

# Strategy Workshop:

## *Psychology on the MCAT*

# Introductions

- Clara Gillan
  - Sr. Content Developer
  - Veteran MCAT Tutor
- Worked with hundreds of students, written and reviewed thousands of MCAT questions
- Personally achieved a 42 MCAT (14's in each section).



# Prepping for the MCAT

## Content Review

Take diagnostic exam

Review sciences

Focus on areas of weakness

## Strategy Development

Learn and perfect:

- Test Strategy
- Question Strategy

## Practice!

- Full length sections
- Full length tests

# How to highlight

- Read briskly, use highlighter to capture key points!

- What to look for:

- Opinion

- Points of contrast

- Cause and effect!



# Psychological, Social, and Biological Foundations of Behavior Passage 1

Researchers sought to connect maternal stress to low birthweight by examining a population of 130 low socioeconomic-status women from the Los Angeles metro area. Scientists hypothesized that maternal stress was linked to low birthweight due to hormonal and other physiological changes associated with stress, such as elevated catecholamine levels, decreased visceral blood flow, and elevated cortisol levels.

The study participants were all women seeking prenatal care at free clinics. Participants were enrolled only if they were over the age 18 and under 40, presented for their first appointment within the first two months of pregnancy, and continued prenatal visits throughout pregnancy. Women were interviewed at each prenatal appointment, at least five times each, and on average seven times throughout pregnancy. Researchers noted that at these free clinics there were no Spanish-speaking doctors, despite over half of study participants only speaking Spanish. Doctors also spent very little time with each patient and seemed too rushed to discuss health concerns fully with each patient.

An index of the latent variable stress was created through assessments of three different factors: environmental (event) stress, perceptions of stress, and affective responses to stress. The first was measured by asking the women to report on adverse life events that happened to friends and family (everything from mundane stressors like moving, to larger stressors like losing a job, to potential trauma like being a victim of a crime were included). Perceptions of stress were assessed through surveys about how the adverse life events were perceived, ranging from “not at all stressful” to “extremely stressful”. Finally, affective response was measured through anxiety inventories.

Finally, patients were also extensively interviewed about their medical background, especially with respect to medical conditions that present serious risk during and after pregnancy and labor to generate a “medical risk” score. Birthweight was measured in grams as a continuous variable, rather than classifying the newborns in broad categories. This more specific data allowed the correlations developed below to be analyzed with a high degree of statistical significance.

# Figure 1: Correlation matrix of study results

	Stress	Event distress	Perceived Stress	Anxiety	Medical Risk	Birthweight
Stress	1	0.44	0.84	0.80	0	-0.31
Event Distress		1	N/A	N/A	0	-0.18
Perceived Stress			1	N/A	0	-0.28
Anxiety				1	0	-0.29
Medical Risk					1	-0.15
Birthweight						1

# Interpreting Figures on the MCAT

When reading the passage:

- Mind your axes
- Units matter
- Sum up trends, move on

When answering question:

- Who is the control?
- Deep dive on trends
- Don't assume you need the figure



# Figure 1: Correlation matrix of study results

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Anxiety				1	0	-0.29
Medical Risk					1	-0.15
Birthweight						1

1. The research described in the passage, which takes into account numerical measures of birthweight, survey reports of anxiety, and reports of life events related to friends and family best fits under what model of public health analysis?

A) Medical model

B) Biopsychosocial model

C) Psychosocial model

D) Cohort study

2. Which of the following identifies a potential methodological flaw in the study?

A) The study's sample size was far too small to allow for correlations with any statistical significance to be drawn.

B) By only assessing maternal and not paternal stress, researchers missed out on key data that would be essential to assessing the effect of parental stress on fetal health.

C) It is already well known that low birth weight correlates with preterm labor so the research findings are redundant.

D) By only working with women who had already chosen to come in for prenatal care very early in their pregnancies and to receive very frequent prenatal checkups, the researchers were working with a sample that may be unrepresentative.

3. According to the study results, which of the following women would be most likely to give birth to a low birthweight baby?

- A) A first-time mother who was many years younger than the average age in the study
- B) An unmarried woman with several medical risk factors but almost no event distress
- C) A woman who reports a high level of anxiety and perceived stress but a low medical risk
- D) A Latina woman with strong social networks and a large amount of event distress but low anxiety

4. Assessing a latent variable like stress through a series of surveys that create numerical results is an example of:

- A) operationalization.
- B) ethnocentrism.
- C) medical bias.
- D) external validity.

5. The study found that medical risk was not correlated with stress, despite the natural assumption that a woman who has many risk factors would be expected to experience stress about those factors. This lack of correlation may best be explained by:

- A) the unusually robust health of study participants.
- B) the fact that the women in the study were too focused on their high level of distressing life events to worry about their own medical risk factors.
- C) the mothers' unawareness of their risk factors.
- D) cultural differences between the doctors and patients.

# Top 3 Tips for Managing the MCAT

- Move through the test in order
- Stick with your first answer, unless you can PROVE it wrong
- Create a love/hate relationship with the clock

# Questions?



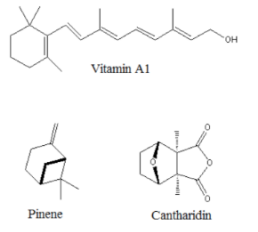
# How Can Next Step Help?

# Realistic MCAT Testing Platform

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Pause  
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FULL LENGTH 1  
Remaining Time  
01:34:06

Passage 6 (Questions 31-34)

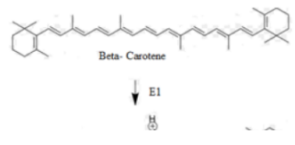
Terpenes have been found to be essential building blocks of complex hormones and molecules, pigments, sterols and even vitamins. Terpenes also play an incredibly important role by providing protection from bacteria and fungus. The basic structure of terpenes is repeating isoprene units ( $C_5H_8$ )<sub>n</sub> and they are grouped according to the number of repeating isoprene units. Monoterpenes contain 2 isoprene units; examples include menthol and pinene. Vitamin A<sub>1</sub>, a diterpene, contains 4 isoprene units. Research has revealed the Isoprene Rule, which states: adjacent isoprene units in terpenes are linked preferentially between carbon atoms located at opposite ends of the isoprene structural subunit. Head-to-head and tail-to-tail connections are rare exceptions to this rule.



Vitamin A<sub>1</sub>  
Pinene  
Cantharidin

Figure 1 Examples of monoterpenes and diterpenes

In human metabolism,  $\beta$ -Carotene A, a 40-Carbon terpene (Compound 1, Figure 2), is utilized as a precursor for the synthesis of vitamin A<sub>1</sub>. Retinal (Figure 2) is a key intermediate in vitamin A<sub>1</sub> biosynthesis. The biosynthetic pathway by which retinal is synthesized *in vivo* from  $\beta$ -Carotene has been identified by using specifically  $^{18}O$  labeled O<sub>2</sub> and  $^{18}O$  labeled H<sub>2</sub>O.



Beta-Carotene

← Previous Mark Review Next

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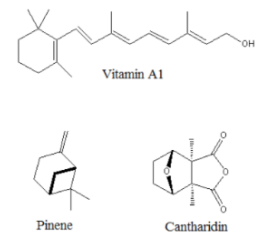
Passage 6 (Questions 31-34)

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Key terms: terpenes, isoprene unit formula, mono/di terpene, isoprene rule

Contrast: the favored isoprene links are head-to-tail, though exceptions do occur

Cause and effect: repeated isoprene units can combine to form several biologically important molecules



Vitamin A<sub>1</sub>  
Pinene  
Cantharidin

Figure 1 Examples of monoterpenes and diterpenes

Figure 1 shows us that the various terpene molecules made up of repeating isoprene units

In human metabolism,  $\beta$ -Carotene A, a 40-Carbon terpene (Compound 1, Figure 2), is utilized as a precursor for the synthesis of vitamin A<sub>1</sub>. Retinal (Figure 2) is a key intermediate in vitamin A<sub>1</sub> biosynthesis. The biosynthetic pathway by which retinal is synthesized *in vivo* from  $\beta$ -Carotene has been identified by using specifically  $^{18}O$  labeled O<sub>2</sub> and  $^{18}O$  labeled H<sub>2</sub>O.

Question 34

A researcher seeks to monitor the conversion of retinal to retinol using infrared spectroscopy. Which of the following signals will indicate the reaction is complete?

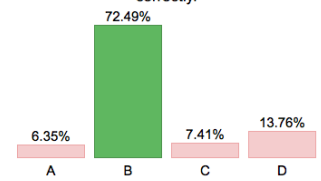
A. Noting the disappearance of peaks in the 3200-3500  $cm^{-1}$  region

B. Noting the appearance of a peak in the 3200-3500  $cm^{-1}$  region

C. Noting the disappearance of peak in the 1580-1640  $cm^{-1}$  region

D. Noting the appearance of a peak in the 1700-1750  $cm^{-1}$  region

72.49% of students answered this question correctly.



Your answer was incorrect

Answer Explanation:

- Difficulty: 2 Medium
- Reasoning Skill: 2 Scientific Reasoning and Problem Solving
- Concept Category: 4D Light and Sound

B is correct. Retinol differs from retinal in that it contains -OH groups, but does not contain a carboxyl group (C=O). The carbonyl stretching frequency falls in the region 1700-1750  $cm^{-1}$ , whereas the O-H stretching frequency is expected to fall in the region 3200-3500  $cm^{-1}$ .

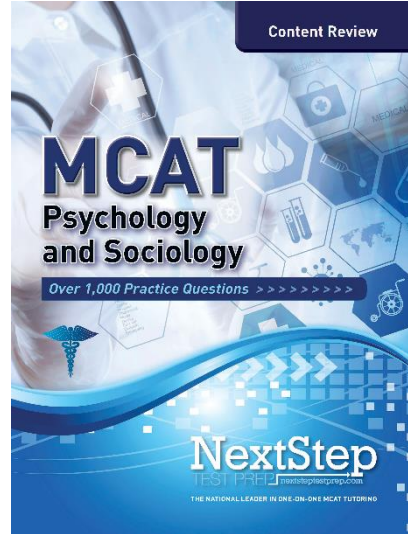
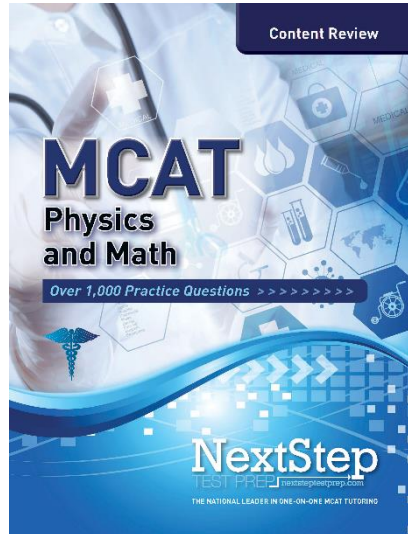
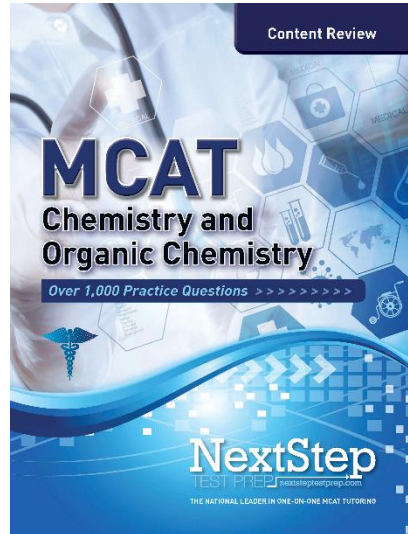
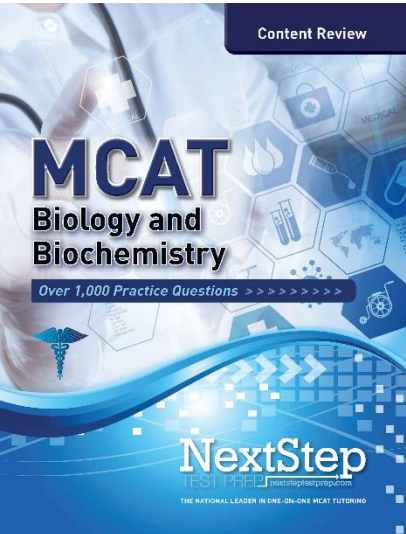
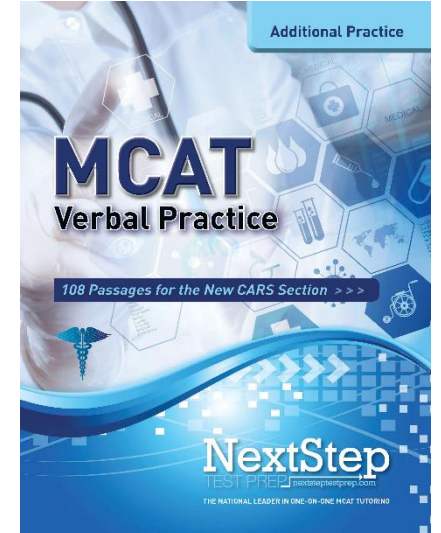
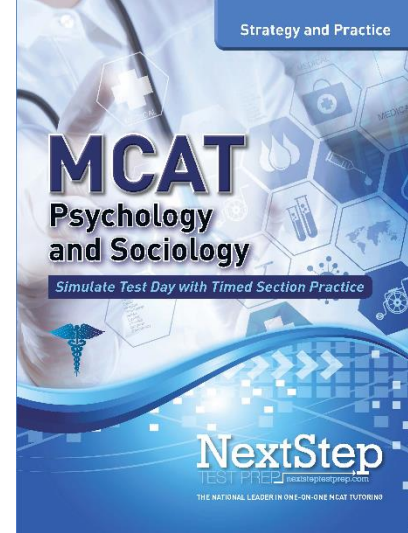
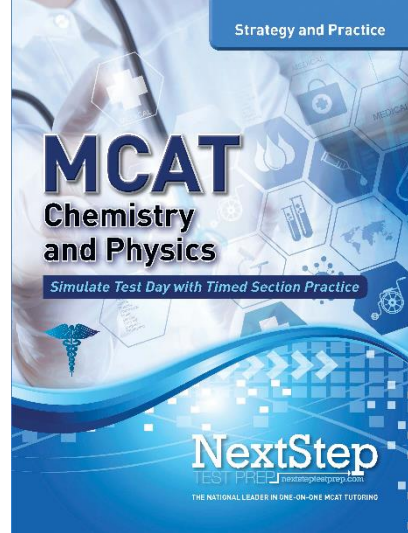
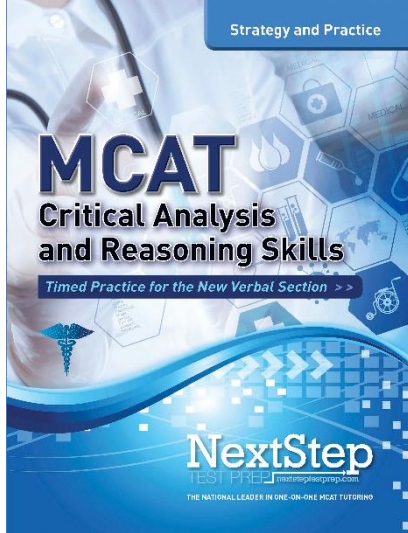
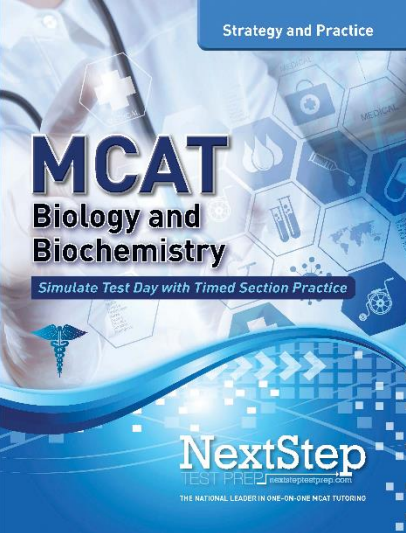
A: This would indicate a lack of OH groups, which is a characteristic of retinal, not retinol.

C: This peak is indicative of C=C groups, which both molecules have and cannot be used to determine when retinal has been converted.

← Previous Passage Previous Next Section Next Next Passage

Full answers and explanations

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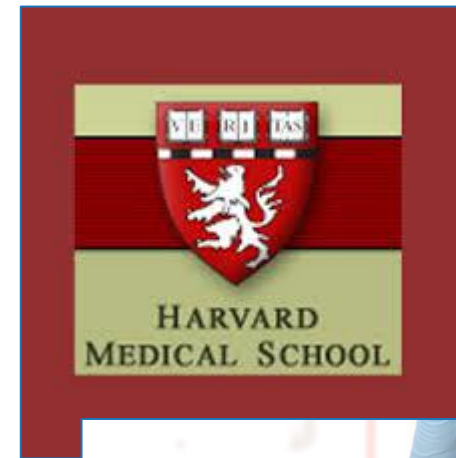
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9:30 - 10:30 Keynote breakfast for P&G	9 - 10 Welcome/Speed Dating	9 - Day 2 Recap
10:30 - 3p P&G sessions/appointments, see San Diego.	10 - Break	9:30 - 10:30 Morning Keynote
11:30 - 1p P&G sessions/appointments, see San Diego.	10:30 - 11:45 Session 1—Cyberbullying OR PR Pitches	10:45 - 12p Session 1—Write Brain or MYOB
	11:45 - 1:15p Lunch	12p - 1:30p Lunch
	1:15p - 2:30p Session 2—Double Slot for Writing or Connecting with Brands	1:30p - 2:45p Change the World—Revolution
4p - 5p Big Toy Book Party	2:45p - 4p Session 3—2nd half writing OR Experience OR Expo/rest/recharge	3p - 4:15p Session 3—Own Your Beauty OR Online Community
	4p - 4:45p Afternoon break	4:15p - 5p Afternoon break
	4:45p - 6p VOTY Community Keynote	5p - 8p The Help Screening!
6p - 8p Expo	6p - 8p VOTY Reception	5p - 6p Closing Keynote
7p - 10p KOYH party?	5:30p - 7:30p Cheap Sally?	
8p - 11p People's Party	7:30p - 9:30p HWTM Party	
8:30p - 11p Goin' Coconuts Luau	9p - 12 Sparklecorn	8p - 10:30p Social Fiesta
		9p - 11p Aiming Low
		10p - 11:30p Cheeseburger



# Thank you for listening!

Contact us if you have any questions about the MCAT



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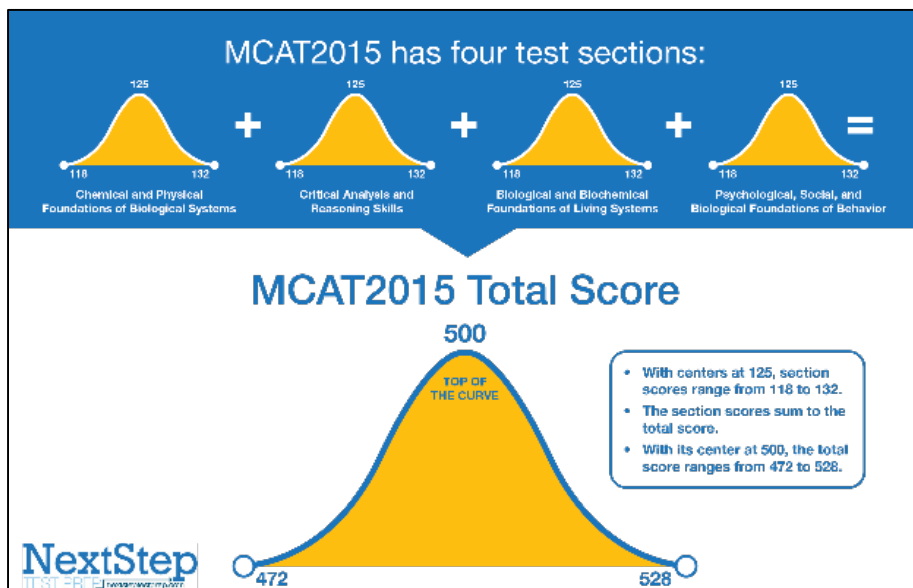
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- [Next Step's Full Length Practice Tests](#): Next Step has created 10 full length practice tests for the new MCAT.



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**Next Step Suggests:**  
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Chemistry: 2 semesters  
O-Chem: 1 to 2 semesters  
Physics: 2 semesters  
Biochemistry: 1 semester  
Psychology: 1 semester  
Sociology: 1 semester  
Statistics: 1 semester  
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