MCAT PUBLIC OFFICE HOURS

Science Strategies

April 17, 2018

Who Is Next Step?

- Began in 2009 as a tutoring company
- Focus on graduate admissions tests only
- Team of educational experts
- First company to have materials built from ground up for 2015 MCAT format
- Now the first company to have new 2018 MCAT Interface

✓ We never stop improving our materials!

Today's Agenda

- Welcome to Office Hours!
- Introduction
- Passage First Approach
- Practice Passage 1 – B/B
- Questions First Approach
- Practice Passage 2 – C/P
- How Your Approach Pays Off
- Practice Passage 3 – P/S
- What Are My Prep Options?
- How Can Next Step Help?

Who Am I?

- Clara Gillan
  - Course Content Director at Next Step
  - Senior instructor; 526 MCAT score
- Managed development of Next Step's updated interface
- Written and edited thousands of questions

Introduction to Office Hours

- **Thanks for coming to Next Step Public Office Hours!**
- **If you haven't been here before, here's how it works…**
- **These sessions are meant to be:**
  - ***Interactive***
  - ***Problem-focused***
  - ***Specific to your needs (so ask questions!)***
- **Today's focus: science passage strategy**
- **Future sessions: content review, FL review, CARS strategies**
- **This is NOT a lecture! You can benefit most by:**
  - ***Raising your hand and speaking***
  - ***Commenting in the Questions box***
  - ***Responding to questions***

Before Getting Started

✓ **Locate the hand-raise button on the toolbar on your screen.**

✓ **Locate the Questions or Chat box on the toolbar.**

✓ **Let us know if you're having any technical issues!**

Think of your questions after Office Hours are over?

Post on our MCAT forums!
Forum.NextStepMCAT.com

Passage Strategy 1: Passage First

- Scan the passage top to bottom (~2 min), glance at figures, (if present) to ID science topics (≈ 5-10 seconds)
- Identify if passage is information-driven or data-driven
- If data-driven passage: ID data trends, conclusions
- If info-driven passage: ID major concepts, relationships
- Keep analysis focused. Save most details for the questions!

Passage Strategy 1: Passage First

Clivorine is a potent toxic compound extracted from the plant *Ligularia hodgsonii Hook*. Studies suggest that clivorine induces mitogen-activated protein kinase phosphorylation, leading to renal failure. An adverse event associated with short term ingestion of clivorine is the formation of calcified kidney stones comprised of calcium phosphate $Ca_3(PO_4)_2$.

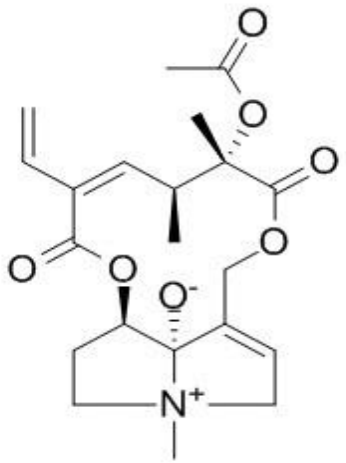


Figure 1 Clivorine

Researchers wished to study clivorine-treated human kidney K-5 cell growth. K-5 cells were seeded in 96-well microplates at a density of 10^3/well and were treated with clivorine (100 μM) for 12, 24 and 48 h. Then 0.75 mg/ml MTT was added and was incubated with cells for 5 h in a CO_2 incubator. When reduced in a cell, either enzymatically or through direct reaction with biomolecules, MTT turns blue to purple and may form an insoluble precipitate. Formazan dyes are useful for cell proliferation and toxicity assays since they only stain living, metabolically active cells.

At last the cells were dissolved in 10% SDS-0.01 M HCl in a CO_2 incubator for 12 h. The intensity was measured using a reader for ELISA under an absorption wavelength of 570/630 nm (Figure 2).

Passage Strategy 1: Passage First

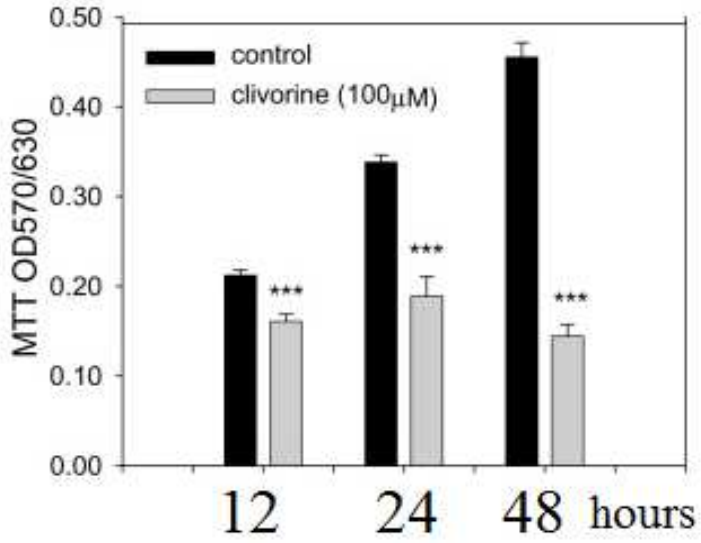


Figure 2 Time course of clivorine on K-5 cells growth. ***$P \leqslant 0.001$ compared with absence of clivorine. Data are means ± SE of three independent experiments

Next, researchers sought to identify the mechanism of the anti-proliferative function of clivorine in K-5 cells. After 48 h of clivorine (100 μM) treatment, fluorescence-activated cell sorting analysis of cell distribution in K-5 cells was performed as seen in Table 1. Clivorine treatment had no effect on p53 protein levels.

Table 1 Cell Distribution in K-5 cells After 48 h Treatment

Cell cycle	Percentage of the cell number	
	Control	Clivorine (100 μM)
G_0–G_1	50.14 ± 8.37	46.40 ± 4.00
G_2–M	20.11 ± 4.90	20.90 ± 1.32
S	19.80 ± 12.25	22.20 ± 6.36
G_2/G_1	12.00 ± 0.09	11.98 ± 0.01

Passage Strategy 1: Passage First

Clivorine is a potent toxic compound extracted from the plant *Ligularia hodgsonii Hook*. Studies suggest that clivorine induces mitogen-activated protein kinase phosphorylation, leading to renal failure. An adverse event associated with short term ingestion of clivorine is the formation of calcified kidney stones comprised of calcium phosphate $Ca_3(PO_4)_2$.

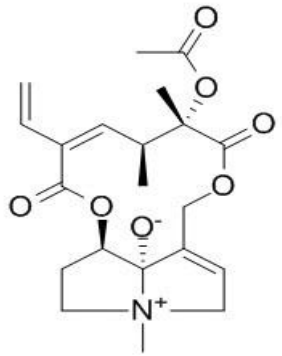


Figure 1 Clivorine

clivorine → kidney stones; clivorine toxicity → cell death by MAPK

Researchers wished to study clivorine-treated human kidney K-5 cell growth. K-5 cells were seeded in 96-well microplates at a density of 10^3/well and were treated with clivorine (100 µM) for 12, 24 and 48 h. Then 0.75 mg/ml MTT was added and was incubated with cells for 5 h in a CO_2 incubator. When reduced in a cell, either enzymatically or through direct reaction with biomolecules, MTT turns blue to purple and may form an insoluble precipitate. Formazan dyes are useful for cell proliferation and toxicity assays since they only stain living, metabolically active cells.

Study of clivorine on kidney cells; formazan dye = living cells/cell prolif

MTT reduction = blue → purple

Passage Strategy 1: Passage First

Cell growth measured via ELISA ($\lambda_{absorbed}$)

Figure 2 shows that compared to control, clivorine significantly reduced cell growth rates

At last the cells were dissolved in 10% SDS-0.01 M HCl in a CO_2 incubator for 12 h. The intensity was measured using a reader for ELISA under an absorption wavelength of 570/630 nm (Figure 2).

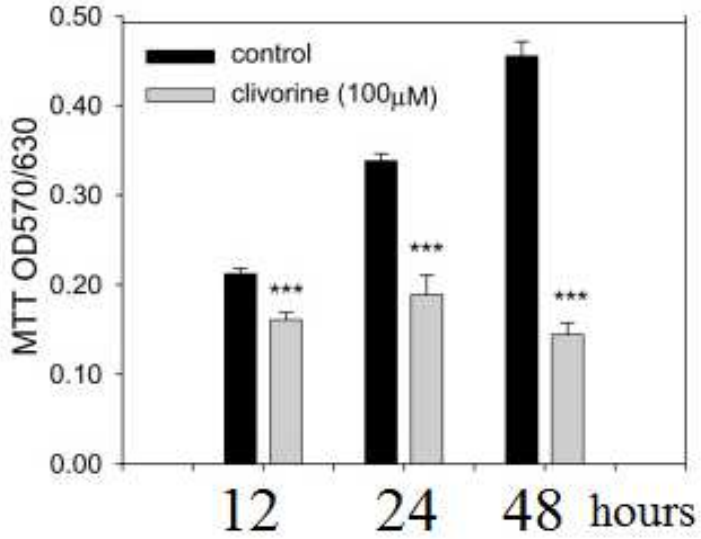


Figure 2 Time course of clivorine on K-5 cells growth (Note: ***P < 0.001, Data are means ± SE of three independent experiments)

Passage Strategy 1: Passage First

Next, researchers sought to identify the mechanism of the anti-proliferative function of clivorine in K-5 cells. After 48 h of clivorine (100 μM) treatment, fluorescence-activated cell sorting analysis of cell distribution in K-5 cells was performed as seen in Table 1. Clivorine treatment had no effect on p53 protein levels.

Clivorine significantly inhibited cell proliferation yet p53 protein appears to be made properly

Table 1 Cell Distribution in K-5 cells After 48 h Treatment

Cell cycle	Percentage of the cell number	
	Control	Clivorine (100 μM)
G_0–G_1	50.14 ± 8.37	46.40 ± 4.00
G_2–M	20.11 ± 4.90	20.90 ± 1.32
S	19.80 ± 12.25	22.20 ± 6.36
G_2/G_1	12.00 ± 0.09	11.98 ± 0.01

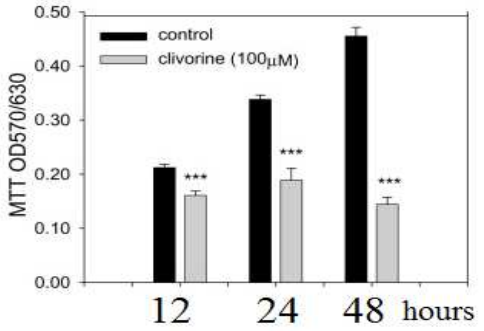
Proportion of cells at any given stage of the cell cycle was unaffected

Passage Strategy 1: Passage First

1) The research findings best support which of the following conclusions?

A. Clivorine inhibits human normal kidney K-5 cell mitosis.
B. Clivorine induces human normal kidney K-5 cell apoptosis.
C. Clivorine reduces p53 protein expression leading to K-5 cell death.
D. Clivorine decreases human normal kidney nuclear replication.

Broad question; let's identify conclusions from the experiment.



¶1 and Figure 2 support that exposure to clivorine leads to cell death and severely inhibited cell proliferation, likely by preventing replication via unidentified mechanism.

Table 1 shows that normal cell cycle functions are not significantly inhibited by clivorine (eliminate choice A and D).

¶4 says levels of p53 protein were not changed upon exposure to the molecule (eliminate choice C).

Passage Strategy 1: Passage First

2) Which of the following molecules is most likely to cause MTT to turn purple in kidney cells?

A. ATP
B. Cytochrome p450 oxidase
C. NADH kinase
D. NADPH

¶3 states that "when reduced in a cell…direct reaction with biomolecules…" MTT turns from blue to purple.

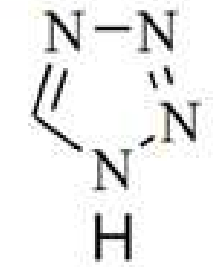
Any reductive biomolecule will do, such as NADH or NADPH.

A, B, C: These are an energy transfer co-enzyme (A), an oxidative enzyme (B), and a phosphotransferase (C).

Passage Strategy 1: Passage First

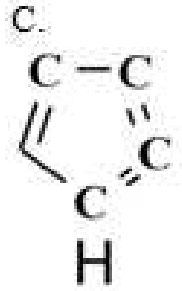
3) MTT belongs to a class of compounds known as tetrazoles. Which of the following structures would be found in MTT?

A.



B.

C.



D.

Pseudo-discrete question; let's examine the name we are given.

***Azoles** are a class of five-membered heterocyclic compounds containing a nitrogen atom and at least one other non-carbon atom (N, S, or O) as part of the ring.*

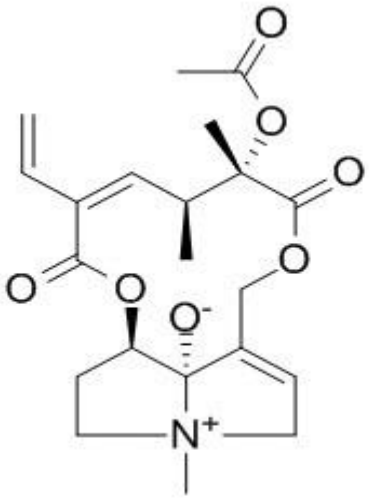
***Tetra-** prefix implies there are 4 N atoms in the 5-member ring.*

Passage Strategy 1: Passage First

4) Which functional groups are found on clivorine?

A. Ether, ketone, amide
B. Ether, ester, alkyne
C. Ester, amine, alkene
D. Aldehyde, ester, ether

We need to go back to examine the structure of clivorine.



A: There is no amide group, ether, or ketone.
B: There is no alkyne group.
C: Correct!
D: There is no aldehyde group.

Passage Strategy 2: Questions First

- Get oriented to the passage (≈ 15 seconds)
- Jump right to the first question
- Look up as needed
- Skip/Mark aggressively

Passage Strategy 2: Questions First

Kidney stones are insoluble aggregate crystals that can form in the urine of certain people. One of the compounds that can contribute to the formation of kidney stones is calcium oxalate (CaC_2O_4, FW = 128.097 g/mol, K_{sp} = 2.3 x 10^{-9}). Oxalic acid is a naturally occurring diprotic acid, ($H_2C_2O_4$, pk_{a1} = 1.3 and pk_{a2} = 4.3) present in foods such as rhubarb and spinach. Oxalic acid can be produced from oxaloacetate, which plays an important role in the citric acid cycle. Uric acid also contributes to the formation of kidney stones, and its crystallization in the joints produces the painful symptoms associated with gout. Uric acid is the final oxidation product of purine metabolism and, like oxalic acid, is a diprotic acid ($H_2C_5H_2N_4O_3$, pK_{a1} = 5.4; pK_{a2} = 10.3). Unlike oxalic acid, uric acid is not completely ionized in normal urine.

If urine becomes supersaturated, seed crystals can aggregate, forming a large mass (stone) in the bladder, the ureters, or the kidneys. Small stones (< 3 mm) are readily passed, however, large stones can cause obstruction and renal colic. In many cases ultrasound can be used to break up stones, but for very large, dense stones, surgery may be required.

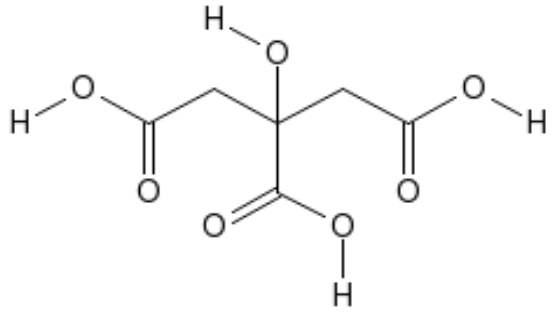


Figure 1 Citric acid ($H_3C_6H_5O_7$)

Reaction 1 Ca^{2+} (aq) + $C_6H_5O_7^{3-}$ (aq) → $CaC_6H_5O_7^{-}$ (aq)

Urine contains a number of natural chelating agents, such as citrate. These agents are polydentate ligands (Lewis bases) that coordinate to a metal ion and form soluble coordination compounds that help prevent the nucleation and precipitation of calcium oxalate. Figure 1 shows citric acid, a weak triprotic acid (pK_{a1} = 3.1, pK_{a2} = 4.8 and pK_{a3} = 6.4). The equilibrium constant at physiological temperature for the formation of the calcium citrate complex ion (Reaction 1) is 1.9 x 10^3. The calcium citrate complex has a residual negative charge that enhances its solubility in aqueous solution.

Passage Strategy 2: Questions First

1) Which of the following formulas best represents the predominant form that exists in solution when citric acid is dissolved in normal urine (pH = approximately 7)?

A) $H_3C_6H_5O_7$
B) $H_2C_6H_5O_7^-$
C) $HC_6H_5O_7^{2-}$
D) $C_6H_5O_7^{3-}$

2) According to the passage, which temperature range corresponds to the physiological formation of the calcium citrate complex?

A) 30-32°F
B) 73-75°F
C) 98-100°F
D) 210-212°F

3) If equal molar solutions of oxalic acid, uric acid, citric acid and urea are prepared, which solution will have the lowest pH?

A) Oxalic acid, because the first acid dissociation constant is the largest of the three acids.
B) Uric acid, because its pK_{a2} value is the largest of the three acids.
C) Citric acid, because it is a triprotic acid.
D) Urea because it is a basic compound.

Passage Strategy 2: Questions First

4) Based on information in the passage, what is the equilibrium constant for the following reaction?

CaC_2O_4 (s) + $C_6H_5O_7^{3-}$ (aq) D $CaC_6H_5O_7^{-}$ (aq) + $C_2O_4^{2-}$ (aq)

A) 4.3×10^{8}
B) 1.9×10^{3}
C) 4.4×10^{-6}
D) 2.3×10^{-9}

5) DNA is made of nucleotides, which utilize non-covalent interactions, such as hydrogen bonding, to form base pairs. Which of the following nucleotides could produce uric acid as a result of metabolism?

I. Adenine
II. Guanine
III. Glucose

A) I only
B) II only
C) I and II only
D) I, II, and III

Passage Strategy 2: Questions First

1) Which of the following formulas best represents the predominant form that exists in solution when citric acid is dissolved in normal urine (pH ≈ 7)?

A) $H_3C_6H_5O_7$
B) $H_2C_6H_5O_7^-$
C) $HC_6H_5O_7^{2-}$
D) $C_6H_5O_7^{3-}$

Skim through looking for citric acid and some numbers about citric acid.

pH > pK_a = solution is relatively basic

Basic solution = deprotonate!

Urine contains a number of natural chelating agents, such as citrate. These agents are polydentate ligands (Lewis bases) that coordinate to a metal ion and form soluble coordination compounds that help prevent the nucleation and precipitation of calcium oxalate. Figure 1 shows citric acid, a weak triprotic acid (pK_{a1} = 3.1, pK_{a2} = 4.8 and pK_{a3} = 6.4). The equilibrium constant at 37°C for the formation of the calcium citrate complex ion (Reaction 1) is 1.9 x 10^3. The calcium citrate complex has a residual negative charge that enhances its solubility in aqueous solution.

Passage Strategy 2: Questions First

2) According to the passage, which temperature range corresponds to the physiological formation of the calcium citrate complex?

A) 30-32°F
B) 73-75°F
C) 98-100°F
D) 210-212°F

Pseudo-discrete; do not spend time researching the passage!

We should recognize 37°C as body/physiological T, which is about 37(9/5) + 32 = 98.6°F.

Passage Strategy 2: Questions First

3) If equal molar solutions of oxalic acid, uric acid, citric acid and urea are prepared, which solution will have the lowest pH?

A) Oxalic acid, because the first acid dissociation constant is the largest of the three acids.
B) Uric acid, because its pK_{a2} value is the largest of the three acids.
C) Citric acid, because it is a triprotic acid.
D) Urea because it is a basic compound.

*Lowest pH means the **most acidic** solution*

pX = -log[X], so the more acidic (high K_a) solution will have a lower pK_a for the molecules in solution

Lowest pK_a listed is 1.3 for oxalic acid

Other pK_a values are orders of magnitude less acidic

Kidney stones are insoluble aggregate crystals that can form in the urine of certain people. One of the compounds that can contribute to the formation of kidney stones is calcium oxalate (CaC_2O_4, FW = 128.097 g/mol, K_{sp} = 2.3 x 10^{-9}). Oxalic acid is a naturally occurring diprotic acid, ($H_2C_2O_4$, pK_{a1} = 1.3; pK_{a2} = 4.3) present in a number of foods, including rhubarb and spinach. Oxalic acid can be produced from oxaloacetate, which plays an important role in the citric acid cycle. Uric acid also contributes to the formation of kidney stones and its crystallization in the joints produces the painful symptoms associated with gout. Uric acid is the final oxidation product of purine metabolism and, like oxalic acid, is diprotic ($H_2C_5H_2N_4O_3$, pK_{a1} = 5.4; pK_{a2} = 10.3). Unlike oxalic acid, uric acid is not completely ionized in normal urine.

Passage Strategy 2: Questions First

Next Step TEST PREP

4) Based on information in the passage, what is the equilibrium constant for the following reaction?

CaC_2O_4 (s) + $C_6H_5O_7^{3-}$ (aq) D $CaC_6H_5O_7^{-}$ (aq) + $C_2O_4^{2-}$ (aq)

A) 4.3×10^{8}
B) 1.9×10^{3}
C) 4.4×10^{-6}
D) 2.3×10^{-9}

Try to move quickly – best to just guess (blindly if needed, educated guess if time):

Either A/B – much bigger than 1 OR C/D – much smaller than 1

Calcium oxalate – very low solubility constant means it does not want to dissolve

So the constant for this reaction that involves it dissolving is probably pretty low. Guess C or D and move on

Kidney stones are insoluble aggregate crystals that can form in the urine of certain people. One of the compounds that can contribute to the formation of kidney stones is calcium oxalate (CaC_2O_4, FW = 128.097 g/mol, $K_{sp} = 2.3 \times 10^{-9}$). Oxalic acid is a naturally occurring diprotic acid, ($H_2C_2O_4$, $pK_{a1} = 1.3$; $pK_{a2} = 4.3$) present in a number of foods, including rhubarb and spinach. Oxalic acid can be produced from oxaloacetate, which plays an important role in the citric acid cycle. Uric acid also contributes to the formation of kidney stones and its crystallization in the joints produces the painful symptoms associated with gout. Uric acid is the final oxidation product of purine metabolism and, like oxalic acid, is diprotic ($H_2C_5H_2N_4O_3$, $pK_{a1} = 5.4$; $pK_{a2} = 10.3$). Unlike oxalic acid, uric acid is not completely ionized in normal urine.

Passage Strategy 2: Questions First

5) DNA is made of nucleotides, which utilize non-covalent interactions, such as hydrogen bonding, to form base-pairs. Which of the following nucleotides could produce uric acid as a result of metabolism.

I. Adenine
II. Guanine
III. Glucose

A) I only
B) II only
C) I and II only
D) I, II and III

RN question, work smarter to save time:

III is not a nucleotide – eliminate choice D

Question is too specific for simple recall, check the passage

Uric acid is produced by purine metabolism (Pure As Gold)

Kidney stones are insoluble aggregate crystals that can form in the urine of certain people. One of the compounds that can contribute to the formation of kidney stones is calcium oxalate (CaC_2O_4, FW = 128.097 g/mol, $K_{sp} = 2.3 \times 10^{-9}$). Oxalic acid is a naturally occurring diprotic acid, ($H_2C_2O_4$, $pK_{a1} = 1.3$; $pK_{a2} = 4.3$) present in a number of foods, including rhubarb and spinach. Oxalic acid can be produced from oxaloacetate, which plays an important role in the citric acid cycle. Uric acid also contributes to the formation of kidney stones and its crystallization in the joints produces the painful symptoms associated with gout. Uric acid is the final oxidation product of purine metabolism and, like oxalic acid, is diprotic ($H_2C_5H_2N_4O_3$, $pK_{a1} = 5.4$; $pK_{a2} = 10.3$). Unlike oxalic acid, uric acid is not completely ionized in normal urine.

How Your Approach Pays Off

- On shorter or info-driven passages, question-first can save time and make us more efficient
- On data-driven passages, closer reading of the purpose and results of the experiment/study will make us more accurate in the questions
- Psych/Soc passages hide data/results in text, C/P and B/B rarely do this
- No one best strategy exists, practice multiple techniques

Passage Strategy Exercise: Psych/Soc

"Setup involves…" looks like we may have a study-based passage here

The implicit association test assesses for implicit attitudes through a categorization task. Participants are presented with a computer screen displaying two words on the left side of the screen and two words on the right. The middle of the screen then flashes a word or image and the participant must click a button to indicate the appropriate category as quickly as they can.

Implicit assumption, bias, prejudice may all show up in passage, Qs

The set up involves putting the categories "good" and "bad" on the sides of the screen (left vs. right, determined randomly) and then categories like "male" and "female" or "rich" and "poor." After going through several assignments, the category pairings are switched. For example, a person might click the left button if an image is either "good or male" and the right button if the image is "bad or female" during round 1, and then have to click left for "good or female" and right for "bad or male" during round 2. The images or words presented unequivocally belong to one of these groups. For example, words like "disgust" or "agony" would be categorized as "bad" by 100% of participants, and the symbol for the men's bathroom would be categorized as "male" by 100% of participants.

Table indicates a study was carried out, data collected

Researchers hypothesize that faster response times indicate an implicit bias in favor of the grouping. That is, if a person is able to categorize an image as "good or male" more quickly than he is able to categorize an image as "good or female," this reveals an implicit sexism in favor of males.

The implicit assumption test was made available on the website of a prominent university and after several news stories, became very popular, with over 150,000 participants in the span of just a few months. Table 1 shows the relative delays from subjects responding to a given image.

Table 1 Average Delay of Subjects Before Image Categorization

	Good	Bad
Slim	751 ms	1003 ms
Fat	1150 ms	633 ms
Abled	833 ms	998 ms
Disabled	1012 ms	710 ms

Passage Strategy Exercise: Psych/Soc

21) Which of the following correctly identifies a limitation of the data set used?

A) The size of the data set prevents the conclusions from having significant statistical power.
B) Because the test works on implicit associations, it is unable to provide insight about those who are consciously biased.
C) Recruitment through media discussion of the test, without the usual small payment to participants, means the data set would skew towards much higher ends of the socioeconomic ladder.
D) The self-selection of participants prevents the data from being generalizable to any particular population.

23) The results from the experiment indicate that:

A) no implicit associations are associated with able-bodied versus disabled people.
B) study participants demonstrated a stronger implicit preference for slimness than against able bodied people.
C) a self-selected participant pool is more likely to have implicit biases than the general population.
D) study participants demonstrated a stronger implicit preference against fat people than against disabled people.

25) The test described in the passage is assessing:

A) unconscious discrimination.
B) conscious discrimination.
C) unconscious prejudice.
D) conscious stereotypes.

Broad Q may require checking multiple answers against the text

22 - EXCEPT question will take longer than most Q, consider skipping if time is short

22) The procedure described in the passage should also include each of the following EXCEPT:

A) one or more training rounds in which the person only needs to categorize an image as "good" vs. "bad", rather than having to be aware of two distinct categorizations at once.
B) controls in which the two categories have no meaningful connection (implicit or otherwise), such as "up or red" vs. "down or green".
C) recruitment procedures to guarantee that equal numbers of male and female participants are gathered.
D) data analysis that discards outlying latencies that indicate the subject did not complete the task.

24) If study participants feel a mild sensation of disgust in response to a word or image associated with disabled people, the Cannon-Bard theory of emotion would assert that:

A) the physiological arousal and emotional sensation of disgust arise separately and independently in separated areas of the brain.
B) the emotion is the result of the brain assessing the context of the physiological arousal experienced in the body.
C) the emotion follows from and is directly caused by the physiological arousal experienced.
D) the emotion is a cognitive response which then causes autonomic reflexes generating the feeling of the affect.

Passage Strategy Exercise: Psych/Soc

The implicit association test assesses for implicit attitudes through a categorization task. Participants are presented with a computer screen displaying two words on the left side of the screen and two words on the right. The middle of the screen then flashes a word or image and the participant must click a button to indicate the appropriate category as quickly as they can.

IA test for internal/unconscious attitude/bias; word-image match task, timed

The set up involves putting the categories "good" and "bad" on the sides of the screen (left vs. right, determined randomly) and then categories like "male" and "female" or "rich" and "poor." After going through several assignments, the category pairings are switched. For example, a person might click the left button if an image is either "good or male" and the right button if the image is "bad or female" during round 1, and then have to click left for "good or female" and right for "bad or male" during round 2. The images or words presented unequivocally belong to one of these groups. For example, words like "disgust" or "agony" would be categorized as "bad" by 100% of participants, and the symbol for the men's bathroom would be categorized as "male" by 100% of participants.

Experimental setup: image matched to "appropriate" word; disgust = bad; gender too

Passage Strategy Exercise: Psych/Soc

Researchers hypothesize that faster response times indicate an implicit bias in favor of the grouping. That is, if a person is able to categorize an image as "good or male" more quickly than he is able to categorize an image as "good or female," this reveals an implicit sexism in favor of males.

lower $t_{response}$ = implicit favorable/unfavorable bias

The implicit assumption test was made available on the website of a prominent university and after several news stories, became very popular, with over 150,000 participants in the span of just a few months. Table 1 shows the relative delays from subjects responding to a given image-word pair.

survey was voluntary, self-enrolled; delays measured

Table 1 Average Delay of Subjects Before Image Categorization

	Good	Bad
Slim	751 ms	1003 ms
Fat	1150 ms	633 ms
Abled	833 ms	998 ms
Disabled	1012 ms	710 ms

Table 1 data shows that images were categorized faster when they were shown combined with their "appropriate" tag

Passage Strategy Exercise: Psych/Soc

21) Which of the following correctly identifies a limitation of the data set used?

A) The size of the data set prevents the conclusions from having significant statistical power.

B) Because the test works on implicit associations, it is unable to provide insight about those who are consciously biased.

C) Recruitment through media discussion of the test, without the usual small payment to participants, means the data set would skew towards much higher ends of the socioeconomic ladder.

D) The self-selection of participants prevents the data from being reliably generalizable to any particular population.

The study had a huge pool of self-selected participants.

Thus, researchers could not control for (or know) the demographic data of the participants. This limits their ability to generalize the data to any particular subset of the population.

A: The sample size was huge (1.5×10^5)!

B: While the test is not one explicit bias, that is not a *limitation* of the study given its goal.

C: We have no reason to think that participants were necessarily unusually high on the socioeconomic ladder.

Passage Strategy Exercise: Psych/Soc

22) The procedure described in the passage should also include each of the following EXCEPT:

A) one or more training rounds in which the person only needs to categorize an image as “good” vs. “bad”, rather than having to be aware of two distinct categorizations at once.

B) controls in which the two categories have no meaningful connection (implicit or otherwise), such as “up or red” vs. “down or green”.

C) recruitment procedures to guarantee that equal numbers of male and female participants are gathered.

D) data analysis that discards outlying latencies that indicate the subject did not complete the task.

We need to identify the one answer that would NOT be a good idea to include in the study.

A: Since the test hinges on very fast reactions, participants should be trained on the basics of selecting left and right.

B: Controls would allow researchers to ensure that any biases are not simply due to lateralization of the categories.

D: Any outliers/data points that do not demonstrate meaningful participation, should also be discarded.

Passage Strategy Exercise: Psych/Soc

23) The results from the study most strongly indicate that:

A) no implicit associations are associated with able-bodied versus disabled people.

B) study participants have a stronger implicit preference for slimness than bias against able-bodied people.

C) a self-selected participant pool is more likely to have implicit biases than the general population.

D) study participants have a stronger implicit preference against fat people than against disabled people.

The study had a huge pool of self-selected participants.

	Good	Bad
Slim	751 ms	1003 ms
Fat	1150 ms	633 ms
Abled	833 ms	998 ms
Disabled	1012 ms	710 ms

Table 1 shows that participants had implicit biases against fat and disability (i.e. they connected these images to "bad").

Responses to "fat-bad" grouping were faster than those to the "disabled-bad" grouping.
Responses to "fat-good" were slower than those to "disabled-good."

This data suggests a stronger negative implicit bias against fat than against disability.

Passage Strategy Exercise: Psych/Soc

24) If study participants feel a mild sensation of disgust in response to a word or image associated with disabled people, the Cannon-Bard theory of emotion would assert that:

A) the physiological arousal and emotional sensation of disgust arise separately and independently in separated areas of the brain.

B) the emotion is the result of the brain assessing the context of the physiological arousal experienced in the body.

C) the emotion follows from and is directly caused by the physiological arousal experienced.

D) the emotion is actually a cognitive response which then causes autonomic reflexes.

The Cannon-Bard theory of emotion posits that the physiological arousal associated with the emotion and the subjective feeling of the emotion itself arise from separate and independent areas of the brain.

This most closely matches choice A.

B: This is more like the Schachter-Singer theory.

C: This is the James-Lange theory of emotion.

Passage Strategy Exercise: Psych/Soc

Because the test is one of implicit or unconscious bias, we can eliminate choices B and D immediately.

A: Discrimination is a behavior, not an attitude bias, or idea.

25) The test described in the passage is assessing:

A) unconscious discrimination.

B) conscious discrimination.

C) unconscious prejudice.

D) conscious stereotypes.

Summary of Strategies

- Scan the passage to help determine which strategy might be best (info-driven vs. data driven)
- Try your hand at highlighting, note-taking, or other/combined strategies before you settle on your best method
- In figures/tables/plots/graphs, initially focus on trends and conclusions

Practice, Practice, Practice!

Questions?

Like what you see? Sign up for a diagnostic account for a free full-length and class demo.

NextStepTestPrep.com/mcat-resources-page/

Planning your prep? Email or call us for a free consultation with one of our academic experts.

MCAT@NextStepTestPrep.com

nextsteptestprep.com

888-530-NEXT

Next Step: Core Values

Educate Daily

Approachability

Authenticity

Professionalism

Ownership

We are dedicated to providing personalized support, advice and prep options that match each student's individual needs.

Students Have A Choice

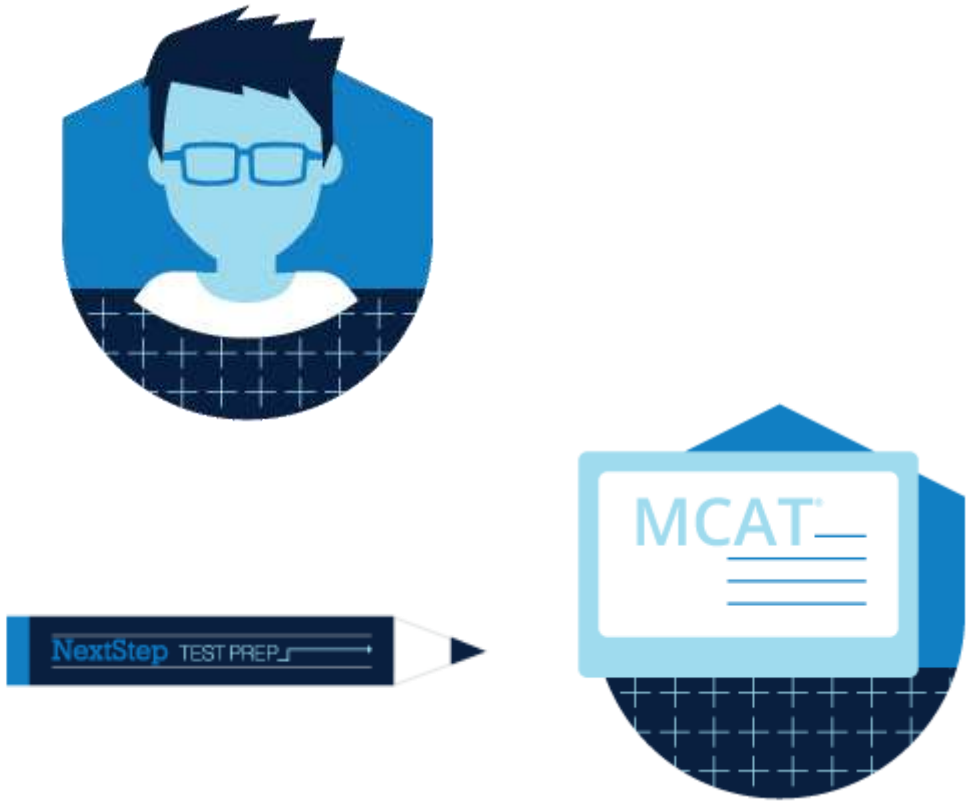
✓ **Over 50,000 students have used Next Step Test Prep in their MCAT Prep journey**

- **Always up-to-date content, strategy and tests**
- **Guaranteed Satisfaction**
- **Expert instructors on call for you**
- **No call center – instead, Academic Managers guiding you all the way**

Personalized Options

✓ **No matter your study-style, subject expertise or MCAT goal, Next Step has an option for your personal needs and lifestyle.**

- **Self-Prep Materials and Planning**
- **Guided Online Study with Free Extra Help**
- **Flexibility and Personalization**
- **One-on-One Tutoring**



Next Step: Educate Every Day

✓ **Start your prep with high-value FREE practice to build a study plan suited to your goals, needs, and schedule.**

Industry's Best Free MCAT Practice Bundle

- **Half-length MCAT diagnostic**
- **Full-length MCAT exam**
- **450+ Question Science Content Diag exam**
- **Test Review Videos**
- **Multiple QBank Samples**
- **16 Test & 4 Content Review Videos**
- **Proprietary Study Plan Generator**
- **Aligned to new MCAT 2018 Interface**

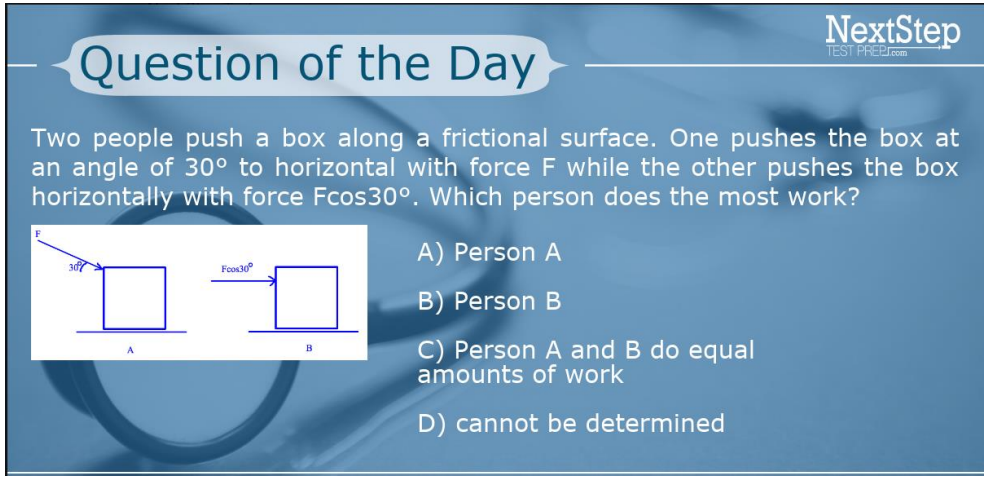
Get Your FREE MCAT Practice Bundle

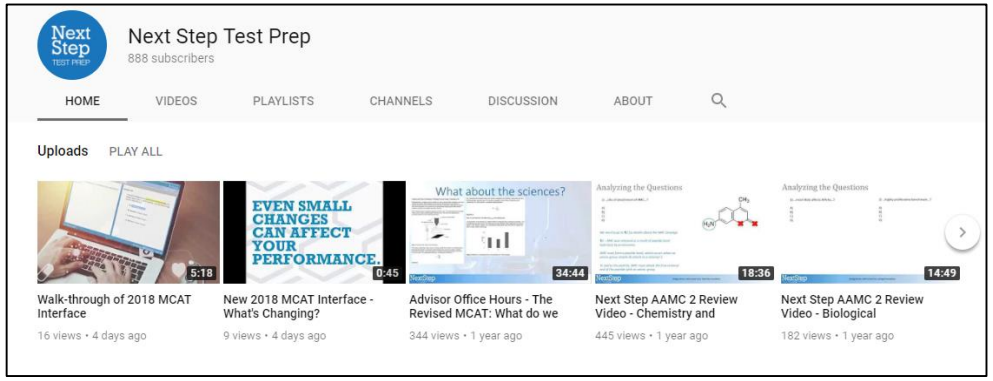
www.nextsteptestprep.com/FreeMCAT

Additional Free Resources

- ✓ **Supplement your prep with additional support tools**

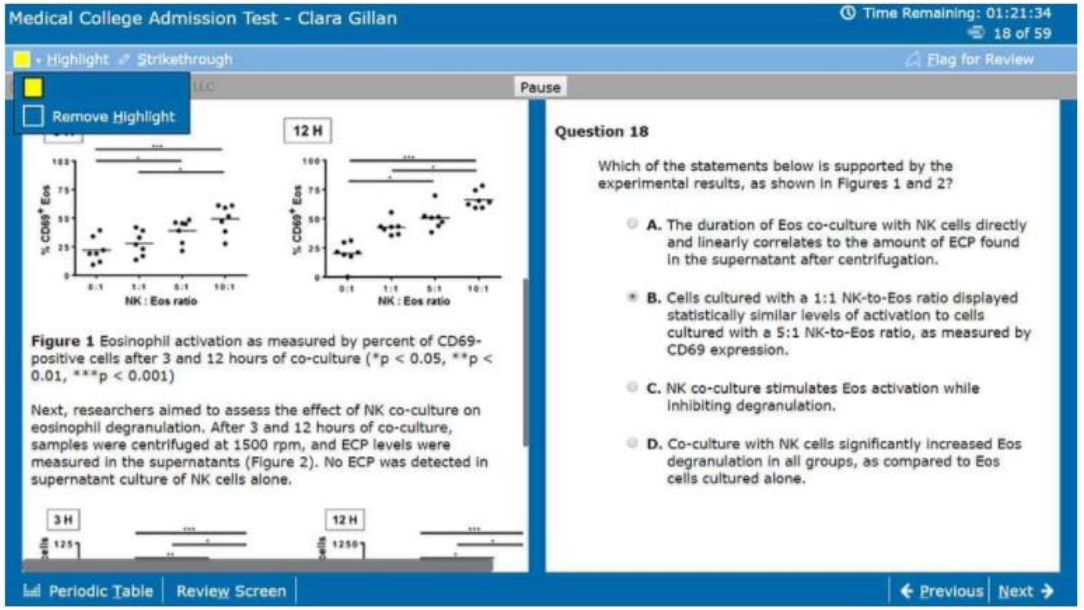
- **Question of the Day Quick Prep**
- **YouTube, Facebook and Instagram Content**
- **Ongoing Public Webinars and Q&A Sessions**
- **MCAT Blog: Content and Admissions**
- **Next Step MCAT Forum**





New 2018 MCAT Interface

- New Highlighting features
- New Strikethrough features
- New Keyboard Shortcuts
- New Navigation/Review Screens



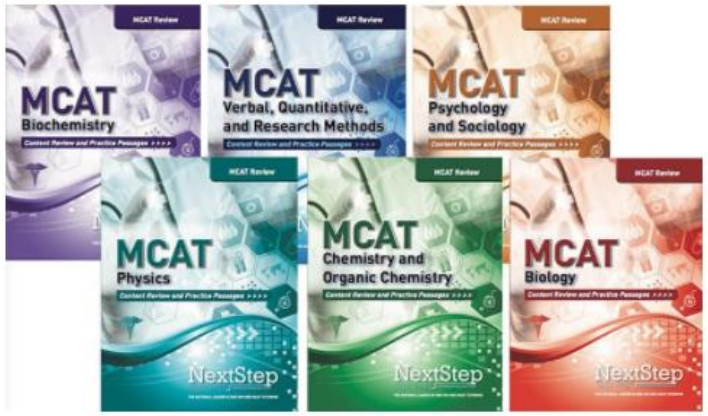
Next Step is ready. Are you?

✓ **Your practice experience matters!**
Prep with the most realistic testing environment with Next Step.

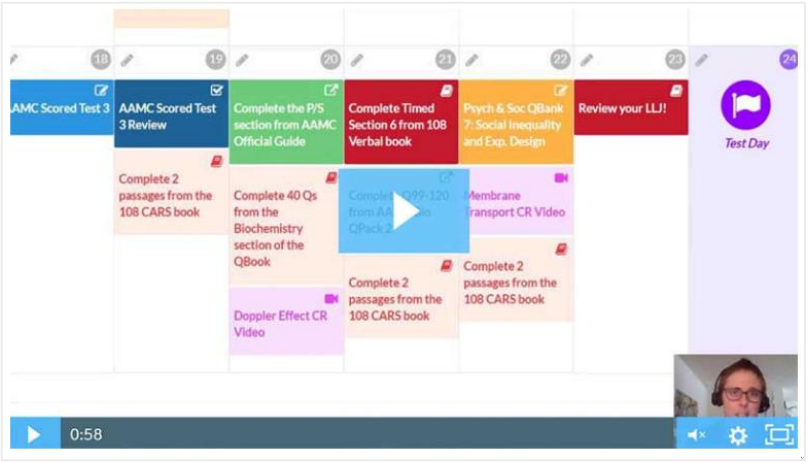
Take the Best Next Step

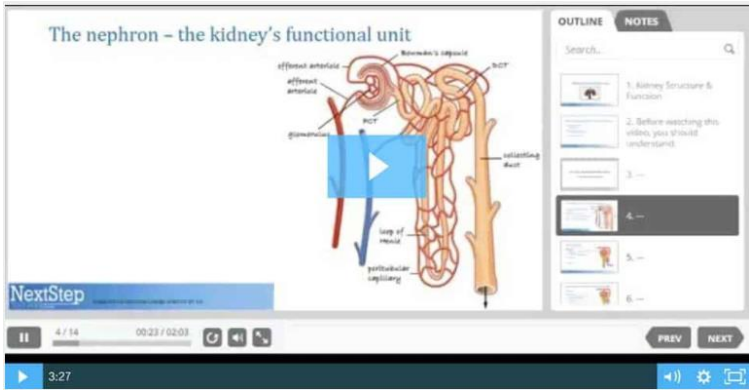
✓ **Others say it. We deliver it.**

- **Most up-to-date Lesson Review Books in 4-color**
- **QBank with passage and discrete question types**
- **Exclusive Study Plan Generator personalized for you**
- **Hundreds of hours of videos**
- **Private, small-group Office Hours 5 days a week**
- **Direct access to MCAT Content Team**
- **Affordable prep options: from books to tutoring**



Next Step TEST PREP





MCAT Study Options

Best-in-Class MCAT Tutoring Packages

- Variety of packages: Crash Course to Elite
- Choices include our MCAT Online Course
- Personalized Study Plan for each student
- Top-scoring tutors

Most up-to-date MCAT Course

- All new books in 4-color, all online AAMC resources
- 10 full-length exams aligned to new interface
- Live online office hours for any Q&A held 5 days per week
- Study Plan Generator to match each person's strengths, weaknesses and schedule needs.

MCAT Practice Test Bundles

- Available in 4-, 6-, 10-pack bundles
- All aligned to new 2018 interface

Next Step TEST PREP

NextStepTestPrep.com

Next Step TEST PREP

Get Solid Advice for Your Next Step

Schedule a one-on-one consultation with an Academic Manager.

REQUEST IN TODAY'S WEBINAR SURVEY.