Directions: Choose the best answer

1557. Which of the following statements pertaining to control of ventilation in neonates is true?
   A. Hypoxia leads to sustained hyperventilation
   B. Hypercarbia leads to sustained hyperventilation
   C. The ventilatory response to hypercarbia in newborns is mature at birth
   D. With both hypoxia and hypercarbia, newborns respond initially by hyperventilating but then start to hypoventilate
   E. None of the above

1558. The most common benign pediatric pain syndrome is
   A. Headache
   B. Chest pain
   C. Limb pain
   D. Back pain
   E. Abdominal pain

1559. Two weeks after a viral syndrome, a 9-year-old girl presents to your clinic with a complaint of several days of drooping of her mouth. In addition to the drooping of the left side of her mouth, you note that she is unable to completely shut her left eye. Her smile is asymmetric, but her examination is otherwise normal. This girl likely has
   A. Guillain-Barre syndrome
   B. Botulism
   C. Cerebral vascular accident
   D. Brainstem tumor
   E. Bell’s palsy

1560. The analogue chromatic continuous scale (ACCS) allows a child to rate his or her pain according to
   A. Numbers
   B. Faces
   C. Color
   D. Words
   E. Pictures

1561. A 2-year-old child cannot raise his arm completely on the right and has torticollis. He has no other congenital abnormalities. Which of following is the most likely diagnosis?
   A. Slipped capital femoral epiphysis
   B. Juvenile rheumatoid arthritis
   C. Sprengel deformity
   D. Arnold-Chiari malformation
   E. Cerebral palsy

1562. Cardiovascular responses of neonates differ from those of adults in all the following ways EXCEPT
   A. Neonates have greater myocardial collateral blood flow
   B. Neonates have less cardiac compliance
   C. Reductions in heart rate significantly decrease neonatal cardiac output compared with that in adults
   D. An immature sympathetic nervous system innervates the fetal myocardium
   E. Neonates have less vasoconstriction in response to hemorrhage

1563. A 12-year-old boy is brought to your office 2 days after a fracture of the humerus in its distal third. The patient complains that he is unable to extend the wrist. Which of the following structures was most likely
   A. Median nerve
   B. Ulnar nerve
   C. Radial nerve
   D. Axillary nerve
   E. Artery supplying the brachial plexus

1564. Examination of the cerebrospinal fluid of an 8-year-old, mildly febrile child with nuchal rigidity and intermittent stupor shows the following white blood cells 100/µL (all lymphocytes), negative Gram stain, protein 150 mg/dL, and glucose 15 mg/dL. The most likely diagnosis is
   A. Tuberous sclerosis
   B. Tuberculous meningitis
   C. Stroke
   D. Acute bacterial meningitis
   E. Pseudotumor cerebri
A pediatric patient treated for grand mal seizures develops abnormal values on liver function tests. Which of the following antiepileptic agents would cause this to occur?

A. Carbamezine  
B. Valproic acid  
C. Phenytoin  
D. Phenobarbital  
E. Gabapentin

The most common reason for a pain consultation in the post pubertal years is

A. Chest pain  
B. Headache  
C. Abdominal pain  
D. Juvenile fibromyalgia  
E. Neuropathic pain from sports injuries

The most common cause of chronic pediatric pelvic pain is

A. Giardia infection  
B. Endometriosis  
C. Psychogenic  
D. Sexual abuse in young childhood  
E. PME (Pelvic Migraine Equivalent)

The most common form of abdominal pain in children is

A. Pelvic inflammatory disease  
B. Recurrent abdominal pain  
C. Abdominal migraine  
D. Mesenteric adenitis  
E. Appendicitis

The most accurate pain assessment tools for preverbal children are

A. Spatial scales  
B. Facial scales  
C. Numerical scales  
D. Physiologic measurements  
E. McGill’s Pain Questionnaire

A 9-year-old girl with no past medical history presents with the acute onset of fever, arthralgias, abdominal pain, hematochezia, and hematuria. Physical examination reveals purpura on the patient’s lower extremities bilaterally. The following is the most likely diagnosis:

A. Cryoglobulinemia  
B. Kawasaki disease  
C. Wegener’s granulomatosis  
D. Goodpasture’s disease  
E. Henoch-Schonlein purpura

A 9-year-old child has developed headaches that are more frequent in the morning and are followed by vomiting. Over the previous few months, his family has noted a change in his behavior (generally more irritable than usual) and his school performance has begun to drop. Imaging of this child is most likely to reveal a lesion that is

A. Subtentorial  
B. Supratentorial  
C. Intraventricular  
D. In the spinal canal  
E. In the peripheral nervous system

The most common malignant bone tumor in children is

A. Osteosarcoma  
B. Ewing’s sarcoma  
C. Neuroblastoma  
D. Wilm’s tumor  
E. Leukemia

The most common form of abdominal pain in children is

A. Pelvic inflammatory disease  
B. Recurrent abdominal pain  
C. Abdominal migraine  
D. Mesenteric adenitis  
E. Appendicitis

Spina bifida occult is a congenital abnormality that is present in what percent of the population?

A. 5%  
B. 10%  
C. 20%  
D. 40%  
E. 50%

Which of the following fracture types is more suspicious of child abuse?

A. Epiphyseal  
B. Diaphyseal  
C. Growth plate  
D. Metaphyseal  
E. Torus

A 16-year-old basketball player complains of pain in his knees. A physical examination reveals, in addition to tenderness, a swollen and prominent tibial tuberosity. Radiographs of the area are unremarkable. The most likely diagnosis is

A. Osgood-Schlatter disease  
B. Popliteal cyst  
C. Slipped capital femoral epiphysis  
D. Osteochondrosis  
E. Gonococcal arthritis
1578. Of all of the scales described to measure pain in small children, which scale is used best for children from 3 to 12 years of age
A. McGrath’s scale (nine faces depicting varying degrees of pain)
B. Oucher scale
C. Visual analog scale (VAS)
D. McGill’s questionnaire
E. Numeric Pain Scale

1579. A 9-year-old girl is brought to you with the complaint of severe intermittent headaches for the last several months. The physical examination, including a careful neurologic examination, is normal. The following characteristics support the diagnosis of childhood migraine in this patient:
A. Strong family history of migraine
B. Frequently isolated to the occipital region
C. Frequently associated with attention deficit hyperactive disorder
D. Duration of headache more than 24h
E. Persistence of headache after sleep

1580. Pain assessment and measurement in children between the ages of 2 and 7 years is best evaluated by
A. Visual analogue scale rating
B. Body movements and facial expressions
C. Self-report
D. Oucher scale (faces scale)
E. All of the above

1581. All the following statements concerning the fetal hematologic system are true EXCEPT
A. Physiologic anemia occurs at 1 month of age
B. Fetal hemoglobin has P-50 of 19mmHg compared with 26mmHg for adult hemoglobin
C. Fetal hemoglobin has a greater affinity for O2, and this manifests as decreased O2 delivery to the periphery compared with adult hemoglobin
D. The decreased P-50 of fetal hemoglobin causes a shift to the left of the oxygen dissociation curve
E. Decreased release of oxygen by fetal hemoglobin is offset by increased oxygen delivery provided by elevated hemoglobin concentrations in neonates

1582. A previously healthy 7-year-old child suddenly complains of a headache and falls to the floor. When examined in the emergency room, he is lethargic and has a left central facial weakness and left hemiparesis with conjugate ocular deviation to the right. The most likely diagnosis is
A. Hemiplegic migraine
B. Supratentorial tumor
C. Todd’s paralysis
D. Acute subdural hematoma
E. Acute infantile hemiplegia

1583. Which of the following is a more common form of pain in children?
A. Migraine headache
B. Abdominal pain

1584. The most common form of scoliosis in children is
A. Neuromuscular
B. Congenital
C. Adolescent
D. Infantile
E. Juvenile

1585. A 16-year old high school student was running track and developed sudden pain in the leg with tenderness on palpation and tingling. Subsequently, pain increased in intensity with ankle swelling and erythema. MRI showed no evidence of fracture but edema of muscles in the lower leg was observed. The most likely diagnosis is:
A. Complex regional pain syndrome
B. Tarsal tunnel syndrome
C. Peroneal tenosynovitis
D. Compartment syndrome
E. Achilles tendonitis

1586. A 4-year-old child falls from the back of a three-wheeled vehicle, hitting his head. He experiences no loss of consciousness. In the emergency room, he is alert and oriented without focal findings on examination. He has blood behind his left tympanic membrane. CT scan of the skull is likely to show
A. Subdural hematoma
B. Epidural hematoma
C. Intraventricular hemorrhage
D. Basilar skull fracture
E. Hydrocephalus

1587. A 3-year-old boy’s parents complain that their child has difficulty walking. The child rolled, sat, and first stood at essentially normal ages and first walked at 13 months of age. Over the past several months, the family has noticed an increased inward curvature of the lower spine as he walks and that his gait has become more “waddling” in nature. On examination, you confirm these findings and also notice that he has enlargement of his calves. This child most likely has
A. Occult spina bifida
B. Muscular dystrophy
C. Brain tumor
D. Guillain-Barre syndrome
E. Botulism

1588. Normal fetal circulation is characterized by all the following EXCEPT
A. High pulmonary vascular resistance
B. Low systemic vascular resistance
C. Right-to-left shunting of blood through the foramen ovale
D. Right-to-left shunting of blood through a ventricular septal defect (VSD) that closes functionally soon after delivery
E. Right-to-left shunting of blood via the ducts arteriosus
1589. The glomerular filtration rate reaches that of the adult by age
A. 1 month
B. 6 month
C. 1 year
D. 18 months
E. 2 years

1590. Most headaches in children are
A. Migraine
B. Tension
C. Morning
D. Vascular
E. Tumor

1591. The following statements about thermoregulation in the neonate are all true EXCEPT
A. Neonates have a larger body surface area compared with body weight than do adults
B. Neonates have mature central thermoregulatory control
C. Neonates have a specialized ability to produce heat
D. Neonates have a very thin layer of subcutaneous fat
E. Neonates cannot shiver to produce heat

1592. About 12 days after a mild upper respiratory infection, a 12-year-old boy complains of weakness in his lower extremities. Over several days, the weakness progresses to include his trunk. On physical examination, he has the weakness described and no lower extremity deep tendon reflexes, muscle atrophy, or pain. Spinal fluid studies are notable for elevated protein only. The most likely diagnosis in this patient is
A. Bell's palsy
B. Muscular dystrophy
C. Guillain-Barre syndrome
D. Charcot-Marie-Tooth disease
E. Werdnig-Hoffmann disease

1593. A 7 -year-old boy presents with a 1-year history of pain of the left anterior thigh. He has no history of trauma. On physical examination, he has limited hip motion, especially with abduction and internal rotation. A slight limp is noticeable with ambulation. Pain is brought on by activity and improves with rest. Which of the following is the most likely diagnosis?
A. Osteochondrosis
B. Osgood-Schlatter disease
C. Muscular dystrophy
D. Rickets
E. juvenile rheumatoid arthritis

1594. The following idiopathic scoliosis would be most commonly found in girls age range:
A. Birth to 3 years
B. 4 to 10 years
C. 11 to 18 years
D. 19 to 25 years
E. >25 years

Directions: Each question below contains four suggested responses of which one or more is correct. Select
A if 1, 2 and 3 are correct
B if 1 and 3 are correct
C if 2 and 4 are correct
D if 4 is correct
E if All (1, 2, 3 and 4) are correct

1595. Regarding complex regional pain syndrome, which of the following are true?
1. In children the female to male ratio is 4:1
2. In adults the female to male ratio is 1:1
3. In children the lower extremities are most often affected
4. In adults, the upper extremities are most often affected

1596. Drug kinetics may be altered in infants, with infants having
1. Decreased total body water
2. Larger volumes of distribution
3. Smaller extracellular fluid space
4. Lower peak blood levels

1597. Which of the following medication regimens would be appropriate for use in ventilated patient in an intensive care unit?
1. Intravenous morphine and diazepam
2. Epidural morphine and local anesthetic with intravenous diazepam
3. Intravenous fentanyl and midazolam
4. Epidural local anesthetic alone

1598. True statements regarding the use of IV-PCA in children include
1. It is safe and effective
2. Its use may be restricted by inability to activate the pump
3. It can be used in children age 7 and older
4. It is a universal therapy for postoperative pain control in children

1599. True statements regarding the use of opioids for pain management in children include the following :
1. Minor side effects occur more commonly in children than adults
2. The incidence of respiratory depression is directly related to dose
3. Meperidine is preferred over morphine
4. Tolerance is an uncommon clinical problem in children
1600. Neonates are susceptible to respiratory suppression with opioids because of:
   1. Decreased protein binding
   2. Increased blood brain barrier permeability
   3. Reduced GFR
   4. Immature hepatic enzymes

1601. Which of the following characterize normal CNS development in humans:
   1. Spinothalamic myelination complete by 12 months post delivery
   2. Thalamocortical projections complete by 37 weeks post conception
   3. C-fiber maturation complete by birth
   4. Nociceptors are present in newborns

1602. Which of the following are potential adverse effect associated with salicylate therapy:
   1. Hypotension
   2. Bronchial hyperactivity
   3. Macular degeneration
   4. Hyperglycemia

1603. Which of the following are true?
   1. Full term infants habituate to repeated stimuli
   2. Premature infants demonstrate sensitization to noxious stimuli
   3. Neonates have well developed nociceptive afferent systems
   4. Newborns are more sensitive to painful stimuli than adults

1604. Advantages of acetaminophen over aspirin when used as an analgesic in children include:
   1. Lack of gastric irritation
   2. No association with Reye syndrome
   3. Lack of platelet dysfunction
   4. Complete absorption when administered rectally

1605. The use of regional anesthesia in premature infants less than 60 weeks of postconceptual age has been advocated to reduce:
   1. Retinopathy of prematurity
   2. Intracranial hemorrhage
   3. Stress reaction to surgery
   4. Postoperative apnea

1606. Down's syndrome is associated with:
   1. A high incidence of congenital heart defects
   2. Upper and lower airway abnormalities
   3. Cervical neck instability
   4. Sensitivity to atropine

1607. Which of the following are true regarding drug pharmacokinetics in the newborn?
   1. Albumen levels are lower than in the adult
   2. Local anesthetics are less protein bound
   3. Drugs have decrease affinity for fetal hemoglobin
   4. Drug free fractions are increased

1608. Concerning sickle cell disease which of the following is or are true?
   1. About 25% of children with an average of 3 vaso-occlusive crises a year are addicted to opioid medication
   2. 1 in 25 African Americans will develop sickle cell disease
   3. Bone marrow transplantation is no longer considered a viable option due to an unacceptable infection rate with HIV
   4. Hydroxyurea increases the proportion of HBF in the blood, minimizing the percentage of cells that can 'sickle'

1609. Compared to the adult, which of the following correctly characterize morphine pharmacokinetics in the neonate?
   1. Blood levels are lower
   2. Clearance is increased
   3. Conjugation is increased
   4. Half life is prolonged

1610. The main differences between adult and pediatric migraine headaches are:
   1. In children, the headache is usually bilateral
   2. Ophthalmoplegic migraine is the most common pediatric migraine variant
      . In children a migraine's range from 1-48 hours in duration where in adults the range is 4-72 hours
   4. Basilar migraine is the least common (but most dangerous) pediatric migraine variant

1611. In the pediatric population the most pain causing problem in oncology is:
   1. Osteosarcomas
   2. End stage lymphoblastic leukemia
   3. Meningiomas
   4. Diagnostic Procedures and Treatment Protocols

1612. The faces pain diagrams are appropriate for use with which of the following types of patients?
   1. The elderly
   2. Children
   3. Individuals with mental retardation
   4. Postoperative patients on a ventilator
1613. Which of the following is (are) characterize common migraine headache in children
1. Without aura
2. Usually unilateral
3. Abdominal pain common
4. Tinnitus and vertigo

1614. The Children's Hospital of Eastern Ontario (CHEOPS) pain assessment tool
1. Designed for postoperative pain
2. Was designed for neonates
3. Incorporates face pictures
4. Measures six items

1615. Statements regarding pain assessment in nonverbal children might include
1. Neurophysiologic elements involved in pain perception are present in preterm infants
2. Undesirable physiologic responses can be caused by pain in neonates
3. Hormonal-metabolic responses to noxious stimuli are present in preterm infants
4. Neonates experience pain

1616. Which of the following are true regarding migraine headaches in children?
1. Migraine without aura more frequent than with aura
2. Prevalence of migraine is about 5% of children
3. Frequency about the same in boys and girls
4. Abdominal pain may be symptom

1618. Which of the following groups of patients are at risk for inadequate measurement?
1. Elderly
2. Pediatric
3. Burn patients
4. Low back pain patients

1619. Gastrointestinal absorption of drugs in infants may vary from adults because in infants
1. Gastric mucosa is less developed than adults
2. Emptying requires 6-8 hours
3. Gastric acid production is less than adults
4. Gastric emptying is biphasic
1557. Answer: D  
   Explanation:  
   (Stoelting, Anesthesia and Co-Existing Disease, 3/e. pp 579-580.)  
   Control of ventilation in premature infants and neonates is immature. When neonates are subjected to hypoxia or hypercarbia, for 1 to 2 min, there is hyperventilation. After this time, the neonate will hypoventilate and may even become apneic. High levels of carbon dioxide may be a respiratory depressant in neonates. Respiratory depressants will act synergistically with the immature response to ventilation. It must also be remembered that oxygen consumption and carbon dioxide production in a neonate are double those in an adult.  
   Source: Curry S

1558. Answer: A  
   Explanation:  
   headache  
   Source: Boswell MV, Board Review 2004

1559. Answer: E  
   Explanation:  
   Bell’s palsy is an acute, unilateral facial nerve palsy that begins about 2 weeks after a viral infection. The exact pathophysiology is unknown, but it is thought to be immune. On the affected side, the upper and lower face are typically paretic, the mouth droops, and the patient cannot close the eye. Treatment consists of maintaining moisture to the affected eye (especially at night) to prevent keratitis. Complete, spontaneous resolution occurs in about 85% of cases, 10% of cases have mild residual disease, and about 5% of cases do not resolve.  
   Source: Yetman and Hormann

1560. Answer: C  
   Explanation:  
   (Ferrante, p 488.) Pain ratings can be reliably assessed using an analogue chromatic continuous scale (ACCS), which allows grading of a child’s pain into a numeric value. The ACCS consists of a slide rule with graduated shades of red. The brightness of the color represents the intensity of pain. The child is asked to rate his or her pain by moving a sliding line indicator onto the appropriate color.  
   Source: Kahn and Desio

1561. Answer: C  
   Explanation:  
   (Seidel, 5/e, p 762.) A child with Sprengel deformity cannot raise one arm completely due to a small and elevated scapula. Torticollis (wry neck due to shortening of the sternocleidomastoid muscle) often accompanies the deformity. Adolescents with slipped capital femoral epiphysis (SCFE) are often obese African American males who present with thigh or knee pain. SCFE is a disorder of unknown etiology that causes posterior and medial displacement of the femoral head. Children with juvenile rheumatoid arthritis (JRA) present with fever, salmon-colored rash, arthritis, hepatosplenomegaly, nodules, pericarditis, and iridocyclitis (may lead to blindness). There is no diagnostic test for JRA, but the disease resolves by puberty in the majority of children. Arnold-Chiari malformation is an abnormality of neural tube closure. Cerebral palsy (CP) is a nonprogressive disorder resulting from a perinatal insult; it causes either a spastic paresis of the limbs or extrapyramidal symptoms (chorea, athetosis, ataxia). Patients with CP often have an associated seizure disorder, mental retardation, and speech or sensory deficits.

1562. Answer: A  
   Explanation:  
   Stoelting, Anesthesia and Co-Existing Disease, 2/e, p 581. Miller, 4/e, pp 1812-1814, 2098-2099.)  
   Neonates do not have greater collateral myocardial blood flow than adults. The adult heart rate has 60 percent contractile elements as opposed to 30 percent in the neonate. This means that for a given volume, less tension or pressure is generated in a neonate heart, which makes it less compliant. Neonates are dependent on maintenance of heart rate for stable cardiac output. The sympathetic nervous system of a neonate is immature and produces less vasoconstriction in response to hemorrhage.  
   Source: Curry S

1563. Answer: C  
   Explanation:  
   (Tierney, 42/e, p 996.) The radial nerve lies next to the shaft of the humerus in the spiral groove. It may be injured as a result of humeral fractures, especially those involving the distal third of the humerus. The radial nerve (C6-C8) supplies the extensor muscles of the wrist; damage to it results in wristdrop, a condition in which the patient is unable to extend the wrist. Clawhand is due to paralyzed interosseous and lumbrical muscles from an ulnar nerve.
(C8-T1) injury. The median nerve (C6-T1) supplies most of the flexors in the forearm (motor branches) and supplies sensory branches to the radial part of the hand; an injury will cause thenar atrophy.

1564. **Answer: B**

Explanation:

Included among those things that can cause the clinical picture are viral meningitis, tuberculous meningitis, meningeal leukemia, and medulloblastoma, all of which can cause pleocytosis as well as elevated protein and lowered glucose concentration in cerebrospinal fluid (CSF). Of the four diseases (and the likely finding if this patient), tuberculous meningitis is associated with the lowest glucose levels in CSF. The cellular response to viral meningitis eventually will be predominantly lymphocytic. Cells found in the CSF of a child who has meningeal leukemia is most commonly are lymphocytes or lymphoblasts. Children who have a medulloblastoma generally present with the signs and symptoms caused by a mass on the posterior cranial fossa; their pleocytic cerebrospinal fluid contains unusual-appearing cells of the monocytic variety. The decrease in the glucose concentration of CSF associated with these disorders has been attributed to a disturbance of glucose transport as a result of meningeal irritation. In pseudotumor cerebri, the constituents of CSF are generally normal except for a low protein content in some instances. Acute bacterial disease typically causes polymorphonuclear cells and positive Gram stains. Neither tuberous sclerosis nor stroke typically causes these findings on CFS examination.

Source: Yetman and Hormann

1565. **Answer: B**

Explanation:
Reference: Katzung, p 411.

Severe hepatotoxicity of an idiosyncratic nature is associated with valproic acid.

The risk is very high in the pediatric population, particularly in patients below the age of two.

Fatalities generally occur within four months of treatment.

Hepatotoxicity may be reversed in some individuals.

Source: Stern- 2004

1566. **Answer: A**

1567. **Answer: A**

Explanation:
Malignancies of the bone, with an average annual incidence rate of 8.7 per million children younger than 20 years of age, comprised about 6% of childhood cancer. In the US, 650-700 children and adolescents younger than 20 years of age are diagnosed with bone tumors each year of which approximately 400 are osteosarcoma and 200 are Ewing’s sarcoma. The two types of malignant bone cancer that predominated in children are osteosarcomas and Ewing’s sarcomas, about 56% and 34% of the malignant bone tumors, respectively.

Source: Boswell MV, Board Review 2004

1568. **Answer: B**

Explanation:
A. Pelvic inflammatory disease is common in adult females

B. Recurrent abdominal pain is the 2nd most common benign pain syndrome in children, with an incidence of about 10%.

C. Abdominal migraine is rare

D. Mesenteric adenitis is in the differential for appendicitis.

E. Appendicitis is the most common reason for exploratory laparotomy, with an incidence of 4/1000 children under the age of 14 years.

Source: Boswell MV, Board Review 2004

1569. **Answer: D**


1570. **Answer: E**

Explanation:
(Tierney, 42/e, p 824.)

The multisystem disease described in this patient is most likely Henoch-Schonlein purpura (HSP), which is a small-vessel vasculitis that affects mostly children. The purpura and all of the symptoms described are a result of the vasculitis. Histopathology of the vasculitic lesions reveals the deposition of 19A in the walls of the small vessels (postcapillary venules). The mnemonic for HSP is AGAR (Abdominal pain, Glomerulonephritis, Arthralgia, and Rash). The prognosis for Henoch-Schonlein purpura is excellent. Kawasaki disease (KD) or mucocutaneous lymph node syndrome is uncommon in children over the age of 8 years and is characterized by fever, a desquamating, edematous, blotchy-appearing, mucocutaneous erythema, cervical lymphadenitis, and aneurysms of the coronary arteries. It is idiopathic. Wegener’s disease and Goodpasture’s disease usually have pulmonary involvement. Cryoglobulinemia does cause palpable purpura, abdominal pain, and glomerulonephritis, but it does not cause any gastrointestinal bleeding. Cryoglobulinemia is associated with hepatitis B or C virus.
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1571. Answer: A
Explanation:
Between 50 and 60% of tumors of the nervous system in children 4 to 11 years old are infratentorial (posterior fossa) and include cerebellar and brainstem tumors, often either medulloblastoma or cerebellar astrocytoma. In adults and infants, most intracranial tumors originate above the tentorium; only 25 to 30% of brain tumors in adults are subtentorial.
Source: Yetman and Hormann

1572. Answer: B
Source: Goodwin J, Board Review 2005

1573. Answer: B
Source: Goodwin J, Board Review 2005

1574. Answer: C
Source: Goodwin J, Board Review 2005

1575. Answer: C
Explanation:
Isolated, clinically insignificant spina bifida occult is present in approximately 20% of the population.
Source: Boswell MV, Board Review 2004

1576. Answer: D
Explanation:
Metaphyseal fractures, such as bucket handle and corner fractures are more likely in abuse situations. Other common findings in abuse include posterior rib, sternum, spinous process fractures and fractures of different ages.
Source: Boswell MV, Board Review 2004

1577. Answer: A
Explanation:
This history is typical of Osgood-Schlatter disease. Microfractures in the area of the insertion of the patellar tendon into the tibial tubercle are common in athletic adolescents. Swelling, tenderness, and an increase in size of the tibial tuberosity are found. Radiographs can be necessary to rule out other conditions. Treatment consists of rest.
Osteochondrosis is avascular necrosis of the femoral head. This condition usually produces mild or intermittent pain in the anterior thigh but can also present as a painless limp.
Gonococcal arthritis, although common in this age range, is uncommon in this anatomic site. More significant systemic signs and symptoms, including chills, fever,
migratory polyarthralgias, and rash, are commonly seen.
Slipped capital femoral epiphysis is usually seen in a younger, more obese child (mean age about 10 years) or in a thinner, older child who has just undergone a rapid growth spurt. Paid upon movement of the hip is diagnostic.
Popliteal cysts are found on the posterior aspect of the knee.
Source: Yetman and Hormann

1578. Answer: B
Source: Raj, Pain Review 2nd Edition

1579. Answer: A
Explanation:
Reference: Behrman, 16/e, pp 1832-1834. McMillan, 3/e, pp 679-680, 1931-1932, 2027-2029. Rudolph, 21/e, pp 2274-2276. In contrast to adults, children with migraine most often have "common" migraine: bifrontal headache without an aura or diffuse throbbing headache of only a few hours' duration. As with adults, the headaches can be terminated with vomiting or sleep. Family history is frequently positive. Association with attention deficit disorder is not common, but a relationship with seizure disorder can be seen.
Source: Yetman and Hormann

1580. Answer: D
Explanation:
(Ferrante, pp 487-488.) Children between the ages of 2 and 7 years lack abstract thinking and the verbal skills necessary to express their feelings of pain. Therefore, nonverbal techniques are used to assess the intensity of their pain. A practical, reliable, and easy-to-apply bedside guide is a faces scale, such as the Oucher scale.
Source: Kahn and Desio

1581. Answer: A
Explanation:
(Stoelting, Anesthesia and Co-Existing Disease, 3/e, p 583.) There are differences between fetal hemoglobin and adult hemoglobin that influence O2 transport and delivery. Fetal hemoglobin has a greater affinity for oxygen, which results in a lower P-50 (19 mmHg) and causes a shift to the left of the O2 dissociation curve. For these reasons, there is decreased release of O2 to the periphery. However, there is a greater amount of fetal hemoglobin, and this offsets the increased affinity by increasing delivery of O2. Physiologic anemia occurs at about 2 to 3 months of age, when production of adult hemoglobin begin in earnest.
Source: Curry S.

1582. Answer: E
Explanation:
Reference: Behrman, 16/e, pp 1854-1855. McMillan, 3/e,
The abrupt onset of a hemisindrome, especially with the eyes looking away from the paralyzed side, strongly indicates a diagnosis of acute infantile hemiplegia. Most frequently, this represents a thromboembolic occlusion of the middle cerebral artery or one of its major branches. Hemisphere migraine commonly occurs in children with a history of migraine headaches. Todd’s paralysis follows after a focal or Jacksonian seizure and generally does not last more than 24 to 48 h. The clinical onset of supratentorial brain tumor is subacute, with repeated headaches and gradually developing weakness. A history of trauma usually precedes the signs of an acute subdural hematoma. Clinical signs of other diseases can appear fairly rapidly, but not often with the abruptness of occlusive vascular disease.

Source: Yetman and Hormann

1583. Answer: B
Explanation: Abdominal pain is the second most common type of benign pain in children. Overall, headache is more common (tension). Migraine headache occurs in about 5% of children.
Source: Boswell MV, Board Review 2004

1584. Answer: C
Explanation: Idiopathic, adolescent scoliosis is the most common type of pediatric scoliosis.
Source: Boswell MV, Board Review 2004

1585. Answer: C
Explanation: The sudden onset with exercise, swelling and tingling suggest compartment syndrome. All the conditions may cause leg and ankle pain. Different Achilles afflictions present with distinctive clinical features. Achilles tendon tears can be sustained during a traumatic incident and can mimic other tendonopathies. Tarsal tunnel syndrome involves the motor and sensory branches of the tibial nerve (L4 to S3) as it travels deep to the flexor retinaculum. Ischemia to the tibial nerve occurs after fracture of the medial malleolus, calcaneus, or sustentaculum tali. Continued distally, a "joggers’ foot" is typically associated with medial plantar nerve entrapment due to hyperpronation (eccentric loading) in long distance runners. Impression occurs at the abductor hallucis insertion with the patient complaining of symptoms from the medial longitudinal arc to the toes during and after exercise.

With the chronic compartment syndrome, the changes are reversible and the involved muscles may be completely normal between episodes. The patient’s initial complaint includes a deep ankle pain over the anterolateral compartments of the leg during or after a relatively long period of exercise; the pain disappears with cessation of activity. Symptoms often interfere enough to cause the athlete to either rest or reduce the intensity of the activity, and the symptoms may be reproduced by either dorsiflexion or plantarflexion of the foot. Patients with recurrent exertion compartment syndrome are at risk for developing peroneal muscle herniations at the fascial tunnel in the anterolateral distal leg. This tunnel serves as a hiatus and source of intercompartment relief of pressure buildup.

In acute compartment syndrome, continued, mounting pressure causes pain out of proportion, pulselessness, and dramatic pain on passive stretching of the muscle in the involved compartment; this causes irreversible tissue necrosis.

Exertional compartment syndromes are often exercise-induced, and typically occur either chronically in well trained athletes or acutely in individuals preforming unaccustomed exercises, such as marching or prolonged running. A compartment syndrome occurs when increased pressure within a limited space comprises the circulation to the contents of that space, resulting in reduction of muscle and nerve profusion. In both traumatic and exercise-induced compartment syndromes, the muscles within the compartment enlarge with lactate and cause a reduction in blood flow to the relatively small anterior and lateral crural compartments. Muscle bulk increases by 20% after exercise. This is not to be confused with anterior shin splint syndrome, which shows no pressure elevation with the anterolateral compartment of the leg. Individual variation in the relationship of muscle bulk to the compartment volume may account for the susceptibility of certain persons to exercise-induced compartment syndrome. Even though the pathophysiology of both forms of compartment syndrome are essentially the same, the end result of the acute form differs from that of the chronic. In both conditions, ischemia resulting from abnormal pressure causes pain.

1586. Answer: D
The history, signs, and symptoms as outlined in the question are characteristics of a basilar skull fracture. Those patients with rupture of the tympanic membrane allowing otorrhea and those with rhinorrhea after the injury are at increased risk of complications of infection. For these children, a semi-upright position and observation for 72 h for evidence of increased intracranial pressure or infection without use of prophylactic antibiotics is appropriate. Cerebrospinal fluid (CSF) drainage frequently stops within 72h. Drainage beyond 72 h can require surgical closure; the risk of complications such as infection increases after this time.
1587. Answer: B
Explanation:
The most common form of muscular dystrophy is Duchenne muscular dystrophy. It is inherited as an X-linked recessive trait. Male infants are rarely diagnosed at birth or early infancy since they often reach gross milestone at the expected age. Soon after beginning to walk, however, the features of this disease become more evident. While these children walk at the appropriate age, the hip girdle weakness is seen by age 2. Increased lordosis when standing is evidence of gluteal weakness. Gower sign (use of the hands to "climb up" the legs in order to assume the upright position) is seen by 3 to 5 years of age, as is the hip waddle gait. Ambulation ability remains through about 7 to 12 years, after which use of a wheelchair is common. Associated features include mental impairment and cardiomyopathy. Death due to respiratory failure, heart failure, pneumonia, or aspiration is common by 18 years of age.
Source: Yetman and Hormann

1588. Answer: D
Explanation:
Stoelting, Anesthesia and Co-Existing Disease, 3/e. pp 37-38, 581-582.)
A ventricular septal defect (VSD) is not a normal component of the fetal circulation pattern. VSDs constitute approximately 28 percent of congenital cardiac anomalies, and they are more common in premature infants. Twenty-eight percent of VSDs are small and will close spontaneously. The symptoms of a large VSD include tachypnea, tachycardia, failure to thrive, recurrent pulmonary infections, and ultimately congestive heart failure. If medical management is unsuccessful, surgical treatment, which depends on the type of VSD, is considered.
Source: Curry S.

1589. Answer: C
Explanation:
(Miller, 4/e, pp 2469-2470.) By age 1 year glomerular filtration reaches the adult rate.
Source: (Miller, 4/e. pp 2469-2470.)

1590. Answer: B
Explanation:
Tension HAs are the most common type of HA in pediatrics, but tension HAs are uncommon before puberty. Migraine HAs occur in 5% of children.
Source: Mark V. Boswell, MD, DABIPP, FIPP

1591. Answer: B
Explanation:
(Stoelting, Anesthesia and Co-Existing Disease, 3/e. pp 583-584.)
- It is due to patellar tendon stress, which causes pain in the region of the tibial tuberosity especially when the patient extends the knee against resistance.

C. Muscular dystrophy is characterized by progressive weakness and muscle atrophy.

D. Rickets is attributed to vitamin D deficiency and is manifested by bowing of the long bones, enlargement of the epiphyses of the long bones, and enlargement of the costochondral junctions of the ribs (rachitic rosary).

E. Juvenile rheumatoid arthritis is an inflammatory disorder that begins in childhood and may produce extraarticular symptoms, including iridocyclitis, fever, rash, anemia, and pericarditis.

Source: Seidel

1594. Answer: C
The most common form of scoliosis is idiopathic scoliosis. Three age ranges of idiopathic scoliosis exist: infantile (which presents at birth to 3 years of age), juvenile (presenting at 4 to 10 years age), and adolescent (the most common form, accounting for 80% of cases and presenting from 11 years and older). To diagnose this condition, the back is viewed from behind, with the patient in the standing position. The waist, shoulders, and pelvis should be symmetric. The spine is examined for symmetry or deformity. The patient is then asked to bring the palms together in the front and bend at the waist. Viewing the patient from behind will allow for identification of any humps, valleys, or other deformities of the spine. Identified abnormalities can be confirmed radiographically. Premenarchal girls with a curvature of the spine of more than 20° on radiographs need close follow-up every 4 to 6 months because the risk of progression is high.
Source: Yetman and Hormann

1595. Answer: E (All)
Source: Goodwin J, Board Review 2005

1596. Answer: C (2 & 4)
Explanation: Infants have larger ECF fraction, thus a larger volume of drug distribution and lower peak blood levels, although similar steady state blood levels
Source: Mark V. Boswell, MD, DABIPP, FIPP

1597. Answer: A (1, 2, & 3)
Explanation: (Shoemaker, pp 796-799.) Ventilated patients in an intensive care setting require analgesia as well as sedation to alleviate anxiety and promote sleep. Intravenous opioids and benzodiazepines administered by infusion and supplemented with boluses as needed are quite effective. Epidural analgesia should be supplemented with intravenous benzodiazepines or other sedating medications that will provide analgesia and promote sleep.
Source: Kahn and Desio

1598. Answer: A (1, 2, & 3)
Explanation: (Ferrante, pp 496-497.) IV-PCA appears to be safe and effective in children and is frequently preferred by nursing staff, parents, and particularly adolescent patients. However, there are a small number of older children and adolescents who may not wish to be bothered with self-medication. They may feel indifferent and even dissatisfied with PCA and would rather receive analgesics by traditional methods. Therefore, PCA is not a universal therapy for postoperative pain control. IV-PCA can be used in children as young as 7 years of age. However, it may be restricted by age, developmental understanding of the purpose of PCA, and inability to activate the pump in the presence of muscular weakness or immobilization.
Source: Kahn and Desio

1599. Answer: C (2 & 4)
Explanation: (Ferrante, pp 491-492.) Meperidine is not routinely used in infants and children because of prolonged elimination half-life in neonates (6 to 39 h) and because repeated administration may lead to an accumulation of the normeperidine metabolite, which may produce CNS excitation and seizures. The incidence of respiratory depression with mu agonists is directly related to the dose. Minor opioid side effects (e.g., nausea and vomiting) occur no more frequently in children than in adults. Tolerance is an uncommon clinical problem in children when opioids are used in appropriate doses for short periods of time.
Source: Kahn and Desio

1600. Answer: E (All)
Source: Goodwin J, Board Review 2005

1601. Answer: C (2 & 4)
Explanation: Spinothalamic myelination is complete by 30 weeks. C-fiber maturation lags behind A-delta fiber development. Nociceptors are present in newborns
Source: Mark V. Boswell, MD, DABIPP, FIPP

1602. Answer: A (1, 2, & 3)
Source: Jackson KC. Board Review 2003

1603. Answer: E (All)
Explanation: Newborns have a well developed afferent nociceptive system. Descending inhibitory systems may not be
mature. The implications of the plasticity of the neonatal (and fetal) systems are unclear. However, environmental stimuli and pharmacologic exposure probably have important effects.
Source: Mark V. Boswell, MD, DABIPP, FIPP

1604. Answer: A (1, 2, & 3)
Explanation:
(Ferrante, p 490.) Acetaminophen is widely used as an analgesic in children of all ages. It is not associated with Reye syndrome, as is aspirin. Other advantages over aspirin include lack of gastric irritation, lack of platelet dysfunction, and lack of cross-sensitivity to aspirin. Hypersensitivity is rare. A higher dose is recommended for rectal use (15 to 20 mg/kg). Absorption of acetaminophen is incomplete and unreliable when the drug is administered rectally.
Source: Kahn and Desio

1605. Answer: D (4 Only)
Explanation:
(Miller, 4/e. pp 2119-2120) Although the use of regional anesthesia has been advocated to reduce the incidence of postoperative apnea in premature infants less than 60 weeks of postconceptional age, unequivocal data based on prospective, randomized, blinded studies are still lacking.
Source: Curry S.

1606. Answer: A (1, 2, & 3)
Explanation:
(Miller, 4/e. pp 968-969.) Patients with Down’s syndrome (trisomy 21) have a high incidence of congenital heart defects. They frequently also have upper and lower airway abnormalities. In addition, they may have atlanto-occipital instability (C1-C2). The previously reported sensitivity to atropine has been disproved.
Source: Curry S.

1607. Answer: E (All)
Explanation:
The key factor is that drug binding is decreased in newborns, with a resulting increased free fraction of drug available for effect. The key blood drug binding proteins are albumen and alpha 1 acid glycoprotein.
Source: Mark V. Boswell, MD, DABIPP, FIPP

1608. Answer: D (4 Only)
Source: Goodwin J, Board Review 2005

1609. Answer: D (4 only)
Explanation:
The clearance of morphine is reduced in the neonate. Clearance increases with age thereafter. The free fraction of drug is increased as well, because of decreased protein binding and other factors.
Source: Mark V. Boswell, MD, DABIPP, FIPP

1610. Answer: B (1 & 3)
Source: Goodwin J, Board Review 2005

1611. Answer: D (4 Only)
Source: Goodwin J, Board Review 2005

1612. Answer: E (All)

1613. Answer: B (1 & 3)
Explanation:
Common migraine is without aura by definition, and is more often bilateral than in adults.
Source: Boswell MV, Board Review 2004

1614. Answer: C (2 & 4)
Source: Boswell MV, Board Review 2004

1615. Answer: E (All)
Explanation:
(Ferrante, pp 486-487.) Available data indicate that the neurophysiologic and neurochemical components necessary for the transduction, transmission, modulation, and perception of nociception are present in term and preterm infants. The hormonal-metabolic responses to noxious stimuli are also intact. Similarly, undesirable physiologic responses can be provoked by pain. Term and preterm infants can undergo substantial changes in hemodynamics, oxygen saturation, and intracranial pressure in response to noxious surgical stimuli. Thus, in contrast to previously held beliefs, the evidence suggests that neonates experience pain and should be treated for it.
Source: Kahn and Desio

1617. Answer: E (All)
Source: Boswell MV, Board Review 2004

1618. Answer: E (All)

1619. Answer: A (1, 2 & 3)
Explanation:
In young infants gastric emptying is linear and slower than adults. This has implications for medication uptake.
Source: Mark V. Boswell, MD, DABIPP, FIPP