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CHAPTER 162
1. An 18-month-old boy presented with 4 days of sudden onset, severe watery diarrhea, after 2 days of being nonspecifically unwell. He was passing stool approximately 15 times/day. He had vomited for one day, but this then stopped. There was no blood in the stool. He was also noted to have a dry cough and appeared to have coryzal symptoms. He had not had a wet nappy for 24 hours. He had stopped breast feeding at 12 months old.

On examination, he was markedly dehydrated, with a temperature of 38.5 °C and a tachycardia. He required aggressive fluid resuscitation.

In addition to intravenous fluids or oral rehydration solutions, what agent would improve his outcome?
A. Ascorbic acid
B. Cholecalciferol
C. Magnesium
D. Thiamine
E. Zinc

CHAPTER 163
2. A 25-year-old primigravida presents at 34/40 with a 1-day history of fevers, rash, dry cough and coryzal symptoms. She had recently moved to the UK and was uncertain of her childhood vaccinations. On examination her temperature is 39 °C, and a generalized maculopapular rash which is coalescent on her trunk. Some small cervical lymph nodes are palpable bilaterally. There are small white spots on the buccal membrane beside her molars. She has bilateral conjunctivitis.

She is concerned about the risk to her baby. What are the possible adverse effects that she should be made aware of?
A. Cataracts
B. Hydrops fetalis
C. Intrauterine death
D. No increased risk of fetal adverse outcome
E. Sensorineural deafness

CHAPTER 164
3. An 11-month-old boy developed a high fever. This was associated with malaise, irritability and poor feeding. After 48 hours he developed a macular rash along his arms and legs. There was extensive confluent blistering of the perineum, but otherwise the trunk and back were spared. There were no lesions on his scalp. There were a number of perioral lesions, but no lesions visible inside the mouth. Some of the lesions progressed into thin-walled vesicles containing clear fluid. There were macules on the soles of his feet. The fever resolved 24 hours after the rash appeared. The rash took 10 days to clear, but left no scars. 3 weeks later the skin on his feet began to desquamate. He attended a nursery for 3 days a week. He had had his vaccinations as per the UK schedule for his age. He had been born at full term and was meeting his developmental milestones. He lived at home with two older siblings.

What is the most likely pathogen?
A. Adenovirus
B. Coxsackievirus A6
C. Echovirus
D. Herpes simplex virus 1
E. Varicella zoster virus

CHAPTER 166
4. A 52-year-old woman developed an encephalopathy and was admitted to her local intensive care unit. On extensive questioning of her partner, a recent travel history and the course of her illness were elicited. She had returned from a 3-week holiday in Bali where she had been bitten by an apparently healthy Rhesus macaque. She had been vaccinated prior to travel with the rabies vaccine, and received two intramuscular rabies boosters after the event. 2 weeks later she had developed localized pain, redness and vesicular skin lesions near the site of the bite, followed by localized numbness. Ataxia and diplopia ensued, with confusion, and then coma.

What intervention could have successfully prevented her illness?
A. Amoxicillin–clavulanic acid 625 mg TDS for 7 days
B. No intervention available
C. Rabies immunoglobulin infiltrated into the bite wound
D. Valaciclovir 1 g BD for 14 days
E. Wound irrigation for 5 minutes with scrubbing

5. A 24-year-old pregnant woman attended her GP at 14/40 as her 2-year-old daughter had developed a rash and fever consistent with chickenpox that morning. She had been born and brought up in the UK. She was unsure of her varicella immune status.

What is the most appropriate management?
A. Ask her to re-attend if a rash illness develops
B. Check her varicella zoster IgG
C. Give her intramuscular varicella zoster immunoglobulin
D. Give her varicella zoster vaccine
E. Reassure her that she is likely to be immune

CHAPTER 167
6. A 21-year-old woman presented to the sexual health clinic with multiple painless lesions over her vulva and perianal area. These were skin-colored, mostly smooth papules of <5 mm, but with a few raised cauliflower-shaped clusters.

What human papillomavirus (HPV) type is most likely to have caused this infection?
A. HPV-1
B. HPV-6
C. HPV-16
D. HPV-18
E. HPV-45
CHAPTER 168

7. A 42-year-old man with polycystic kidney disease underwent cadaveric renal transplantation, cytomegalovirus D/R, HLA-incompatible. His immunosuppressive regimen consisted of tacrolimus, prednisolone and mycophenolate mofetil. He was taking trimethoprim–sulfamethoxazole for PCP prophylaxis. At 10 months after the transplantation he reported rose-colored urine. He was otherwise well.

- Urinalysis: leukocytes +, hematuria +
- Creatinine: 238 μmol/L

What investigation is most likely to be diagnostic?
A. Plasma for CMV PCR
B. Renal biopsy
C. Serum galactomannan
D. Urine cytology for decoy cells
E. Urine for BK virus PCR

CHAPTER 169

8. A 39-year-old woman presented with mild fever, malaise and myalgia one week after her 5-year-old son developed a malar rash, after a few days of fever and coryzal symptoms (see photograph). She was usually fit and well. She had an intrauterine device in situ and did not take any regular medications. She had no known allergies. She had been born and brought up in Albania and had moved to the UK at 18 years of age. She was concerned about the possible complications. What complication is she most likely to develop?
A. Aseptic meningitis
B. Chronic anemia
C. Myocarditis
D. Rheumatoid-like polyarthritis
E. Transient aplastic crisis

CHAPTER 170

9. A 54-year-old pet store owner presented with 4 days of fever and headache, and 2 days of a rash that had started on his face and spread outwards. On examination, he had a macular rash over his face and distal extremities, with only a few lesions on his abdomen and back. His temperature was 38.3°C. He had widespread lymphadenopathy. Examination of his cardiovascular, respiratory and abdominal examinations was unremarkable. He was admitted for observation and investigation. Over the next few days the rash evolved from macules to vesicles to pustules. The fever persisted for 8 days in total, the rash for 12 days.

- Electron microscopy of lesion biopsy: see photograph.

What is the most likely pathogen?
A. Herpes B virus
B. Monkeypox virus
C. Streptobacillus moniliformis
D. Treponema pallidum
E. Varicella zoster virus

CHAPTER 171

10. A 29-year-old man seeks medical attention on returning from a camping holiday in Germany. He sustained a bite wound to his left hand 4 days previously from a wild fox he had tried to feed by hand. He has not seen any other healthcare professionals. He is concerned about the risk of rabies. He has received a full course of tetanus vaccinations and the wound looks clean and dry. What intervention is required?
A. Wound debridement and washout
B. Topical povidone-iodine
C. Five doses of intramuscular rabies vaccine days 0, 3, 7, 14 and 28
D. Human rabies immunoglobulin infiltrated into the wound
E. Rabies vaccination

CHAPTER 172

11. A 66-year-old woman on 40 mg prednisolone/day for temporal arteritis was exposed to a confirmed case of influenza A (H1N1) pdm09. She also had hypertension, asthma and osteoarthritis, for which she took amlodipine, Lisinopril, paracetamol and inhaled salmeterol. She had not yet received her seasonal influenza vaccination. She presented to her doctor 24 hours after the exposure and a choice of prophylaxis with either oral oseltamivir or inhaled zanamivir was considered.

What side effect of zanamivir is she at risk of developing?
A. Agitation
B. Bronchospasm
C. Cardiac arrhythmia
D. Guillain-Barré syndrome
E. Reye's syndrome

CHAPTER 173

12. There was an outbreak of a viral respiratory illness on the bone marrow transplantation unit. Sixteen patients were affected, with varying degrees of upper and lower respiratory tract involvement. Transmission in the outpatient unit was implicated with close contact and surface contamination important as routes of transmission rather than droplet spread. No healthcare workers were affected. One of the patients was a 59-year-old man who had received a matched unrelated donor allogeneic hematopoietic stem cell transplantation with non-myeloablative conditioning. 60 days after his BMT, he developed coryzal symptoms. He deteriorated over 24 hours and developed symptoms of a lower respiratory tract infection, with cough, tachypnoea, fever and hypoxia. He was admitted to a side room on the hematology ward. A chest radiograph was obtained which showed new pulmonary infiltrates. A nasopharyngeal aspirate was sent for respiratory virus
PCR panel, microscopy and culture for bacteria, fungi and mycobacteria. A urine Legionella antigen was negative. A high-resolution CT scan of the chest showed small peribronchial nodules. These were noncavitating, diameter <5 mm.

What is the most likely pathogen?
A. Adenovirus 14
B. Human bocavirus 1
C. Influenza A (H1N1)
D. Parainfluenza 3
E. SARS-coronavirus

CHAPTER 174

13. A 48-year-old Senegalese man was found to be HIV positive on routine screening with a fourth-generation combined p24 Ag/Ab ELISA. A confirmatory test with a second-generation ELISA for IgG to differentiate between HIV-1 and HIV-2 infection detected HIV-2 antibodies. He was negative for HIV-1 antibodies and an HIV-1 RNA viral load was negative. An HIV-2 RNA viral load was sent to the reference laboratory. His CD4 count was 458 cells/µL (mm³).

What class of antiretrovirals is HIV-2 intrinsically resistant to?
A. Chemokine receptor 5 (CCR5) antagonists
B. Integrase inhibitors
C. Non-nucleoside reverse transcriptase inhibitors
D. Nucleoside reverse transcriptase inhibitors
E. Protease inhibitors

14. A 33-year-old man attended the sexual health clinic following partner notification for gonorrhea. He was screened for rectal, urethral and pharyngeal gonorrhea and chlamydia, and had epidemiological treatment for gonorrhea with intramuscular ceftriaxone and oral azithromycin. Given his high-risk sexual behavior (>30 partners in the preceding 3 months, unprotected insertive and receptive anal sex, participation in chemsex parties) he requested a point of care HIV test. This was positive, and a laboratory sample confirmed HIV and hepatitis C infection. CD4 count was 525 cells/µL (mm³), HIV viral load 12,458 copies/mL. Treatment was recommended given his co-infection status and as he wanted to reduce the risk of transmission to partners. A baseline HIV resistance screen was obtained prior to starting Atripla (tenofovir, emtricitabine, efavirenz). What mutation in his resistance test would predict likely treatment failure with efavirenz?
A. M41L
B. K65R
C. N155H
D. Y181C
E. M184V

CHAPTER 175

15. A 45-year-old nurse returned from voluntary work during an outbreak of Ebola virus in rural Guinea. She had been directly involved in caring for patients within the Red Zone (isolation area) in an Ebola treatment unit. 4 days after her return she self-isolated and contacted her local public health unit as she had developed a fever, severe frontal headache and a sore throat. Urine, serum and an EDTA sample were sent urgently to the reference laboratory for an extended VHF PCR panel.

What type of virus is Ebola classified as?
A. Alphavirus
B. Arenavirus
C. Bunyavirus
D. Filovirus
E. Flavivirus

16. During an outbreak of West Nile virus (WNV) in late summer in northern Texas, a 44-year-old woman presented with a 4-day history of fever, headache, abdominal pain, myalgias and anorexia. She had attended the emergency department as she had noticed difficulty in walking and twitching of her thigh muscles in the preceding 24 hours. On examination she had reduced power grade 3/5 in left hip flexion and knee extension, absent deep tendon reflexes in both lower limbs and widespread generalized fasciculations. Sensory examination was normal.

CSF microscopy:
- Total protein: 0.55 g/L (0.15–0.45)
- Glucose: 4.1 mmol/L (3.3–4.4)
- White cell count: 0.34 x10³/L (55), 70% polymorphs
- HSV-1/2 / VZV / enterovirus / echovirus / WNV negative

Acute serum: WNV IgM antibody positive
Convalescent serum: significantly high titer of neutralizing antibodies to WNV (1: 320)
MRI: spine ill-defined non-enhancing hyperintensity in the cervicothoracic cord
What is the likelihood that she will recover strength to near baseline?
A. 5%
B. 20%
C. 35%
D. 75%
E. 95%

CHAPTER 176

17. A 29-year-old intravenous drug user presented with a 1-day history of severe dyspnea, fevers, myalgia, cough and hemoptysis. He had been treated in the community for 2 days with oral amoxicillin but had deteriorated. He was known to be hepatitis C-positive, genotype 1a, and was on the waiting list for antiviral treatment. He had previously had a right leg above-knee DVT, and was on treatment dose low molecular weight heparin in the community. He also took methadone, diazepam and multivitamins. On examination his temperature was 39.2°C, heart rate 140 beats per minute, blood pressure 110/64 mmHg, respiratory rate 32 breaths per minute, SaO₂ 92% on 15 L O₂. He looked profoundly unwell. There were coarse crackles bilaterally in the bases and midzones. A critical care consult was requested and the patient was discussed with the infection team.

- Neutrophil count: 1.9 x10³/L
- CRP: 352 mg/L (<10)
- Viral throat swab: respiratory virus PCR panel negative (including influenza A and B)
- Urinary Legionella antigen negative
- X-ray of chest: multilobar infiltrates with small bilateral effusions

What antimicrobial regimen would be most appropriate?
A. Daptomycin
B. Fluclaxocillin and clindamycin
C. Linezolid, clindamycin and rifampin
D. Trimethoprim–sulfamethoxazole
E. Vancomycin and rifampin
CHAPTER 178

18. A 23-year-old intravenous drug user presented with an infected injection site in his left groin. He was septic and required intraves in addition to aggressive fluid resuscitation. The left groin was red, hot and had marked localized edema around a central necrotic lesion. He was taken to theatre for a surgical debridement and then transferred to the intensive care unit.

Gram stain of tissue gram-positive bacilli

What microbiological features would support a diagnosis of Bacillus anthracis?
A. Negative catalase
B. β-hemolysis
C. α-hemolysis
D. Motile at 25°C
E. Resistance to trimethoprim–sulfamethoxazole

19. A 22-year-old man attended clinic for review of a split-skin graft to a full-thickness burn on his left calf. The doctor was concerned about infection as there was worsening exudate and pain, with 2 cm erythema around the edges. A wound swab was taken and the patient started on empirical flucloxacinill.

Wound swab:
1. Staphylococcus aureus, sensitive to methicillin
2. Streptococcus pyogenes
3. Gram-positive rod, identifying as Corynebacterium diphtheriae, awaiting confirmation.

What confirmatory test on organism 3 would substantially alter the management of this patient?
A. Bacitracin sensitivity
B. Modified Elek test
C. Nagler’s reaction
D. Quellung test
E. Reverse CAMP test

20. A 24-year-old primigravida, 32+4/40 attended with a 1-day history of fever, chills, myalgia and malaise. The pregnancy had been uncomplicated to date. She had had all her childhood vaccinations on schedule, and had not been in contact with a rash illness in this pregnancy. She worked in an office. No other contacts were unwell. A single temperature measurement was 38.0°C, but otherwise there was no other abnormality. There was no meningism, no rash and no pharyngitis. Bedside urinalysis was negative. She was kept for 6 hours’ observation during which she was afebrile. She was discharged home with advice to seek help if her symptoms persisted. Three days later, her clinician was phoned by the microbiology laboratory with the following result:

Blood cultures gram-positive rods

What are the possible consequences that should be taken into consideration?
A. Congenital glaucoma
B. Hydrocephalus
C. No increased risk of adverse outcome
D. Stillbirth
E. Thrombocytopenic purpura

CHAPTER 181

21. A 75-year-old man presented with severe left-sided otalgia, worse at night, extending into his temporomandibular joint. The pain was aggravated by chewing, and his hearing was reduced on that side. There was a purulent discharge from the ear. He had type 2 diabetes mellitus, hypertension and end-stage renal disease requiring maintenance hemodialysis via a native fistula. He had been seen in the ENT outpatients department 3 months earlier with left otitis externa, and received routine aural suction and gentamicin/hydrocortisone ear drops topically.

On examination he had a swollen erythematous external auditory canal on the left, with purulent debris and underlying granulation tissue on the floor of the canal; the right side was normal in appearance. It was not possible to visualize the tympanic membrane. There was erythema extending anteriorly over the temporomandibular joint, and posteriorly over the left mastoid process; the bony prominences and soft tissues were tender on palpation.

He had a left-sided lower motor neurone facial nerve palsy; other cranial nerves were intact.

What is the most likely causative organism?
A. Aspergillus fumigatus
B. Proteus mirabilis
C. Pseudomonas aeruginosa
D. Staphylococcus aureus
E. Streptococcus agalactiae

CHAPTER 182

22. A 32-year-old woman presented with a 7-day history of cramping abdominal pain and bloody diarrhea. She had opened her bowels over 15 times in the preceding 24 hours. There was fresh red blood mixed in with the stool. She had vomited once, and felt feverish. Her symptoms had not abated since their onset. She had returned from a family holiday with her partner and three children 2 days before onset. Nobody else was symptomatic. She had no past medical history of note.

Stool culture Campylobacter jejuni

In addition to fluid replacement therapy, what is the most appropriate management?
A. Azithromycin
B. Ciprofloxacin
C. Metronidazole
D. No antimicrobials needed
E. Trimethoprim–sulfamethoxazole

23. A 23-year-old man attended the out of hours medical service and asked about postexposure prophylaxis for leptospirosis. He had fallen into a canal earlier that day, and had been fully submerged. He was taking isotretinoin for acne but was not on any other regular medication. He had no known drug allergies. He had no open grazes and had showered 1 hour after the incident.

What is the most appropriate postexposure prophylaxis?
A. Amoxicillin
B. Azithromycin
C. Doxycycline
D. No prophylaxis required
E. Trimethoprim–sulfamethoxazole

24. An 8-year-old boy was admitted to a hospital in Malawi with torrential rice water diarrhea. He was from a rural area where there had been a recent outbreak of cholera associated with contaminated drinking water supply.

What is the mechanism of action of the cholera toxin?
A. ADP ribosylation of Elongation Factor 2
B. ADP ribosylation of inhibitory G proteins
C. ADP ribosylation of stimulatory G proteins
D. Formation of cation-selective pores in cell membranes
E. Zinc-dependent hydrolysis of phosphatidylycholine

CHAPTER 183

25. A 10-week-old infant was admitted to the pediatric intensive care unit with severe bronchopneumonia requiring intubation and ventilation. She suffered repeated apneic attacks. She had been born at full term by normal vaginal delivery, with no instrumentation. Her APGAR scores had been 8 and 9 at 1 and 5 minutes respectively. She had received her 8-week immunizations with
A biopsy was performed.

Direct microscopy: scanty gram-positive bacilli seen; branching filaments, diphtheroids and coccobacilli
Modified Kinyoun stain negative
Bacterial cultures: aerobic, enhanced CO₂ and anaerobic cultures negative
Fungal cultures: no growth at 25°C or 37°C
Histology: chronic inflammation with the presence of multiple granules surrounded by polymorphonuclear leukocytes; an eosinophilic fringe surrounds the PMN zone

What is the most likely diagnosis?
A. Actinomycosis
B. Mucormycosis
C. Nocardiosis
D. Nontuberculous mycobacterial infection
E. Tuberculosis

26. A 55-year-old man was clinically diagnosed with infective endocarditis of a native aortic valve. Three sets of blood cultures were taken and he was started on empirical treatment with amoxicillin (2 g q4h) and gentamicin (1 mg/kg BD).

Blood cultures  
Gram-negative coccobacilli isolated from 3/6 bottles at 4 days
Adherent star-shaped colonies of 1 mm on blood agar at 37°C in enhanced CO₂ (5–10%) at 48 hours
Catalase positive, oxidase positive, nonhemolytic

What is the most appropriate antibiotic regimen pending identification and sensitivities?
A. Change to benzylpenicillin 2.4 g q4h and gentamicin 1 mg/kg BD
B. Change to ceftriaxone 2 g OD and gentamicin 1 mg/kg BD
C. Change to doxycycline 100 mg BD po and hydroxychloroquine 200 mg TDS po
D. Change to vancomycin 1 g BD and rifampin 600 mg BD po
E. Continue amoxicillin and gentamicin

CHAPTER 184

27. A 56-year-old man presented with a slow-growing painless soft tissue swelling of the perimandibular region over 2 months. It had started discharging small amounts of pus through a small opening in the skin 2 weeks earlier. It had responded temporarily to a short course of co-amoxiclav but had then relapsed. He had no weight loss, fever, chills or other constitutional symptoms. He was otherwise in good health, worked in an office and had a long-term male partner. He smoked 15 cigarettes a day. There was no history of recent dental work or trauma to the face or mouth.

On examination there was a firm 4x5 cm mass in right submandibular region, tender to palpate and partially fixed on the deep tissue planes. The overlying skin was slightly bluish in color and there was a small sinus discharging thick yellow exudate.

Investigations:
CT head/neck: ill-defined mass in the left pyriform fossa involving the perimandibular gland and platysma muscle. Mass is infiltrative, crossing tissue planes. Moderately enhancing with several low attenuating foci. No associated lymphadenopathy.

A biotopy was performed.

DTaP/IPV/HiB, PCV, meningococcal B and rotavirus vaccines 1 week before she became unwell. She lived at home with her parents, grandmother and two older siblings. Initial investigations revealed a lymphocytosis.

What microbiological findings would be most consistent with this infection?
A. Bisected pearl colonies on charcoal cephalexin agar
B. Blue-grey colonies on Thayer Martin agar with vancomycin, colistin, nystatin
C. Grey colonies on Hoyle’s agar with potassium tellurite
D. Colonies on buffered charcoal yeast extract agar with L cysteine which fluoresce yellow-green under UV light
E. Growth around combined X+V disc only on nutrient agar

28. A 20-year-old man presented with fever, rigors, neck pain and respiratory distress. He had had a sore throat for the preceding week.

On examination, his heart rate was 148 beats per minute, temperature 38.5°C, blood pressure 82/54 mmHg, SaO₂ 89% on room air.

Examination of the oropharynx showed erythema over the soft palate and swollen tonsils. His neck movements were restricted and there was tenderness and induration over the right jugular vein.

Investigations:
Peripheral white cell count 28.7 x 10⁹/L (4.0–11.0)
Platelets 67 x 10⁹/L (150–400)
X-ray of chest – multifocal bilateral infiltrates
CT neck – see image below

What is the most likely causative organism?
A. Bacteroides fragilis
B. Eikenella corrodens
C. Fusobacterium necrophorum
D. Streptococcus dysgalactiae
E. Streptococcus pyogenes
CHAPTER 187
29. A 58-year-old woman developed an abrupt onset of high fever, which she had measured at home as 39.1°C and flu-like symptoms. She presented four days later when a generalized rash appeared. She had returned 3 days before the onset of fever from a 4-week visit to family in Turkey in June. She had diet-controlled diabetes mellitus and well-controlled hypertension. She was taking regular amiodipine and Lisinopril. Her family lived in a rural village in the Thrakya region of Turkey.

On examination she was alert and oriented, and her temperature was 38.3°C. She had a widespread maculopapular rash which spared her face but involved her palms and the soles of her feet. There was an eschar on the medial aspect of her lower left calf. This was not associated with any edema or regional lymphadenopathy.

Serology and blood cultures were taken and a punch biopsy of the eschar performed. She was treated presumptively with oral doxycycline for 7 days.

What is the primary target of the likely causative organism?
A. Endothelial cell
B. Erythrocyte
C. Monocyte
D. Neutrophil
E. Striated muscle cell

CHAPTER 191
30. A 47-year-old man presented with an intensely painful ulcer of 13 days’ duration over the glans penis, surrounding the urethral orifice. The lesion had started as multiple small superficial ulcers which had then coalesced. The ulcer had distinct raised thickened erythematous edges. There was necrotic slough and a foul-smelling hemopurulent discharge. The penis was edematous and there was bilateral tender inguinal lymphadenopathy. He had had unprotected insertive and receptive anal sex with at least 20 men in the preceding 3 months.

HIV: Ag/Ab negative
Syphilitic EIA negative
Direct wet mount microscopy: trophozoites containing ingested red blood cells (see photograph)

What is the most likely diagnosis?
A. Balamuthia mandrillaris
B. Dientamoeba fragilis
C. Entamoeba histolytica
D. Giardia lamblia
E. Trichomonas vaginalis

CHAPTER 192
31. A 58-year-old man living with HIV developed sudden onset watery, non-bloody diarrhea. He was not taking antiretroviral therapy and had disengaged from services for 3 years. He sought medical help after the diarrhea had persisted for several weeks. He also reported malaise, anorexia and abdominal pain. On examination he was thin and his mucous membranes were dry. He had lost 10 kg in weight since his last recorded weight 3 years earlier.

Investigations:
- Eosinophil count: $0.7 \times 10^9/L$ (0.04–0.40)
- Serum potassium: 2.8 mmol/L (3.5–4.9)
- Serum creatinine: 185 µmol/L (60–110) (baseline 74)
- Stool microscopy (see photograph): elliptical cysts visualized, $30 \times 15 \mu m$ using a modified Kinyoun stain

What complication is reported with this infection?
A. Acalculous cholecystitis
B. Keratoconjunctivitis
C. Myositis
D. Pancreatitis
E. Reactive arthritis

CHAPTER 193
32. A 39-year-old woman presented with a painful right eye, describing a foreign-body-like sensation and tearing. She wore soft contact lenses on a daily basis and admitted to poor practice, including showering while wearing her contact lenses, and wearing them for prolonged periods. She was otherwise well, and had no significant comorbidities. On examination: see photograph 1.

A corneal scraping was taken: see photograph 2.

What is the most likely causative organism?
A. Acanthamoeba spp.
B. Balamuthia mandrillaris
C. Encephalitozoon hellem
D. Naegleria fowleri
E. Sappinia pedata
CHAPTER 194

33. A 54-year-old farmer in Massachusetts became acutely unwell in late August. He had had nonspecific symptoms which came on gradually for 1 week, including fatigue, anorexia and headache. He then developed high sustained fevers, sweats, myalgia and dark urine. His medical history included splenectomy following a road traffic accident 15 years earlier, hypercholesterolemia and hypertension. He was up to date with his immunizations and took amlodipine and atorvastatin. He had not traveled outside of the USA in the preceding 10 years, and had not left Massachusetts in the preceding 6 months. He lived with his wife and two teenage daughters, all of whom were well.

On examination, he was visibly icteric, with pale conjunctivae, and was dyspneic at rest. His temperature was 38.5°C, heart rate 124 beats per minute, blood pressure 85/50 mmHg, respiratory rate 34 breaths per minute. He had inspiratory crackles to mid-zones bilaterally. His liver was palpable 2 cm below the right costal margin and his spleen tip was also palpable.

Investigations:
- HIV Ag/Ab negative, hepatitis C IgG negative, HBS negative
- Hemoglobin 63 g/L (130–180)
- White blood cell count 17.6×10⁹/L
- Neutrophil count 14.3×10⁹/L
- Platelet count 112×10⁹/l
- Serum creatinine 213 µmol/L (60–110)
- Serum alkaline phosphatase 167 U/L (45–105)

Blood film: see photograph

What is the most appropriate treatment?
A. Atovaquone plus azithromycin
B. Atovaquone plus proguanil
C. Chloroquine plus primaquine
D. Quinine sulfate plus clindamycin
E. Sulfadiazine plus pyrimethamine
CHAPTER 8

Multiple Choice Questions

34. A 72-year-old Chinese man presented with fatigue, abdominal discomfort, anorexia, weight loss of 6 kg, and diarrhea for 2 months. He had been born and brought up in Guangdong province of China, and had emigrated 5 years previously to live with his daughter after she married.

Stool microscopy for ova, cysts and parasites: scanty oval eggs, 30 × 15 µm, with a terminal spine seen.

What malignancy is associated with this infection?
A. Cholangiocarcinoma
B. Gastric carcinoma
C. Gastrointestinal stromal tumor
D. Hepatocellular carcinoma
E. MALT lymphoma

35. A 57-year-old Japanese man presented with a 1-day history of severe headache, fevers and photophobia. He had also had intermittent abdominal pains and diarrhea for the preceding month. On examination, his temperature was 38.1 °C, heart rate 110 beats per minute, blood pressure 102/60 mmHg. He was drowsy but rousable. Respiratory examination demonstrated a moderate left-sided pleural effusion and scattered crackles. His abdomen was soft, mildly distended but nontender. He had bilateral ankle edema. There was no focal neurology.

Neutrophils 16.4 x 10^9/L (1.5–7.0)
Eosinophils 0.3 x 10^9/L (0.04–0.40)
CRP 252 mg/L (<10)
Albumin 24 g/L
Alkaline phosphatase 96 U/L (45–105)
ALT 34 U/L (5–35)
CSF Opening pressure 260 mmH₂O (120–250)
Protein 0.92 g/L (0.15–0.45)
Glucose 0.2 mmol/L
White cells 350/µL (≤5), 90% polymorphs
Gram stain gram-negative rods
X-ray of chest Pleural effusion to midzone on left. Scattered bilateral pulmonary infiltrates throughout

What is the most likely underlying pathology?
A. Alcoholism
B. Deferoxamine therapy (Desferrioxamine)
C. Diabetic ketoacidosis
D. Infection with HIV-1 virus
E. Infection with Strongyloides stercoralis

36. A 34-year-old woman presented with migratory swellings over her right arm and back. They typically lasted for 1–3 days, and were hot, red, painful and itchy. She had returned 4 weeks earlier from a 12-month job in Cameroon. A presumptive diagnosis of loiasis was made, pending investigations.

What was the most likely vector for her infection?
A. Anopheles mosquito
B. Chrysops deerfly
C. Culex mosquito
D. Mansonia mosquito
E. Simulium blackfly
CHAPTER 162

1. E. This is a case of rotavirus infection. There is no specific antiviral treatment. However, zinc, given for 10–14 days during and after a diarrheal episode, has been shown to decrease diarrhea mortality by 23%. Additionally, vitamin A supplementation reduces all-cause diarrhea mortality by 30% in children aged 6–59 months. 
   Hint: See Chapter 162, section on management.

CHAPTER 163

2. C. This is measles, as evidenced clinically by the 3 Cs – cough, coryza, conjunctivitis – and the Koplik spots. Measles infection in pregnancy is associated with higher rates of premature delivery and intrauterine death. 
   Hint: See Chapter 163. Identify the likely causative organism using Figure 163-2 as an aid. The pregnancy-associated outcomes of viral exanthema are pathogen-specific.

CHAPTER 164

3. B. This is a case of hand, foot and mouth disease (HMFD), most commonly caused by coxsackieviruses A10, A6, A16 and enterovirus A71. Outbreaks are commonly associated with daycare centers amongst others (see Table 164-6); and in infants and children under the age of 5. See Table 164-7 for other common manifestations of enteroviral infection. 
   Hint: See Table 164-7.

CHAPTER 166

4. D. This is the recommended postexposure prophylaxis for high-risk herpes B virus infection incidents. However, the low incidence of infection relative to the number of exposures can complicate the decision. 
   Hint: See Chapter 166, clinical manifestations of herpes viruses.

5. B. She may require VZIG to reduce the risk of severe maternal disease and to reduce the risk of fetal varicella syndrome, but as it is a human product and there is time, she should have her immunity checked first, as she may be immune already. 
   Hint: See Chapter 166, section on prevention.

6. B. HPV-6 and HPV-11 are the etiologic agents of genital warts which occur in sexually active individuals, and also of recurrent respiratory papillomatosis (RRP), which may have onset in childhood or in adult life. 
   Hint: See Chapter 166-1.

CHAPTER 168

7. B. This is a case of BK virus nephropathy (see Chapter 168). The definitive diagnosis of BKVN requires a renal biopsy showing polyomavirus-induced cytopathic changes in tubular or glomerular epithelial cells. 
   Hint: See Chapter 168, section on clinical manifestations.

CHAPTER 169

8. D. Accompanying joint symptoms are rare in children but may be severe in adults, more often in women. These consist of an acute, symmetric, rheumatoid-like polyarthritis which usually improves within 2 weeks but occasionally may persist for months. 
   Hint: See Chapter 169, section on clinical manifestations.

CHAPTER 170

9. B. The diagnosis of monkeypox infection requires clinical (rash), epidemiologic (equatorial Africa) and laboratory (the presence of genomic DNA or brick-shaped virions in scab material) findings. 
   Hint: See Chapter 170 > orthopoxviruses > clinical manifestations.

CHAPTER 171

10. E. Western Europe (including Germany) is free of rabies in terrestrial animals. As such, even though a bite that penetrates skin is high risk, the epidemiology means that rabies postexposure prophylaxis is not warranted. If this had been a bat bite, this would not be the case. 
   Hint: A postexposure risk assessment for rabies includes elements such as the vaccination status of the patient, the animal involved, the body part exposed and the country where the exposure took place. See Chapter 171.

CHAPTER 172

11. B. This is a recognized complication of zanamivir use in patients with a history of asthma. The CDC recommends that zanamivir is not used in patients with an underlying respiratory disease. 
   Public Health England do not have the same restriction. 
   Hint: See Chapter 172, Table 172-1.

CHAPTER 173

12. D. Parainfluenza is one of the more common causes of respiratory viral infections in patients with hematologic malignancies, hematopoietic stem cell transplantation, or solid organ transplantation and is associated with a high rate of progressive disease involving the lower airway and an increased mortality rate. Parainfluenza viruses are transmitted by direct person-to-person contact through large respiratory droplets and contact with fomites contaminated with respiratory secretions. Respiratory precautions are not necessary, because the droplets are large and do not aerosolize. PIV can cause asymptomatic shedding, particularly among HSCT recipients, which may contribute to nosocomial spread. Risk factors in this patient for progressive disease include allogeneic BMT and reduced intensity conditioning. Lower airway involvement may be characterized by small peribronchial nodules on CT radiography. 
   Hint: See Chapter 173.

CHAPTER 174

13. C. The NNRTI binding pocket is structurally different in HIV-2, conferring innate resistance onto this class of drugs. They should not be used in the treatment of HIV-2. 
   Hint: See Table 174-1.

14. D. Amino acid substitutions such as K103N or Y181C prevent NNRTIs binding. 
   Hint: See Table 174-4 – Common HIV drug resistance mutations.

CHAPTER 175

15. D. Ebola and Marburg are both filoviruses. They have a distinctive filamentous morphology under the electron microscope with a nonsegmented, negative-stranded RNA genome. They have a lipid envelope derived from host cell plasma membrane. 
   Hint: See Chapter 175.
16. C. Among patients with acute flaccid paralysis, about one-third recover strength to near baseline, one-third have some improvement and one-third have little or no improvement. Treatment of WNV infection is supportive. Several investigated therapeutic approaches, including ribavirin, steroids, IVIG and monoclonal antibodies, have failed to demonstrate efficacy.

Hint: Chapter 175 > West Nile virus > clinical manifestations.

CHAPTER 176
17. C. The suspicion here is of Panton–Valentine leucocidin-Staph. aureus necrotizing pneumonia. The efficacy of antibiotics in necrotizing pneumonia is affected by the requirement for penetration into necrotic tissue and activity within anaerobic conditions. Public Health England suggest an empiric combination of clindamycin, linezolid and rifampin to start with, plus consideration of intravenous immunoglobulin (IVIG) and admission to a side room in intensive care.

Hint: See Chapter 176, management of Staphylococcus aureus infections.

CHAPTER 178
18. E. B. anthracis is commonly susceptible to penicillins, tetracyclines, quinolones, vancomycin and clindamycin; it is usually resistant to the cephalosporins and TMP–SMX.

Hint: See Chapter 178, identification of Bacillus anthracis.

19. B. The Elek immunoprecipitation test confirms the production of diphtheria toxin. PCR tests are now also available to demonstrate presence of the diphtheria toxin genes. Diphtheria toxin production requires enhanced public health management of both the patient and their close contacts.

Hint: See Chapter 178, diagnostic microbiology of Corynebacterium diphtheriae.

20. D. This is a case of maternal listeriosis. The risks of this in late pregnancy include death in utero, or premature delivery of an infected infant if the infection progresses untreated. The classic description is of a biphasic illness, in which the first phase is a nonspecific acute influenza-like illness. Blood cultures at this point are invaluable in providing an early diagnosis. If unnoticed or untreated, premature labor or death in utero may follow within 2–14 days of the acute presentation. This can be prevented by early antibiotic treatment.

Hint: See Chapter 178, gram-positive rods.

CHAPTER 181
21. C. This is a case of malignant (necrotizing) otitis externa, which is an aggressive infection of the external auditory canal that may be fatal. The majority of cases are caused by P. aeruginosa. Other organisms implicated less frequently include Staphylococcus aureus, Aspergillus fumigatus and Proteus mirabilis. Elderly people with diabetes mellitus are particularly at risk. As the infection progresses it may spread to cause an osteomyelitis of the base of the skull and the temporomandibular joint. See Chapter 181, section on ear infections, for further information.

Hint: See Chapter 181.

CHAPTER 182
22. A. This is the first choice antibiotic for Campylobacter enteritis, as resistance is low for macrolide antibiotics. See Chapter 182.

Hint: See Chapter 182.

23. D. The role of postexposure prophylaxis for leptospirosis is debatable, with local guidelines varying. Current UK guidelines are that postexposure management is limited to advice on showers promptly after water exposure, to minimize the swallowing of water and to thoroughly clean abrasions caused during the water exposure. The contraindication to doxycycline in this patient due to his isotretinoin treatment means that the most appropriate option is no antimicrobial prophylaxis, but heightened awareness and self-monitoring for fever and flu-like symptoms.

Hint: See Chapter 182, section on prevention of leptospirosis.

24. C. The CTA1 subunit of the cholera toxin catalyses ADP ribosylation of stimulatory G proteins leading to elevated levels of cAMP intracellularly. This leads to an increase in intestinal chloride secretion and a decrease in sodium chloride absorption resulting in a passive watery excretion, and diarrhea. The volume typically exceeds 10 mL/kg/hour in children and one liter per hour in adults.

Hint: See Chapter 182, section on the pathogenesis of cholera.

CHAPTER 183
25. A. This would be consistent with Bordetella pertussis, the likely pathogen in this infant (see photograph). Pernasal swabs with a dacron tip or nasopharyngeal aspirates are the specimens of choice, and should be plated at the bedside or placed in charcoal transport medium. PCR is more sensitive, especially later in the presentation and after antibiotics. See Chapter 183 for further details on the diagnostic microbiology and clinical manifestations of Bordetella pertussis. The highest rates of disease in the UK are in infants under 3 months. It is highly contagious, with up to 90% of unimmunized household contacts developing the disease. Public health should be notified as contacts may need assessment, chemoprophylaxis and vaccination (households with other infants <4 months old, pregnant women and healthcare workers).

Hint: See Chapter 183 and Figure 183-2.
CHAPTER 184

27. A. Actinomycosis is most commonly caused by Actinomyces israelii, which may be a component of normal oropharyngeal flora. This chronic, invasive infection mimics malignancy as it may invade local muscle and bone if left untreated. Sinus tracts may occur. Oral cervicofacial actinomycosis is the commonest presentation, but thoracic and abdominopelvic infections are also seen. Diagnosis is usually by demonstration of gram-positive branching filamentous bacilli and sulfur granules; cultures are rarely positive if broad-spectrum antibiotics have been taken. See Chapter 184 for further information on management.
   Hint: See Chapter 184.

28. C. Lemierre's syndrome is characterized by thrombosis and suppurative thrombophlebitis of the internal jugular vein. It is associated with disseminated septic emboli to the lungs and other sites. The most common pathogen is Fusobacterium necrophorum, but other organisms implicated include Eikenella, Bacteroides and streptococcal species. Organisms may be isolated from blood cultures and from infective metastases.
   Hint: See Chapter 184.

CHAPTER 187

29. A. This is a case of Mediterranean spotted fever as characterized by the eschar, high fever and maculopapular rash. This is caused by infection with Rickettsia conorii subsp. conorii. SFG Rickettsia are injected by infected ticks while feeding, which then adhere to their primary target, the endothelial cell. Adherence leads to phagocytosis and then release of the organisms into the cytoplasm of the infected endothelial cell. Although Rickettsia are obligate intracellular organisms that can infect vertebrate endothelium, vascular smooth muscle and macrophages, it is the endothelial cell that is the most important target cell.
   Hint: See Chapter 187 to determine the likely clinical syndrome, and then the section on pathogenicity.

CHAPTER 189

30. C. Primary infection of the skin by E. histolytica can be acquired by direct contact with an infected subject during vaginal or anal intercourse. Identification of trophozoites containing ingested red blood cells is consistent with a clinical picture of amebic infection. Biopsy may be necessary to demonstrate trophozoites and to exclude other diagnoses such as squamous cell carcinoma. PCR may be useful in confirming the diagnosis. See Chapter 116 Clinical features, and Diagnosis.
   Hint: See Chapter 191.

CHAPTER 192

31. A. Acalculous cholecystitis is recognized as a complication of infection with Cystispora belli. It is also recognized in infection of HIV patients with Enteroctozoon bieneusi and Encephalitozoon intestinalis. Cystispora belli causes self-limited watery diarrhea in the immunocompetent, but illness is more severe and more prolonged in immunocompromised patients. Diagnosis is usually made by detecting typical oocysts in feces, although acid-fast staining improves sensitivity above routine fecal microscopy.
   Hint: See Table 192-2.

CHAPTER 193

32. A. Acanthamoeba keratitis (AK) is an infection of the cornea typically associated with contact lens wear. The hallmark of AK is severe ocular pain, photophobia, and a central or paracentral 360° stromal ring infiltrate. Corneal scrapings may reveal trophozoites and cysts of Acanthamoeba spp. infiltrated between the lamellae of the cornea.
   Hint: See Chapter 193.

CHAPTER 194

33. D. In asplenic patients infection with Babesia microti can be severe, with intense hemolysis leading to severe anemia, jaundice and renal failure. DIC, ARDS and noncardiac pulmonary edema are described. Diagnosis is by microscopic examination of a Giemsa-stained thin blood film. The blood film (photograph) shows a typical tetrad of merozoites within an erythrocyte (‘Maltese cross’) as well as multiple ring forms. First-line treatment for severe babesiosis or infection in immunosuppressed patients is with quinine and clindamycin. Treatment is recommended for at least 6 weeks. Blood transfusion and intensive care support may be required.
   Hint: See Chapter 194.

CHAPTER 195

34. A. Cholangiocarcinoma is a recognized complication of Clonorchis sinensis infection; there may be an association with the consumption of carcinogenic nitrosamines.
   Hint: Use the diagram above to determine the causative pathogen and then Chapter 195, section on trematodes in liver, lung, intestines and blood.

35. E. This is a case of hyperinfection with Strongyloides stercoralis. Immunocompromised individuals are at risk of cycles of autoinfection leading to rapidly increasing parasite burden. Gram-negative bacteremias and subsequent seeding to other organs result from the filariform larvae crossing the intestinal wall in great numbers. Complications such as gram-negative meningitis are well recognized. Given his ethnic origins, this man is probably infected with HTLV-1 which is a significant risk factor for disseminated strongyloidiasis.
   Hint: Consider this man’s ethnic origins and possible underlying infection that may explain the two linked infections manifest in his current presentation. See Chapter 195.

36. B. This is the vector responsible for the transmission of Loa loa, with the female of the species biting during the day, especially in the wet season.
   Hint: See the section on nematodes in Chapter 195.