Current Antimicrobial Guidelines
Immunization Schedules

American College of Physicians Best Practice Guidelines

- Chronic obstructive pulmonary disease (COPD) exacerbation and acute uncomplicated bronchitis.
- Clinicians should limit antibiotic treatment duration to five days when managing patients with exacerbations of chronic obstructive pulmonary disease and acute uncomplicated bronchitis who have clinical signs of a bacterial infection (presence of increased sputum purulence in addition to increased dyspnea and/or increased sputum volume).

American College of Physicians Best Practice Guidelines

- Community-acquired pneumonia.
- Clinicians should prescribe antibiotics for a minimum of five days. Any extension of therapy should be guided by validated measures of clinical stability, which include resolution of vital sign abnormalities, ability to eat, and normal mentation.

American College of Physicians Best Practice Guidelines

- Uncomplicated urinary tract infection.
- In women with uncomplicated bacterial cystitis, clinicians should prescribe short-course antibiotics, specifically nitrofurantoin for five days, trimethoprim-sulfamethoxazole for three days, or fosfomycin as a single dose.
- In men and women with uncomplicated pyelonephritis, clinicians should prescribe short-course therapy with fluoroquinolones (five to seven days) or trimethoprim-sulfamethoxazole (14 days) based on antibiotic susceptibility.

American College of Physicians Best Practice Guidelines

- Cellulitis.
- In patients with nonpurulent cellulitis, clinicians should use a five- to six-day course of antibiotics active against streptococci, particularly for those who are able to self-monitor and have close follow-up with primary care.

Newer tick borne illnesses

- Rickettsia parkeri
- Found in Gulf and Mid-Atlantic states, Argentina
- Heartland virus
- Lone Star tick
- Found from Texas to Maine
- Ixodes scapularis
- Deer tick
- Found in upper Midwest and Canada

Recently recognized illnesses

- Use a scoring based system for treatment of prosthetic joint infections
- α-defensin and CRP as markers
- Candida auris
- Multidrug resistant
- Echinocandin sensitive
- Burkholder pseudomallei
- Resurgent in San Francisco, Northern Australia

University of San Francisco
Antibiotic Guidelines

Sepsis

Marik Protocol

FLCCC alliance

Accessed 01/18/2024

How to Treat Sepsis: Hospital Setting

Inpatient (MHAT)

Melatonin: 6-10 mg nightly.

Hydrocortisone: 50 mg intravenously every 6 hours, for at least 4 days and until patients are off vasopressors. If treatment is less than 10 days, a taper is not required.

Ascorbic acid: 1.5 g intravenously every 6 hours for a minimum of 12 doses, ideally 16 doses. Should treatment be initiated in excess of 6 hours after presentation to the hospital, the dose should be increased to 3 g intravenously every 6 hours. With delays in treatment of greater than 24 hours, mega-dose vitamin C should be considered, namely 20-25 g intravenously every 12 hours.

Thiamine: 200 mg intravenously every 12 hours.

How to Treat Sepsis: Outpatient Setting

Outpatient (MCAZ+)

Melatonin: 10 mg nightly.

Ascorbic acid (Vitamin C): 1 g orally every 2-4 hours (6 times a day) for 2 weeks. Intravenous vitamin C (1.5-3 g every 6-12 hours or 12-15 g daily) can be considered when feasible.

Antibiotics: Empiric antibiotics started as soon as possible. Dosed according to the specific antibiotic chosen.

Zinc: 75-100 mg daily for no longer than 2 weeks.

PLUS

Quercetin: *500 mg twice daily for 2 weeks.*

Nano curcumin: *500 mg twice daily.*

Pre- and Probiotics: *Daily bifidobacterium probiotics together with prebiotics are recommended to normalize the microbiome.*

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)
Septic Shock Community onest, no recent healthcare exposure	Enterobacteriaceae *S. aureus* *Streptococci spp.*	**Vancomycin** PLUS one of: **Piperacillin/** **Tazobactam**[ID-R: SFGH] 4.5 g IV q8h OR **Ertapenem** 1 g IV daily	For severe PCN allergy: **Vancomycin** PLUS **Metronidazole** 500 mg IV/PO q8h PLUS one of **Aztreonam**[ID-R: SFGH] 2 g IV q8h OR **Tobramycin**

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)
Healthcare-associated and/or previous antibiotic therapy	Enterobacteriaceae *S. aureus* *Streptococci spp.* *P. aeruginosa*	**Vancomycin** PLUS **Piperacillin/Tazobactam** ID-R: SFGH 4.5 g IV q6h OR **Cefepime** ID-R: SFGH VASF 2 g IV q8h	For severe PCN allergy: **Vancomycin** PLUS **Metronidazole** 500 mg IV q8h AND **Aztreonam** ID-R: SFGH 2 g IV q8h WITH OR WITHOUT: **Tobramycin**

For patients with neutropenia, organ transplant, severe hepatic failure, or current/recent (<7 days):

Piperacillin/tazobactam
OR
Cefepime

Vancomycin
Plus
Meropenem[I] 1-2 g IV q8h

Initial Antimicrobial Treatment for Inpatient Code Sepsis (All doses listed below are LOADING doses and are intended for initial doses only.)

GIVE IMMEDIATELY (Hang concurrently if possible through available lines – or hang in order listed)

Hang 1st: **Piperacillin/Tazobactam** 4.5 g IV x 1 dose over 30 minutes [subsequent doses by extended infusion, if applicable] **OR**
Cefepime 2 g IV x 1 over 30 minutes (*if febrile neutropenia or CNS infection)* **OR**
Meropenem 1 g IV x 1 dose over 30 minutes (*if organ transplant or re-induction within 3 months, febrile neutropenia on cefepime, current/recent (<7 days) piperacillin/tazobactam or cefepime, or hepatic failure and meets criteria per LTU protocol)*

Hang 2nd: ***Vancomycin** 1 g IV x 1 dose over 1 hour **OR**
Linezolid 600 mg IV x 1 dose over 30 minutes
(if severe vancomycin allergy, history of VRE infection, or recent vancomycin and meets criteria per LTU protocol)

Alternatives for Penicillin Allergy:
➔ **If non-life threatening:** **Cefepime** 2 g IV x 1 dose over 30 minutes
➔ **If life-threatening:** ***Aztreonam** 2 g IV x 1 dose over 30 minutes + **Gram (+) Coverage** (Only has gram (-) coverage)

THEN CONSIDER (Hang concurrently if possible through available lines)

If vancomycin started, complete load with following **AND** initiate vancomycin per pharmacy for subsequent dosing
61 – 89 kg ➔ ***Vancomycin** 500 mg IV x 1 dose over 30 minutes
> 90 kg ➔ ***Vancomycin** 1 g IV x 1 dose over 60 minutes

If meropenem started AND patient with cystic fibrosis or CNS infection, give an additional dose: **Meropenem** 1 g x 1 over 30 minutes

SPECIAL POPULATIONS

Febrile neutropenia with hemodynamic instability or high risk for MDR organisms
*Add *Tobramycin 7 mg/kg IV x 1 dose over 30 minutes **OR***
Add Levofloxacin 750 mg IV x 1 dose over 30 minutes (if renal impairment)

Febrile neutropenia not on voriconazole OR Severe hepatic failure on fluconazole OR surgical patient w/persistent intra-abdominal infection from anastomotic leak/GI perforation
Add Caspofungin 70 mg IV x 1 dose over 30 minutes

Suspected intra-abdominal source AND cefepime or aztreonam selected initially
Add Metronidazole 500 mg IV x 1 dose over 30 minutes

*Need combination therapy Febrile neutropenia [T ≥ 38.3°C once or ≥38.0°C for over 1 hr.] + [ANC < 500 **or** ANC < 1000 expected to drop < 500 w/in 48 hr.]

Neutropenic fever

- Dehydration, sepsis, hypertension, treatment for hematologic malignancy places patient at high risk for infection.
- Parenteral routes required.
- Antifungal prophylaxis in patients treated for hematologic malignancy.
- Low risk patients may be treated with oral ciprofloxacillin and amoxicillin-clavulinic acid and managed as outpatients pending culture results and work-up.

Neutropenic fever

- Hospital acquired pneumonia also requires addition of a fluoroquinolone or macrolide with beta-lactam antibiotic.
- Maintain regimen in stable patient even if persistently febrile.
- After 3 days, begin antifungal therapy.
- Treat for Herpes simplex if suspicious oral ulcers present.

Bone and joint infections

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Osteomyelitis Presumed hematogenous source or contiguous without vascular insufficiency	*S. aureus*	**Vancomycin**	**Vancomycin**	If *S. aureus* is methicillin-susceptible then cefazolin 2 g IV q8h or nafcillin 2 g IV q4h are the antibiotics of choice. Obtain bone biopsy to determine microbiologic cause prior to initiation of antimicrobial therapy if blood cultures are negative and patient clinically stable.
Osteomyelitis With vascular insufficiency or diabetes mellitus (e.g. severe diabetic foot ulcer)	*S. aureus* Enterobacteriaceae Anaerobes	**Vancomycin** PLUS ONE OF: **Piperacillin/Tazobactam** ID-R: SFGH 4.5 g IV q6-8h OR **Ertapenem** 1 g IV daily	For **severe** PCN allergy: **Vancomycin** PLUS ONE OF: **Ciprofloxacin** ID-R: VASF 400 mg IV q12h OR **Levofloxacin** ID-R: VASF 750 mg IV daily OR **Aztreonam** ID-R: SFGH 2 g IV q8h ALL WITH OR WITHOUT: **Metronidazole** 500 mg IV q8h (if patient critically ill)	Other organisms are possible, esp. with hardware microbiologic diagnosis and ID consultation recommended Obtain bone biopsy to determine microbiologic cause prior to initiation of antimicrobial therapy if patient clinically stable Once stable, switch to oral antibiotics based on susceptibility results.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Septic Arthritis	*S. aureus* *Streptococci spp.* *N. gonorrhoeae* *Enterobacteriaceae (rarely)*	**Vancomycin** PLUS **Ceftriaxone**1 g IV daily	For **severe** PCN allergy: **Vancomycin** PLUS ONE OF: **Ciprofloxacin**ID-R: VASF 400 mg IV q12h OR **Levofloxacin** ID-R: VASF 500 mg IV daily OR **Aztreonam**ID-R: SFGH 2 g IV q8h if gonococcus is strongly suspected	Gram stain recommended to guide therapy. Narrow coverage to microbiologically confirmed pathogens.

CNS infections

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Brain abscess	Streptococci (anaerobic or aerobic) *Bacteroides spp* *Prevotella* spp Enterobacteriaceae	**Ceftriaxone** 2 g IV q12h PLUS **Metronidazole** 500 mg PO/IV q8h WITH OR WITHOUT*: **Vancomycin**	For **severe** PCN allergy: **Aztreonam** ID-R: SFGH 2 g IV q8h PLUS **Vancomycin** PLUS **Metronidazole** 500 mg PO/IV q8h	ID consultation recommended. *Consider expanded Gram-positive coverage if patient at risk for drug-resistant streptococci or MRSA

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Epidural Abscess	*S. aureus* Streptococci (anaerobic or aerobic) *E.coli*	**Ceftriaxone** 2 g IV q12h PLUS **Vancomycin**	For **severe** PCN allergy: **Aztreonam**[ID-R: SFGH] 2 g IV q8h PLUS **Vancomycin**	ID consultation recommended.

Meningitis

- While cultures and other test results are pending, broad-spectrum coverage for bacterial and viral etiologies of meningitis should be initiated, covering not only meningococcal infection, but other potential etiologies as well.
- **Children**
- give parenteral cefotaxime as soon as meningococcal disease is suspected using age- and weight-based dosing
- for neonates aged 0-7 days, give 100-150 mg/kg/day in divided doses every 8-12 hours
- for neonates aged 8-28 days, give 150-200 mg/kg/day in divided doses every 6-8 hours
- for infants and children > 28 days old, give 225-300 mg/kg/day in divided doses every 6-8 hours
- **Adults**
- ceftriaxone 2 g every 12 hours
- cefotaxime 1.33-2 g every 4 hours or 2-3 g every 6 hours
- Consider adjusting antibiotics after meningococcal infection is confirmed based on penicillin minimal inhibitory concentration (MIC).

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Meningitis Community-onset	*S. pneumoniae* *Neisseria meningitidis* *Listeria* (especially in immuno-compromised, elderly patients, and alcoholics)	**Ceftriaxone** 2 g IV q12h PLUS **Vancomycin** WITH OR WITHOUT* one of: **TMP/SMX** 15 mg/kg/day (in divided doses) OR **Ampicillin** 2 g IV q4h	For **severe** PCN allergy: **Vancomycin** PLUS **Aztreonam**[ID-R: SFGH] 2 g IV q6h-q8h WITH OR WITHOUT*: **TMP/SMX** (if *Listeria*) 15 mg/kg/day (in divided doses)	ID consultation recommended. Therapy should be guided by Gram stain. If bacterial meningitis suspected, dexamethasone 10 mg PO/IV q6h x 4 days given before or with initial dose of antibiotics. *Coverage for *Listeria* with TMP/SMX or ampicillin should be added for patients who are >50 years of age or immunocompromised.
Meningitis Post-neurosurgical or device associated	*S. aureus* Coagulase negative Staphylococci Gram negative rods	**Cefepime**[ID-R: SFGH VASF] 2 g IV q8h PLUS **Vancomycin**	For **severe** PCN allergy: **Aztreonam**[ID-R: SFGH] 2 g IV q6h-q8h PLUS **Vancomycin**	ID consultation recommended.

Abdominal infections

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Spontaneous Bacterial Peritonitis (SBP)	*E. coli* *Klebsiella spp.* *Streptococci. spp.*	**Ceftriaxone** 1 g IV daily x 5 days	For severe PCN allergy: **Vancomycin** PLUS **Aztreonam**[ID-R: SFGH] 2 g IV q8h	Gram stain recommended. In patients who received previous courses of antibiotics, consider expanding coverage.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Secondary Peritonitis **Mild-Moderate** intra-abdominal abscess	*E. coli* *Klebsiella* *B. fragilis* *Streptococci spp* *S. aureus*	**Ertapenem** 1g IV daily OR **Piperacillin/tazobactam**[ID-R: SFGH] 3.375 g IV q6h - 4.5g IV q6h	For severe PCN allergy: **Vancomycin** PLUS **Aztreonam**[ID-R: SFGH] 2 g IV q8h PLUS **Metronidazole** 500 mg IV q8h	
Secondary Peritonitis **Severe** (major peritoneal soilage, large or multiple abscesses, patient hemodynamically unstable)	*E. coli* *Klebsiella* *B. fragilis* *P. aeruginosa* *Enterococcus spp.* *Streptococcus spp* *S. aureus*	**Vancomycin** PLUS **Piperacillin/tazobactam**[ID-R: SFGH] 4.5 g IV q6h	For severe PCN allergy: **Vancomycin** PLUS **Aztreonam** [ID-R: SFGH] 2 g IV q8h PLUS **Metronidazole** 500 mg IV q8h	ID consultation recommended. For hemodynamically unstable health-care associated infection, consider meropenem.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Comments
Clostridium difficile-associated diarrhea	*Clostridium difficile*	Initial episode, mild to moderate disease (WBC ≤15K and SCr less than 1.5 times premorbid level) **Vancomycin** 125mg PO q6h x 10-14 days. If unable to obtain at discharge, can complete course with **Metronidazole** 500mg po q8h Initial episode, severe disease (WBC >15k and/or 50% increase in SCr) **Vancomycin** 125mg PO q6h x 10-14 days. Initial episode, severe disease with complications (Severe disease with hypotension, shock, ilios, and/or megacolon) **Vancomycin** 500mg PO/NG q6h x 10-14 days PLUS **Metronidazole** 500 mg IV q8h x 10-14 days WITH OR WITHOUT **Vancomycin** PR Rectal vancomycin should be considered in patients with ileus. It is given as 500 mg in 100 mL of 0.9% NaCl and instilled q6h (retain each dose for 1h) First recurrence Same therapy as initial episode, stratified by illness severity First recurrence, special population (hematologic malignancy with >30 days expected neutropenia, recent HSCT, recent treatment for GVHD, solid organ transplant <3 months) **Fidaxomicin**[ID-R: UCSF SFGH VASF] 200mg PO BID x10 days Second recurrence **Vancomycin** with tapered or pulsed regimen	For full guidance for UCSFMC, see document on **Management of *C. difficile* Infection.** Discontinue or streamline concomitant antimicrobials if possible. IV metronidazole alone is not indicated for treatment of *C. difficile* diarrhea. IV metronidazole should only be used in combination with PO vancomycin in the ICU. Recurrence in 5-30% of patients after first episode and 33-60% after second episode. ID CONSULT recommended in patients with severe disease with complications or multiply recurrent disease, and for consideration of rectal vancomycin administration.

Fidaxomicin preferred in C. dificile as is associated with fewer recurrences
Metronidazole only if toxic megacolon (IV)

GYN infections

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Endometritis	*Bacteroides* *Prevotella bivia* Group B & Astreptococci Enterobacteriaceae *M. hominis*	***1st line:*** **Cefoxitin** 2 g IV q6h ***2nd line:*** **Ertapenem** 1 g IV daily ***3rd line:*** **Ampicillin/sulbactam** 3 g IV q6h	For severe PCN allergy: **Vancomycin** PLUS **Gentamicin** PLUS **Metronidazole** 500 mg IV q12h	If test for chlamydia is positive add azithromycin or doxycycline. Continue antibiotics until afebrile for 24-48 hours. If still febrile > 48 hours and on cefoxitin or clindamycin/gentamicin postpartum, switch to ertapenem. Wait 48 hours on an antibiotic regimen before considering regimen failed.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Candidal Vaginitis	*Candida albicans*	**Fluconazole** 150 mg PO x 1 dose	**Miconazole** 2% cream 5 g intravaginally x 3 days OR **Miconazole** 100 mg suppository, one suppository daily x 7 days OR **Clotrimazole** 1% cream 5 g intravaginally x 7-14 days	Single dose topical therapies are available but are less effective. Seven day regimens are not superior to 3 day regimens.
Protazoan Vaginitis	*Trichomonas vaginalis*	**Metronidazole** 2 g PO x 1 dose	**Metronidazole** 500 mg PO BID x 7 days	In treatment failures to metronidazole, retreat with metronidazole 500 mg PO BID x 7 days.
Bacterial Vaginitis	*Gardnerella, other anaerobes*	**Metronidazole** 500 mg BID PO x 7 days OR **Metronidazole** vaginal gel 0.75%, 5 g intravaginally daily x 5 days OR **Clindamycin** vaginal cream 2%, 5 g intravaginally daily x 7 days	**Clindamycin** 300 mg PO BID X 7 days OR **Clindamycin** ovules 100 mg intravaginally daily x 3 days	

ENT infections

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Acute otitis media OR **Otitis media with effusion (OME) with signs or symptoms of acute infection**	*S. pneumoniae* *H. influenzae* *M. catarrhalis* *Group A Strep.*	**Amoxicillin** 1 g PO BID x 5-7 days OR 500 mg PO TID x 5-7 days	For severe PCN allergy: **Azithromycin** 500 mg PO daily x 1 day; then 250 mg PO daily x 4 days OR **Doxycycline** 100 mg PO BID for 5-7 days	Amoxicillin/clavulanic acid not indicated as initial therapy of acute otitis. High dose amoxicillin 1 g PO TID should be used over low dose in the treatment of patients at risk for drug resistant *S. pneumoniae*. OME in the absence of acute signs and symptom of infection does not require antibiotics.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Pharyngitis	Viral (EBV, rhinovirus, coronavirus, adenovirus etc) *Group A Streptococcus* (5-20%)	**Penicillin VK** 250 mg PO TID-QID x 10 days	For severe PCN allergy: **Clindamycin** 300 mg PO TID x 7-10 days	Most pharyngitis is viral thus antibiotics should not be used. Treatment with PCN prevents rheumatic fever. Treat documented Group A streptococcal infection confirmed by rapid strep. antigen test or culture or if 3 out 4 clinical criteria present. Clinical Criteria: history of fever, tender anterior cervical adenopathy, absence of cough, tonsillar exudates. Penicillin resistance has not been observed.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Acute Sinusitis	Viruses *S. pneumoniae* *H. influenzae* *M. catarrhalis*	**Amoxicillin** 500 mg PO TID X 5-7 days	For severe PCN allergy: **Doxycycline** 100 mg PO BID X 5-7 days	Majority of cases are viral. Consider treatment only in presence of fever, purulence or bloody discharge following an upper respiratory infection if symptoms persist for 7-10 days suggesting bacterial etiology.
Chronic Sinusitis	Viruses *S. pneumoniae* *H. influenzae* *M. catarrhalis* Anaerobes *Staph. aureus* *Enterobacteriacae*	**Amoxicillin/clavulanate** 875 mg/125 mg PO BID X 10-14 days OR **Amoxicillin/clavulanate** CR 2 g BID X 10-14 days if drug-resistant *Streptococcus pneumonia*	For severe PCN allergy: **Ciprofloxacin** 500 mg PO BID OR **Levofloxacin** 500 mg PO daily x 10-14 days EITHER OF ABOVE WITH OR WITHOUT*: **Clindamycin** 300 mg PO TID	Consider otolaryngology consult to rule out anatomic abnormality. If acute exacerbation, treat as acute sinusitis. HIV positive patients may need a 2-3 week course. *Consider clindamycin if anaerobes and/or *S. aureus* are high on the differential.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Peritonsillar abscess, deep neck infections	Group A streptococci Anaerobes *S. aureus*	**Ampicillin/sulbactam** 3 g IV q6h WITH OR WITHOUT* **Vancomycin** Alternatively: **Ertapenem** 1 g IV daily WITH OR WITHOUT* **Vancomycin** Alternatively: **Metronidazole** 500 mg IV/PO q8h PLUS **Ceftriaxone**1 g IV q24h WITH OR WITHOUT* **Vancomycin**	For severe PCN allergy: **Clindamycin**[ID-R: VASF] 600 – 900 mg IV q8h PLUS **Ciprofloxacin**[ID-R: VASF] 400 mg IV q12h OR **Levofloxacin**[ID-R: VASF] 500 mg IV daily	Often polymicrobial Combinations of piperacillin/tazobactam, ampicillin/sulbactam, or ertapenem PLUS metronidazole should not be used. *Consider vancomycin use for patients at high risk for MRSA

Indwelling catheters

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Line-related bacteremia	*S. epidermidis* *S. aureus* *Enterococci spp.* Gram-negative rods* *Yeast***	**Vancomycin** WITH OR WITHOUT* one of: **Piperacillin/tazobactam** ID-R: SFGH 4.5 g IV q6h OR **Cefepime** ID-R: SFGH VASF 2 g IV q8h	For severe PCN allergy: **Vancomycin** WITH OR WITHOUT* one of: **Aztreonam** ID-R: SFGH 2 g q8h	Remove the offending intravascular device immediately, if possible. *Consider Gram-negative coverage for immunocompromised patients or those with prolonged hospitalization, recent antibiotic exposure or sepsis.

Lung infections

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Acute Bronchitis	*Viral*	No drug therapy required	No drug therapy required	Antibiotics are NOT useful in acute bronchitis. Purulent sputum alone is not an indication for antibiotics.

Category	Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments	Expected duration
RESPIRATORY and HEAD and NECK INFECTIONS	Acute Bronchitis	Viral	No drug therapy required	No drug therapy required	Antibiotics are NOT useful in acute bronchitis. Purulent sputum alone is not an indication for antibiotics.	None

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)
Acute bacterial exacerbation of chronic bronchitis (COPD)	*S. pneumoniae* *H. influenzae* *Moraxella catarrhalis*	**Doxycycline** 100 mg PO BID X 10 days	**Azithromycin** 500 mg PO daily X 1 day; then 250 mg PO daily X 4 days

Diagnosis	Common Pathogens	Drug(s) of First Choice	Comments
Community-acquired Pneumonia (CAP)	*S. pneumoniae* *M. pneumoniae* *C. pneumoniae* Respiratory viruses *Legionella* spp. C. psittaci	No recent antibiotic therapy: **Doxycycline** 100 mg PO BID X 7 days OR **Azithromycin** 500 mg PO daily X 1 day; then 250 mg PO daily X 4 days	**Previous antibiotic therapy within last 3 month** should be elicited from patient. A course of antibiotics is a risk factor for drug resistance. Recent use of a fluoroquinolone should dictate selection of a non-fluoroquinolone regimen, and vice versa.
	H. influenzae (if patient has co-morbidity)	Recent antibiotic therapy or patients with co-morbidities: **Levofloxacin** 750 mg PO daily X 5 days OR **Moxifloxacin**[ID-R: SFGH] 400 mg PO daily X 7 days Alternatively the combination of: **Amoxicillin (High-dose)** 1 g PO TID X 7 days PLUS ONE OF: **Doxycycline** 100 mg PO BID X 7 days OR **Azithromycin** 500 mg PO daily X 1; then 250 mg PO daily X 4 days]	Careful follow-up highly recommended.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Community-Acquired Pneumonia **Immunocompetent patient** – Medical Ward	*S. pneumoniae* *Mycoplasma pneumoniae* *Chlamydia pneumoniae* *H. influenzae* *Legionella pneumophilia* *Klebsiella pneumoniae* *(alcoholics)*	No Recent antibiotic therapy:* **Ceftriaxone** 1 g IV daily PLUS **Doxycycline** 100 mg PO/IV q12h	For severe PCN allergy: **Levofloxacin** 750 mg PO/IV daily OR **Moxifloxacin**[ID-R: SFGH] 400 mg PO/IV daily	ID consultation is recommended if ICU admission or high level PCN-resistant pneumococci documented. *If patient has had recent antibiotic therapy, antibiotics from a different class should be selected (i.e. recent use of a fluoroquinolone should dictate selection of a non-fluoroquinolone regimen, and vice versa). Consider influenza testing and treatment with oseltamivir.

Mycoplasma that is macrolide or quinoline resistant is treated with dactinomycin

Community-Acquired Pneumonia **Immunocompetent patient** – ICU	*S. pneumoniae* *Mycoplasma pneumoniae* *Chlamydia pneumoniae* *H. influenzae* *Legionella pneumophilia* *Klebsiella pneumoniae* (alcoholics) *S. aureus*	**Ceftriaxone** 1 g IV daily PLUS **Azithromycin** 500 mg IV daily WITH OR WITHOUT*: **Vancomycin**	For severe PCN allergy: **Vancomycin** PLUS one of: **Levofloxacin** 750 mg IV daily OR **Moxifloxacin**[ID-R: SFGH] 400 mg IV daily	* MRSA risk factors: prior influenza, presence cavitary disease, empyema. Consider influenza testing and treatment with oseltamivir. If no microbiologic confirmation of MRSA then discontinue vancomycin. See HCAP for risk factors for infection with *Pseudomonas aeruginosa*.

Anaerobic lung infection	**Amoxicillin/clavulanate** 875 mg/125 mg PO BID OR **Clindamycin** 300 mg PO TID

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Healthcare-associated pneumonia (HCAP): The concept of healthcare-associated pneumonia (HCAP), i.e. pneumonia that is acquired outside the hospital in patients with healthcare-associated risk factors, is no longer included in the guidelines for hospital-acquired pneumonia (HAP) and ventilator-associated pneumonia (VAP). We recommend that most patients admitted for pneumonia with a history of contact with the healthcare system (e.g. past hospital admission within 90 days, dialysis) are treated for CAP. Broader therapy is recommended in some situations (see below):				
Pneumonia in patient admitted from skilled nursing or other long term care facility after at least one week stay	*S. pneumoniae* *S. aureus* *H. influenzae* Enteric Gram negative bacilli *P. aeruginosa*	**Vancomycin** PLUS ONE OF: **Ertapenem** or **Cefepime** or **Piperacillin/ tazobactam**	For severe penicillin allergy: **Vancomycin** PLUS **Levofloxacin**	Obtain sputum for Gram stain and culture

Pneumonia with significant prior healthcare exposure and admitted to ICU	*S. pneumoniae* *S. aureus* *H. influenzae* Enteric Gram negative bacilli *P. aeruginosa* *Legionella*	**Vancomycin** PLUS **Azithromycin** PLUS ONE OF: **Cefepime** or **Piperacillin/ tazobactam**	For severe penicillin allergy: **Vancomycin** PLUS **Aztreonam** PLUS **Azithromycin**	Obtain sputum for Gram stain and culture
Pneumonia with significant prior healthcare exposure and large or loculated pleural effusion or cavitary disease	*S. pneumoniae* Enteric Gram negative bacilli *S. aureus* *P. aeruginosa*	**Vancomycin** PLUS ONE OF: **Cefepime** or **Piperacillin/ tazobactam**	For severe penicillin allergy: **Vancomycin** PLUS **Aztreonam**	Obtain sputum for Gram stain and culture

ZSFGH/VASF **Hospital-acquired pneumonia**: mild disease (or unclear diagnosis) without extensive prior antibiotic exposure	*S.pneumoniae* *H.influenzae* Possible enteric Gram-negative rods	**Ceftriaxone** or **Ertapenem** or **Levofloxacin**	For severe penicillin allergy: **Levofloxacin**	Obtain sputum for Gram stain and culture
ZSFGH/VASF **Hospital-acquired pneumonia:** severe disease (severe hypoxemia, multifocal disease, large or loculated pleural effusion, cavitary disease)	*S. pneumoniae* *H. influenzae* Enteric Gram negative rods *S. aureus* Possible *P. aeruginosa*	**Vancomycin** PLUS ONE OF: **Cefepime** or **Piperacilin/ tazobactam**	For severe PCN allergy: **Vancomycin** PLUS **Aztreonam**	Obtain sputum for Gram stain and culture
ZSFG/VASF **Ventilator-associated pneumonia:** intubated < 5 days without complicated disease (see below)	*S. pneumoniae* *H. influenzae* Enteric Gram negative rods	**Ceftriaxone** or **Ertapenem** or **Levofloxacin**	For severe penicillin allergy: **Levofloxacin**	Obtain tracheal aspirate for Gram stain and culture
ZSFG/VASF **Ventilator-associated pneumonia**: intubated > 5 days or with multifocal disease, large or loculated pleural effusion, or cavitary disease	Enteric Gram-negative rods *Pseudomonas* *Acinetobacter* *Staph aureus*	**Vancomycin** PLUS ONE OF: **Cefepime** or **Piperacilin/ tazobactam**	For severe PCN allergy: **Vancomycin** PLUS **Aztreonam**	Obtain tracheal aspirate for Gram stain and culture

Mycobacteria

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)
Treatment of active tuberculosis	*Mycobacterium tuberculosis*	**Isoniazid** 300 mg PO daily x 6 months PLUS **Rifampin** 600 mg PO daily x 6 months PLUS **Pyrazinamide** 25 mg/kg PO daily x 2 months PLUS **Ethambutol** 15 mg/kg PO daily until Isoniazid or Rifampin sensitivity established PLUS: **Pyridoxine** (Vitamin B-6) 50 mg PO daily for 6 months	

INH+Rifapentine+Pyridoxine
weekly, 3 months
Rifampin+Pyridoxine
daily, 3 months
Rifampin
daily, 4 months
INH+Pyridoxine
weekly, 9 months

NO rifampin+pyrazinamide

Latent TB		**Isoniazid** 300 mg PO daily x 9 months	**Rifampin** 600 mg PO daily x 4 months

Table 3.2a STANDARD REGIMENS FOR NEW TB PATIENTS

(presumed, or known, to have drug-susceptible TB)

Intensive phase treatment	Continuation phase
2 months of HRZE[a]	4 months of HR

a WHO no longer recommends omission of ethambutol during the intensive phase of treatment for patients with non-cavitary, smear-negative PTB or EPTB who are known to be HIV-negative. In tuberculous meningitis, ethambutol should be replaced by streptomycin.

H = isoniazid, R = rifampicin, Z = pyrazinamide, E = ethambutol, S = streptomycin

Table 3.1 RECOMMENDED DOSES OF FIRST-LINE ANTITUBERCULOSIS DRUGS FOR ADULTS

	Recommended dose			
	Daily		3 times per week	
Drug	Dose and range (mg/kg body weight)	Maximum (mg)	Dose and range (mg/kg body weight)	Daily maximum (mg)
Isoniazid	5 (4–6)	300	10 (8–12)	900
Rifampicin	10 (8–12)	600	10 (8–12)	600
Pyrazinamide	25 (20–30)	–	35 (30–40)	–
Ethambutol	15 (15–20)	–	30 (25–35)	–
Streptomycin[a]	15 (12–18)		15 (12–18)	1000

a Patients aged over 60 years may not be able to tolerate more than 500–750 mg daily, so some guidelines recommend reduction of the dose to 10 mg/kg per day in patients in this age group (2). Patients weighing less than 50 kg may not tolerate doses above 500–750 mg daily (*WHO Model Formulary 2008*, www.who.int/selection_medicines/list/en/).

Table 2

Treatment of *Mycobacterium avium* complex pulmonary disease

Indications	Regimen	Duration of therapy
Non-cavitary nodular bronchiectatic form	Azithromycin 500 mg tiw or clarithromycin 1,000 mg tiw and rifampin 600 mg tiw and ethambutol 25 mg/kg tiw	12 Months beyond sputum culture conversion to negative
Fibrocavitary form or cavitary nodular bronchiectatic form	Azithromycin 250–500 mg daily or clarithromycin 1000 mg daily and rifampin 450–600 mg daily and ethambutol 15 mg/kg daily and/or amikacin 15 mg/kg IV or IM tiw	12 Months beyond sputum culture conversion to negative
Macrolide-resistant	Rifampin 450–600 mg daily and ethambutol 15 mg/kg daily and/or moxifloxacin 400 mg daily and/or clofazimine 100 mg daily and/or inhaled amikacin and/or bedaquiline	12 Months beyond sputum culture conversion to negative

tiw: three times weekly; IV: intravenous injection; IM: intramuscular injection.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6304322/

Immunocompromised patients are treated with clarithromycin and ethambutol daily

In patients with CD4 <50 cells/fl, fluoroquinolone with or without amikacin.

Leprosy

- Tuberculoid leprosy (Paucibacillary)
- Rifampin monthly plus dapsone daily for 6 months.
- Lepromatous leprosy (Multibacillary)
- Monthly rifampin plus dapsone and clofazimine daily for 12 months
- Single skin lesion (Paucibacillary)
- Single dose of rifampicin, ofloxacin, and minocycline

Skin infections

Diagnosis	Common Pathogens	Drug(s) of First Choice
Abscess	*S.aureus*	**Vancomycin**
Cellulitis	Group A streptococci Other beta-hemolytic streptococci *S.aureus*	**Vancomycin** *Alternatively:* **Cefazolin** 1 g IV q8h if patient is stable and cellulitis is not associated with an abscess or other purulent focus of infection

Incision and drainage of abscess

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Necrotizing fasciitis or suspected deep tissue extension	Group A streptococci *S. aureus* Anaerobes Gram-negative rods	**Vancomycin** PLUS ONE OF: **Piperacillin/tazobactam**[ID-R: SFGH] 4.5 g IV q6-8h OR **Ertapenem** 1 g IV daily ALL WITH: **Clindamycin**[ID-R: VASF] 600 – 900 mg IV q8h Alternatively if infection is health-care associated: **Vancomycin** PLUS **Meropenem**[ID-R: SFGH VASF] 1-2 g IV q8h PLUS **Clindamycin**[ID-R: VASF] 600-900 mg IV q8h	For severe PCN allergy: **Vancomycin** PLUS **Aztreonam**[ID-R: SFGH] 2 g IV q8h PLUS **Clindamycin**[ID-R: VASF] 600-900 mg IV q8h	Emergent ID and surgical consultation recommended. Clindamycin added for anti-toxin properties. Limited data support use for infections caused by Group A streptococci and *Clostridium perfringens*. Discontinue clindamycin once adequate surgical debridement is achieved.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Comments
Abscess	*S. aureus*	Uncomplicated: Incision and drainage, no antibiotics needed Complicated: Incision and drainage PLUS **TMP/SMX** 1-2 DS tablets PO BID OR **Doxycycline** 100 mg PO BID	Give antibiotics for complicated abscess ▪ Abscess is large (> 5 cm) or incompletely drained ▪ There is significant surrounding cellulitis ▪ Systemic signs and symptoms of infection are present ▪ Patient is immunocompromised 7-10 days of therapy is generally adequate

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Bites Dog and Cat	Streptococci *Pasteurella* spp.* Staphylococci Oral anaerobes	**Amoxicillin/clavulanate** 875 mg/125 mg PO BID Prophylaxis – x 5 days Treatment – x 10 days	For severe PCN allergy **Clindamycin** 300 mg PO TID PLUS ONE OF: **Ciprofloxacin** 500 mg PO BID OR **Levofloxacin** 500 mg PO daily	Only 5% of dog bites become infected, whereas 30-50% of cat bites become infected. **Prophylaxis** in high risk patients or in high risk bite only: *High risk patient* = post splenectomy, immunocompromised *High risk bite* = hand or foot
**P.multocida* is resistant to cephalexin & clindamycin; many strains are resistant to erythromycin but sensitive to fluoroquinolones, doxycycline and penicillin.				
Bites Human	Viridans streptococci *Eikenella** Oral anaerobes	**Amoxicillin/clavulanate** 875 mg/125 mg PO BID Prophylaxis – x 5 days Treatment – x 10 days	For severe PCN allergy: **Clindamycin** 300 mg PO TID PLUS ONE OF: **Ciprofloxacin** 500 mg PO BID OR **Levofloxacin**500 mg PO daily OR **TMP/SMX** One DS tablet PO BID	

Diagnosis	Common Pathogens	Drug(s) of First Choice	Comments
Diabetic Foot Ulcer Localized cellulitis without systemic signs or symptoms, no osteomyelitis	*S. aureus* *Streptococci* *Enterobacteriaceae*	**Clindamycin** 300 mg PO TID If patient has been treated with antibiotics within the past month ADD: **Levofloxacin**[ID-R: VASF] 750 mg PO daily OR **Ciprofloxacin** 500 mg PO BID	While infections may be polymicrobial, they frequently respond to Gram-positive coverage alone. Increasing rates of MRSA in the community may be a cause for failure to respond to initial therapy. Consider osteomyelitis especially if there is a failure to respond to therapy. 7-14 days of treatment is generally sufficient, duration should be based on clinical response.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Comments
Immunocompetent (Shingles/Zoster) **Immunocompromised** (Lymphoma, HIV infection, etc) and not severe (one dermatome)	Varicella-Zoster Virus	**Acyclovir** 800 mg PO 5x/day x 7-10 days OR **Valacyclovir** 1 g PO TID x 7 days	Treatment effective only if initiated within 48-72 hours of onset of lesions. May shorten duration of illness in immunocompetent patients. In patients > 65 years old administration of concomitant corticosteroids may improve quality of life.
Primary Infection in Adults (Chicken Pox)	Varicella-Zoster Virus	**Acyclovir** 800 mg PO 5x/day x 5 days OR **Valacyclovir** 1 g PO TID x 5 days	Initiate therapy within 24 hours of onset of rash. Vaccination of non-immune close contacts recommended. Acyclovir treatment may also be effective for prophylaxis of at-risk individuals.

Hepatitis C should always be treated

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Mastitis Postpartum	*S. aureus* *Including MRSA becoming more frequent*	**Dicloxacillin** 500 mg PO QID x 10-14 days OR **Cephalexin** 500 mg PO QID x 10 -14 days If patient with risk factors for MRSA: **TMP/SMX** One DS tablet PO BID x 10-14 days OR **Clindamycin** 300mg PO TID x 10-14 days	For mild PCN allergy: **Cephalexin** 500 mg PO QID x 10-14 days For severe PCN allergy: **Clindamycin** 300 mg PO TID x 10-14 days	If no abscess, increased frequency of nursing may hasten response. If abscess, I & D required; discontinue nursing. Doxycycline is active against MRSA but should not be used if patient is breastfeeding.

Urinary tract infections

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Asymptomatic bacteriuria	Enterobacteriaceae *Enterococcus* species	No treatment required		Pyuria alone is not an indication for treatment. Exceptions: pregnant women, patients having traumatic urologic procedures, recent kidney transplant .

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Community-acquired Pyelonephritis	Enterobacteriaceae *(E. coli)*	Ceftriaxone 1 g IV q24h OR Cefazolin 1g IV q8h (VASF only) OR Ertapenem 1g IV daily	For **severe** PCN allergy: Vancomycin PLUS ONE OF EITHER: Gentamicin OR Aztreonam ID-R: SFGH 2 g IV q8h -	Switch to oral therapy when susceptibilities known and patient stable. Duration of therapy 7-14 days based on clinical response.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Healthcare-associated UTI	Enterobacteriaceae *(e.g. E. coli)* *P. aeruginosa* (less common)	**Ceftriaxone** 1 g IV q24h OR **Ertapenem** 1g IV daily OR **Piperacillin/tazobactam**[ID-R: SFGH] 4.5g IV q8h	For **severe** PCN allergy: ONE OF: **Gentamicin** OR **Aztreonam** [ID-R: SFGH] 2 g IV q8h BOTH WITH OR WITHOUT: **Vancomycin**	Criteria: signs and symptoms compatible with a UTI, no other identified source of infection, & ≥ 1000 cfu of ≥ 1 bacterial species on urine culture. Pyuria alone is not an indication for treatment. A negative urinalysis suggests an alternative source of infection. Remove catheter if possible. Switch to oral therapy when susceptibilities known and patient stable. 7 days of therapy is recommend if patient has prompt resolution of symptoms

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Catheter-associated candiduria	*Candida* species	No treatment required		Pyuria alone is not an indication for treatment.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Uncomplicated Cystitis Women	Enterobacteriaceae *(E. coli)* *S. saprophyticus* (Coagulase negative staphylococcus) (4%)	**Nitrofurantoin** 100 mg PO BID x 5-7 days – contraindicated in renal insufficiency (CrCl < 60 ml/min) OR **TMP/SMX** 1 DS tablet PO BID x 3 days (if no previous antibiotic therapy) OR **Fosfomycin** 3 g PO x1 dose	Reserve for patients at highest risk of failure (selection for resistant isolates): **Ciprofloxacin** 500 mg PO BID x 3 days OR **Levofloxacin** 500 mg PO daily x 3 days Reserve for patients with history of resistant organisms or therapeutic failure (less effective): **Cephalexin** 500 mg PO QID x 7 days OR **Cefpodoxime** 200 mg PO BID x 7 days	IDSA guidelines state Trimethoprim/ Sulfamethoxazole is appropriate if resistance rates do not exceed 20%. Susceptibility data: UCSF SFGH VASF Nitrofurantoin is contraindicated in renal insufficiency (CrCl <60 ml/min). Fosfomycin is not on the SFGH formulary.
Recurrent Cystitis Women (3 or more episodes/year)	Enterobacteriaceae (*E. coli*) *S. saprophyticus* (Coagulase negative staphylococcus) (4%)	Prophylaxis: Either self administration if symptoms occur or prophylactic post-coital antibiotics Post menopausal: topical estrogen	Antibiotic choice should be based on susceptibility results of previous culture.	

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Pyelonephritis	Enterobacteriaceae *(E. coli)* Enterococci	**Ciprofloxacin** 500 mg PO BID X 7-14 days OR **Levofloxacin**[ID-R: VASF] 500 mg PO daily X 7-14 days OR **Trimethoprim/ Sulfamethoxazole** 1 DS tablet PO BID X 14 days PLUS **Ceftriaxone** 1 g IV X 1 dose	**Cephalexin** 500 mg PO QID X 10-14 days OR **Cefpodoxime** 200 mg PO BID X 10-14 days EITHER OF ABOVE PLUS: **Ceftriaxone** 1 g IV X 1 dose	Urine analysis and urine culture should be performed and therapy adjusted based on culture and sensitivity. Trimethoprim-sulfamethoxazole is preferred if organism is susceptible. Consider a single intravenous dose of ceftriaxone prior to fluoroquinolone therapy if patient is at high risk for fluoroquinolone-resistant organisms.

Cefepime-taniborbactam instead or meropenem

GI infections

Diagnosis	Common Pathogens	Drug(s) of First Choice	Comments
Dysenteric Diarrhea Frequent, sometimes bloody, small-volume diarrhea associated with abdominal pain and cramping. Patient may be febrile and toxic.	*Shigella* *Salmonella* *Campylobacter* *Yersinia* *E. coli* 0157:H7 *C.difficile*	**Ciprofloxacin** 500 mg PO BID OR **Ciprofloxacin** 750 mg daily x 3 days (avoid in cases of *E. coli* O157:H7 as it may increase the risk of hemolytic-uremic syndrome) Recent antibiotic exposure: consider *C. difficile* Antimotility drugs should not be used in *C.difficile*. *C. difficile* - **Metronidazole** 500 mg PO TID x 10-14 days. If no response at 5 days, switch to **Vancomycin** 125mg PO QID x10-14 days. See inpatient guidelines for severe or recurrent *C. difficile* infection and/or policy on *C. difficile* management.	**Empiric therapy** is generally indicated if patient is toxic appearing, elderly or immunocompromised. If empiric therapy is given, obtain culture and give fluoroquinolone x 3 days while awaiting cultures. **Azithromycin** should be used for pregnancy and suspected quinolone resistant *Campylobacter*. Antimotility drugs improve symptoms and can be used if patient is not toxic. Strict handwashing is mandatory in all food preparation. Antimicrobial treatment may worsen outcomes in patients with *E. coli* 0157:H7 *E. histolytica* - **Metronidazole** 750 mg PO TID x 7-10 days then **Iodoquinol** 650 mg PO TID x 20 days or **Paromomycin**[5] 25-35 mg/kg/day in 3 divided doses x 7 days

Shigella flexneri is resistant to azithromicin

Fidoxamicin preferred in C. dificile as associated with fewer recurrences
Metronidazole only if toxic megacolon (IV)

Nondysenteric Diarrhea Large volume, nonbloody, watery diarrhea. Patient may have nausea, vomiting, and abdominal cramping but fever often absent.	Viruses *Giardia* Enterotoxigenic *E. coli* *Enterotoxin-producing bacteria*	General Care: Observation Oral rehydration Antimotility agents *Giardia* – especially if patient describes recent history of travel and/or ingestion of unfiltered water (e.g., camping), consider – **Metronidazole** 250 mg PO TID x 5 days.	Generally, empiric therapy and stool cultures are **not** indicated. Most disease is self-limiting and can be treated with antimotility agents. If patient fails to improve, cultures (-), and symptoms persist, consider stool for O & P. Metronidazole resistance seen in 20% giardia cases. Check *C. difficile* toxin if recent history of antibiotic use or hospitalization.
Traveler's diarrhea Empiric treatment while abroad	Toxigenic *E. coli* *Salmonella* *Shigella* *Campylobacter* Amebiasis	**Ciprofloxacin** 500 mg PO BID x 1-3 days Pregnancy or fluoroquinolone-resistant campylobacter: **Azithromycin** 1 g x 1 dose EITHER WITH or WITHOUT: **Loperamide** 4 mg PO x 1; then 2 mg after each loose stool, MAX 16 mg/day	Mild, self-limited cases can be treated with fluid and electrolyte repletion and bismuth subsalicylate. Prophylaxis generally not recommended.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Comments
Diverticulitis No signs of bowel perforation. If bowel perforation, see Secondary Peritonitis on Inpatient Antibiotic Guidelines.	Enterobacteriaceae *Bacteroides fragilis* *Enterococcus*	**Amoxicillin/clavulanate** 875 mg/125 mg PO BID OR **Moxifloxacin**[ID-R: SFGH] 400 mg PO daily OR the combination of: **Metronidazole** 500 mg PO TID PLUS ONE OF: **Ciprofloxacin** 500 mg PO BID OR **Levofloxacin**[ID-R: VASF] 500 mg PO daily	Duration of treatment should be until patient is afebrile for 3-5 days. Surgical evaluation and follow up is advised.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Prostatitis Acute	Enterobacteriaceae *(E. coli)*	**Cephalexin** 500 mg PO QID x 21 days (SFVAMC only) OR **Ciprofloxacin** 500 mg PO BIDX 2-4 weeks* OR **Levofloxacin**[ID-R: VASF] 500 mg PO daily x 2-4 weeks*	**Trimethoprim/ Sulfamethoxazole** 1 DS tablet PO BID	Antibiotic penetration in the acute inflammatory state is adequate for most antibiotics. Consider sexually transmitted disease treatment (Gonococcus or *C. trachomatis*) for appropriate patient populations. *Cultures should be obtained and definitive therapy should be based on sensitivities.
Prostatitis Chronic	Enterobacteriaceae *(E. coli)*	**Ciprofloxacin** x 2 months* OR **Levofloxacin**[ID-R: VASF] x 2 months*	**Trimethoprim/ Sulfamethoxazole** 1 DS tablet PO BID	Few drugs penetrate non-inflamed prostate. Fluoroquinolones and trimethoprim/sulfamethoxazole adequately penetrate in non-inflamed state. Consider sexually transmitted disease treatment (Gonococcus or *C. trachomatis*) for appropriate patient populations.

Influenza

Influenza A

- Oseltamivir
- Drug of choice for most patients.
- Adverse effects: nausea/vomiting, rare neuropsychiatric effects.
- 5 day course
- Zanamavir
- Inhaled drug.
- Cannot use in intubated patients or those with underlying respiratory disease (asthma/COPD) as it can cause cough, bronchospasm.

Influenza A

- Peramivir
- IV option
- Consider use in hospitalized patients with influenza in whom there is a concern for GI absorption that would limit the use of oral oseltamivir.
- Consider inhaled zanamivir as an alternative in stable floor patients.
- Baloxavir
- Oral administration
- Single dose
- More rapid response than other agents
- Inhibits cap-dependent endonuclease

Sexually transmitted infections

Diagnosis	Common Pathogens	Drug(s) of First Choice
Chlamydia **Genital/Rectal** **Pharyngeal**	*Chlamydia trachomatis*	**Azithromycin** 1 g PO once OR **Doxycycline** 100 mg PO BID X 7 days

Diagnosis	Common Pathogens	Drug(s) of First Choice	Comments
Pelvic inflammatory diseases (PID)	*N.gonorrhoeae* *C.trachomatis* anaerobes Gram-negative facultative bacteria streptococci	**Ceftriaxone** 250 mg IM X 1 PLUS **Doxycycline** 100 mg PO BID X 14 days PLUS **Metronidazole** 500 mg PO BID x 14 days if BV is present or cannot be ruled out	Follow-up examination should be performed within 72 hours when PID is treated with these regimens. Fluoroquinolones should not be used due to increasing resistance and treatment failures.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
First Clinical Episode or Anogenital Herpes	HSV 2 = 70-90% HSV 1 = 10-30%	**Acyclovir** 400 mg PO TID x 7-10 days	**Valacyclovir** 1 g PO BID x 7-10 days	In HIV patients with documented acyclovir resistance, use foscarnet.
Episodic Therapy for Recurrent Episodes		**Acyclovir** 400 mg PO TID x 5 days OR **Acyclovir** 800 mg PO BID x 5 days OR **Acyclovir** 800 mg PO TID x 2 days	**Valacyclovir** 1 g PO daily x 5 days	HIV patients: **Acyclovir** 400 mg PO TID x 5-10 days OR **Valacyclovir** 1 g PO BID x 5-10 days
Suppression for Frequent Recurrence	HSV 2 = 70-90% HSV 1 = 10-30%	**Acyclovir** 400 mg PO BID HIV patients: **Acyclovir** 400-800 mg BID or TID OR **Valacyclovir** 500 mg PO BID	**Valacyclovir** 500-1000 mg PO daily	Consider suppressive therapy for patients experiencing greater than 3-4 episodes in 12 months.

Diagnosis	Common Pathogens	Drug(s) of First Choice	Alternative Drug(s)	Comments
Syphilis **Primary, Secondary, Early Latent**	*T. pallidum*	**Benzathine penicillin G** 2.4 MU IM X 1 dose	Doxycycline 100 mg PO BID X 2 weeks	Sexual partners must be treated. Alternatives should only be used for penicillin-allergic patients because efficacy of these therapies has not been established. Compliance with some of these regimens is difficult, and close follow-up is essential.
Syphilis **Late Latent and Latent of Unknown Duration**	*T. pallidum*	**Benzathine penicillin G** 2.4 MU IM Q week X 3 doses	Doxycycline 100 mg PO BID X 4 weeks	

UK Guidelines

Sore throat (acute): antimicrobial prescribing

NICE National Institute for Health and Care Excellence

Choice of antibiotic: adults aged 18 years and over

Antibiotic[1]	Dosage and course length for adults[2]
First choice	
Phenoxymethylpenicillin[3]	500 mg four times a day or 1000 mg twice a day for 5 to 10 days
Alternative first choices for penicillin allergy or intolerance[4]	
Clarithromycin	250 mg to 500 mg twice a day for 5 days
Erythromycin	250 mg to 500 mg four times a day or 500 mg to 1000 mg twice a day for 5 days

[1] See BNF for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, pregnancy and breast-feeding.
[2] Doses given are by mouth using immediate-release medicines, unless otherwise stated.
[3] Five days of phenoxymethylpenicillin may be enough for symptomatic cure; but a 10-day course may increase the chance of microbiological cure.
[4] Erythromycin is preferred in women who are pregnant.

Choice of antibiotic: children and young people under 18 years

Antibiotic[1]	Dosage and course length for children and young people[2]
First choice	
Phenoxymethylpenicillin[3]	1 to 11 months: 62.5 mg four times a day or 125 mg twice a day for 5 to 10 days 1 to 5 years: 125 mg four times a day or 250 mg twice a day for 5 to 10 days 6 to 11 years: 250 mg four times a day or 500 mg twice a day for 5 to 10 days 12 to 17 years: 500 mg four times a day or 1000 mg twice a day for 5 to 10 days
Alternative first choices for penicillin allergy or intolerance[4]	
Clarithromycin	1 month to 11 years: Under 8 kg: 7.5 mg/kg twice a day for 5 days 8 to 11 kg: 62.5 mg twice a day for 5 days 12 to 19 kg: 125 mg twice a day for 5 days 20 to 29 kg: 187.5 mg twice a day for 5 days 30 to 40 kg: 250 mg twice a day for 5 days or 12 to 17 years: 250 mg to 500 mg twice a day for 5 days
Erythromycin	1 month to 1 year: 125 mg four times a day or 250 mg twice a day for 5 days 2 to 7 years: 250 mg four times a day or 500 mg twice a day for 5 days 8 to 17 years: 250 mg to 500 mg four times a day or 500 mg to 1000 mg twice a day for 5 days

[1] See BNF for children for appropriate use and dosing in specific populations, for example, hepatic impairment and renal impairment.
[2] The age bands apply to children of average size and, in practice, the prescriber will use the age bands in conjunction with other factors such as the severity of the condition and the child's size in relation to the average size of children of the same age. Doses given are by mouth using immediate-release medicines, unless otherwise stated.
[3] Five days of phenoxymethylpenicillin may be enough for symptomatic cure; but a 10-day course may increase the chance of microbiological cure.
[4] Erythromycin is preferred in young women who are pregnant.

When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Influenza Public Health England Last updated: Feb 2019	**Annual vaccination is essential for all those 'at risk' of influenza.**[1D] Antivirals are not recommended for healthy adults.[1D,2A+] Treat 'at risk' patients with 5 days oseltamivir 75mg BD,[1D] when influenza is circulating in the community, and ideally within 48 hours of onset (36 hours for zanamivir treatment in children),[1D,3D] or in a care home where influenza is likely.[1D,2A+] **At risk**: pregnant (and up to 2 weeks post-partum); children under 6 months; adults 65 years or older; chronic respiratory disease (including COPD and asthma); significant cardiovascular disease (not hypertension); severe immunosuppression; chronic neurological, renal or liver disease; diabetes mellitus; morbid obesity (BMI>40).[4D] See the PHE Influenza guidance for the treatment of patients under 13 years.[4D] In severe immunosuppression, or oseltamivir resistance, use zanamivir 10mg BD[5A+,6A+] (2 inhalations twice daily by diskhaler for up to 10 days) and seek advice.[4D] *Access supporting evidence and rationales on the PHE website.*					
Scarlet fever (GAS) Public Health England Last updated: Oct 2018	**Prompt treatment** with appropriate antibiotics significantly reduces the risk of complications.[1D] Vulnerable individuals (immunocompromised, the comorbid, or those with skin disease) are at increased risk of developing complications.[1D]	Phenoxymethylpenicillin[2D]	500mg QDS[2D]	BNF for children	10 days[3A+,4A+,5A+]	*Not available. Access supporting evidence and rationales on the PHE website*
		Penicillin allergy: clarithromycin[2D]	250mg to 500mg BD[2D]	BNF for children	5 days[2D,5A+]	
		Optimise analgesia[2D] and give safety netting advice				
Acute otitis media **NICE** Public Health England Last updated: Feb 2018	Regular paracetamol or ibuprofen for pain (right dose for age or weight at the right time and maximum doses for severe pain). **Otorrhoea or under 2 years with infection in both ears**: no, back-up or immediate antibiotic. **Otherwise**: no or back-up antibiotic. **Systemically very unwell or high risk of complications**: immediate antibiotic. *For detailed information click on the visual summary.*	**First choice**: amoxicillin	-		5 to 7 days	
		Penicillin allergy: clarithromycin **OR**	-		5 to 7 days	
		erythromycin (preferred if pregnant)	-			
		Second choice: co-amoxiclav	-		5 to 7 days	
Acute otitis externa Public Health England Last updated: Nov 2017	**First line**: analgesia for pain relief,[1D,2D] and apply localised heat (such as a warm flannel).[2D] **Second line**: topical acetic acid or topical antibiotic +/- steroid: similar cure at 7 days.[2D,3A+,4B-] **If cellulitis or disease extends outside ear canal**, or systemic signs of infection, start oral flucloxacillin and refer to exclude malignant otitis externa.[1D]	**Second line**: topical acetic acid 2%[2D,4B-] **OR**	1 spray TDS[5A-]	BNF for children	7 days[5A]	*Not available. Access supporting evidence and rationales on the PHE website*
		topical neomycin sulphate with corticosteroid[2D,5A-] (consider safety issues if perforated tympanic membrane)[6B-]	3 drops TDS[5A-]		7 days (min) to 14 days (max)[3A+]	
		If cellulitis: flucloxacillin[7B+]	250mg QDS[2D] If severe: 500mg QDS[2D]	BNF for children	7 days[2D]	

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Sinusitis **NICE** Public Health England Last updated: Oct 2017	Advise paracetamol or ibuprofen for pain. Little evidence that nasal saline or nasal decongestants help, but people may want to try them. **Symptoms for 10 days or less**: no antibiotic. **Symptoms with no improvement for more than 10 days**: no antibiotic or back-up antibiotic depending on likelihood of bacterial cause. Consider high-dose nasal corticosteroid (if over 12 years). **Systemically very unwell or high risk of complications**: immediate antibiotic. *For detailed information click on the visual summary.*	**First choice**: phenoxymethylpenicillin	500mg QDS		5 days	
		Penicillin allergy: doxycycline (not in under 12s) **OR**	200mg on day 1, then 100mg OD		5 days	
		clarithromycin **OR**	500mg BD			
		erythromycin (preferred if pregnant)	250 to 500mg QDS or 500 to 1000mg BD			
		Second choice or first choice if systemically very unwell or high risk of complications: co-amoxiclav	500/125mg TDS		5 days	
▼ **Lower respiratory tract infections**						
Acute exacerbation of COPD **NICE** Public Health England Last updated: Dec 2018	Many exacerbations are not caused by bacterial infections so will not respond to antibiotics. Consider an antibiotic, but only after taking into account severity of symptoms (particularly sputum colour changes and increases in volume or thickness), need for hospitalisation, previous exacerbations, hospitalisations and risk of complications, previous sputum culture and susceptibility results, and risk of resistance with repeated courses. Some people at risk of exacerbations may have antibiotics to keep at home as part of their exacerbation action plan. *For detailed information click on the visual summary. See also the NICE guideline on COPD in over 16s.*	**First choice**: amoxicillin **OR**	500mg TDS (see BNF for severe infection)	-	5 days	
		doxycycline **OR**	200mg on day 1, then 100mg OD (see BNF for severe infection)	-		
		clarithromycin	500mg BD	-		
		Second choice: use alternative first choice				
		Alternative choice (if person at higher risk of treatment failure): co-amoxiclav **OR**	500/125mg TDS	-	5 days	
		co-trimoxazole **OR**	960mg BD	-		
		levofloxacin (with specialist advice if co-amoxiclav or co-trimoxazole cannot be used; consider safety issues)	500mg OD	-		
		IV antibiotics *(click on visual summary)*				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Acute exacerbation of bronchiectasis (non-cystic fibrosis) **NICE** Public Health England Last updated: Dec 2016	Send a sputum sample for culture and susceptibility testing. Offer an antibiotic. When choosing an antibiotic, take account of severity of symptoms and risk of treatment failure. People who may be at higher risk of treatment failure include people who've had repeated courses of antibiotics, a previous sputum culture with resistant or atypical bacteria, or a higher risk of developing complications. Course length is based on severity of broncheictasis, exacerbation history, severity of exacerbation symptoms, previous culture and susceptibility results, and response to treatment. Do not routinely offer antibiotic prophylaxis to prevent exacerbations. Seek specialist advice for preventing exacerbations in people with repeated acute exacerbations. This may include a trial of antibiotic prophylaxis after a discussion of the possible benefits and harms, and the need for regular review. *For detailed information click on the visual summary.*	**First choice empirical treatment:** amoxicillin (preferred if pregnant) **OR**	500mg TDS		7 to 14 days	
		doxycycline (not in under 12s) **OR**	200mg on day 1, then 100mg OD			
		clarithromycin	500mg BD			
		Alternative choice (if person at higher risk of treatment failure) empirical treatment: co-amoxiclav **OR**	500/125mg TDS		7 to 14 days	
		levofloxacin (adults only: with specialist advice if co-amoxiclav cannot be used; consider safety issues) **OR**	500mg OD or BD			
		ciprofloxacin (children only: with specialist advice if co-amoxiclav cannot be used; consider safety issues)	-			
		IV antibiotics (click on visual summary)				
		When current susceptibility data available: choose antibiotics accordingly				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Acute cough **NICE** Public Health England Last updated: Feb 2019	Some people may wish to try honey (in over 1s), the herbal medicine pelargonium (in over 12s), cough medicines containing the expectorant guaifenesin (in over 12s) or cough medicines containing cough suppressants, except codeine, (in over 12s). These self-care treatments have limited evidence for the relief of cough symptoms. **Acute cough with upper respiratory tract infection**: no antibiotic. **Acute bronchitis**: no routine antibiotic. **Acute cough and higher risk of complications (at face-to-face examination)**: immediate or back-up antibiotic. **Acute cough and systemically very unwell (at face to face examination)**: immediate antibiotic. Higher risk of complications includes people with pre-existing comorbidity; young children born prematurely; people over 65 with 2 or more of, or over 80 with 1 or more of: hospitalisation in previous year, type 1 or 2 diabetes, history of congestive heart failure, current use of oral corticosteroids. Do not offer a mucolytic, an oral or inhaled bronchodilator, or an oral or inhaled corticosteroid unless otherwise indicated. *For detailed information click on the visual summary. See also the NICE guideline on pneumonia for prescribing antibiotics in adults with acute bronchitis who have had a C-reactive protein (CRP) test (CRP<20mg/l: no routine antibiotic, CRP 20 to 100mg/l: back-up antibiotic, CRP>100mg/l: immediate antibiotic).*	**Adults first choice:** doxycycline	200mg on day 1, then 100mg OD	-	5 days	
		Adults alternative first choices: amoxicillin (preferred if pregnant) **OR**	500mg TDS	-		
		clarithromycin **OR**	250mg to 500mg BD	-		
		erythromycin (preferred if pregnant)	250mg to 500mg QDS or 500mg to 1000mg BD	-		
		Children first choice: amoxicillin	-		5 days	
		Children alternative first choices: clarithromycin **OR**	-			
		erythromycin **OR**	-			
		doxycycline (not in under 12s)	-			

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Community-acquired pneumonia **NICE** Public Health England Last updated: Sept 2019	Assess severity in adults based on clinical judgement guided by mortality risk score (CRB65 or CURB65). See the NICE guideline on pneumonia for full details: **low severity** – CRB65 0 or CURB65 0 or 1 **moderate severity** – CRB65 1 or 2 or CURB65 2 **high severity** – CRB65 3 or 4 or CURB65 3 to 5. 1 point for each parameter: **confusion**, (**urea** >7 mmol/l), **respiratory rate** ≥30/min, low systolic (<90 mm Hg) or diastolic (≤60 mm Hg) **blood pressure**, **age** ≥65. Assess severity in children based on clinical judgement. Offer an antibiotic. Start treatment as soon as possible after diagnosis, within 4 hours (within 1 hour if sepsis suspected and person meets any high risk criteria – see the NICE guideline on sepsis). When choosing an antibiotic, take account of severity, risk of complications, local antimicrobial resistance and surveillance data, recent antibiotic use and microbiological results. * Stop antibiotics after 5 days unless microbiological results suggest a longer course is needed or the person is not clinically stable. *For detailed information click on the visual summary. See also the NICE guideline on pneumonia.*	**First choice (low severity in adults or non-severe in children):** amoxicillin	500mg TDS (higher doses can be used, see BNF)		5 days*	
		Alternative first choice (low severity in adults or non-severe in children): doxycycline (not in under 12s) **OR**	200mg on day 1, then 100mg OD			
		clarithromycin **OR**	500mg BD			
		erythromycin (in pregnancy)	500mg QDS			
		First choice (moderate severity in adults): amoxicillin **AND (if atypical pathogens suspected)**	500mg TDS (higher doses can be used, see BNF)	-	5 days*	
		clarithromycin **OR**	500mg BD	-		
		erythromycin (in pregnancy)	500mg QDS	-		
		Alternative first choice (moderate severity in adults): doxycycline **OR**	200mg on day 1, then 100mg OD	-		
		clarithromycin	500mg BD	-		
		First choice (high severity in adults or severe in children): co-amoxiclav **AND (if atypical pathogens suspected)**	500/125mg TDS		5 days*	
		clarithromycin **OR**	500mg BD			
		erythromycin (in pregnancy)	500mg QDS			
		Alternative first choice (high severity in adults): levofloxacin (consider safety issues)	500mg BD	-		
		IV antibiotics *(click on visual summary)*				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Hospital-acquired pneumonia **NICE** Public Health England Last updated: Sept 2019	If symptoms or signs of pneumonia start within 48 hours of hospital admission, see community acquired pneumonia. Offer an antibiotic. Start treatment as soon as possible after diagnosis, within 4 hours (within 1 hour if sepsis suspected and person meets any high risk criteria – see the NICE guideline on sepsis). When choosing an antibiotic, take account of severity of symptoms or signs, number of days in hospital before onset of symptoms, risk of developing complications, local hospital and ward-based antimicrobial resistance data, recent antibiotic use and microbiological results, recent contact with a health or social care setting before current admission, and risk of adverse effects with broad spectrum antibiotics. No validated severity assessment tools are available. Assess severity of symptoms or signs based on clinical judgement. Higher risk of resistance includes relevant comorbidity (such as severe lung disease or immunosuppression), recent use of broad spectrum antibiotics, colonisation with multi-drug resistant bacteria, and recent contact with health and social care settings before current admission. If symptoms or signs of pneumonia start within days 3 to 5 of hospital admission in people not at higher risk of resistance, consider following community acquired pneumonia for choice of antibiotic. *For detailed information click on the visual summary. See also the NICE guideline on pneumonia.*	**First choice (non-severe and not higher risk of resistance):** co-amoxiclav	500/125 mg TDS	[redacted]	5 days then review	
		Adults alternative first choice (non-severe and not higher risk of resistance) Choice based on specialist microbiological advice and local resistance data **Options include:** doxycycline	200mg on day 1, then 100mg OD	-	5 days then review	
		cefalexin (caution in penicillin allergy)	500 mg BD or TDS (can increase to 1 to 1.5g TDS or QDS)	-		
		co-trimoxazole	960mg BD	-		
		levofloxacin (only if switching from IV levofloxacin with specialist advice; consider safety issues)	500mg OD or BD	-		
		Children alternative first choice (non-severe and not higher risk of resistance): clarithromycin Other options may be suitable based on specialist microbiological advice and local resistance data	-	[redacted]	-	
		For first choice IV antibiotics (severe or higher risk of resistance) and antibiotics to be added if suspected or confirmed MRSA infection see visual summary				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
▼ Urinary tract infections						
Lower urinary tract infection **NICE** Public Health England Last updated: Oct 2018	Advise paracetamol or ibuprofen for pain. **Non-pregnant women**: back up antibiotic (to use if no improvement in 48 hours or symptoms worsen at any time) or immediate antibiotic. **Pregnant women, men, children or young people**: immediate antibiotic. When considering antibiotics, take account of severity of symptoms, risk of complications, previous urine culture and susceptibility results, previous antibiotic use which may have led to resistant bacteria and local antimicrobial resistance data. If people have symptoms of pyelonephritis (such as fever) or a complicated UTI, see acute pyelonephritis (upper urinary tract infection) for antibiotic choices. *For detailed information click on the visual summary. See also the NICE guideline on urinary tract infection in under 16s: diagnosis and management and the Public Health England urinary tract infection: diagnostic tools for primary care.*	**Non-pregnant women first choice**: nitrofurantoin (if eGFR ≥45 ml/minute) **OR**	100mg m/r BD (or if unavailable 50mg QDS)	-	3 days	
		trimethoprim (if low risk of resistance)	200mg BD	-		
		Non-pregnant women second choice: nitrofurantoin (if eGFR ≥45 ml/minute) **OR**	100mg m/r BD (or if unavailable 50mg QDS)	-	3 days	
		pivmecillinam (a penicillin) **OR**	400mg initial dose, then 200mg TDS	-	3 days	
		fosfomycin	3g single dose sachet	-	single dose	
		Pregnant women first choice: nitrofurantoin (avoid at term) – if eGFR ≥45 ml/minute	100mg m/r BD (or if unavailable 50mg QDS)	-	7 days	
		Pregnant women second choice: amoxicillin (only if culture results available and susceptible) **OR**	500mg TDS	-	7 days	
		cefalexin	500mg BD	-		
		Treatment of asymptomatic bacteriuria in pregnant women: choose from nitrofurantoin (avoid at term), amoxicillin or cefalexin based on recent culture and susceptibility results				
		Men first choice: trimethoprim **OR**	200mg BD	-	7 days	
		nitrofurantoin (if eGFR ≥45 ml/minute)	100mg m/r BD (or if unavailable 50mg QDS)	-		
		Men second choice: consider alternative diagnoses basing antibiotic choice on recent culture and susceptibility results				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
		Children and young people (3 months and over) first choice: trimethoprim (if low risk of resistance) **OR**	-			
		nitrofurantoin (if eGFR ≥45 ml/minute)	-			
		Children and young people (3 months and over) second choice: nitrofurantoin (if eGFR ≥45 ml/minute and not used as first choice) **OR**	-		-	
		amoxicillin (only if culture results available and susceptible) **OR**	-			
		cefalexin	-			
Acute prostatitis **NICE** Public Health England Last updated: Oct 2018	Advise paracetamol (+/- low-dose weak opioid) for pain, or ibuprofen if preferred and suitable. Offer antibiotic. Review antibiotic treatment after 14 days and either stop antibiotics or continue for a further 14 days if needed (based on assessment of history, symptoms, clinical examination, urine and blood tests). *For detailed information click on the visual summary.*	**First choice** (guided by susceptibilities when available): ciprofloxacin (consider safety issues) **OR**	500mg BD	-	14 days then review	
		ofloxacin (consider safety issues) **OR**	200mg BD	-		
		trimethoprim (if fluoroquinolone not appropriate; seek specialist advice)	200mg BD	-		
		Second choice (after discussion with specialist): levofloxacin (consider safety issues) **OR**	500mg OD	-	14 days, then review	
		co-trimoxazole	960mg BD	-		
		IV antibiotics *(click on visual summary)*				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Acute pyelonephritis (upper urinary tract) **NICE** Public Health England Last updated: Oct 2018	Advise paracetamol (+/- low-dose weak opioid) for pain for people over 12. Offer an antibiotic. When prescribing antibiotics, take account of severity of symptoms, risk of complications, previous urine culture and susceptibility results, previous antibiotic use which may have led to resistant bacteria and local antimicrobial resistance data. Avoid antibiotics that don't achieve adequate levels in renal tissue, such as nitrofurantoin. *For detailed information click on the visual summary. See also the NICE guideline on urinary tract infection in under 16s: diagnosis and management and the Public Health England urinary tract infection: diagnostic tools for primary care.*	**Non-pregnant women and men first choice:** cefalexin **OR**	500mg BD or TDS (up to 1g to 1.5g TDS or QDS for severe infections)	-	7 to 10 days	
		co-amoxiclav (only if culture results available and susceptible) **OR**	500/125mg TDS	-	7 to 10 days	
		trimethoprim (only if culture results available and susceptible) **OR**	200mg BD	-	14 days	
		ciprofloxacin (consider safety issues)	500mg BD	-	7 days	
		Non-pregnant women and men IV antibiotics *(click on visual summary)*				
		Pregnant women first choice: cefalexin	500mg BD or TDS (up to 1g to 1.5g TDS or QDS for severe infections)	-	7 to 10 days	
		Pregnant women second choice or IV antibiotics *(click on visual summary)*				
		Children and young people (3 months and over) first choice: cefalexin **OR**	-		-	
		co-amoxiclav (only if culture results available and susceptible)	-			
		Children and young people (3 months and over) IV antibiotics *(click on visual summary)*				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Recurrent urinary tract infection **NICE** Public Health England Last updated Oct 2016	First advise about behavioural and personal hygiene measures, and self-care (with D-mannose or cranberry products) to reduce the risk of UTI. For postmenopausal women, if no improvement, consider vaginal oestrogen (review within 12 months). For non-pregnant women, if no improvement, consider single-dose antibiotic prophylaxis for exposure to a trigger (review within 6 months). For non-pregnant women (if no improvement or no identifiable trigger) or with specialist advice for pregnant women, men, children or young people, consider a trial of daily antibiotic prophylaxis (review within 6 months). For detailed information click on the visual summary. See also the NICE guideline on urinary tract infection in under 16s: diagnosis and management and the Public Health England urinary tract infection: diagnostic tools for primary care.	**First choice antibiotic prophylaxis**: trimethoprim (avoid in pregnancy) **OR**	200mg single dose when exposed to a trigger or 100mg at night		-	
		nitrofurantoin (avoid at term) - if eGFR ≥45 ml/minute	100mg single dose when exposed to a trigger or 50 to 100mg at night		-	
		Second choice antibiotic prophylaxis: amoxicillin **OR**	500mg single dose when exposed to a trigger or 250mg at night		-	
		cefalexin	500mg single dose when exposed to a trigger or 125mg at night		-	

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Catheter-associated urinary tract infection **NICE** Public Health England Last updated: Nov 2018	Antibiotic treatment is not routinely needed for asymptomatic bacteriuria in people with a urinary catheter. Consider removing or, if not possible, changing the catheter if it has been in place for more than 7 days. But do not delay antibiotic treatment. Advise paracetamol for pain. Advise drinking enough fluids to avoid dehydration. Offer an antibiotic for a symptomatic infection. When prescribing antibiotics, take account of severity of symptoms, risk of complications, previous urine culture and susceptibility results, previous antibiotic use which may have led to resistant bacteria and local antimicrobial resistance data. Do not routinely offer antibiotic prophylaxis to people with a short-term or long-term catheter. *For detailed information click on the visual summary. See also the Public Health England urinary tract infection: diagnostic tools for primary care.*	**Non-pregnant women and men first choice if no upper UTI symptoms:** nitrofurantoin (if eGFR ≥45 ml/minute) **OR**	100mg m/r BD (or if unavailable 50mg QDS)	-	7 days	
		trimethoprim (if low risk of resistance) **OR**	200mg BD	-		
		amoxicillin (only if culture results available and susceptible)	500mg TDS	-		
		Non-pregnant women and men second choice if no upper UTI symptoms: pivmecillinam (a penicillin)	400mg initial dose, then 200mg TDS	-	7 days	
		Non-pregnant women and men first choice if upper UTI symptoms: cefalexin **OR**	500mg BD or TDS (up to 1g to 1.5g TDS or QDS for severe infections)	-	7 to 10 days	
		co-amoxiclav (only if culture results available and susceptible) **OR**	500/125mg TDS	-		
		trimethoprim (only if culture results available and susceptible) **OR**	200mg BD	-	14 days	
		ciprofloxacin (consider safety issues)	500mg BD	-	7 days	
		Non-pregnant women and men IV antibiotics *(click on visual summary)*				
		Pregnant women first choice: cefalexin	500mg BD or TDS (up to 1g to 1.5g TDS or QDS for severe infections)	-	7 to 10 days	
		Pregnant women second choice or IV antibiotics *(click on visual summary)*				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
		Children and young people (3 months and over) first choice: trimethoprim (if low risk of resistance) **OR**	-			
		amoxicillin (only if culture results available and susceptible) **OR**	-		-	
		cefalexin **OR**	-			
		co-amoxiclav (only if culture results available and susceptible)	-			
		Children and young people (3 months and over) IV antibiotics *(click on visual summary)*				
▼ **Meningitis**						
Suspected meningococcal disease Public Health England Last updated: Feb 2019	**Transfer all patients to hospital immediately.**[1D] If time before hospital admission,[2D,3A+] if suspected meningococcal septicaemia or non-blanching rash,[2D,4D] give IV benzylpenicillin[1D,2D,4D] as soon as possible.[2D] Do not give IV antibiotics if there is a definite history of anaphylaxis;[1D] rash is not a contraindication.[1D]	IV or IM benzylpenicillin[1D,2D]	Child <1 year: 300mg[5D] Child 1 to 9 years: 600mg[5D] Adult/child 10+ years: 1.2g[5D]		Stat dose;[1D] give IM, if vein cannot be accessed [1D]	*Not available. Access the supporting evidence and rationales on the PHE website*
Prevention of secondary case of meningitis Public Health England Last updated: July 2019	Only prescribe following advice from your local health protection specialist/consultant: ☎ [INSERT PHONE NUMBER] Out of hours: contact on-call doctor: ☎ [INSERT PHONE NUMBER] Expert advice is available for managing clusters of meningitis. Please alert the appropriate organisation to any cluster situation. Public Health England, Colindale (tel: 0208 200 4400) AWARe (all Wales Acute Response team) (tel: 0300 003 0032) *Access the supporting evidence and rationales on the PHE website.*					

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
▼ Gastrointestinal tract infections						
Oral candidiasis Public Health England Last updated: Oct 2018	**Topical azoles** are more effective than topical nystatin.[1A+] Oral candidiasis is rare in immunocompetent adults;[2D] consider undiagnosed risk factors, including HIV.[2D] Use 50mg fluconazole if extensive/severe candidiasis;[3D,4D] if HIV or immunocompromised, use 100mg fluconazole.[3D,4D]	Miconazole oral gel[1A+,4D,5A-]	2.5ml of 24mg/ml QDS (hold in mouth after food) [4D]	BNF for children	7 days; continue for 7 days after resolved[4D,6D]	*Not available. Access supporting evidence and rationales on the PHE website*
		If not tolerated: nystatin suspension[2D,6D,7A-]	1ml; 100,000units/ml QDS (half in each side) [2D,4D,7A-]	BNF for children	7 days; continue for 2 days after resolved[4D]	
		fluconazole capsules[6D,7A-]	50mg/100mg OD[3D,6D,8A-]	BNF for children	7 to 14 days[6D,7A-,8A-]	
Infectious diarrhoea Public Health England Last updated: Oct 2018	Refer previously healthy children with acute painful or bloody diarrhoea, to exclude *E. coli* O157 infection.[1D] **Antibiotic therapy is not usually indicated unless patient is systemically unwell.**[2D] If systemically unwell and campylobacter suspected (such as undercooked meat and abdominal pain),[3D] consider clarithromycin 250mg to 500mg BD for 5 to 7 days, if treated early (within 3 days).[3D,4A+] If giardia is confirmed or suspected – tinidazole 2g single dose is the treatment of choice.[5A+] *Access the supporting evidence and rationales on the PHE website.*					
Clostridium difficile Public Health England Last updated: Oct 2018	Review need for antibiotics,[1D,2D] PPIs,[3B-] and antiperistaltic agents and discontinue use where possible.[2D] Mild cases (<4 episodes of stool/day) may respond without metronidazole;[2D] 70% respond to metronidazole in 5 days; 92% respond to metronidazole in 14 days.[4B-] **If severe (T>38.5, or WCC>15, rising creatinine, or signs/symptoms of severe colitis):**[2D] treat with oral vancomycin,[1D,2D,5A-] review progress closely,[1D,2D] and consider hospital referral.[2D]	**First episode**: metronidazole[2D,4B-]	400mg TDS[1D,2D]	BNF for children	10 to 14 days[1D,4B-]	*Not available. Access supporting evidence and rationales on the PHE website*
		Severe, type 027 or recurrent: oral vancomycin[1D,2D,5A-]	125mg QDS[1D,2D,5A-]	BNF for children	10 to 14 days, then taper[1D,2D]	
		Recurrent or second line: fidaxomicin[2D,5A-]	200mg BD[5A-]	-	10 days[5A-]	
Traveller's diarrhoea Public Health England Last updated: Oct 2018	Prophylaxis rarely, if ever, indicated.[1D] Consider **standby** antimicrobial only for patients at high risk of severe illness,[2D] or visiting high-risk areas.[1D,2D]	**Standby**: azithromycin	500mg OD[1D,3A+]	-	1 to 3 days[1D,2D,3A+]	*Not available. Access supporting evidence and rationales on the PHE website*
		Prophylaxis/treatment: bismuth subsalicylate	2 tablets QDS[1D,2D]	-	2 days[1D,2D,4A-]	

Fidaxomicin preferred in C. dificle as it is associated with fewer recurrences
Metronidazole only if toxic megacolon (IV)

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Helicobacter pylori Public Health England See PHE quick reference guide for diagnostic advice: PHE *H. pylori* Last updated: Feb 2019	Always test for *H.pylori* before giving antibiotics. Treat all positives, if known DU, GU,[1A+] or low-grade MALToma.[2D,3D] NNT in non-ulcer dyspepsia: 14.[4A+] Do not offer eradication for GORD.[3D] Do not use clarithromycin, metronidazole or quinolone if used in the past year for any infection.[5A+,6B+,7A+] **Penicillin allergy**: use PPI **PLUS** clarithromycin **PLUS** metronidazole.[2D] If previous clarithromycin, use PPI **PLUS** bismuth salt **PLUS** metronidazole **PLUS** tetracycline hydrochloride.[2D,8A-,9D] **Relapse and no penicillin allergy** use PPI **PLUS** amoxicillin **PLUS** clarithromycin or metronidazole (whichever was not used first line).[2D] **Relapse and previous metronidazole and clarithromycin**: use PPI **PLUS** amoxicillin **PLUS** either tetracycline **OR** levofloxacin (if tetracycline not tolerated).[2D,7A+] **Relapse and penicillin allergy (no exposure to quinolone)**: use PPI **PLUS** metronidazole **PLUS** levofloxacin.[2D] **Relapse and penicillin allergy (with exposure to quinolone)**: use PPI **PLUS** bismuth salt **PLUS** metronidazole **PLUS** tetracycline.[2D] **Retest for *H. pylori***: post DU/GU, or relapse after second-line therapy,[1A+] using UBT or SAT,[10A+,11A+] consider referral for endoscopy and culture.[2D]	**Always use PPI**[2D,3D,5A+,12A+] **First line and first relapse and no penicillin allergy** PPI **PLUS** 2 antibiotics	-	BNF for children	7 days[2D] MALToma 14 days[7A+,16A+]	*Not available. Access supporting evidence and rationales on the PHE website*
	amoxicillin[2D,6B+] **PLUS**	1000mg BD[14A+]	BNF for children			
	clarithromycin[2D,6B+] **OR**	500mg BD[4A-]	BNF for children			
	metronidazole[2D,6B+]	400mg BD[2D]	BNF for children			
	Penicillin allergy and previous clarithromycin: PPI **WITH** bismuth subsalicylate PLUS 2 antibiotics	-	-			
	bismuth subsalicylate[13A+] **PLUS**	525mg QDS[15D]				
	metronidazole[2D] **PLUS**	400mg BD[2D]	BNF for children			
	tetracycline[2D]	500mg QDS[15D]				
	Relapse and previous metronidazole and clarithromycin: PPI **PLUS** 2 antibiotics	-	-			
	amoxicillin[2D,7A+] **PLUS**	1000mg BD[14A+]	BNF for children			
	tetracycline[2D,7A+] **OR**	500mg QDS[15D]				
	levofloxacin (if tetracycline cannot be used)[2D,7A+]	250mg BD[7A+]				
	Third line on advice: PPI **WITH**	-	-	10 days		
	bismuth subsalicylate **PLUS**	525mg QDS[15D]	-			
	2 antibiotics as above not previously used **OR**	-	-			
	rifabutin[14A+] **OR**	150mg BD	-			
	furazolidone[17A+]	200mg BD	-			

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Acute diverticulitis **NICE** Last updated: Nov 2019	**Acute diverticulitis and systemically well:** Consider no antibiotics, offer simple analgesia (for example paracetamol), advise to re-present if symptoms persist or worsen. **Acute diverticulitis and systemically unwell, immunosuppressed or significant comorbidity:** offer an antibiotic. Give oral antibiotics if person not referred to hospital for suspected complicated acute diverticulitis. Give IV antibiotics if admitted to hospital with suspected or confirmed complicated acute diverticulitis (including diverticular abscess). If CT-confirmed uncomplicated acute diverticulitis, review the need for antibiotics. * A longer course may be needed based on clinical assessment.	**First-choice (uncomplicated acute diverticulitis):** co-amoxiclav	500/125mg TDS	-	5 days*	
		Penicillin allergy or co-amoxiclav unsuitable: cefalexin (caution in penicillin allergy) **AND** metronidazole **OR**	cefalexin: 500mg BD or TDS (up to 1g to 1.5g TDS or QDS for severe infections) metronidazole: 400mg TDS	-		
		trimethoprim **AND** metronidazole **OR**	trimethoprim: 200mg BD metronidazole: 400mg TDS	-		
		ciprofloxacin (only if switching from IV ciprofloxacin with specialist advice; consider safety issues) **AND** metronidazole	ciprofloxacin: 500mg BD metronidazole: 400mg TDS			
		For IV antibiotics in complicated acute diverticulitis (including diverticular abscess) see visual summary				
Threadworm Public Health England Last updated: Nov 2017	**Treat all household contacts at the same time.**[1D] **Advise hygiene measures for 2 weeks**[1D] (hand hygiene;[2D] pants at night; morning shower, including perianal area).[1D,2D] Wash sleepwear, bed linen, and dust and vacuum.[1D] **Child <6 months**, add perianal wet wiping or washes 3 hourly.[1D]	**Child >6 months:** mebendazole[1D,3B-]	100mg stat[3B-]	BNF for children	1 dose;[3B-] repeat in 2 weeks if persistent[3B-]	*Not available. Access supporting evidence and rationales on the PHE website*
		Child <6 months or pregnant (at least in first trimester): only hygiene measure for 6 weeks[1D]	-	-	-	
▼ **Genital tract infections**						
STI screening Public Health England Last updated: Nov 2017	People with risk factors should be screened for chlamydia, gonorrhoea, HIV and syphilis.[1D] Refer individual and partners to GUM.[1D] **Risk factors**: <25 years; no condom use; recent/frequent change of partner; symptomatic or infected partner; area of high HIV.[2B-] *Access the supporting evidence and rationales on the PHE website*					

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Chlamydia trachomatis/ urethritis Public Health England Last updated: July 2019	Opportunistically screen all sexually active patients aged 15 to 24 years for chlamydia annually and on change of sexual partner.[1B-] If positive, treat index case, refer to GUM and initiate partner notification, testing and treatment.[2D,3A+] As single dose azithromycin has led to increased resistance in GU infections, doxycycline should be used first line for chlamydia and urethritis.[4A+] Advise patient with chlamydia to abstain from sexual intercourse until doxycycline is completed or for 7 days after treatment with azithromycin (14 days after azithromycin started and until symptoms resolved if urethritis).[3A+,4A+] If chlamydia, test for reinfection at 3 to 6 months following treatment if under 25 years; or consider if over 25 years and high risk of re-infection.[1B-,3B+, 5B-] **Second line, pregnant, breastfeeding, allergy, or intolerance**: azithromycin is most effective.[6A+,7D,8A+,9A+,10D] As lower cure rate in pregnancy, test for cure at least 3 weeks after end of treatment.[3A+] Consider referring all patients with symptomatic urethritis to GUM as testing should include *Mycoplasma genitalium* and *Gonorrhoea*.[11A-] If *M.genitalium* is proven, use doxycycline followed by azithromycin using the same dosing regimen and advise to avoid sex for 14 days after start of treatment and until symptoms have resolved.[11A-,12A+]	**First line:** doxycycline[4A+,11A-,12A+]	100mg BD[4A+,11A-,12A+]	-	7 days[4A+,11A-,12A+]	*Not available. Access supporting evidence and rationales on the PHE website*
		Second line/ pregnant/breastfeeding/ allergy/intolerance: azithromycin[4A+,11A-,12A+]	1000mg[4A+,11A-,12A+] then 500mg OD[4A+,11A-,12A+]		Stat[4A+,11A-,12A+] 2 days[4A+,11A-,12A+] (total 3 days)	

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Epididymitis Public Health England Last updated: Nov 2017	Usually due to Gram-negative enteric bacteria in men over 35 years with low risk of STI.[1A+,2D] If under 35 years or STI risk, refer to GUM.[1A+,2D]	Doxycycline[1A+,2D] **OR**	100mg BD[1A+,2D]	-	10 to 14 days[1A+,2D]	*Not available. Access supporting evidence and rationales on the PHE website*
		ofloxacin[1A+,2D] **OR**	200mg BD[1A+,2D]		14 days[1A+,2D]	
		ciprofloxacin[1A+,2D]	500mg BD[1A+,2D,3A+]		10 days[1A+,2D,3A+]	
Vaginal candidiasis Public Health England Last updated: Oct 2018	All topical and oral azoles give over 80% cure.[1A+,2A+] **Pregnant**: avoid oral azoles, the 7 day courses are more effective than shorter ones.[1A+,3D,4A+] **Recurrent (>4 episodes per year):**[1A+] 150mg oral fluconazole every 72 hours for 3 doses induction,[1A+] followed by 1 dose once a week for 6 months maintenance.[1A+]	Clotrimazole[1A+,5D] **OR**	500mg pessary[1A+]	-	Stat[1A+]	*Not available. Access supporting evidence and rationales on the PHE website*
		fenticonazole[1A+] **OR**	600mg pessary[1A+]		Stat[1A+]	
		clotrimazole[1A+] **OR**	100mg pessary[1A+]		6 nights[1A+]	
		oral fluconazole[1A+,3D]	150mg[1A+,3D]		Stat[1A+]	
		If recurrent: fluconazole (induction/maintenance)[1A+]	150mg every 72 hours **THEN** 150mg once a week[1A+,3D]	-	3 doses 6 months[1A+]	
Bacterial vaginosis Public Health England Last updated: Nov 2017	Oral metronidazole is as effective as topical treatment,[1A+] and is cheaper.[2D] 7 days results in fewer relapses than 2g stat at 4 weeks.[1A+,2D] **Pregnant/breastfeeding**: avoid 2g dose.[3A+,4D] Treating partners does not reduce relapse.[5A+]	oral metronidazole[1A+,3A+] **OR**	400mg BD[1A+,3A+] **OR** 2000mg[1A+,2D]	-	7 days[1A+] **OR** Stat[2D]	*Not available. Access supporting evidence and rationales on the PHE website*
		metronidazole 0.75% vaginal gel[1A+,2D,3A+] **OR**	5g applicator at night[1A+,2D,3A+]		5 nights[1A+,2D,3A+]	
		clindamycin 2% cream[1A+,2D]	5g applicator at night[1A+,2D]		7 nights[1A+,2D,3A+]	
Genital herpes Public Health England Last updated: Nov 2017	**Advise**: saline bathing,[1A+] analgesia,[1A+] or topical lidocaine for pain,[1A+] and discuss transmission.[1A+] **First episode**: treat within 5 days if new lesions or systemic symptoms,[1A+,2D] and refer to GUM.[2D] **Recurrent**: self-care if mild,[2D] or immediate short course antiviral treatment,[1A+,2D] or suppressive therapy if more than 6 episodes per year.[1A+,2D]	oral aciclovir[1A+,2D,3A+,4A+] **OR**	400mg TDS[1A+,3A+]	-	5 days[1A+]	*Not available. Access supporting evidence and rationales on the PHE website*
			800mg TDS (if recurrent)[1A+]		2 days[1A+]	
		valaciclovir[1A+,3A+,4A+] **OR**	500mg BD[1A+]		5 days[1A+]	
		famciclovir[1A+,4A+]	250mg TD[1A+]		5 days[1A+]	
			1000mg BD (if recurrent)[1A+]		1 day[1A+]	

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Gonorrhoea Public Health England Last updated: Feb 2019	Antibiotic resistance is now very high.[1D,2D] Use IM ceftriaxone if susceptibility not known prior to treatment[2D]. Use Ciprofloxacin **only** if susceptibility is known prior to treatment and the isolate is sensitive to ciprofloxacin at all sites of infection[1D,2D] Refer to GUM.[3B-] Test of cure is essential.[2D]	ceftriaxone[2D] **OR**	1000mg IM[2D]	-	Stat[2D]	*Not available. Access supporting evidence and rationales on the PHE website*
		ciprofloxacin[2D] (only if known to be sensitive)	500mg[2D]		Stat[2D]	
Trichomoniasis Public Health England Last updated: Nov 2017	Oral treatment needed as extravaginal infection common.[1D] Treat partners,[1D] and refer to GUM for other STIs.[1D] **Pregnant/breastfeeding**: avoid 2g single dose metronidazole;[2A+,3D] clotrimazole for symptom relief (not cure) if metronidazole declined.[2A+,4A-,5D]	metronidazole[1A+,2A+,3D,6A+]	400mg BD[1A+,6A+] 2g (more adverse effects)[6A+]	-	5 to 7 day[1A+] Stat[1A+,6A+]	*Not available. Access supporting evidence and rationales on the PHE website*
		Pregnancy to treat symptoms: clotrimazole[2A+,4A-,5D]	100mg pessary at night[5D]		6 nights[5D]	
Pelvic inflammatory disease Public Health England Last updated: Feb 2019	**Refer** women and sexual contacts to GUM.[1A+] **Raised CRP** supports diagnosis, absent pus cells in HVS smear good negative predictive value.[1A+] **Exclude**: ectopic pregnancy, appendicitis, endometriosis, UTI, irritable bowel, complicated ovarian cyst, functional pain. Moxifloxacin has greater activity against likely pathogens, but always test for gonorrhoea, chlamydia, and *M. genitalium* .[1A+] *If M. genitalium* tests positive use moxifloxacin.[1A+]	**First line therapy**: ceftriaxone[1A+,3C,4C] **PLUS**	1000mg IM[1A+,3C]	-	Stat[1A+,3C]	*Not available. Access supporting evidence and rationales on the PHE website*
		metronidazole[1A+,5A+] **PLUS**	400mg BD[1A+]		14 days[1A+]	
		doxycycline[1A+,5A+]	100mg BD[1A+]		14 days[1A+]	
		Second line therapy: metronidazole[1A+,5A+] **PLUS**	400mg BD[1A+]		14 days[1A+]	
		ofloxacin[1A+,2A-,5A+] **OR**	400mg BD[1A+,2A-]		14 days[1A+]	
		moxifloxacin alone[1A+] (first line for *M. genitalium* associated PID)	400mg OD[1A+]		14 days[1A+]	
▼ Skin and soft tissue infections						
Note: Refer to RCGP Skin Infections online training.[1D] For MRSA, discuss therapy with microbiologist.[1D]						
Cold sores Public Health England Last updated: Nov 2017	**Most resolve after 5 days without treatment**.[1A-,2A-] Topical antivirals applied prodromally can reduce duration by 12 to 18 hours.[1A-,2A-,3A-] **If frequent, severe, and predictable triggers**: consider oral prophylaxis:[4D,5A+] aciclovir 400mg, twice daily, for 5 to 7 days.[5A+,6A+] Access supporting evidence and rationales on the PHE website					

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
PVL-SA Public Health England Last updated: Nov 2017	Panton-Valentine leukocidin (PVL) is a toxin produced by 20.8 to 46% of *S. aureus* from boils/abscesses.[1B+,2B+,3B-] PVL strains are rare in healthy people, but severe.[2B+] **Suppression therapy** should only be started after primary infection has resolved, as ineffective if lesions are still leaking.[4D] **Risk factors for PVL**: recurrent skin infections;[2B+] invasive infections;[2B+] MSM;[3B-] if there is more than one case in a home or close community[2B+,3B-] (school children;[3B-] military personnel;[3B-] nursing home residents;[3B-] household contacts).[3B-] Access the supporting evidence and rationales on the PHE website.					
Eczema Public Health England Last updated: Nov 2017	**No visible signs of infection**: antibiotic use (alone or with steroids)[1A+] encourages resistance and does not improve healing.[1A+] **With visible signs of infection**: use oral flucloxacillin[2D] or clarithromycin,[2D] or topical treatment (as in impetigo).[2D] Access the supporting evidence and rationales on the PHE website.					
Impetigo **NICE** Public Health England Last updated: Feb 2020	**Localised non-bullous impetigo:** Hydrogen peroxide 1% cream (other topical antiseptics are available but no evidence for impetigo). If hydrogen peroxide unsuitable or ineffective, short-course topical antibiotic. **Widespread non-bullous impetigo:** Short-course topical or oral antibiotic. Take account of person's preferences, practicalities of administration, previous use of topical antibiotics because antimicrobial resistance can develop rapidly with extended or repeated use, and local antimicrobial resistance data. **Bullous impetigo, systemically unwell, or high risk of complications:** Short-course oral antibiotic. Do not offer combination treatment with a topical and oral antibiotic to treat impetigo. *5 days is appropriate for most, can be increased to 7 days based on clinical judgement. *For detailed information click on the visual summary.*	**Topical antiseptic:**				
		hydrogen peroxide 1%	BD or TDS		5 days*	
		Topical antibiotic:				
		First choice: fusidic acid 2%	TDS		5 days*	
		Fusidic acid resistance suspected or confirmed: mupirocin 2%	TDS			
		Oral antibiotic:				
		First choice: flucloxacillin	500mg QDS		5 days*	
		Penicillin allergy or flucloxacillin unsuitable: clarithromycin **OR**	250mg BD			
		erythromycin (in pregnancy)	250 to 500mg QDS			
		If MRSA suspected or confirmed – consult local microbiologist				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Leg ulcer infection **NICE** Public Health England Last updated: Feb 2020	Manage any underlying conditions to promote ulcer healing. Only offer an antibiotic when there are symptoms or signs of infection (such as redness or swelling spreading beyond the ulcer, localised warmth, increased pain or fever). Few leg ulcers are clinically infected but most are colonised by bacteria. When prescribing antibiotics, take account of severity, risk of complications and previous antibiotic use. *For detailed information click on the visual summary.*	**First-choice:**				
		flucloxacillin	500mg to 1g QDS	-	7 days	
		Penicillin allergy or if flucloxacillin unsuitable:				
		doxycycline **OR**	200mg on day 1, then 100mg OD (can be increased to 200mg daily)	-	7 days	
		clarithromycin **OR**	500mg BD			
		erythromycin (in pregnancy)	500mg QDS			
		Second choice:				
		co-amoxiclav **OR**	500/125mg TDS	-	7 days	
		co-trimoxazole (in penicillin allergy)	960mg BD			
		For antibiotic choices if severely unwell or MRSA suspected or confirmed, click on the visual summary				
Cellulitis and erysipelas **NICE** Public Health England Last updated: Sept 2019	Exclude other causes of skin redness (inflammatory reactions or non-infectious causes). Consider marking extent of infection with a single-use surgical marker pen. Offer an antibiotic. Take account of severity, site of infection, risk of uncommon pathogens, any microbiological results and MRSA status. Infection around eyes or nose is more concerning because of serious intracranial complications. *A longer course (up to 14 days in total) may be needed but skin takes time to return to normal, and full resolution at 5 to 7 days is not expected. Do not routinely offer antibiotics to prevent recurrent cellulitis or erysipelas. *For detailed information click on the visual summary.*	**First choice:**				
		flucloxacillin	500mg to 1g QDS		5 to 7 days*	
		Penicillin allergy or if flucloxacillin unsuitable:				
		clarithromycin **OR**	500mg BD		5 to 7 days*	
		erythromycin (in pregnancy) **OR**	500mg QDS			
		doxycycline (adults only) **OR**	200mg on day 1, then 100mg OD	-		
		co-amoxiclav (children only: not in penicillin allergy)	-			
		If infection near eyes or nose:				
		co-amoxiclav	500/125mg TDS		7 days*	
		If infection near eyes or nose (penicillin allergy):				
		clarithromycin **AND**	500mg BD		7 days*	
		metronidazole (only add in children if anaerobes suspected)	400mg TDS			
		For alternative choice antibiotics for severe infection, suspected or confirmed MRSA infection and IV antibiotics click on the visual summary				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Diabetic foot infection **NICE** Public Health England Last updated: Oct 2019	In diabetes, all foot wounds are likely to be colonised with bacteria. Diabetic foot infection has at least 2 of: local swelling or induration; erythema; local tenderness or pain; local warmth; purulent discharge. Severity is classified as: **Mild**: local infection with 0.5 to less than 2cm erythema **Moderate**: local infection with more than 2cm erythema or involving deeper structures (such as abscess, osteomyelitis, septic arthritis or fasciitis) **Severe**: local infection with signs of a systemic inflammatory response. Start antibiotic treatment as soon as possible. Take samples for microbiological testing before, or as close as possible to, the start of treatment When choosing an antibiotic, take account of severity, risk of complications, previous microbiological results and antibiotic use, and patient preference. *A longer course (up to a further 7 days) may be needed based on clinical assessment. However, skin does take time to return to normal, and full resolution at 7 days is not expected. Do not offer antibiotics to prevent diabetic foot infection. *For detailed information click on the visual summary.*	**Mild infection: first choice**				
		flucloxacillin	500mg to 1g QDS	-	7 days*	
		Mild infection (penicillin allergy):				
		clarithromycin **OR**	500mg BD	-	7 days*	
		erythromycin (in pregnancy) **OR**	500mg QDS			
		doxycycline	200mg on day 1, then 100mg OD (can be increased to 200mg daily)			
		For antibiotic choices for moderate or severe infection, infections where *Pseudomonas aeruginosa* or MRSA is suspected or confirmed, and IV antibiotics click on the visual summary				
Tick bites (Lyme disease) Public Health England Last updated: Feb 2020	**Treatment**: Treat erythema migrans **empirically**; serology is often negative early in infection.[1D] For other suspected Lyme disease such as neuroborreliosis (CN palsy, radiculopathy) seek advice.[1D]	**Treatment:** doxycycline[1D]	100mg BD[1D]	BNF for children	21 days[1D]	*Not available. Access supporting evidence and rationales on the PHE website*
		Alternative: amoxicillin[1D]	1,000mg TDS[1D]	BNF for children		

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Acne Public Health England Last updated: Nov 2017	**Mild** (open and closed comedones)[1D] or **moderate** (inflammatory lesions):[1D] **First line**: self-care[1D] (wash with mild soap; do not scrub; avoid make-up).[1D] **Second line**: topical retinoid or benzoyl peroxide.[2D] **Third-line**: add topical antibiotic,[1D,3A+] or consider addition of oral antibiotic.[1D] **Severe (nodules and cysts)**:[1D] add oral antibiotic (for 3 months max)[1D,3A+] and refer.[1D,2D]	**Second line**: topical retinoid[1D,2D,3A+] **OR**	Thinly OD[3A+]	BNF for children	6 to 8 weeks[1D]	*Not available. Access supporting evidence and rationales on the PHE website*
		benzoyl peroxide[1A-2D,3A+,4A-]	5% cream OD-BD[3A+]	BNF for children	6 to 8 weeks[1D]	
		Third-line: topical clindamycin[3A+]	1% cream, thinly BD[3A+]	BNF for children	12 weeks[1A-,2D]	
		If treatment failure/severe: oral tetracycline[1A-,3A+] **+ OR**	500mg BD[3A+]	BNF for children	6 to 12 weeks[3A+]	
		oral doxycycline[3A+,4A-]	100mg OD[3A+]	BNF for children	6 to 12 weeks[3A+]	
Scabies Public Health England Last updated: Oct 2018	**First choice permethrin**: Treat whole body from ear/chin downwards,[1D,2D] and under nails.[1D,2D] **If using permethrin** and patient is under 2 years, elderly or immunosuppressed, or **if treating with malathion**: also treat face and scalp.[1D,2D] **Home/sexual contacts**: treat within 24 hours.[1D]	permethrin[1D,2D,3A+]	5% cream[1D,2D]	BNF for children	2 applications, 1 week apart[1D]	*Not available. Access supporting evidence and rationales on the PHE website*
		Permethrin allergy: malathion[1D]	0.5% aqueous liquid[1D]	BNF for children		
Bites Public Health England Last updated: July 2019	**Human**: thorough irrigation is important.[1A+,2D] Antibiotic prophylaxis is advised.[1A+,2D,3D] Assess risk of tetanus, rabies,[1A+] HIV, and hepatitis B and C.[3D] **Cat**: always give prophylaxis.[1A+,3D] **Dog**: give prophylaxis if: puncture wound;[1A+,3D] bite to hand, foot, face, joint, tendon, or ligament;[1A+] immunocompromised; cirrhotic; asplenic; or presence of prosthetic valve/joint.[2D,4A+] **Penicillin allergy**: Review all at 24 and 48 hours,[3D] as not all pathogens are covered.[2D,3	**Prophylaxis/treatment all**: co-amoxiclav[2D,3D]	375mg to 625mg TDS[3D]	BNF for children	7 days3D	*Not available. Access supporting evidence and rationales on the PHE website*
		Human + penicillin allergy: metronidazole[3D,4A+] **AND**	400mg TDS[2D]	BNF for children	7 days[3D]	
		clarithromycin[3D,4A+]	250mg to 500mg BD[2D]	BNF for children		
		Animal + penicillin allergy: metronidazole[3D,4A+] **AND**	400mg TDS[2D]	BNF for children	7 days[3D]	
		doxycycline[3D]	100mg BD[2D]			

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Mastitis Public Health England Last updated: Nov 2017	*S. aureus* is the most common infecting pathogen.[1D] Suspect if woman has: a painful breast;[2D] fever and/or general malaise;[2D] a tender, red breast.[2D] **Breastfeeding**: oral antibiotics are appropriate, where indicated.[2D,3A+] Women should continue feeding,[1D,2D] including from the affected breast.[2D]	flucloxacillin[2D]	500mg QDS[2D]	-	10 to 14 days[2D]	*Not available. Access supporting evidence and rationales on the PHE website*
		Penicillin allergy: erythromycin[2D] **OR**	250mg to 500mg QDS[2D]			
		clarithromycin[2D]	500mg BD[2D]			
Dermatophyte infection: skin Public Health England Last updated: Feb 2019	**Most cases**: use terbinafine as fungicidal, treatment time shorter and more effective than with fungistatic imidazoles or undecenoates.[1D,2A+] If candida possible, use imidazole.[4D] **If intractable, or scalp**: send skin scrapings,[1D] and if infection confirmed: use oral terbinafine[1D,3A+,4D] or itraconazole.[2A+,3A+,5D] **Scalp**: oral therapy,[6D] and discuss with specialist.[1D]	topical terbinafine[3A+,4D] **OR**	1% OD to BD[2A+]	BNF for children	1 to 4 weeks[3A+]	*Not available. Access supporting evidence and rationales on the PHE website*
		topical imidazole[2A+,3A+]	1% OD to BD[2A+]	BNF for children	4 to 6 weeks[2A+,3A+]	
		Alternative in athlete's foot: topical undecenoates2A+ (such as Mycota®)2A+	OD to BD[2A+]	BNF for children		
Dermatophyte infection: nail Public Health England Last updated: Oct 2018	**Take nail clippings**;[1D] start therapy only if infection is confirmed.[1D] Oral terbinafine is more effective than oral azole.[1D,2A+,3A+,4D] Liver reactions 0.1 to 1% with oral antifungals.[3A+] If candida or non-dermatophyte infection is confirmed, use oral itraconazole.[1D,3A+,4D] Topical nail lacquer is not as effective.[1D,5A+,6D] **To prevent recurrence**: apply weekly 1% topical antifungal cream to entire toe area.[6D] **Children**: seek specialist advice.[4D]	**First line:** terbinafine[1D,2A+,3A+,4D,6D]	250mg OD[1D,2A+,6D]	BNF for children	Fingers: 6 weeks[1D,6D] Toes: 12 weeks[1D,6D]	*Not available. Access supporting evidence and rationales on the PHE website*
		Second line: itraconazole[1D,3A+,4D,6D]	200mg BD[1D,4D]	BNF for children	1 week a month[1D] Fingers: 2 courses[1D] Toes: 3 courses[1D]	
		Stop treatment when continual, new, healthy, proximal nail growth.[6D]				

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Varicella zoster/ chickenpox **Herpes zoster/ shingles** Public Health England Last updated: Oct 2018	**Pregnant/immunocompromised/ neonate**: seek urgent specialist advice.[1D] **Chickenpox**: consider aciclovir[2A+,3A+,4D] if: onset of rash <24 hours,[3A+] and 1 of the following: >14 years of age;[4D] severe pain;[4D] dense/oral rash;4D,[5B+] taking steroids;[4D] smoker.[4D,5B+] Give paracetamol for pain relief.[6C] **Shingles**: treat if >50 years[7A+,8D] (PHN rare if <50 years)[9B+] and within 72 hours of rash,[10A+] or if 1 of the following: active ophthalmic;[11D] Ramsey Hunt;[4D] eczema;[4D] non-truncal involvement;[8D] moderate or severe pain;[8D] moderate or severe rash.[5B+,8D] Shingles treatment if not within 72 hours: consider starting antiviral drug up to 1 week after rash onset,[12B+] if high risk of severe shingles[12B+] or continued vesicle formation;[4D] older age;[7A+,8D,12B+] immunocompromised;[4D] or severe pain.[7D,11B+]	**First line for chicken pox and shingles**: aciclovir[3A+,7A+,10A+,13B+,14A-,15A+]	800mg 5 times daily[16A-]	BNF for children	7 days[14A-,16A-]	*Not available. Access supporting evidence and rationales on the PHE website*
		Second line for shingles if poor compliance: *not for children*: famciclovir[8D,14A-,16A-] **OR**	250mg to 500mg TDS[15A+] **OR** 750mg BD[15A+]	-		
		valaciclovir[8D,10A+,14A-]	1g TDS[14A-]	BNF for children		
▼ **Eye infections**						
Conjunctivitis Public Health England Last updated: July 2019	**First line**: bath/clean eyelids with cotton wool dipped in sterile saline or boiled (cooled) water, to remove crusting.[1D] **Treat only if severe**,[2A+] as most cases are viral[3D] or self-limiting.[2A+] **Bacterial conjunctivitis**: usually unilateral and also self-limiting.[2A+,3D] It is characterised by red eye with mucopurulent, not watery discharge.[3D] 65% and 74% resolve on placebo by days 5 and 7.[4A-,5A+] **Third line**: fusidic acid as it has less Gram-negative activity.[6A-,7D]	**Second line:** chloramphenicol[1D,2A+,4A-,5A+] 0.5% eye drop[1D,2A+] **OR** 1% ointment[1D,5A+]	Eye drops: 2 hourly for 2 days,[1D,2A+] then reduce frequency[1D] to 3 to 4 times daily.[1D] Eye ointment: 3 to 4 times daily or once daily at night if using antibiotic eye drops during the day.[1D]	BNF for children	48 hours after resolution[2A+,7D]	*Not available. Access supporting evidence and rationales on the PHE website*
		Third line: fusidic acid 1% gel[2A+,5A+,6A-]	BD[1D,7D]	BNF for children		

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Blepharitis Public Health England Last updated: Nov 2017	**First line**: lid hygiene[1D,2A+] for symptom control,[1D] including: warm compresses;[1D,2A+] lid massage and scrubs;[1D] gentle washing;[1D] avoiding cosmetics.[1D] **Second line**: topical antibiotics if hygiene measures are ineffective after 2 weeks.[1D,3A+] **Signs of meibomian gland dysfunction**,[3D] or acne rosacea:[3D] consider oral antibiotics.[1D]	**Second line:** topical chloramphenicol[1D,2A+,5A-]	1% ointment BD[2A+,3D]	BNF for children	6-week trial[3D]	*Not available. Access supporting evidence and rationales on the PHE website*
		Third line: oral oxytetracycline[1D,3D] **OR**	500mg BD[3D] 250mg BD[3D]	BNF for children	4 weeks (initial)[3D] 8 weeks (maint)[3D]	
		oral doxycycline[1D,2A+,3D]	100mg OD[3D] 50mg OD[3D]	BNF for children	4 weeks (initial)[3D] 8 weeks (maint)[3D]	
▼ Suspected dental infections in primary care (outside dental settings)						
Derived from the Scottish Dental Clinical Effectiveness Programme (SDCEP) 2013 Guidelines. This guidance is not designed to be a definitive guide to oral conditions, as GPs should not be involved in dental treatment. Patients presenting to non-dental primary care services with dental problems should be directed to their regular dentist, or if this is not possible, to the NHS 111 service (in England), who will be able to provided details of how to access emergency dental care.						
Note: Antibiotics do not cure toothache.[1D] First-line treatment is with paracetamol[1D] and/or ibuprofen;[1D] codeine is not effective for toothache.[1D]						
Mucosal ulceration and inflammation (simple gingivitis) Public Health England Last updated: Nov 2017	Temporary pain and swelling relief can be attained with saline mouthwash (½ tsp salt in warm water)[1D]. Use antiseptic mouthwash if more severe,[1D] and if pain limits oral hygiene to treat or prevent secondary infection.[1D,2A-] The primary cause for mucosal ulceration or inflammation (aphthous ulcers;[1D] oral lichen planus;[1D] herpes simplex infection;[1D] oral cancer)[1D] needs to be evaluated and treated.[1D]	Chlorhexidine 0.12 to 0.2%[1D, 2A-,3A+,4A+] (do not use within 30 minutes of toothpaste)[1D] **OR**	1 minute BD with 10 ml[1D]	BNF for children BNF for children	Always spit out after use.[1D] Use until lesions resolve[1D] or less pain allows for oral hygiene[1D]	*Not available. Access supporting evidence and rationales on the PHE website*
		hydrogen peroxide 6%[5A-,1D]	2 to 3 minutes BD/TDS with 15ml in ½ glass warm water[1D]	BNF for children		
Acute necrotising ulcerative gingivitis Public Health England Last updated: Nov 2017	Refer to dentist for scaling and hygiene advice.[1D,2D] Antiseptic mouthwash if pain limits oral hygiene.[1D] Commence metronidazole if systemic signs and symptoms.[1D,2D,3B-,4B+,5A-]	chlorhexidine 0.12 to 0.2% (do not use within 30 minutes of toothpaste)[1D] **OR**	1 minute BD with 10ml[1D]	BNF for children	Until pain allows for oral hygiene[6D]	*Not available. Access supporting evidence and rationales on the PHE website*
		hydrogen peroxide 6%[1D]	2 to 3 minutes BD/TDS with 15ml in ½ glass warm water	BNF for children		
		metronidazole[1D,3B-,4B+,5A-]	400mg TDS[1D,2D]	BNF for children	3 days[1D,2D]	

Infection	Key points	Medicine	Doses		Length	Visual summary
			Adult	Child		
Pericoronitis Public Health England Last updated: Nov 2017	Refer to dentist for irrigation and debridement.[1D] If persistent swelling or systemic symptoms,[1D] use metronidazole[1D,2A+,3B+] or amoxicillin.[1D,3B+] Use antiseptic mouthwash if pain and trismus limit oral hygiene.[1D]	metronidazole[1D,2A+,3B+] **OR**	400mg TDS[1D]	BNF for children	3 days[1D,2A+]	*Not available. Access supporting evidence and rationales on the PHE website*
		amoxicillin[1D,3B+]	500mg TDS[1D]	BNF for children	3 days[1D]	
		chlorhexidine 0.2% (do not use within 30 minutes of toothpaste)[1D] **OR**	1 minute BD with 10ml[1D]	BNF for children	Until less pain allows for oral hygiene[1D]	
		hydrogen peroxide 6%[1D]	2 to 3 minutes BD/TDS with 15ml in ½ glass warm water[1D]	BNF for children		
Dental abscess Public Health England Last updated: Oct 2018	Regular analgesia should be the first option[1A+] until a dentist can be seen for urgent drainage,[1A+,2B-,3A+] as repeated courses of antibiotics for abscesses are not appropriate.[1A+,4A+] Repeated antibiotics alone, without drainage, are ineffective in preventing the spread of infection.[1A+,5C] Antibiotics are only recommended if there are signs of severe infection,[3A+] systemic symptoms,[1A+,2B-,4A+] or a high risk of complications.[1A+] Patients with severe odontogenic infections (cellulitis,[1A+,3A+] plus signs of sepsis;[3A+,4A+] difficulty in swallowing;[6D] impending airway obstruction)6D should be referred urgently for hospital admission to protect airway,6D for surgical drainage3A+ and for IV antibiotics.[3A+] The empirical use of cephalosporins,[6D] co-amoxiclav,[6D] clarithromycin,[6D] and clindamycin[6D] do not offer any advantage for most dental patients,[6D] and should only be used if there is no response to first-line drugs.[6D]					
	If pus is present, refer for drainage,[1A+,2B-] tooth extraction,[2B-] or root canal.[2B-] Send pus for investigation.[1A+] If spreading infection[1A+] (lymph node involvement[1A+,4A+] or systemic signs,[1A+,2B-,4A+] that is, fever[1A+] or malaise)[4A+] ADD metronidazole.[6D,7B+] Use clarithromycin in true penicillin allergy[6D] and, if severe, refer to hospital.[3A+,6D]	amoxicillin[6D,8B+,9C,10B+] **OR**	500mg to 1000mg TDS[6D]	BNF for children	Up to 5 days; [6D,10B+] review at 3 days[9C,10B+]	*Not available. Access supporting evidence and rationales on the PHE website*
		phenoxymethylpenicillin[11B-]	500mg to 1000mg QDS[6D]	BNF for children		
		metronidazole[6D,8B+,9C]	400mg TDS[6D]	BNF for children		
		Penicillin allergy: clarithromycin[6D]	500mg BD[6D]	BNF for children		

▼ Abbreviations

BD, twice a day; eGFR, estimated glomerular filtration rate; IM, intramuscular; IV, intravenous; MALToma, mucosa-associated lymphoid tissue lymphoma; m/r, modified release; MRSA, methicillin-resistant *Staphylococcus aureus*; MSM, men who have sex with men; stat, given immediately; OD, once daily; TDS, 3 times a day; QDS, 4 times a day.

Infective Endocarditis

Treatment guides

- Drug selection is initially guided by Gram-stain until definitive identification antibiotic sensitivities are available.
- If an acute presentation (days), native valve, treat for Staph. aureus, β-hemolytic Strep., and aerobic Gram-negative bacilli until culture results available.
- Consider vancomycin (target trough concentration of 15-20 mcg/mL) plus cefepime 2 g IV every 8 hours.

Treatment guides

- Drug selection is initially guided by Gram-stain until definitive identification antibiotic sensitivities are available.
- If a subacute presentation (weeks), native valve, treat for Staph. aureus, Strep. viridians, HACEK, and Enterococcus until culture results available.
- Consider consider vancomycin (target trough concentration of 15-20 mcg/mL) plus ampicillin-sulbactam 3 g IV every 6 hours.

Treatment guides

- If prosthetic valve and <1yr has passed since placement, treat for Staph., Enterococcus, and aerobic Gram-negative bacilli until culture results available.
- Consider vancomycin (target trough concentration of 15-20 mcg/mL) plus gentamicin 1 mg/kg IV every 8 hours and cefepime 2 g IV every 8 hours
- If staphylococcal prosthetic valve endocarditis is identified, rifampin can be added 3-5 days after culture clearance

Treatment guides

- If prosthetic valve and >1yr has passed since placement, treat for Staph., Strep. Viridians, and Enterococcus until culture results available.
- Consider vancomycin (target trough concentration of 15-20 mcg/mL) plus ceftriaxone 2 g IV every 24 hours

- Antifungal therapy is generally not started empirically.

- No routine anticoagulation

Treatment guides

- Indications for surgery
- Heart failure due to valvular dysfunction
- Left-sided endocarditis due to *Staphylococcus aureus*, fungi or highly resistant organisms
- Persistent bacteremia despite therapy
- Cardiac complications such as annular or aortic abscess and heart block.

HIV THERAPY

When to initiate ART

- The optimal time to initiate antiretroviral therapy in adult patients with CD4 count >350 cells/μl is not well defined.
- For HIV-infected patients older than 50 years of age, antiretroviral therapy (ART) is recommended for all, regardless of CD4 cell count.
- Older patients frequently have a blunted immune response
- Older patients have high virologic response rates.
- Older patients have relatively poor CD4 cell increases in response to antiretroviral therapy as measured by an increase of CD4 count by 100 cells/fl

When to initiate ART

- Older HIV-infected patients have a greater risk of developing serious non-AIDS complications.
- Patients >55 years old may be at higher clinical risk even after starting therapy
- The administration of ART during pregnancy or intrapartum significantly reduces the risk of mother-to-child transmission
- A 96% reduction in transmission between sero-discordant heterosexual couples when the positive partner was receiving ART

Necessary testing

- 20-25% drug naïve patients possess resistant strains.
- Reverse transcriptase and protease genotypic resistance testing should be used to guide selection of a regimen
- If transmitted integrase strand transfer inhibitor resistance is a concern, testing should also include the integrase gene
- HLA-B*5701 testing should be performed before initiation of abacavir (ABC).
- Patients should be screened for hepatitis B and hepatitis C virus infection before initiating ART

Necessary testing

- A co-receptor tropism assay should be performed whenever the use of a CCR5 co-receptor antagonist is being considered
- Co-receptor tropism testing is recommended for patients who exhibit virologic failure on a CCR5 antagonist
- A phenotypic tropism assay is preferred to determine HIV-1 co-receptor usage
- A genotypic tropism as an alternative
- A proviral DNA tropism assay can be utilized for patients with undetectable HIV-1 RNA when a CCR5 antagonist is considered for use

Monitor therapy

- HIV screening is recommended to begin at age 13
- Two surrogate markers are used to monitor people with HIV:
- Plasma HIV RNA (viral load) to assess level of HIV viremia
- CD4 T lymphocyte cell count to assess immune function.

Outcomes

- With maximally suppressed viral loads (200 copies/fl), life expectancy approaches that of non-HIV infected population
- Therapy that achieves a plasma viral load of < 50 copies/mL has been shown to provide a durable response to the therapy employed.

Outcomes

- Those with less cumulative time with detectable plasma viremia are less likely to suffer certain complications:
- Cardiovascular disease
- Neurocognitive dysfunction
- Decreased risk of severe bacterial infections
- Malignancies

ART complications

- ART initiation is associated with a risk of immune reconstitution inflammatory syndrome (IRIS).
- IRIS is a clinical syndrome characterized by new or worsening infectious and non-infectious complications observed after the initiation of ART
- The risk of IRIS increases when ART is begun:
- At low CD4 cell counts (<100 cells/fl)
- With the presence of cryptococcal or TB meningitis
- With cutaneous Kaposi's sarcoma

Monitor therapy

- HIV screening is recommended to begin at age 13
- Two surrogate markers are used to monitor people with HIV:
- Plasma HIV RNA (viral load) to assess level of HIV viremia
- CD4 T lymphocyte cell count to assess immune function.

Initial treatment regimen

- An antiretroviral regimen for a treatment-naive patient generally consists of two nucleoside reverse transcriptase inhibitors (NRTIs) administered in combination with a third active drug from one of three drug classes:
- An integrase strand transfer inhibitor (INSTI)
- A non-nucleoside reverse transcriptase inhibitor (NNRTI)
- A protease inhibitor (PI) with a pharmacokinetic (PK) enhancer (also known as a booster)

Pharmacologic therapy

- Six distinct classes of drugs:
- Nucleoside and nucleotide reverse transcriptase inhibitors (NRTI)
- Integrase strand transfer inhibitors (INSTI)
- Non-nucleoside reverse transcriptase inhibitors (NNRTI)
- Protease inhibitors (PI)
- CCR5 co-receptor antagonists
- Entry or Fusion inhibitors (EI)

Drug names

- Nucleoside reverse transcriptase inhibitors (NRTI)
- ABC abacavir
- 3TC lamivudine
- FTC emtricitabine
- TAF tenofovir alafenamide
- TDF tenovir disoproxil fumarate
- CCR5 antagonists
- MVC maraviroc
- Entry Inhibitors (EI)
- IBA ibalizumab

Drug names

- Protease Inhibitors (PI)
- DRV/c darunavir with cobicistat
- DRV/r darunavir with ritonavir
- Integrase strand inhibitors (INSTI)
- BIC bictegravir
- DTG dolutegravir
- RAL raltegravir
- EVG/c elvitegravir with cobicistat
- Non-nucleoside reverse transcriptase inhitibots (NNRTI)
- NVP nevarapine

Table 6a. Recommended Antiretroviral Regimens for Initial Therapy

Recommended Initial Regimens for Most People with HIV
Recommended regimens are those with demonstrated durable virologic efficacy, favorable tolerability and toxicity profiles, and ease of use.
INSTI plus 2 NRTIs: **Note**: For individuals of childbearing potential, see Table 6b before prescribing one of these regimens. • BIC/TAF/FTC **(AI)** • DTG/ABC/3TC **(AI)—if HLA-B*5701 negative** • DTG plus (TAF or TDF)[a] plus (FTC or 3TC) **(AI)** • RAL plus (TAF or TDF)[a] plus (FTC or 3TC) (**BI** for TDF/[FTC or 3TC], **BII** for TAF/FTC) **INSTI plus 1 NRTI**: • DTG/3TC **(AI)**, except for individuals with HIV RNA >500,000 copies/mL, HBV coinfection, or in whom ART is to be started before the results of HIV genotypic resistance testing for reverse transcriptase or HBV testing are available

Recommended Initial Regimens in Certain Clinical Situations

These regimens are effective and tolerable but have some disadvantages when compared with the regimens listed above or have less supporting data from randomized clinical trials. However, in certain clinical situations, one of these regimens may be preferred (see Table 7 for examples).

INSTI plus 2 NRTIs:

Note: For individuals of childbearing potential, see Table 6b before prescribing one of these regimens.

- EVG/c/(TAF or TDF)[a]/FTC **(BI)**

Boosted PI plus 2 NRTIs:

- In general, boosted DRV is preferred over boosted ATV
- (DRV/c or DRV/r) plus (TAF or TDF)[a] plus (FTC or 3TC) **(AI)**
- (ATV/c or ATV/r) plus (TAF or TDF)[a] plus (FTC or 3TC) **(BI)**
- (DRV/c or DRV/r) plus ABC/3TC—**if HLA-B*5701 negative (BII)**

NNRTI plus 2 NRTIs:

- DOR/TDF[a]/3TC **(BI)** or DOR plus TAF[a]/FTC **(BIII)**
- EFV plus (TAF or TDF)[a] plus (FTC or 3TC)
  - EFV 600 mg plus TDF plus (FTC or 3TC) **(BI)**
  - EFV 400 mg/TDF/3TC **(BI)**
  - EFV 600 mg plus TAF/FTC **(BII)**
- RPV/(TAF or TDF)/FTC **(BI)—if HIV RNA <100,000 copies/mL and CD4 count >200 cells/mm^3**

Regimens to Consider when ABC, TAF, and TDF Cannot be Used or Are Not Optimal:

- DTG/3TC **(AI)**, except for individuals with HIV RNA >500,000 copies/mL, HBV coinfection, or in whom ART is to be started before the results of HIV genotypic resistance testing for reverse transcriptase or HBV testing are available
- DRV/r plus RAL twice a day **(CI)—if HIV RNA <100,000 copies/mL and CD4 count >200 cells/mm^3**
- DRV/r once daily plus 3TC[a] **(CI)**

Table 7. Antiretroviral Regimens Recommended for Initial Therapy for HIV Infection in Children

Preferred Regimens			
Age	**Regimens**		**FDC Available** (see Appendix A, Table 1)
Infants, Birth to Age <14 Days[a,b]	Two NRTIs **plus** NVP		No
	Weight ≥2 kg	Two NRTIs **plus** RAL[c]	No
Children Aged ≥14 Days to <3 Years	Two NRTIs **plus** LPV/r[b]		No
	Weight ≥2 kg	Two NRTIs **plus** RAL[c]	No
Children Aged ≥3 Years	Weight <25 kg	Two NRTIs **plus** ATV/r	No
		Two NRTIs **plus** twice-daily DRV/r[d]	No
		Two NRTIs **plus** RAL[c]	No
	Weight ≥25 kg	Two NRTIs **plus** DTG[e]	Yes
		Two NRTIs **plus** EVG/c[f]	Yes
Adolescents Aged ≥12 Years with SMRs of 1–3	Weight ≥25 kg	Two NRTIs **plus** BIC[g]	Yes

Once daily dosing

Available as a Multi-Tablet Regimen with Once-Daily Dosing		
Tenofovir alafenamide/ emtricitabine *and* dolutegravir* (TAF 25 mg/FTC *and* DTG; Descovy *and* Tivicay)	• Initiate ***only*** in patients with CrCl ≥30 mL/min. • Documented DTG resistance after initiation in treatment-naive patients is rare. • Contains 25 mg of TAF, unboosted. • Magnesium- or aluminum-containing antacids may be taken 2 hours before or 6 hours after DTG; calcium-containing antacids or iron supplements may be taken simultaneously if taken with food.	A1
Tenofovir alafenamide/ emtricitabine *and* raltegravir (TAF 25 mg/FTC *and* RAL HD; Descovy *and* Isentress HD)	• Initiate ***only*** in patients with CrCl ≥30 mL/min. • To date, no clinical trials have been conducted with TAF and RAL; data are based on bioequivalence pharmacokinetic studies. • Contains 25 mg of TAF, unboosted. • Administer as TAF/FTC once daily and RAL HD 1200 mg once daily, dosed as two 600 mg HD tablets. • Magnesium- or aluminum-containing antacids are contraindicated; co-administration of calcium-containing antacids is not recommended with RAL HD.	

Nucleoside reverse transcriptase inhibitors

- Competitively inhibit nucleotide binding to reverse transcriptase and terminate the DNA chain
- Lack a 3’-OH group
- Require phosphorylation to be active
- Tenovir is a nucleotide reverse transcriptase inhibitor and does not require phosphorylation to be active
- Adverse effects include bone marrow suppression and peripheral neuropathy
- Lactic acidosis (nucleosides only)

Nucleoside reverse transcriptase inhibitors

- Emtricitabine has few adverse effects
- Selects for the M184V resistance mutation which confers high-level resistance
- Improves susceptibility to tenofovir.
- 5-8% of patients who begin abacavir have hypersensitivity reactions (HSRs).
- Risk highly associated with the presence of the HLA-B*5701 allele.
- Triple NRTI regimens are biologically inferior.

Non-nucleoside reverse transcriptase inhibitors

- Bind to reverse transcriptase at a site that differs from NRTIs.
- Do not require phosphorylation to be active
- Do not compete with nucleotides
- Rash and hepatotoxicity as common adverse events
- CNS symptoms common with efavirenz
- Not for use in pregnancy either
- Resistance mutations affect all NNRTIs

Integrase strand inhibitors

- INSTI-based regimens have quickly become the recommended regimens because of their virologic efficacy, lack of drug interactions, and favorable toxicity profile.
- Prevent viral integration into host genome
- BIC and DTG, the second-generation INSTIs, have higher barriers to resistance than the first-generation INSTIs RAL and EVG and may have more activity against non-B subtypes of HIV
- TDF has higher renal and bone adverse effects than does TAF
- Hypercholesterolemia may be seen

Protease inhibitors

- Advantages include excellent virologic potency and a high barrier to drug resistance (since multiple mutations are required for a patient to develop resistance).
- Because PIs are metabolized via hepatic enzymes, these drugs have the potential for multiple drug interactions.
- They may also be associated with metabolic complications such as dyslipidemia, fat maldistribution, and insulin resistance.
- CYP34A inhibitors

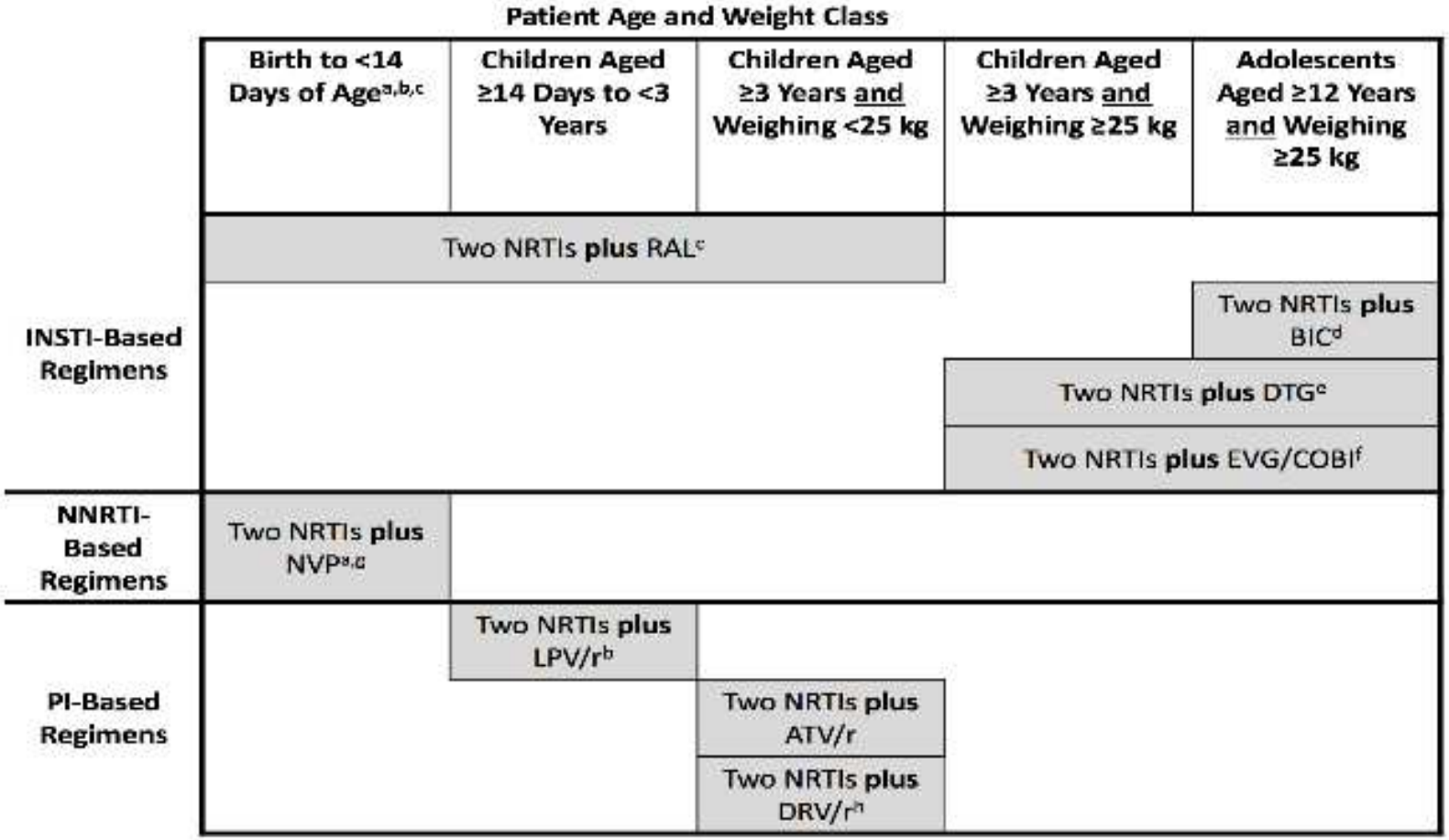
Other inhibitors

- CCR5 antagonists
- Maraviroc binds to CCR5, preventing an interaction with gp120.
- CD4 post-attachment inhibitors
- Ibaluzimab is a monoclonal antibody that binds to domain 2 of CD4 and interferes with post-attachment steps required for the entry of HIV-1 virus particles into host cells and prevents the viral transmission that occurs via cell-cell fusion.

When to initiate ART therapy in children

- Antiretroviral therapy is initiated in infants <12 months of age regardless of clinical status, CD4 count, or viral load.
- The 1-year risk of AIDS or death is substantially higher in younger than older children at any given level of CD4 count, particularly for infants age <12 months.
- Always test for drug resistance.

Figure 1. Preferred Regimen by Age, Weight, and Drug Class



Pediatric therapy

- When combined with two NRTIs, the following drugs and drug combinations are considered Preferred regimens for children:
- Children aged <14 days: NVP
- NVP is associated with rare occurrences of significant hypersensitivity reactions (HSRs).
- Low barrier to viral resistance.
- Switch to another regimen at 15 days of age
- Children aged <14 days and weighing ≥2 kg: Raltegravir (RAL)
- Children aged ≥14 days to <3 years: LPV/r or RAL

Pediatric therapy

- RAL plus a two-NRTI backbone is recommended as a Preferred INSTI-based regimen for infants and children from birth to age 3 years who weigh ≥2 kg and for children aged ≥3 years and weighing <25 kg
- Viral mutation affects all NNRTI drug class

Pediatric therapy

- BIC/FTC/TAF is recommended as a Preferred INSTI-based regimen for adolescents aged ≥12 years and weighing ≥25 kg
- DTG plus a two-NRTI backbone is recommended as a Preferred INSTI-based regimen for children and adolescents aged ≥3 years and weighing ≥25 kg
- Under 20kg, PK varies
- EVG/c/FTC/TAF is recommended as a Preferred INSTI-based regimen for children and adolescents weighing ≥25 kg who have creatinine clearance (CrCl) ≥30 mL/min

Pediatric therapy

- Children aged ≥3 years and
- Weighing <25 kg: Atazanavir/ritonavir (ATV/r), twice-daily darunavir/ritonavir (DRV/r), or RAL
- Weighing ≥25 kg: Dolutegravir (DTG)
- Weighing ≥25 kg: Elvitegravir/cobicistat (EVG/c). Adolescents aged ≥12 years and weighing ≥25 kg: Bictegravir (BIC).

Pediatric therapy

- ATV/r plus a two-NRTI backbone is recommended as a Preferred PI-based regimen for children aged ≥3 years and weighing <25 kg.
- DRV/r plus a two-NRTI backbone is recommended as a Preferred PI-based regimen for children aged ≥3 years and weighing ≥10 kg but <25 kg
- Dosing frequency depends upon age and viral mutations
- LPV/r plus a two-NRTI backbone is recommended as a Preferred PI-based regimen for infants with a postmenstrual age ≥42 weeks and postnatal age ≥14 days to <3 years

Other combinations

- ABC plus 3TC or FTC is recommended as the Preferred dual-NRTI combination for children aged ≥3 months
- FTC/TAF is recommended as a Preferred dual-NRTI combination in children and adolescents weighing ≥25 kg who have estimated CrCl ≥30 mL/min when this combination is used with an INSTI or NNRTI
- FTC/ATF is considered a Preferred dual-NRTI combination when used with a PI in children and adolescents weighing ≥35 kg who have estimated CrCl ≥30 mL/min
- EVG/c/FTC/TAF for children and adolescents weighing ≥25 kg

Pregnancy

- Zidovudine/lamivudine remains as the preferred option in pregnant women.
- This dual-NRTI has the most safety and efficacy data for both mother and newborn.
- Infants who are identified as HIV-infected during the first 6 weeks of life while receiving zidovudine chemoprophylaxis should have zidovudine discontinued and initiate treatment with combination therapy with at least 3 drugs.
- Trimethoprim-sulfasoxazole prophylaxis.

Exposure prophylaxis

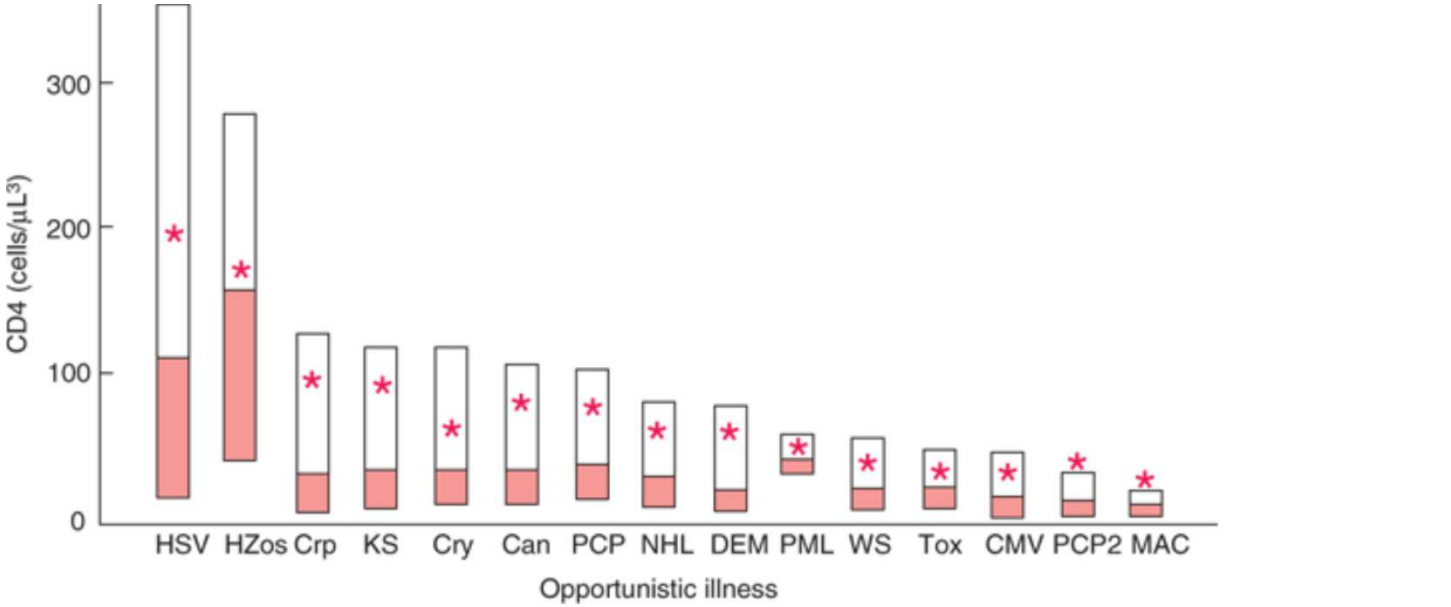
- Pre-exposure prophylaxis with tenofovir and emtricitabine.
- Post-exposure prophylaxis with a 28 day course of ART therapy.
- This is not 100% effective in blocking HIV infection.

Pre-exposure protection

Table 10: Recommended Oral PrEP Medications

Generic Name	Trade Name	Dose
Tenofovir disoproxil fumarate (TDF)	Viread	300 mg
Emtricitabine (FTC)[a]	Emtriva	200 mg
TDF + FTC	Truvada	300mg/200 mg

CD4 counts and development of opportunistic infections



Boxplot of the median (line inside the box), first quartile (bottom of the box), third quartile (top of the box), and mean (asterisk) CD4+ lymphocyte count at the time of the development of opportunistic disease. Can, candidal esophagitis; CMV, cytomegalovirus infection; Crp, cryptosporidiosis; Cry, cryptococcal meningitis; DEM, AIDS dementia complex; HSV, herpes simplex virus infection; HZos, herpes zoster; KS, Kaposi's sarcoma; MAC, Mycobacterium avium complex bacteremia; NHL, non-Hodgkin's lymphoma; PCP, primary Pneumocystis jiroveci pneumonia; PCP2, secondary P. jiroveci pneumonia; PML, progressive multifocal leukoencephalopathy; Tox, Toxoplasma gondii encephalitis; WS, wasting syndrome. (From RD Moore, RE Chaisson: Ann Intern Med 124:633, 1996.)

Accessed 02/03/2016

Opportunistic infections

- CD4 <250 Coccidiomycosis
- Endemic in Sonoran life zone
- Fluconazole prophylaxis
- CD4 <200 Pneumocystis jiroveci
- Trimethoprim-sulfamethoxazole prophylaxis
- CD4 <150 Histoplasma capsulatum (Ohio valley)
- Itraconazole prophylaxis
- CD4 <100 Toxoplasma gondii
- Trimethoprim-sulfamethoxazole prophylaxis

Opportunistic infections

- CD4 <100 Penicillosis
- Endemic in SE Asia
- Fluconazole prophylaxis
- CD4 <50 Mycobacterium avium complex
- Azithromycin prophylaxis

CDC Immunization Guidelines

Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2024

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
COVID-19	1 or more doses of updated (2023–2024 Formula) vaccine (See Notes)			
Influenza inactivated (IIV4) or **Influenza recombinant** (RIV4)	1 dose annually			
or	or			
Influenza live, attenuated (LAIV4)	1 dose annually			
Respiratory Syncytial Virus (RSV)	Seasonal administration during pregnancy. See Notes.			≥60 years
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes)			
	1 dose Tdap, then Td or Tdap booster every 10 years			
Measles, mumps, rubella (MMR)	1 or 2 doses depending on indication (if born in 1957 or later)			For healthcare personnel, see notes
Varicella (VAR)	2 doses (if born in 1980 or later)		2 doses	
Zoster recombinant (RZV)	2 doses for immunocompromising conditions (see notes)		2 doses	
Human papillomavirus (HPV)	2 or 3 doses depending on age at initial vaccination or condition	27 through 45 years		
Pneumococcal (PCV15, PCV20, PPSV23)				See Notes
				See Notes
Hepatitis A (HepA)	2, 3, or 4 doses depending on vaccine			
Hepatitis B (HepB)	2, 3, or 4 doses depending on vaccine or condition			
Meningococcal A, C, W, Y (MenACWY)	1 or 2 doses depending on indication, see notes for booster recommendations			
Meningococcal B (MenB)	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations			
	19 through 23 years			
***Haemophilus influenzae* type b** (Hib)	1 or 3 doses depending on indication			
Mpox				

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of immunity

Recommended vaccination for adults with an additional risk factor or another indication

Recommended vaccination based on shared clinical decision-making

No recommendation/ Not applicable

Table 2 Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2024

Always use this table in conjunction with Table 1 and the Notes that follow. Medical conditions or indications are often not mutually exclusive. If multiple medical conditions or indications are present, refer to guidance in all relevant columns. See Notes for medical conditions or indications not listed.

VACCINE	Pregnancy	Immunocompromised (excluding HIV infection)	HIV infection CD4 percentage and count		Men who have sex with men	Asplenia, complement deficiency	Heart or lung disease	Kidney failure, End-stage renal disease or on dialysis	Chronic liver disease; alcoholism[a]	Diabetes	Healthcare Personnel[b]
			<15% or <200mm³	≥15% and ≥200mm³							
COVID-19		See Notes									
IIV4 or RIV4	1 dose annually										
LAIV4					1 dose annually if age 19–49 years		1 dose annually if age 19–49 years				
RSV	Seasonal administration. See Notes	See Notes				See Notes					
Tdap or Td	Tdap: 1 dose each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years									
MMR	*										
VAR	*			See Notes							
RZV		See Notes									
HPV	*	3 dose series if indicated									
Pneumococcal											
HepA											
Hep B	See Notes									Age ≥ 60 years	
MenACWY											
MenB											
Hib		HSCT: 3 doses[c]				Asplenia: 1 dose					
Mpox	See Notes				See Notes						See Notes

Recommended for all adults who lack documentation of vaccination, **OR** lack evidence of immunity

Not recommended for all adults, but recommended for some adults based on either age **OR** increased risk for or severe outcomes from disease

Recommended based on shared clinical decision-making

Recommended for all adults, and additional doses may be necessary based on medical condition or other indications. See Notes.

Precaution: Might be indicated if benefit of protection outweighs risk of adverse reaction

Contraindicated or not recommended
*Vaccinate after pregnancy, if indicated

No Guidance/ Not Applicable

a. Precaution for LAIV4 does not apply to alcoholism.

b. See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations.

c. Hematopoietic stem cell transplant.

Table 1 Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, United States, 2024

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars.
To determine minimum intervals between doses, see the catch-up schedule (Table 2).

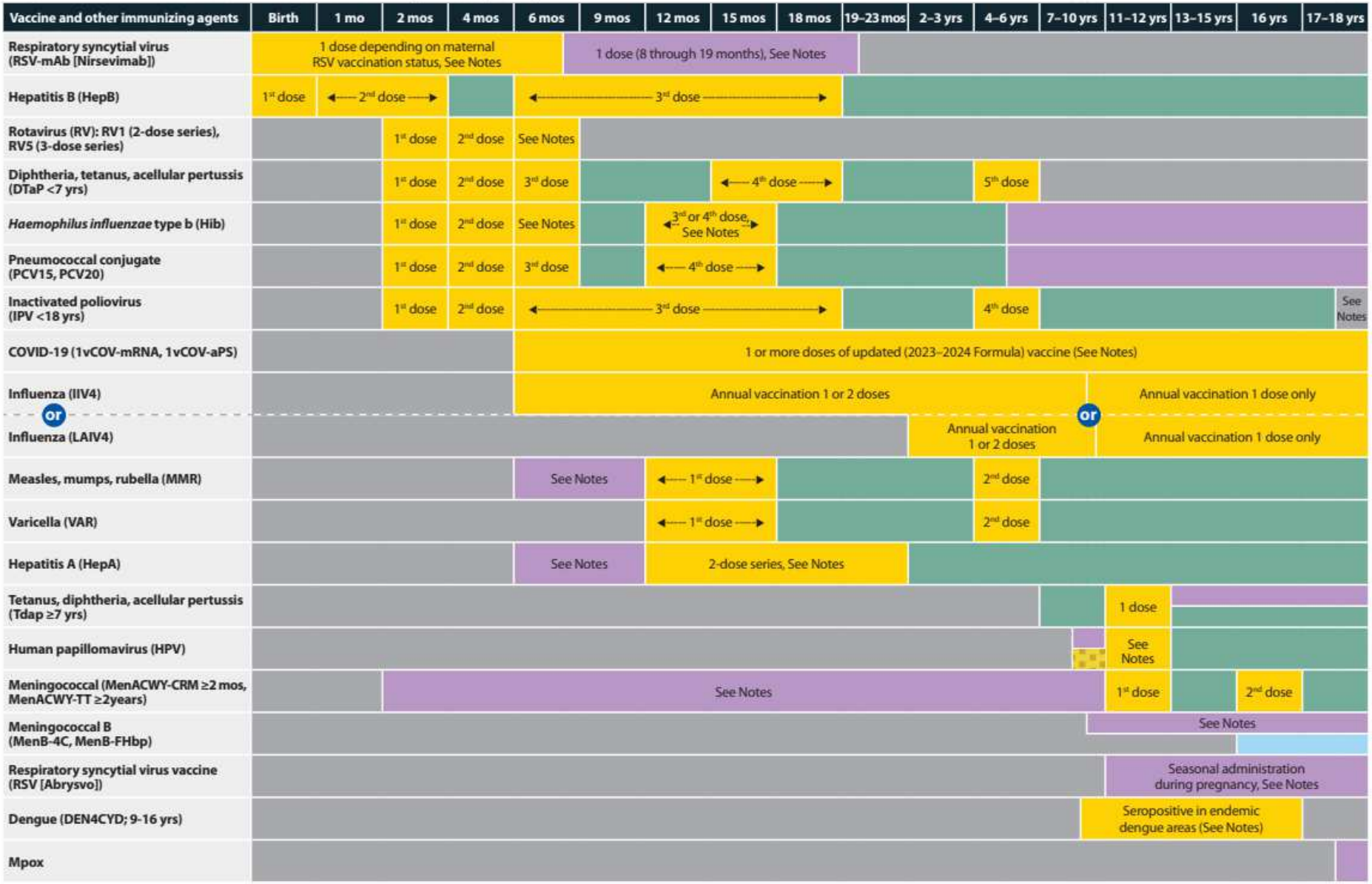


Table 3 Recommended Child and Adolescent Immunization Schedule by Medical Indication, United States, 2024

Always use this table in conjunction with Table 1 and the Notes that follow. Medical conditions are often not mutually exclusive. If multiple conditions are present, refer to guidance in all relevant columns. See Notes for medical conditions not listed.

Vaccine and other immunizing agents	Pregnancy	Immunocompromised (excluding HIV infection)	HIV infection CD4 percentage and count[a]		CSF leak or cochlear implant	Asplenia or persistent complement component deficiencies	Heart disease or chronic lung disease	Kidney failure, End-stage renal disease or on Dialysis	Chronic liver disease	Diabetes
			<15% or <200mm	≥15% and ≥200mm						
RSV-mAb (nirsevimab)		2nd RSV season		1 dose depending on maternal RSV vaccination status, See Notes			2nd RSV season for chronic lung disease (See Notes)	1 dose depending on maternal RSV vaccination status, See Notes		
Hepatitis B										
Rotavirus		SCID[b]								
DTaP/Tdap	DTaP Tdap: 1 dose each pregnancy									
Hib		HSCT: 3 doses	See Notes			See Notes				
Pneumococcal										
IPV										
COVID-19		See Notes								
IIV4										
LAIV4							Asthma, wheezing: 2–4 years[c]			
MMR	*									
VAR	*									
Hepatitis A										
HPV	*	3 dose series. See Notes								
MenACWY										
MenB										
RSV (Abrysvo)	Seasonal administration, See Notes									
Dengue										
Mpox	See Notes									

Recommended for all age-eligible children who lack documentation of a complete vaccination series

Not recommended for all children, but is recommended for some children based on increased risk for or severe outcomes from disease

Recommended for all age-eligible children, and additional doses may be necessary based on medical condition or other indications. See Notes.

Precaution: Might be indicated if benefit of protection outweighs risk of adverse reaction

Contraindicated or not recommended
*Vaccinate after pregnancy, if indicated

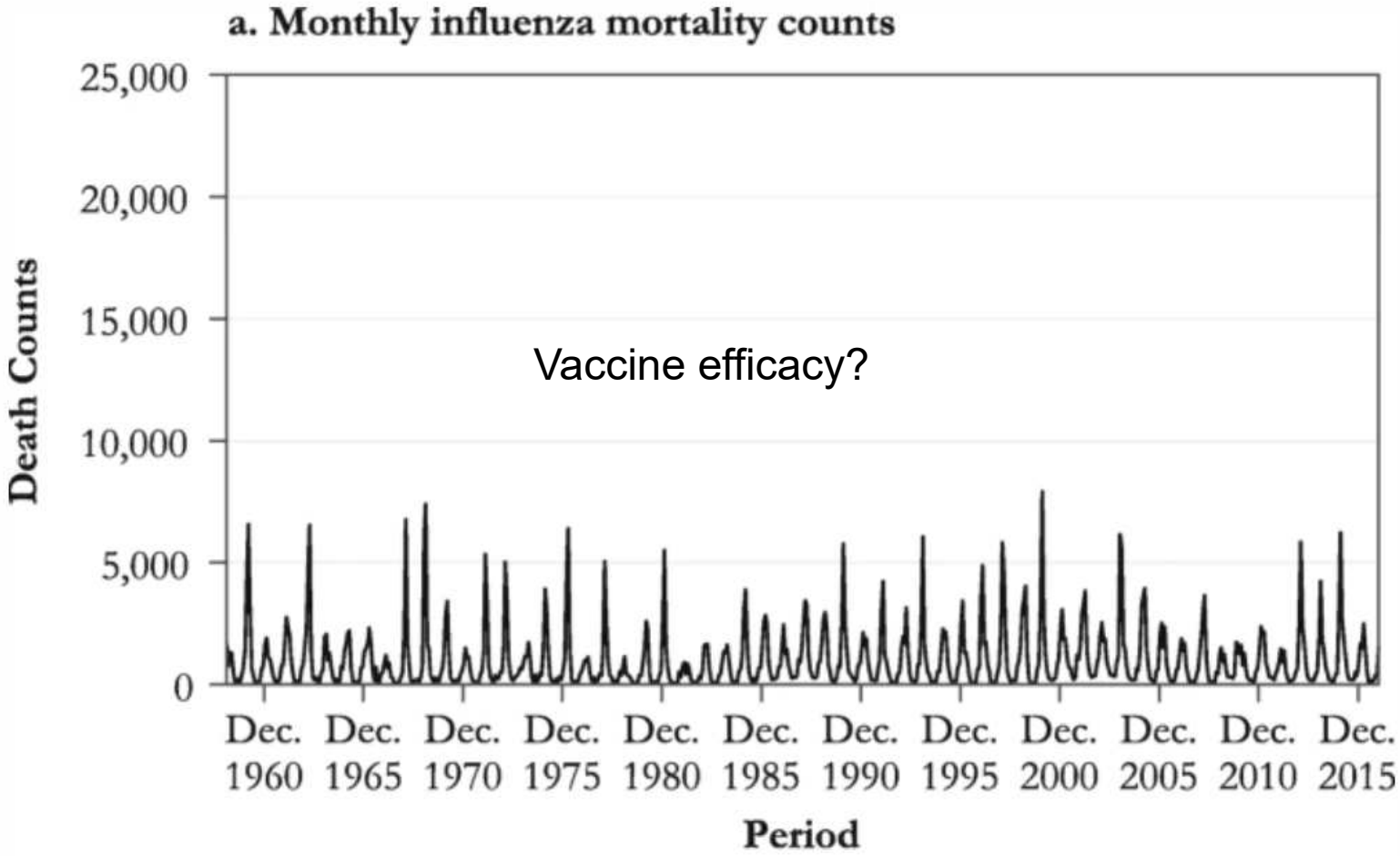
No Guidance/ Not Applicable

a. For additional information regarding HIV laboratory parameters and use of live vaccines, see the General Best Practice Guidelines for Immunization, "Altered Immunocompetence," at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompetence.html and Table 4-1 (footnote J) at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html.

b. Severe Combined Immunodeficiency

c. LAIV4 contraindicated for children 2–4 years of age with asthma or wheezing during the preceding 12 months

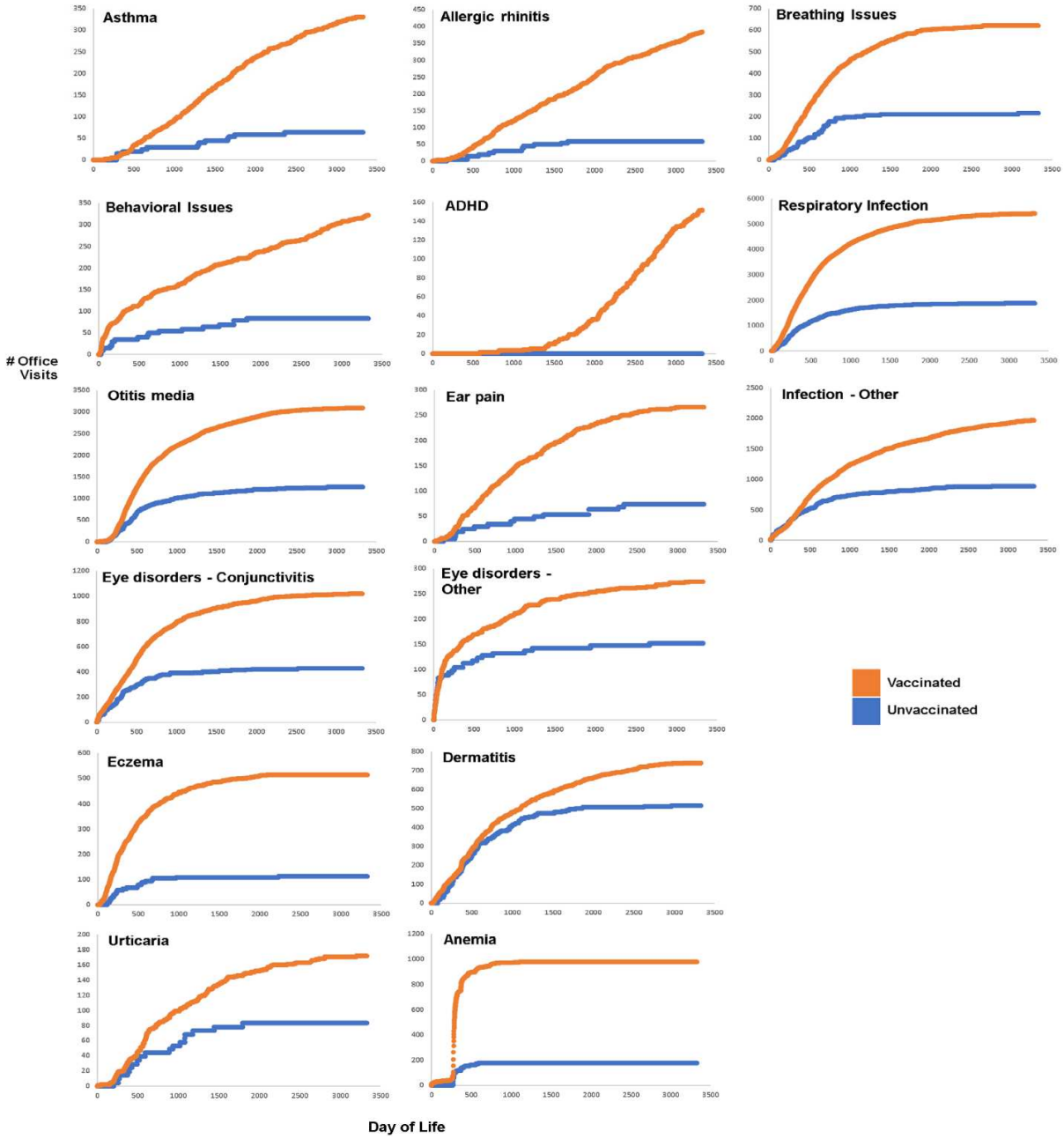
Fig. 3


a. Monthly influenza mortality counts
Death Counts
25,000
20,000
15,000
10,000
5,000
0
Vaccine efficacy?
Dec. 1960
Dec. 1965
Dec. 1970
Dec. 1975
Dec. 1980
Dec. 1985
Dec. 1990
Dec. 1995
Dec. 2000
Dec. 2005
Dec. 2010
Dec. 2015
Period

DOD
Deployment immunization guidelines

Vaccine	Administration
Anthrax	• **Schedule:** 0,4w,6,12,18m + annual booster • **Route:** Intramuscular • **Dose:** 0.5ml
Chickenpox	• **Schedule:** 0, 4-8w (2 dose) or + serologic testing • **Route:** Subcutaneous • **Dose:** 0.5ml
Hepatitis A	• **Schedule:** 0, 6m (2 dose) or + serologic testing • **Route:** Intramuscular • **Dose:** 1-18 years, 0.5ml; >=19 years, 1 ml; Twinrix >=18 years, 1ml
Hepatitis B	• **Schedule:** Engerix-B, Recombivax, Twinrix: 0,1,6m (3 dose)or Heplisav-B: 0,1m (2 dose) or + serologic testing • **Route:** Intramuscular • **Dose:** Engerix-B or Recombivax: 0-19 years, 0.5ml; >=20 years, 1 ml; Twinrix >=18 years, 1ml; Heplisav-B >=18 years, 0.5mL
Influenza, Northern Hemisphere (NH)	• **Schedule:** 1 dose annually • **Route:** Intramuscular, Intranasal • **Dose:** IM 0.5ml; Intranasal 0.2ml
Influenza, Southern Hemisphere (SH)	• **Schedule:** 1 dose annually • **Route:** Intramuscular • **Dose:** IM 0.5ml
Japanese encephalitis	• **Schedule:** 0,28 d (2 dose). One-time booster dose if >11 months after series complete and still in endemic area. • **Route:** Intramuscular • **Dose:** 0.5ml

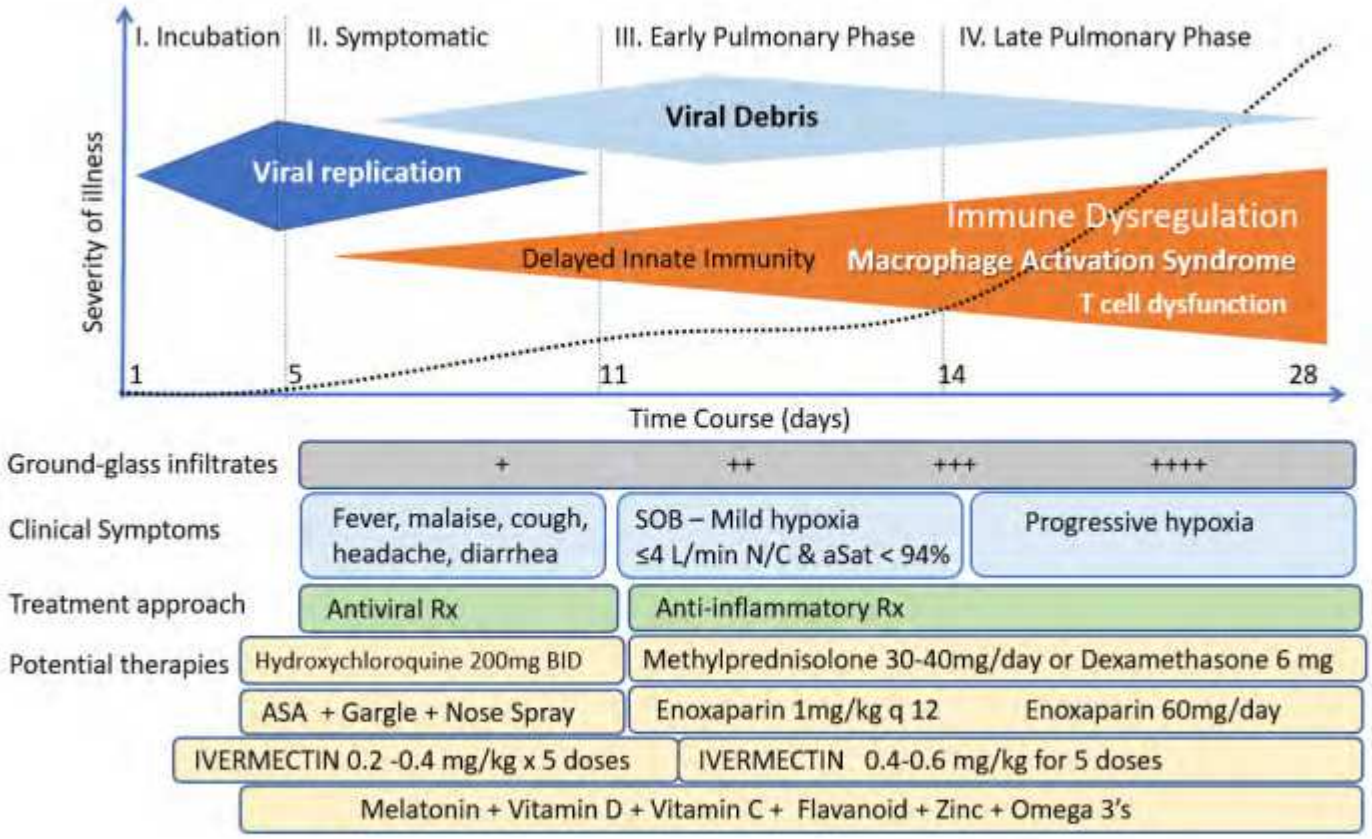
M-M-R	• **Schedule:** 2 lifetime doses or + serologic testing • **Route:** Subcutaneous • **Dose:** 0.5ml
Pneumococcal	• **Schedule:** High risk: 1 dose, Asplenic Only: 1 dose + 1 time booster if 5 yrs or greater since 1st dose • **Route:** Subcutaneous or Intramuscular • **Dose:** 0.5ml
Polio	• **Schedule:** 1 dose as adult • **Route:** Subcutaneous or Intramuscular • **Dose:** 0.5ml
Rabies	• **Schedule:** Pre-Exposure: 0,7,(21 or 28d) Booster: 2-5 yr (when titer drops >1:5) • **Route:** Intramuscular • **Dose:** 1ml
Smallpox	• **Schedule:** 1 dose, every 10 yr • **Route:** 15 percutaneous jabs for primary and re-vaccinees, over deltoid.
Tdap	• **Schedule:** 1 lifetime dose of Tdap, Td boosters every 10 yrs. For adults who previously have not received a dose of Tdap, 1 dose should be given regardless of interval since last tetanus vaccine. • **Route:** Intramuscular (Tdap, Td, Tetanus Toxoid) • **Dose:** 0.5ml (Tdap, Td, Tetanus Toxoid)
Typhoid	• **Schedule:** Injectable: every 2 yr; Oral: every 5 yr • **Route:** Intramuscular or Oral • **Dose:** IM 0.5ml; Oral, 4 capsules (day 1,3,5,7)
Yellow Fever	• **Schedule:** 1 lifetime dose. Must be administered 10 days prior to travel. • **Route:** Subcutaneous • **Dose:** 0.5ml



Lyons-Weiler J, Thomas P. Relative Incidence of Office Visits and Cumulative Rates of Billed Diagnoses Along the Axis of Vaccination. International Journal of Environmental Research and Public Health. 2020; 17(22):8674. https://doi.org/10.3390/ijerph17228674

COVID 19 PROTOCOLS

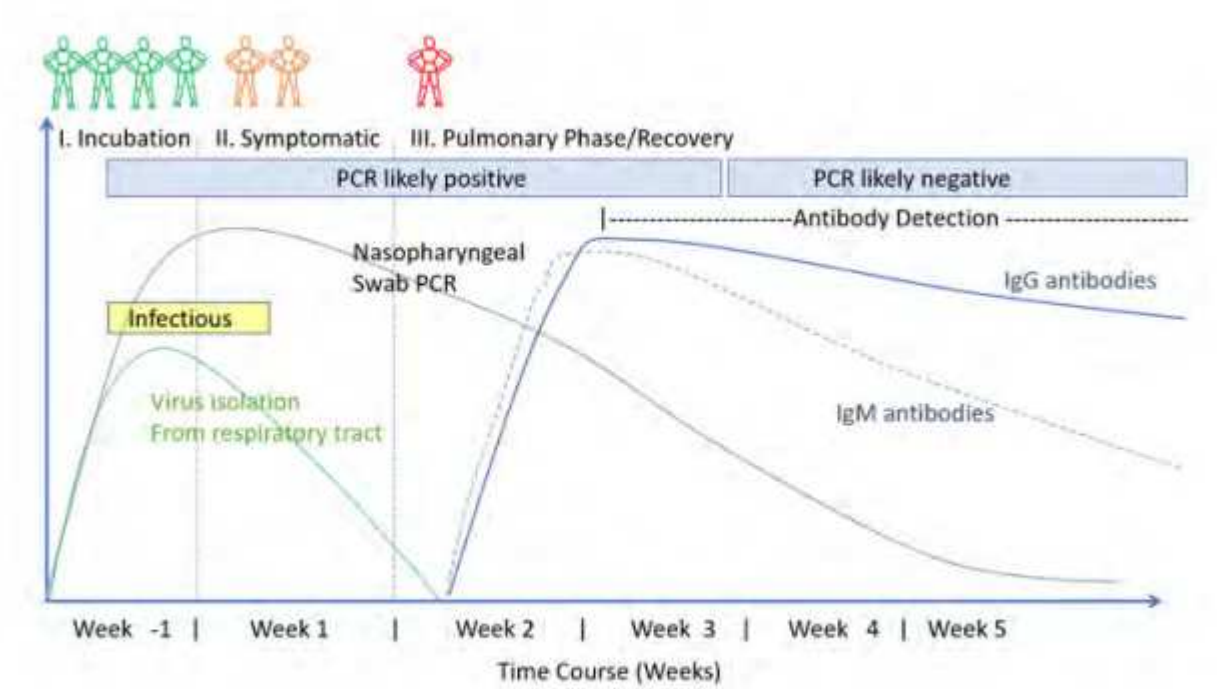
Figure 2. The Course of COVID-19 and General Approach to Treatment



Note. This time course was developed for the ancestral strain (Wuhan) as well as the Alpha, Gamma, and Delta strains. With the Omicron and newer strains, the time course has been compressed. Source: FLCCC

Accessed 01/18/2024

Figure 3. Time Course of Laboratory Tests for COVID-19



Note. This time course was developed for the ancestral strain (Wuhan) as well as the Alpha, Gamma, and Delta strains. With the Omicron and newer strains, the time course has been compressed. Source: FLCCC

Accessed 01/18/2024

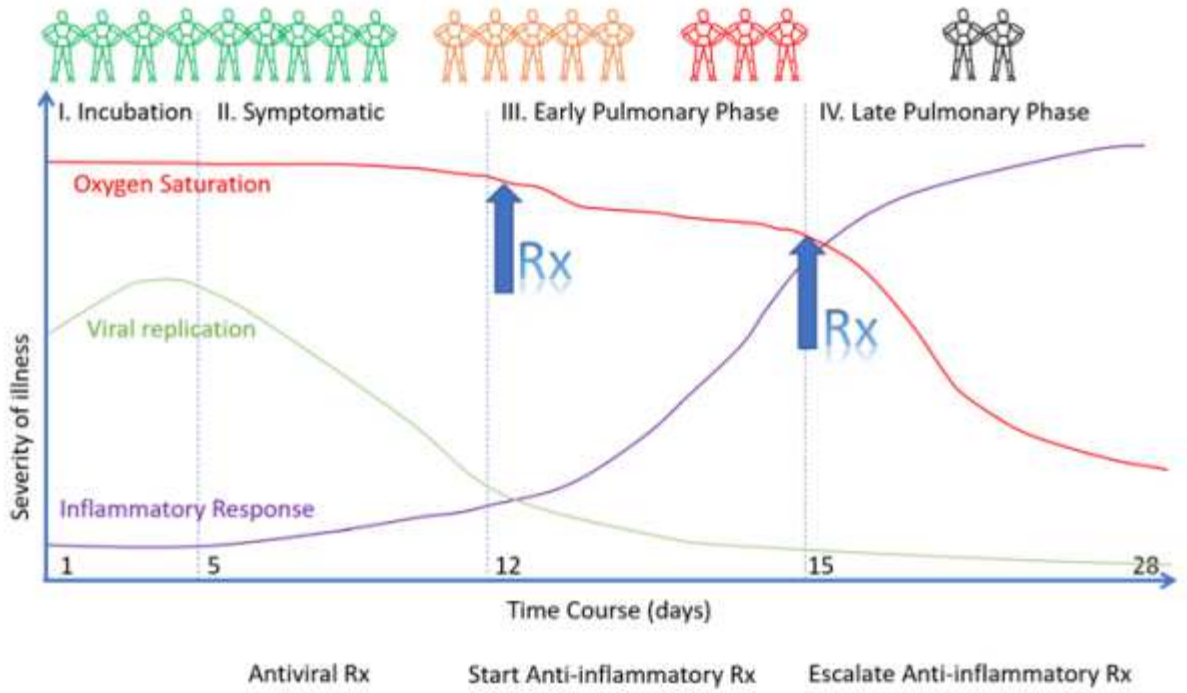
Table 1. Pharmacological Therapy for COVID-19 by Stage of Illness: What has worked and what has failed

	Pre-exposure/ Post-Exposure/Incubation	Symptomatic Phase	Pulmonary/ inflammatory phase
Ivermectin	BENEFIT	BENEFIT	BENEFIT
Hydroxychloroquine	Benefit**	Benefit**	?Trend to harm
Corticosteroids	n/a	Trend to harm	BENEFIT
Anti-androgen Rx	? Benefit	Benefit	BENEFIT
LMWH	n/a	n/a	BENEFIT
Paxlovid/Molnupiravir	n/a	No Benefit	n/a
Monoclonal Abs	No Benefit	No benefit	HARM
Lopivinar-Ritonavir	n/a	No benefit	No benefit
Tocilizumab	n/a	n/a	Unclear Benefit
Convalescent Serum	n/a	No benefit	Trend to harm
Colchicine	n/a	Unclear benefit	No Benefit

Source: FLCCC

Accessed 01/18/2024

Figure 3. Timing of the Initiation of Anti-Inflammatory Therapy



Source: FLCCC

Ivermectin, low molecular weight heparin (LMWH) and corticosteroids form the foundation of care for the hospitalized patient.

Accessed 01/18/2024

Severe Covid Pulmonary Disease

- I. Methylprednisolone 250 mg daily for at least 3 days, then titrate guided by clinical status and CRP
- II. Ivermectin 1 mg/kg for 5 days
- III. Melatonin 10 mg by mouth at night
- IV. Enoxaparin 60 mg daily; critically ill patients usually have some degree of renal impairment and will require a renally adjusted lower dose. Patients with very high D- dimer and or thrombotic complications may require full anticoagulant doses of Lovenox. It may be prudent to monitor Xa levels aiming for 0.4-0.8 IU/ml (a somewhat lower anti-Xa).
- V. Vitamin C 3 g every 6 hours to 25 g every 12 hours

Severe Covid Pulmonary Disease

- Consider:
- VI. Cyproheptadine 4–8 mg by mouth every 6 hours
- VII. Fluvoxamine 50-100 mg twice daily
- VIII. Spironolactone 100 mg twice daily
- IX. Thiamine 200 mg every 12 hours
- X. NAC 1200 mg by mouth twice daily [154]
- XI. Finasteride 10 mg daily or dutasteride 2 mg day 1 then 1 mg daily or bicalutamide 150 mg daily
- XII. Omega-3 fatty acids 4 g/day
- XIII. Famotidine 40 mg twice daily
- XIV. Calcifediol (0.014 mg/kg) use as a single dose

Covid

- No benefit from vaccination against influenza or Covid (hospitalization or death) demonstrated in review of 9 million VA patient encounter records 2022-2023.
- Xie, Choi, Al-Aly, JAMA (2023) 329:1697-1699
- Vaccination deaths increased following introduction of vaccination; higher risk in those receiving multiple boosters.
- Alessandria, M, Malatesta, GM, Berrino, F, Donzelli, A, Microorganisms (2024) 12:1343