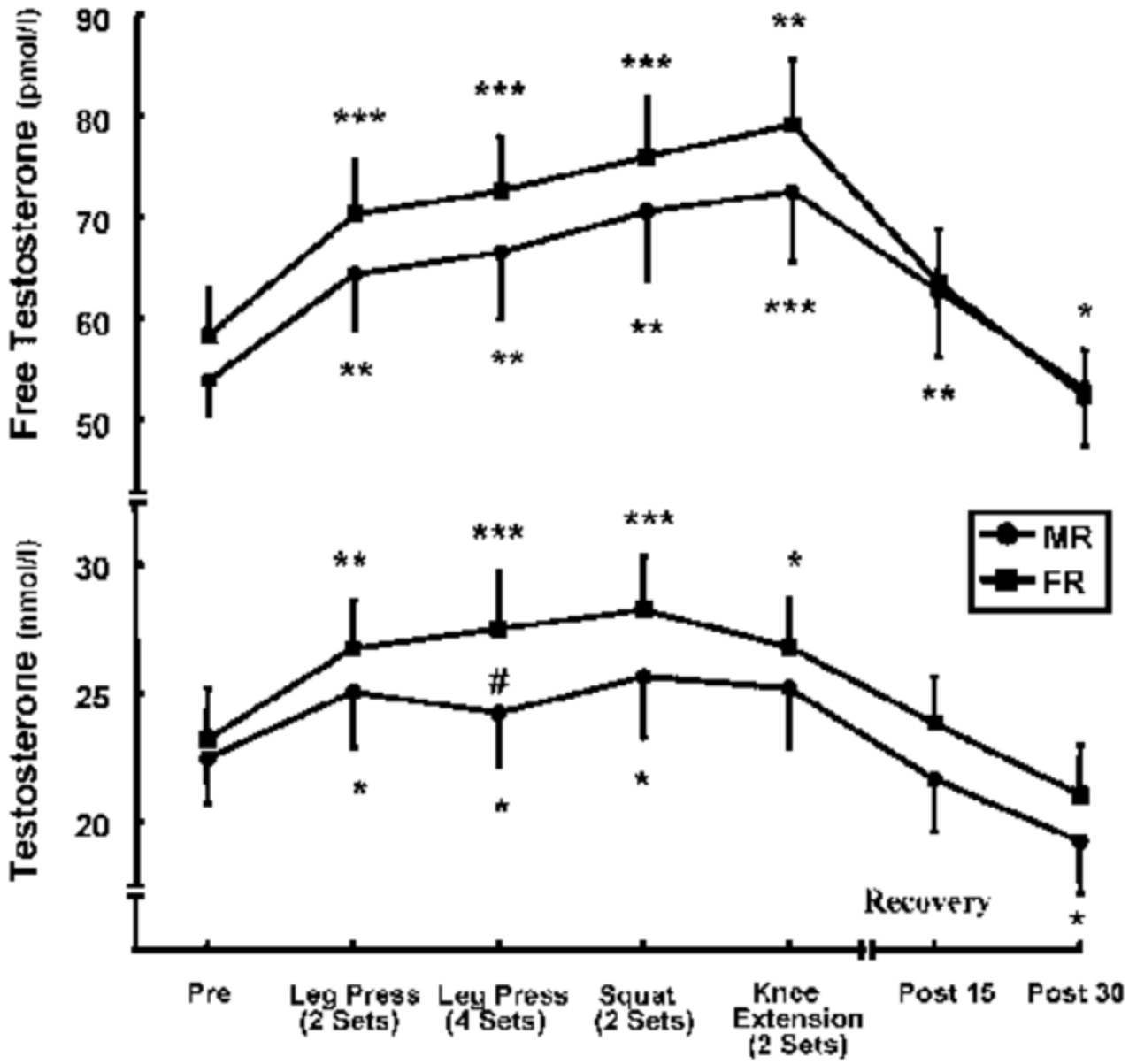
5. Suppose the researchers added another exercise to the end of the workout in the FR condition and measured Free Testosterone concentration at that point. If the current trend continued, what would be the most likely concentration observed at that timestamp?

- Greater than or equal to 80 nmol/l
- Between 64 and 78 pmol/l
- Less than or equal to 64 pmol/l
- Greater than or equal to 78 pmol/l

Question: 6

Exercising elicits an acute hormonal response. The magnitude of this response is dependent on the mode and intensity of exercise. Figure 1 shows the concentration of two hormones in response to exercise as measured by researchers in pmol/l and nmol/l (1 pmol/l = .001 nmol/l). Measurements were taken at multiple timestamps before beginning the workout, after the completion of each exercise in the workout, 15 minutes after completing the workout, and 30 minutes after completing the workout. Changes in these hormones were tracked across two different exercise conditions, or modes, defined as MR and FR.



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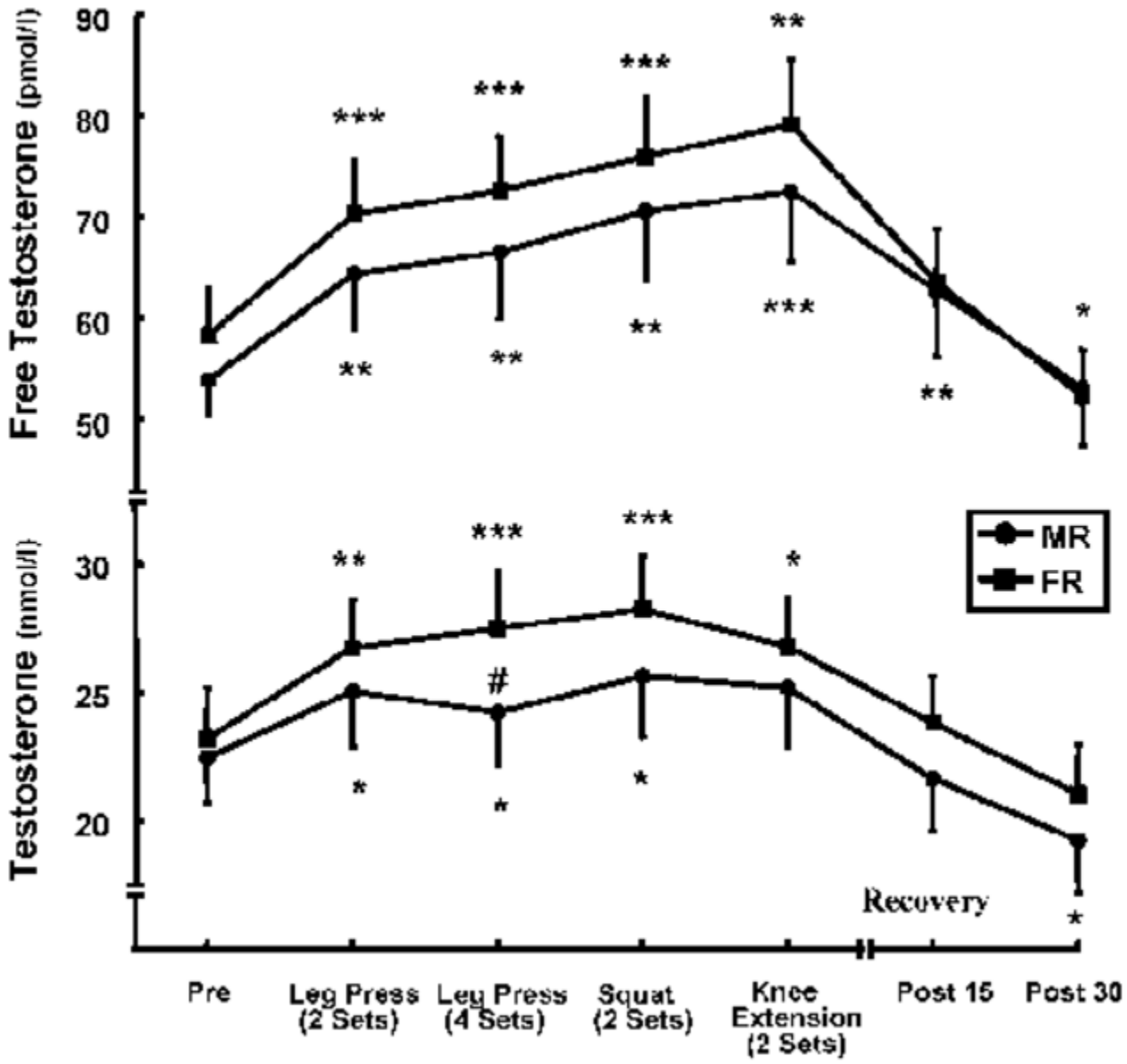
6. In both the MR and FR conditions for Testosterone, how do concentrations at the Post 30 timestamp relate to concentrations at the Pre timestamp?

- Concentrations at the Post 30 timestamp are similar to Pre timestamp
- Concentrations at the Post 30 timestamp are greater than concentrations at the Pre timestamp
- Concentrations at the Post 30 timestamp are lesser than concentrations at the Pre timestamp

Concentrations at the Post 30 timestamp vary in relationship to the Pre timestamp by condition

Question: 7

Exercising elicits an acute hormonal response. The magnitude of this response is dependent on the mode and intensity of exercise. Figure 1 shows the concentration of two hormones in response to exercise as measured by researchers in pmol/l and nmol/l (1 pmol/l = .001 nmol/l). Measurements were taken at multiple timestamps before beginning the workout, after the completion of each exercise in the workout, 15 minutes after completing the workout, and 30 minutes after completing the workout. Changes in these hormones were tracked across two different exercise conditions, or modes, defined as MR and FR.



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7. In general, is Testosterone concentration greater in the FR or MR condition?

- Testosterone concentration is generally greater in the FR condition
- Testosterone concentration is generally greater in the MR condition
- Testosterone concentration is generally similar in both conditions
- The relationship between Testosterone concentration in the FR and MR conditions is generally unclear and varied

Question: 8

Use this passage for the next 7 questions:

A chemist performed two experiments. The chemist had the objective of determining the melting points and boiling points of multiple elements. When an element reaches its Melting Point or Boiling Point, its state of matter changes. A solid object heated to its Melting Point becomes a liquid, and if further heated to its Boiling Point it becomes a gas. If a gas is cooled to its Boiling Point it will transition back to a liquid, and if cooled further to its Melting Point it will transition back to a solid.

In Experiment 1, the chemist gathered eight elements and stored them each individually at temperatures that allowed them to exist in their solid state. Following this, the chemist heated each element and recorded the temperature at which melting occurred. The results are shown in Figure 1.

Element	Melting Point (Celsius)
Hydrogen	-259.16
Magnesium	650
Argon	-189.34
Oxygen	-218.79

Phosphorus	44.15
Lithium	180.5
Sodium	97.79
Barium	727

Figure 1

In Experiment 2, the chemist stored each of the eight elements used in Experiment 1 at temperatures that allowed them to exist in their liquid state. Following this, the chemist heated each element and recorded the temperature at which boiling occurred. The results are shown in Figure 2.

Element	**Boiling Point (Celsius)**
Hydrogen	-252.87
Magnesium	1090
Argon	-185.85
Oxygen	-182.96
Phosphorus	280.5
Lithium	1342

Sodium	882.94
Barium	1845

Figure 2

1. Based on the results of Experiments 1 and 2, it is safe to conclude:

- The Melting Point of an element is always higher than the Boiling Point of that same element
- The Boiling Point of an element is always higher than the Melting Point of that same element
- The Melting Point of any element is always higher than the Boiling Point of any element
- The Boiling point of any element is always higher than the Melting Point of any element

Question: 9

A chemist performed two experiments. The chemist had the objective of determining the melting points and boiling points of multiple elements. When an element reaches its Melting Point or Boiling Point, its state of matter changes. A solid object heated to its Melting Point becomes a liquid, and if further heated to its Boiling Point it becomes a gas. If a gas is cooled to its Boiling Point it will transition back to a liquid, and if cooled further to its Melting Point it will transition back to a solid.

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Figure 2

2. If the chemist had continued heating the elements in Experiment 1 past their Melting Point until they boiled without stopping, would the results be the same as in Experiment 2?

- Yes, if tested on the same day results will not vary, an element's Boiling Point only fluctuates between days
- No, the elements are consistently heated for a longer period, increasing the Boiling Point
- No, the elements are consistently heated for a longer period, decreasing the Boiling Point
- Yes, an element's Boiling Point is a constant and will always occur at the same temperature

Question: 10

A chemist performed two experiments. The chemist had the objective of determining the melting points and boiling points of multiple elements. When an element reaches its Melting Point or Boiling Point, its state of matter changes. A solid object heated to its Melting Point becomes a liquid, and if further heated to its Boiling Point it becomes a gas. If a gas is cooled to its Boiling Point it will transition back to a liquid, and if cooled further to its Melting Point it will transition back to a solid.

In Experiment 1, the chemist gathered eight elements and stored them each individually at temperatures that allowed them to exist in their solid state. Following this, the chemist heated each element and recorded the temperature at which melting occurred. The results are shown in Figure 1.

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Figure 2

3. Suppose that after the completion of Experiment 2, the chemist wanted to test the state of matter each element would be in at room temperature (23 degrees Celsius). How would the chemist most effectively do this?

- Place each element safely on a heating device set to 46 degrees Celsius
- Place each element safely on a cooling device set to slightly below its melting point
- Place each element safely in an area with exposure to room temperature air
- Place each element safely on a cooling device set to slightly below its boiling point

Question: 11

4. If each element were returned to its state at room temperature (23 degrees Celsius), how many elements would be solid?

- 3
- 5

- 8
- 0

Question: 12

5. If each element were returned to its state at room temperature (23 degrees Celsius), how many elements would be liquid?

- 3
- 5
- 8
- 0

Question: 13

6. If the Melting Point and Boiling Point characteristics of experiments 1 and 2 were to be generalized to all other elements, which of these statements would be false?

- All elements can exist as a solid, liquid, or gas
- The element Silver can exist as a gas
- All elements exist in different states at different temperatures
- Most elements can exist as a solid, liquid, or gas with a rare exception

Question: 14

7. Suppose that after the experiment the chemist made a mistake and mixed up storage of the elements Oxygen and Argon. How would the chemist be able to identify which element is which if both are currently at a room temperature of 23 degrees Celsius?

- Use a heating device to determine which element transitions into a gas at -189.34 degrees Celsius
- Use a cooling device to determine which element transitions into a gas at -189.34 degrees Celsius
- Use a cooling device to determine which element transitions into a solid at -182.96 degrees Celsius

Use a cooling device to determine which element transitions into a liquid at -182.96 degrees Celsius