1. Pain on ulnar deviation of the wrist with the thumb grasped in the fist is a positive sign for which of the following conditions?
   A) Carpal tunnel syndrome  
   B) Rheumatoid arthritis  
   C) Medial epicondylitis  
   D) De Quervain’s tenosynovitis

   • A positive _____________ test (as described in the stem above) is suggestive of de Quervain’s tenosynovitis, which is a tendonopathy of the extensor pollicis brevis and abductor pollicis longus tendons.
   • This syndrome is commonly seen in new mothers and repetitive movements that involve repetitive ulnar or radial deviation of the wrist.
   • De Quervain’s tenosynovitis may also be seen in patients with rheumatoid arthritis.

   ![Diagram of thumb placement](image1)
   ![Diagram of hand tilt](image2)

2. Which of the following is NOT a type of connective tissue fiber?
   A) Ependymal  
   B) Collagen  
   C) Elastic  
   D) Reticular

<table>
<thead>
<tr>
<th>Collagenous fibers</th>
<th>Elastic fibers</th>
<th>Reticular fibers</th>
</tr>
</thead>
</table>
   | * are the most abundant of the connective tissue fibers  
   | * are found in vessels, cartilage, gut, skin, bone, tendons, and ligaments.  
   | * form the extracellular matrix and can stretch up to 1.5 times their length.  
   | * provide a framework and are found in the liver, marrow, and lymphatic organs.  |

3. What type of collagen deficiency is present in osteogenesis imperfecta?
   A) Type 1 collagen  
   B) Type 2 collagen  
   C) Type 3 collagen  
   D) Type 4 collagen

   • Osteogenesis imperfecta, or brittle bone disease, is an autosomal dominant disorder caused by a gene mutation producing type ____ collagen.
   • Type ____ collagen is the most abundant collagen in the body, found in scar tissue during healing.
   • The bone mass in individuals with this disorder is diminished.
   • Patients classically have ____ sclera because of the lack of type 1 collagen formation in the eye allowing the choroidal veins to be seen.

 ![Image of osteogenesis imperfecta](image3)  
 ![Image of sclera](image4)
4. Which of the following pediatric conditions leads to fragile bones resulting in multiple fractures?
A) Juvenile rheumatoid arthritis
B) Sickle cell disease
C) Osteogenesis imperfecta
D) Osteoarthritis

- Osteogenesis imperfecta, also known as brittle bone disease, is caused by gene mutations of alpha-1 and alpha-2 chains of type 1 collagen and posttransitional modification of type 1 collagen.
- Type 1 collagen is an important structural protein for ligament, tendon, sclera, and bone.
- Dysfunctional type 1 collagen results in defective quality and fragility of bone seen in patients with osteogenesis imperfecta.

5. Which of the following vitamin deficiencies can cause scurvy?
A) Vitamin A
B) Vitamin B
C) Vitamin C
D) Vitamin D

- Vitamin C deficiency leads to impaired collagen synthesis, resulting in pathological manifestations in tissues and organs containing collagen.

6. Which of the following is NOT a feature of Scheuermann kyphosis?
A) Vertebral body wedging of at least 5 degrees
B) Flattening of curvature with extension
C) Involvement of at least three vertebral bodies
D) Anterior wedging

- Scheuermann kyphosis occurs in early adolescence and is defined as anterior wedging of at least 5 degrees involving at least three vertebral bodies.
- Forward bending, extension, or lying supine does not resolve this rigid kyphosis that usually involves the thoracic or thoracolumbar spine.
7. Which of the following is true of gouty arthritis?
   A) Calcium pyrophosphate dihydrate crystals are found in joint fluid
   B) Female predominance
   C) Allopurinol can be used during an attack
   D) Tophi (deposits of uric acid crystals) may be present

   • _______ can be seen in gout.
   • Calcium pyrophosphate dihydrate crystals are seen in pseudogout.
   • Gout has a male predominance.
   • Allopurinol is used to lower serum uric acid and prevent or decrease attacks, but is not used for an acute attack.

<table>
<thead>
<tr>
<th>Gout</th>
<th>Pseudogout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monosodium urate</td>
<td>Calcium pyrophosphate dihydrate</td>
</tr>
<tr>
<td>Needle-shaped crystals</td>
<td>Rhomboid-shaped crystals</td>
</tr>
</tbody>
</table>

8. What is the name for an abnormal fibrous hyperplasia and contracture of the palmar fascia that causes a flexion contracture of the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints?
   A) Charcot joint
   B) Dupuytren’s contracture
   C) De Quervain’s tenosynovitis
   D) Trigger finger

   • _____________ is an abnormal fibrous hyperplasia and contracture of the palmar fascia that causes a flexion contracture of the MCP and PIP joints.
   • It is more common in white men age 50 to 70.
   • It is associated with alcoholism, pulmonary tuberculosis, epilepsy, and diabetes mellitus.
   • It is painless, but can cause functional problems.
9. What is the term given to the enlargement of the gastrocnemius-semimembranous bursa?
A) Baker’s cyst
B) Septic arthritis
C) Gout
D) Pseudogout

- The gastrocnemius-semimembranous bursa is found between the tendons of the medial head of the gastrocnemius and the semimembranosus muscles.
- The distention of this bursa is called a _________.
- Although usually asymptomatic, the rupture of a _________ can cause acute pain in the back of the knee.

10. Which of the following is the most common benign tumor composed of adipocytes?
A) Focal nodular hyperplasia
B) Neuroblastoma
C) Hemangioma
D) Lipoma

- Lipoma are lobules of adipocytes found in subcutaneous tissue, deep soft tissue, or surfaces of bone.
- These lesions are usually painless, unless compressing against adjacent tissue or nerves resulting in neurological or functional deficits.

<table>
<thead>
<tr>
<th>Lipoma</th>
<th>Ganglion cyst (Bible Bump)</th>
</tr>
</thead>
<tbody>
<tr>
<td>benign tumor made of fat tissue</td>
<td>fluid filled lump associated with a joint or tendon sheath</td>
</tr>
</tbody>
</table>

11. Which of the following disorders is caused by a fibrillin defect?
   A) Osteogenesis imperfecta
   B) Rheumatoid arthritis
   C) Marfan syndrome
   D) Scleroderma

   - ________________ is an autosomal dominant condition caused by FBN1 gene mutation located on chromosome 5.
   - Excess linear growth of long bones, arachnodactyly, and joint laxity are common skeletal findings.
   - Cardiac conditions such as aortic root dilation and mitral valve pathology may be noted.
   - Ectopia lentis seen in 50% to 80% of patients with Marfan syndrome.

<table>
<thead>
<tr>
<th>Arachnodactyly</th>
<th>Pectus excavatum</th>
<th>Dilation of aorta</th>
<th>Ectopia lentis</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
</tbody>
</table>

12. Which of the following is the leading cause of morbidity and mortality in patients with Marfan syndrome?
   A) Arachnodactyly
   B) Pneumothorax
   C) Ectopia Lentis
   D) Aortic disease

   - Aortic disease causing aortic dilatation, aortic dissection, and regurgitation is the main cause of morbidity and mortality in patients with Marfan syndrome.
   - Approximately 60% to 80% of adult patients with Marfan syndrome have aortic root dilatation, and the American Heart Association recommends an echocardiograph at the time of diagnosis.

Marfan syndrome is featured many typical hand characteristics. However a combination of two specific hands signs related to a long hand shape (hand signs) and hand motorics (joint hypermobility) is usually enough identify the disorder.

<table>
<thead>
<tr>
<th>WRIST SIGN (Walker-Murdoch sign)</th>
<th>THUMB SIGN (Steinberg sign)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grip the wrist with the opposite hand. If thumb and fifth finger overlap with each other, this represents (+) Walker-Murdoch sign</td>
<td>Fold the thumb into the closed fist. This test is positive if the thumb tip extends from palm of hand.</td>
</tr>
</tbody>
</table>

13. How many tender points need to be present for the diagnosis of fibromyalgia?
   A) 4  B) 7  C) 11  D) 18

   - According to the American College of Rheumatology Fibromyalgia Diagnostic Criteria, 18 specific tender points and 9 bilateral sites are used in the diagnosis of fibromyalgia.
   - Out of 18 tender points, ______ must be present for more than 3 months duration.
   - The bilateral tender point sites include the occiput, lower cervical, trapezius, supraspinatus, second rib, lateral epicondyle, gluteal, greater trochanter, and knee.
14. Which of the following antibodies is tested in patients suspected of having systemic lupus erythematosus (SLE)?
A) Anti-centromere
B) Anti-gliadin
C) Anti-histone
D) Anti-Smith

- SLE is a chronic inflammatory disorder involving multiple organs of the body, including skin, lungs, kidneys, and joints.
- Antibody testing for SLE usually includes antinuclear antibodies (ANA), antiphospholipid, anti-dsDNA, and anti-Smith antibodies.
- Complement levels C3 and C4 are monitored for response to therapy.

<table>
<thead>
<tr>
<th>Most sensitive test</th>
<th>Most specific test</th>
</tr>
</thead>
<tbody>
<tr>
<td>antinuclear antibodies (ANA)</td>
<td>anti-dsDNA antibodies / anti-______ antibodies</td>
</tr>
</tbody>
</table>

15. Antihistone antibodies are present in which of the following conditions?
A) Rheumatoid arthritis
B) Sjögren’s syndrome
C) Drug-induced lupus
D) Polymyositis

- Drug-induced lupus is a lupus-like syndrome without involvement of the central nervous system or kidneys. Certain drugs, including hydralazine, procainamide, isoniazid, chlorpromazine, methyl dopa, and quinidine, have been linked to drug-induced lupus. Upon discontinuing the offending drug, symptoms usually resolve. Antihistone antibodies are present, which can help identify the problem.
- Rheumatoid arthritis is an autoimmune disease resulting in inflammation in tissue and joints.
- Sjögren’s syndrome is an autoimmune disease involving lymphocyte infiltration and destruction of lacrimal and salivary glands. Patients with Sjögren’s syndrome usually have dry eyes and dry mouth.
- Polymyositis is an inflammatory myopathy that results in symmetrical proximal muscle weakness.

<table>
<thead>
<tr>
<th>Most specific test for SLE</th>
<th>Most specific test for Drug-induced lupus</th>
</tr>
</thead>
<tbody>
<tr>
<td>anti-dsDNA antibodies / anti-Smith antibodies</td>
<td></td>
</tr>
</tbody>
</table>

16. What is a characteristic finding in polymyositis?
A) Skin abnormalities
B) Proximal muscle weakness
C) Distal muscle weakness
D) Ligamentous laxity

- Polymyositis is characterized by proximal muscle weakness (hips are affected first, then the shoulders), dysphagia, and elevated muscle enzymes.
- Dermatomyositis has dermatological abnormalities in addition to the other listed symptoms.

<table>
<thead>
<tr>
<th>Dermatomyositis = Polymyositis + Skin signs/symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Face/Eye</strong> → heliotrope rash</td>
</tr>
</tbody>
</table>

17. Which of the following organisms has been identified as the cause of Lyme disease?
A) Borrelia burgdorferi
B) Streptococcus pyogenes
C) Neisseria meningitidis
D) Babesia microti

- Lyme disease is a tick-borne illness caused mostly by _______________ in the United States.
- The early stage of Lyme disease involves formation of erythema migrans, a characteristic skin lesion that develops within 2 weeks to a month of exposure.
- Later stages can involve neurological and cardiac symptoms along with persistent arthritis involving large joints such as the knee.

18. Pseudogout commonly involves which of the following areas?
A) Elbow
B) Fingers
C) Knee
D) Toe

- Pseudogout commonly involves the knee and wrist as opposed to gout, which usually affects the big toe (term podagra).
- Pseudogout is inflammation caused by calcium pyrophosphate crystals.
- Gout is inflammation caused by monosodium urate monohydrate crystals.
- Both can be diagnosed with aspirated synovial fluid.
- Pseudogout presents with acute joint swelling and pain commonly in the knee, but can also affect the wrist, shoulders, and hip.
19. Gout commonly involves which of the following areas?
   A) Toe  
   B) Knee  
   C) Elbow  
   D) Fingers

- Gout is an inflammatory arthritis most commonly found in the metatarsophalangeal joint at the base of the big toe, also termed __________.
- Gout is caused by elevated levels of uric acid in the blood, which crystallizes into monosodium urate monohydrate crystals.
- These crystals are deposited into joints, most commonly the great toe.
- Causes include genetic predisposition, medications such as diuretics, increased alcohol consumption, and high purine diets.
- During an acute gouty attack, the great toe can become red, tender, and swollen.
- Acute gouty attacks can be treated with nonsteroidal anti-inflammatory drugs (NSAIDs), colchicine, and steroids.
- For long-term prevention, xanthine oxidase inhibitors such as allopurinol would be indicated.

20. Which of the following is NOT a seronegative arthritis?
   A) Psoriatic arthritis  
   B) Reactive arthritis  
   C) Rheumatoid arthritis  
   D) Ankylosing spondylitis

- Rheumatoid arthritis is an autoimmune disease, usually with a positive rheumatoid factor, resulting in inflammation in tissue and joints.
- A seronegative arthritis is an arthritis in which the rheumatoid factor is negative.
- Psoriatic arthritis is often a milder inflammatory arthritis that develops in approximately 30% of patients who already suffer with psoriasis. During flares, the arthritic symptoms may worsen.
- Reactive arthritis is an autoimmune condition developed in response to a recent infection, particularly after a genital infection with Chlamydia trachomatis or after an episode of gastroenteritis by Campylobacter species. The triad of symptoms includes urethritis, conjunctivitis, and arthritis.
- Ankylosing spondylitis is a chronic inflammatory condition of the spine and sacroiliac joint with osseous formation.

21. Which of the following is not associated with HLA-B27 (+) serology?
   A) Reiter’s syndrome (reactive arthritis)  
   B) Ankylosing spondylitis  
   C) Psoriatic arthritis  
   D) Osteoarthritis

- All of the choices above except osteoarthritis are associated with HLA-B27 (+) serology.
- They are called seronegative arthropathies.
- Other HLA-B27 (+) diseases include enteropathic arthropathy and pauciarticular juvenile rheumatoid arthritis.

22. Which joint/area of the body is affected first in ankylosing spondylitis (AS)?
   A) Lumbar spine  
   B) Sacroiliac joint  
   C) Cervical spine  
   D) Thoracic spine

- In AS, the typical order of progression is that the sacroiliac joint is affected first, followed by the lumbar spine, thoracic spine, and lastly cervical spine.
- This is a distal to proximal progression.
23. Which of the following sports would be contraindicated in a patient with ankylosing spondylitis?
   A) Archery
   B) Badminton
   C) Bicycling
   D) Table tennis

   - Owing to the loss of joint and spinal motion in patients with ankylosing spondylitis, these patients should engage in range of motion exercises, including stretching and strengthening.
   - Spinal extension exercises help decrease the severity of the condition.
   - Sports that promote spinal extension are favored, including archery, badminton, and table tennis.
   - Sports that require spinal flexion should be avoided in this group, including golf, bicycling, and bowling.
   - Ninety percent of patients with ankylosing spondylitis are HLAB27 positive.

24. Ankylosing spondylitis is associated with which of the following HLA allele?
   A) HLA-B47
   B) HLA-B27
   C) HLA-DR4
   D) HLA-B72

   - The human leukocyte antigen is synonymous with the major histocompatibility complex and describes a group of genes on chromosome 6.
   - Ankylosing spondylitis is a chronic inflammatory disease of the axial skeleton commonly associated with ________.

25. Reiter’s syndrome, or reactive arthritis, is made up of a triad of symptoms. Which of the following is not involved in Reiter’s syndrome?
   A) Conjunctivitis
   B) Urethritis
   C) Arthritis
   D) Pericarditis

   - Reactive arthritis is an autoimmune condition developed in response to a recent infection, particularly after a genital infection with Chlamydia trachomatis or after an episode of gastroenteritis by Campylobacter species.
   - The triad of symptoms includes conjunctivitis (CAN’T SEE), urethritis (CAN’T PEE), and arthritis (CAN’T CLIMB A TREE).
   - The mechanism of action is unknown, but it is assumed to involve the migration of bacterial antigens into the affected triad sites which proceed to cause an inflammatory response.
   - This syndrome is usually self-limiting, but if symptoms are more severe, a course of steroids and immunosuppressants may be indicated.
26. What is the most common cause of acute nontraumatic monoarthritis in young adults?
   A) Septic arthritis
   B) Gout
   C) Gonococcal arthritis
   D) Rheumatoid arthritis

   - Typically healthy, sexually active adults.
   - Disseminated gonococcal infection can lead to gonococcal arthritis.
   - Women more susceptible.
   - Presents with migratory arthritis, tenosynovitis, and/or skin lesions.
   - This may present initially as tenosynovitis and eventually lead to destruction of the articular cartilage and fibrosis of the joint.
   - Culture from synovial fluid is important for early diagnosis and to determine sensitivity to antibiotic therapy.
   - Treatment: 3rd generation cephalosporin

   ![Neisseria gonorrhoeae](image)

27. What is the most appropriate treatment for pain relief for osteoarthritis of the base of the thumb (carpometacarpal and metacarpophalangeal joints)?
   A) Massage
   B) Transcutaneous electrical nerve stimulation (TENS)
   C) Range of motion exercises
   D) Thumb spica splint

   - A thumb spica splint immobilizes the two joints of the thumb.
   - Although it may interfere with some activities of daily living (ADLs), it does provide consistent pain relief.

28. What is the most common form of childhood arthritis?
   A) Osteoarthritis
   B) Juvenile rheumatoid arthritis
   C) Rheumatic fever
   D) Ankylosing spondylitis

   - Juvenile rheumatoid arthritis is the most common form of childhood arthritis and is characterized by onset < 16 years of age, persistent arthritis of one or more joints for at least 6 weeks, exclusion of other types of childhood arthritis, type of onset of disease during the first 6 months classified as polyarthritis, oligoarthritis, or systemic arthritis with intermittent fever.
29. Which of the following is NOT a subtype of juvenile rheumatoid arthritis?

A) Chronic
B) Systemic
C) Pauciarticular
D) Polyarticular

- The subtypes of rheumatoid arthritis are systemic, pauciarticular, and polyarticular.
- Pauciarticular involves 1 to 4 joints, polyarticular involves ≥5 joints, and systemic is characterized by a systemic onset.
- Age of onset is less than 16, and duration of disease is equal to or more than 6 weeks.

30. Which of the following is NOT part of the CREST syndrome?

A) Calcinosis
B) Raynaud’s phenomenon
C) Esophageal dysfunction
D) Arachnodactyly
E) Telangiectasia

- The CREST syndrome comprises calcinosis, Raynaud’s phenomenon, esophageal dysmotility, sclerodactyly, and telangiectasia.

<table>
<thead>
<tr>
<th>Scleroderma</th>
<th>Localized</th>
<th>Systemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphea</td>
<td>Linear</td>
<td>Limited (CREST)</td>
</tr>
</tbody>
</table>

The limited symptoms of scleroderma are referred to as CREST:

- **C**alcinosi - Calcium deposits in the skin.
- **R**aynaud’s phenomenon - spams of blood vessels in response to cold or stress.
- **E**sophageal dysfunction - acid reflux and decrease in motility of esophagus.
- **S**clerodactyly - thickening and tightening of the skin on the fingers and hands.
- **T**elangiectasias - dilation of capillaries causing red marks on surface of the skin.
31. Which of the following is NOT a feature of fibromyalgia?
   A) Pain in all four quadrants
   B) Pain in 11 to 18 tender points
   C) Symptoms for at least 3 months
   D) CREST syndrome

   - Diagnosis of fibromyalgia syndrome according to the American College of Rheumatology (ACR) classification requires widespread pain in all four quadrants of the body, pain in 11 to 18 tender points, and symptoms lasting for at least ___ months.
   - The syndrome is most commonly seen in women 20 to 60 years old.
   - Triggers include physical activity, inactivity, sleep disturbance, and emotional stress.

32. What tendons are affected by de Quervain’s synovitis?
   A) Extensor carpi radialis longus (ECRL) and extensor carpi radialis brevis (ECRB)
   B) Abductor pollicis longus (APL) and extensor pollicis brevis (EPB)
   C) Extensor pollicis longus (EPL) and EPB
   D) Extensor digiti minimi (EDM) and extensor carpi ulnaris (ECU)

   - The first compartment of the wrist contains the _____ and _____ tendons and is affected in de Quervain’s synovitis.