1. Which of the following is the clinical definition of spasticity?

A. Brief involuntary twitching of muscle groups
B. Gross lack of coordination of muscle movements
C. Sustained muscle contraction causing repetitive movement
D. Velocity dependent increase in muscle tone


2. Which of the following is a negative sign of upper motor neuron syndrome?

A. Extensor and flexor spasm
B. Loss of dexterity and muscle weakness
C. Spastic co-contraction during movement
D. Velocity dependent increase in muscle tone


3. Risk factors for the development of permanent spasticity after stroke include which of the following?

A. Hemi spasticity that occurs within 6 weeks from the incidence of stroke
B. Modified Ashworth scale of 1 in at least one joint 6 weeks after stroke
C. Muscle tone that affects at least one but no more than two joints
D. Less severe paresis at 16 weeks compared to the first week


4. What is the prevalence of spasticity in individuals with chronic spinal cord injury (greater than 1 year post injury)?

A. 10%
B. 30%
C. 50%
D. 70%

5. For individuals with spinal cord injury, approximately what percentage of individuals requires pharmacologic treatment for spasticity?

A. 10%
B. 30%
C. 50%
D. 80%


6. Which of the following is considered a predictor for post stroke spasticity?

a. Immobility prior to stroke
b. Lesions to the frontal lobe
c. Mild weakness at stroke onset
d. Younger age at time of stroke


7. Which of the following describes the pathological responses associated with spasticity?

A. Continuous and random-appearing sequences of discrete involuntary movements
B. Increased activity in muscles and exaggerated reflex responses from peripheral stimulation
C. Repetitive large amplitude involuntary movements of the proximal limbs
D. Weakness and reduced muscle tone secondary to reduced nerve transmission


8. What percentage of patients with multiple sclerosis experience spasticity?

A. 10%
B. 30%
C. 50%
D. 80%

9. When managing spasticity, assessing which factor helps minimize risk to the patient?

A. Cost of the treatment.
B. Access to therapy.
C. Patient’s educational level.
D. Impact of spasticity on function.


10. Which of the following factors associated with spasticity is typically not considered when setting treatment goals?

A. Pain.
B. Fatigue.
C. Aesthetics.
D. Hygiene.


11. In addition to elbow flexion, shoulder internal rotation, and shoulder adduction, which one of the following is the most frequent arm spasticity posture post stroke?

A. Neutral position of the forearm and wrist.
B. Pronated forearm and neutral wrist.
C. Pronated forearm, and flexed wrist.
D. Supinated forearm and extended wrist.


12. Which one of the following is the most frequent pattern of lower limb spasticity post stroke?

A. Hip external rotation, knee flexion, and ankle dorsiflexion.
B. Hip internal rotation, knee flexion, and ankle dorsiflexion.
C. Hip adduction, knee extension, and equinovarus foot.
D. Hip flexion, knee flexion, and equinovarus foot.

13. Which of the following scales is used most commonly to assess spasticity?

A. Barthel Index.
B. King’s Hypertonicity Scale.
C. Modified Ashworth Scale
D. Tone Assessment Scale.


14. When conducting a nerve block the injection needle is placed close to the nerve of interest and the desired direct current stimulation is:

A. 0.25 to 1.0 milliampere
B. 1.0 to 1.5 milliampere
C. 1.5 to 2.0 milliampere
D. 2.0 to 3.0 milliampere


15. Which of the following statements is TRUE regarding the physiologic effects of transcutaneous electrical nerve stimulation (TENS) on spasticity?

A. It decreases H-reflex latency, decreasing motoneuron excitability.
B. It can decrease pain, thereby reducing spasms.
C. The duration of the spasticity reduction is prolonged.
D. In patients with stroke, TENS alone was equally effective to TENS combined with task-specific training.


16. Application of casts in the management of spasticity may help lengthen muscle tissue by:

A. increasing external stimulation
B. increasing number of sarcomeres
C. reducing limb temperature
D. reducing edema within the limb

17. Icing may reduce spasticity by:

A. increasing sensory stimulation  
B. reducing nerve conduction velocity  
C. normalizing muscle spindle reflexes  
D. diminishing spinal cord inhibition


18. Which antispasticity medication works at GABA\textsubscript{B} receptors?

A. Baclofen  
B. Valium  
C. Gabapentin  
D. Tizanidine


19. Which antispasticity medication works peripherally by blocking release of calcium from the sarcoplasmic reticulum within skeletal muscles?

A. Baclofen  
B. Valium  
C. Clonidine  
D. Dantrolene


20. Which is the most common surgical approach used in the management of spasticity?

A. cerebellar stimulation  
B. cervical rhizotomy  
C. neurectomy  
D. tendon lengthening

21. Which surgical procedure would be most appropriate in a child with spastic diplegic cerebral palsy who is unable to flex the knee during swing phase?

A. derotational osteotomy of the femur
B. lengthening of the iliotibial band
C. rectus femoris transfer to hamstrings
D. arthrodesis of the knee joint


22. Botulinum toxin A works by cleaving which presynaptic translocation protein?

A. VAMP/SYB2
B. Syntaxin
C. gamma SNAP
D. SNAP 25


23. When administering botulinum toxin injections, which technique allows the practitioner to place the medication at the point of highest neuromuscular junction density?

A. motor nerve stimulation
B. ultrasound guidance
C. motor point stimulation
D. fluoroscopic guidance


24. In which of the following scenarios is the implantation of an intrathecal baclofen programmable pump contraindicated?

A. Reduction in gait speed resulting from the trial injection
B. Painful spasticity due to amyotrophic lateral sclerosis
C. Spastic hemiparesis due to a cerebrovascular accident
D. Inability to implant the pump within 2.5 cm from the abdominal surface

25. A patient with incomplete paraplegia and spasticity that interferes with transfers and ambulation is referred for an intrathecal baclofen trial. Following a 50 µg intrathecal baclofen injection, the patient experiences 12 hours of weakness and a 2-point reduction in Modified Ashworth Scale scores of the lower limb muscles bilaterally. Based on these results, you would advise the patient that the

A. trial had positive results and to proceed with pump implantation  
B. degree and duration of spasticity reduction argue against pump implantation  
C. trial should be repeated with a lower intrathecal baclofen dose  
D. trial should be repeated with discontinuation of oral medications at least 48 hours prior to the injection


26. What is the most common adverse effect of oral baclofen?

A. hypotension  
B. sexual dysfunction  
C. sedation  
D. nightmares


27. Which is the least likely complication when switching from oral to intrathecal baclofen?

A. mechanical failure  
B. CNS depression  
C. dural leak  
D. line infection

28. The most common pharmacologic side effects encountered with an intrathecal baclofen trial are

A. seizures and headache
B. nausea and sedation
C. itching and tachycardia
D. hypothermia and rhabdomyolysis

References:
Brashear MD, Allison; Elie MD Elovic Spasticity: Diagnosis and Management. Springer Publishing. 2010.


29. Which is the most appropriate first step in management of suspect baclofen withdrawal due to mechanical failure of the pump?

A. CT scan with injection of dye into the pump
B. administer physostigmine
C. give a dose of oral baclofen
D. call the implant surgeon


30. A patient experiencing lethargy, slowed breathing, and low blood pressure the day after a baclofen pump refill most likely has a:

A. line infection
B. pump failure
C. dural leak
D. baclofen overdose

References:

Brashear MD, Allison; Elie MD Elovic Spasticity: Diagnosis and Management. Springer Publishing. 2010.
31. A patient with spasticity that fluctuates based on her activities during certain days of the week is inquiring about an intrathecal baclofen pump. She is currently using high doses of oral baclofen to control her spasticity but she does not like the sedation associated with this dose. She also notes that she works as a sales manager and travels frequently. After an interview and exam you determine she

A. is not a good candidate due to the variable nature of her spasticity
B. may benefit from a baclofen pump and recommend a trial
C. is not a candidate due to her long periods away on trips
D. may not like the complicated inconvenience of pump refills