

Question No. 1 of 10

Instructions: (1) Read the problem and answer choices carefully (2) Work the problems on paper as needed (3) Pick the answer (4) Go back to review the core concept tutorial as needed.

<p>Question #01</p>	<p>1. _____ are pain receptors stimulated by harmful stimuli, resulting in the sensation of pain.</p> <p>(A) Nociceptors (B) Histamines (C) NSAIDs (D) Prostaglandins (E) TNF-α and IL-1</p>
<p>Feedback on Each Answer Choice</p>	<p>A. Correct! Nociceptors are pain receptors stimulated by harmful stimuli, resulting in the sensation of pain.</p> <p>B. Incorrect! Histamine is a cell derived mediator which plays a role in inflammation.</p> <p>C. Incorrect! NSAIDs are non-steroidal anti-inflammatory drugs.</p> <p>D. Incorrect! Prostaglandins are cell derived mediators which play a role in inflammation. It causes vasodilation, fever and pain.</p> <p>E. Incorrect! TNF-α and IL-1 cause fever, chemotaxis and systemic inflammation symptoms.</p>
<p>Solution</p>	<p>Pain in the physical sense is often mediated by nociceptors, which are pain receptors stimulated by harmful stimuli, resulting in the sensation of pain. Nociceptors are activated once pain reaches a threshold level, which triggers signal transmission through the nervous system to the brain, where it is perceived as pain. Nociceptors may detect mechanical, thermal or chemical stimuli.</p> <p>The correct answer is (A).</p>

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Question #02	<p>2. Methotrexate, azathioprine, penicilliamine, hydroxychloroquine, chloroquine, organic gold compounds and sulfasalazine are all _____.</p> <p>(A) NSAIDs (B) DMARDs (C) Cytokines (D) Histamines (E) Prostaglandins</p>
Feedback on Each Answer Choice	<p>A. Incorrect! NSAIDs are non-steroidal anti-inflammatory drugs.</p> <p>B. Correct! Methotrexate, azathioprine, penicilliamine, hydroxychloroquine, chloroquine, organic gold compounds and sulfasalazine are all DMARDs.</p> <p>C. Incorrect! Cytokines are not a type of drug.</p> <p>D. Incorrect! Histamine is not a type of drug.</p> <p>E. Incorrect! Prostaglandins are cell derived mediators which play a role in inflammation. It causes vasodilation, fever and pain.</p>
Solution	<p>Disease Modifying Antirheumatic Drugs (DMARDs) do not provide immediate relief of symptoms; however, they slow the progression of the disease. These drugs include methotrexate, azathioprine, penicilliamine, hydroxychloroquine, chloroquine, organic gold compounds and sulfasalazine.</p> <p>The correct answer is (B).</p>

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<p>Question #03</p>	<p>3. _____ are thought to be responsible for most of the analgesic effects of opioids, and for some major unwanted effects such as respiratory depression, euphoria, sedation and dependence.</p> <p>(A) μ-receptors (B) δ-receptors (C) Opioid receptors (D) Opiates (E) Corticosteroids</p>
<p>Feedback on Each Answer Choice</p>	<p>A. Correct! μ-receptors are thought to be responsible for most of the analgesic effects of opioids, and for some major unwanted effects such as respiratory depression, euphoria, sedation and dependence.</p> <p>B. Incorrect! δ-receptors are probably most important in the periphery but may also contribute to analgesia.</p> <p>C. Incorrect! Opioid receptors are linked through the G-proteins to inhibition of adenylate cyclase.</p> <p>D. Incorrect! Opiates are any narcotic opioid alkaloid found as a natural product of the opium poppy plant.</p> <p>E. Incorrect! Corticosteroids are used in rheumatoid arthritis.</p>
<p>Solution</p>	<p>μ-receptors are thought to be responsible for most of the analgesic effects of opioids, and for some major unwanted effects such as respiratory depression, euphoria, sedation and dependence.</p> <p>The correct answer is (A).</p>

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<p>Question #04</p>	<p>4. _____ are probably most important in the periphery but may also contribute to analgesia.</p> <p>(A) μ-receptors (B) δ-receptors (C) Opioid receptors (D) Opiates (E) Corticosteroids</p>
<p>Feedback on Each Answer Choice</p>	<p>A. Incorrect! μ-receptors are thought to be responsible for most of the analgesic effects of opioids, and for some major unwanted effects such as respiratory depression, euphoria, sedation and dependence.</p> <p>B. Correct! δ-receptors are probably most important in the periphery but may also contribute to analgesia.</p> <p>C. Incorrect! Opioid receptors are linked through the G-proteins to inhibition of adenylate cyclase.</p> <p>D. Incorrect! Opiates are any narcotic opioid alkaloid found as a natural product of the opium poppy plant.</p> <p>E. Incorrect! Corticosteroids are used in rheumatoid arthritis.</p>
<p>Solution</p>	<p>δ-receptor are probably most important in the periphery but may also contribute to analgesia, although they are less effective than μ Opioid Receptors.</p> <p>The correct answer is (B).</p>

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<p>Question #05</p>	<p>5. _____ is a cytokine that has a central role in inflammation.</p> <p>(A) Adalimumab (B) TNF-α (C) Infliximab (D) Methadone (E) Histamine</p>
<p>Feedback on Each Answer Choice</p>	<p>A. Incorrect! Adalimumab is a monoclonal antibody that cross links TNF receptors on the cell surface and inhibit the effects of T-cells and macrophages.</p> <p>B. Correct! TNF-α is a cytokine that has a central role in inflammation.</p> <p>C. Incorrect! Infliximab is a monoclonal antibody that cross links TNF receptors on the cell surface and inhibit the effects of T-cells and macrophages.</p> <p>D. Incorrect! Methadone is pharmacologically similar to morphine, and is not a cytokine.</p> <p>E. Incorrect! Histamine is not a cytokine.</p>
<p>Solution</p>	<p>TNF-α is a cytokine that has a central role in inflammation. Monoclonal antibodies such as adalimumab and infliximab cross link TNF receptors on the cell surface and inhibit the effects of T-cells and macrophages. Adalimumab is a fully human IgG TNF blocking agent, while infliximab is a chimeric (25% mouse + 75% human) monoclonal antibody.</p> <p>The correct answer is (B).</p>

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<p>Question #06</p>	<p>6. _____ is a useful DMARD in rheumatoid arthritis where it exerts its effects by inhibiting aminoimidazolecarboxamide ribonucleotide transformylase and thymidylate synthetase.</p> <p>(A) Methadone (B) Fentanyl (C) Methotrexate (D) Naloxone (E) Codeine</p>
<p>Feedback on Each Answer Choice</p>	<p>A. Incorrect! Methadone is not a DMARD.</p> <p>B. Incorrect! Fentanyl is not a DMARD.</p> <p>C. Correct! Methotrexate is a useful DMARD in rheumatoid arthritis where it exerts its effects by inhibiting aminoimidazolecarboxamide ribonucleotide transformylase and thymidylate synthetase.</p> <p>D. Incorrect! Naloxone was the first pure opioid antagonist.</p> <p>E. Incorrect! Codeine is made commercially from morphine, and is not a DMARD.</p>
<p>Solution</p>	<p>Methotrexate is a useful DMARD in rheumatoid arthritis where it exerts its effects by inhibiting aminoimidazolecarboxamide ribonucleotide transformylase and thymidylate synthetase.</p> <p>The correct answer is (C).</p>

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Question #07	<p>7. _____ are also known as coxibs, and inhibit prostaglandin synthesis without affecting COX-1 enzymes.</p> <p>(A) COX 2 selective inhibitors (B) Aspirin (C) Salicylate (D) δ-receptors (E) Monoclonal antibodies</p>
Feedback on Each Answer Choice	<p>A. Correct! COX 2 selective inhibitors, also known as coxibs, inhibit prostaglandin synthesis without affecting COX-1 enzymes.</p> <p>B. Incorrect! Aspirin inhibits both COX-1 and COX-2.</p> <p>C. Incorrect! Salicylate causes irreversible inactivation of cyclo-oxygenase, acting mainly on the constitutive enzyme, COX-1.</p> <p>D. Incorrect! δ-receptors are opioid receptors.</p> <p>E. Incorrect! Monoclonal antibodies are not coxibs.</p>
Solution	<p>COX 2 selective inhibitors, also known as coxibs, inhibit prostaglandin synthesis without affecting COX-1 enzymes. COX-2 inhibitors include celecoxib, etoricoxib, meloxicam and valdecoxib. COX-2 Inhibitors are not associated with gastrointestinal disturbances or inhibition of platelet aggregation. However, they do cause renal toxicities since COX-2 is found in the kidneys.</p> <p>The correct answer is (A).</p>

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<p>Question #08</p>	<p>8. _____ has antipyretic but no anti-inflammatory actions. It is given orally and metabolized in the liver.</p> <p>(A) Acetaminophen (B) Corticosteroids (C) Adalimumab (D) Salicylate (E) Celecoxib</p>
<p>Feedback on Each Answer Choice</p>	<p>A. Correct! Acetaminophen has antipyretic but no anti-inflammatory actions. It is given orally and metabolized in the liver.</p> <p>B. Incorrect! Corticosteroids have anti-inflammatory actions.</p> <p>C. Incorrect! Adalimumab is a monoclonal antibody that cross links TNF receptors on the cell surface and inhibit the effects of T-cells and macrophages.</p> <p>D. Incorrect! Salicylate causes irreversible inactivation of cyclo-oxygenase, acting mainly on the constitutive enzyme, COX-1.</p> <p>E. Incorrect! Celecoxib is a selective COX-2 inhibitor.</p>
<p>Solution</p>	<p>Acetaminophen has antipyretic but no anti-inflammatory actions. It is given orally and metabolized in the liver.</p> <p>The correct answer is (A).</p>

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<p>Question #09</p>	<p>9. _____ cause(s) vasodilation, fever and pain.</p> <p>(A) Nociceptors (B) Histamine (C) NSAIDs (D) Prostaglandins (E) Leukotrienes</p>
<p>Feedback on Each Answer Choice</p>	<p>A. Incorrect! Nociceptors are pain receptors stimulated by harmful stimuli, resulting in the sensation of pain.</p> <p>B. Incorrect! Histamine is a cell derived mediator which dilates blood vessels.</p> <p>C. Incorrect! NSAIDs are non-steroidal anti-inflammatory drugs.</p> <p>D. Correct! Prostaglandins are cell derived mediators which play a role in inflammation. It causes vasodilation, fever and pain.</p> <p>E. Incorrect! Leukotrienes dilate blood vessels during the inflammation response.</p>
<p>Solution</p>	<p>A number of cell-derived mediators play a role in inflammation, including prostaglandins, which cause vasodilation, fever and pain</p> <p>The correct answer is (D).</p>

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Question #10	<p>10. Morphine has the following actions:</p> <ul style="list-style-type: none">(A) Analgesia(B) Euphoria(C) Sedation(D) Respiratory depression(E) All of the above
Feedback on Each Answer Choice	<p>A. Incorrect! This is just one of the actions of morphine.</p> <p>B. Incorrect! This is just one of the actions of morphine.</p> <p>C. Incorrect! This is just one of the actions of morphine.</p> <p>D. Incorrect! This is just one of the actions of morphine.</p> <p>E. Correct! Morphine causes analgesia, euphoria, sedation and respiratory depression.</p>
Solution	<p>The main pharmacological effects of morphine are analgesia, euphoria and sedation, respiratory depression and suppression of cough, nausea and vomiting, papillary constriction, reduced gastrointestinal motility and release of histamine.</p> <p>The correct answer is (E).</p>