Guideline

Central Administration of Pharmaceutical Care
General Administration For Drug Utilization & Pharmacy Practice

National Guidance for Non-Surgical Antimicrobial Prophylaxis 2023

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Introduction [1]

Appropriate use of antimicrobial agents involves obtaining an accurate diagnosis of the infectious disease, the antimicrobial needed (for empirical therapy, surgical prophylaxis or non-surgical prophylaxis), determining the timing of antimicrobial therapy, understanding how dosing affects the antimicrobial activities of different agents, tailoring antimicrobial therapy to host characteristics, using the narrowest spectrum and shortest duration of therapy, and switching to oral agents as soon as possible. In addition, non-antimicrobial interventions, such as abscess drainage, are equally or more important in some cases and should be pursued diligently in comprehensive infectious disease management.

Risks of Antibiotics Misuse [2]

1-Antibiotic resistance:

The biggest concern with antibiotic misuse is antibiotic resistance. Antibiotic resistance happens when germs such as bacteria and fungi learn to defeat the antibiotics that previously killed them. They become very difficult to treat when this happens.

2-Side effects:

Like all medicines, antibiotics can have side effects. Some side effects from antibiotics can include:

- Nausea
- Diarrhea
- Rash
- Yeast infections
- Allergic reactions
- Clostridium difficile (C. diff) infection, which is difficult to treat and causes severe and possibly life-threatening diarrhea.

Appropriate use of antimicrobials [3], [4]

It involves the following:

- Empirical
- Definitive therapy
- Prophylactic antimicrobials (surgical and non-surgical)

1- Appropriate use of antimicrobials for ***Empirical Therapy***

Empirical therapy is the initial therapy for infection which is guided by the clinical presentation. It has been shown that inadequate therapy for infections in critically ill, hospitalized patients is associated with poor outcomes, including greater morbidity and mortality as well as increased length of stay. Therefore, a common approach is to use broad-spectrum antimicrobial agents as initial empiric therapy

with the intent to cover multiple possible pathogens commonly associated with the specific clinical syndrome. This is true for both community- and hospital-acquired infections [3],[4].

In selecting empiric antimicrobial therapy for infections, clinicians should consider the following [3],[4]:

(a) The site of infection and the organisms most likely to be colonizing that site (e.g., intravascular catheter-associated bacteraemia is frequently a result of colonization and infection caused by staphylococci present on the skin)

(b) Prior knowledge of bacteria known to colonize a given patient (e.g., a screening nasal swab may indicate that the patient is colonized with MRSA)

(c) The local bacterial resistance patterns or antibiograms that are available for important pathogens at most hospitals.

(d) Patient`s characteristics and comorbidities.

2- Appropriate use of antimicrobials for ***Definitive Therapy***

Definitive therapy is prescribed based on the microbiology results, where the etiologic pathogen and/or antimicrobial susceptibility data are available, every attempt should be made to narrow the antibiotic spectrum. This is a critically important component of antibiotic therapy because it can reduce cost, toxicity and prevent the emergence of antimicrobial resistance in the community. Antimicrobial agents with a narrower spectrum should be directed at the most likely pathogens for the duration of therapy for infections [3],[4].

3- Appropriate use of antimicrobials for Prophylactic Antimicrobials

Prophylactic antimicrobials are those taken to prevent infection. In general, antimicrobials are prescribed when there is an infection. In some circumstances where there is a high risk of infection, antimicrobials may be prescribed to prevent infection [4],[5].

Prophylactic antimicrobials can be categorized into:

a) Surgical prophylaxis: refer to National Guide for Antibiotic Use in Surgical Prophylaxis [6].

b) Non-surgical prophylactic antimicrobials are given for many different reasons, the most common conditions are mentioned in the table

Non-surgical prophylactic antimicrobials

Condition/pathogen to be prevented	Antimicrobial regimen	Duration	Vulnerable people
CARDIAC CONDITIONS			
Endocarditis [7],[8],[9].	Amoxicillin 2g Alternative regimens If penicillin allergy: Cephalexin 2 gm oral(po) OR Azithromycin 500mg (po) OR Clarithromycin 500mg (po) OR Cefazolin or Ceftriaxone 1 gm IV/IM	30-60 minutes before procedure	Antibiotic prophylaxis is recommended for patients with the following predisposing cardiac conditions: ➢ Prosthetic cardiac valve or prosthetic material used for cardiac valve repair. ➢ Previous infective endocarditis (IE). ➢ Congenital heart disease (CHD) (unrepaired cyanotic CHD, including palliative shunts and conduits; completely repaired congenital heart defect with prosthetic material or device within the first 6 months after the procedure; repaired CHD with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device). Prophylaxis is recommended for the patients with the mentioned conditions who undergoes the following dental procedures Any manipulation of gingival tissue, dental periapical regions, or perforating the oral mucosa
Rheumatic fever [9],[10],[11].	Benzathine Penicillin G Weight ≤27 kg: 600,000 units IM q3–4 weeks Weight ≥27 kg: 1.2 million units IM q3–4 week Alternative regimens	If no rheumatic carditis: continue prophylaxis 5 years after the acute rheumatic fever or until age 21, whichever is longer. Carditis without residual heart disease: continue prophylaxis for 10 years after the acute	Secondary prophylaxis is indicated for previous documented rheumatic fever or those with rheumatic heart disease, specifically mitral stenosis.

	Penicillin V 250 mg po twice daily (bid) Azithromycin: (preferred regimen for penicillin allergy) Weight ≤27 kg: 5 mg/kg po once daily, Weight ≥27 kg: 250 mg po once daily Erythromycin 10 mg/kg twice daily (up to 250 mg twice daily)	rheumatic fever or until age 21, whichever is longer. Carditis with residual valvular disease: continue prophylaxis for 10 years since last episode or until age 40, whichever is longer, lifetime prophylaxis may be needed	

Condition/pathogen to be prevented	Antimicrobial Regimen	Duration	Vulnerable people
Cancer Related Infections			
Chemotherapy Induced Neutropenia [9],[12]	Antibacterial Levofloxacin 500-750mg PO/IV/24hours OR Ciprofloxacin 500–750 mg PO every 12 hours or 400 mg IV every 8–12 hours OR Sulfamethoxazole/ trimethoprim Double strength (DS) 3 times per week	Antibacterial and antifungal: Until recovery of neutropenia Anti HSV/VZV: For intermediate risk: Consider during active therapy and possibly longer depending on degree of immunosuppression If autologous hematopoietic cell transplant (HCT) Consider for at least 6–12 months after autologous HCT	Antibacterial, antifungal and antiviral (Herpes simplex virus (HSV), Varicella-Zoster virus (VZV)) indications: In patients deemed at: Intermediate risk for infection (Autologous hematopoietic cell transplant (HCT), Lymphoma, Multiple myeloma, Chronic lymphoblastic leukemia (CLL), Purine analog therapy (ie, fludarabine, clofarabine, nelarabine, cladribine), Anticipated neutropenia absolute neutrophil count (ANC) < 1000 cells/mcL for 7–10 days). OR High risk (Allogeneic HCT, Acute leukemia (Induction/Consolidation/maintenance), Alemtuzumab therapy, Moderate to severe GVHD, Anticipated neutropenia greater than 10 days

	<u>Antifungal:</u> If acute lymphoblastic leukemia (ALL) OR Autologous hematopoietic cell transplant(HCT) with mucositis OR Allogeneic HCT (anticandidiasis is indicated) Fluconazole 400mg po/IV /24hours. If acute myeloid leukemia (AML) OR myelodysplastic syndromes (MDS) OR allogenic HCT recepient (antiaspergillus is indicated) Posaconazole Oral suspension 200 mg three times daily (TID) OR Micafungin 150 mg IV daily <u>Antiviral:</u> Acyclovir 400-800mg po bid If post- Varicella-Zoster virus (VZV) exposure prophylaxis: Acyclovir 800 mg PO 5 times daily	<u>For high risk:</u> During active therapy including periods of Neutropenia <u>For High risk (on Alemtuzumab therapy)</u> Minimum of 2 months after alemtuzumab and until CD4 ≥200 cells/mcl <u>For allogeneic HCT</u> Prophylaxis should be considered for at least 1 year after allogeneic HCT	N.B., consider Anti-viral in low risk for infection: (Standard chemotherapy regimens for most solid tumors, anticipated neutropenia less than 7 days) if prior HSV episode N.B., patients receiving proteasome inhibitors have high risk for varicella zoster virus (VZV) so should receive VZV prophylaxis during active therapy including periods of neutropenia
Cytomegalovirus (CMV)[9],[12].	Needing surveillance period (weekly monitoring by PCR) <u>Antiviral</u> <u>If viremia detected (and patient is asymptomatic) in high-risk patients use one of the following antivirals:</u>	<u>Surveillance typically required for at least:</u> 3 to 6 months after transplant in CMV IgG seropositive cases	<u>If high risk for CMV (Allogeneic HCT recipients or receiving Alemtuzumab)</u> <u>Risk factors for CMV disease in HCT recipients</u> 1. CMV seropositive recipient (R+) of a CMV seronegative donor (D-) 2. T-cell depleted or cord blood transplants;

	Ganciclovir (IV) 5 mg/kg every 12 h Valgancyclovir (PO) Induction with 900 mg PO BID; consider additional 900 mg PO daily for at least 7 days after a negative test for maintenance	• Graft versus host diseases (GVHD) requiring therapy • For a minimum of 2 months after alemtuzumab Antiviral is needed for at least 2 weeks and until CMV is no longer detected	3. Graft versus host diseases (GVHD).
PNEUMOCYSTIS JIROVECII (PJP) [9],[12].	Sulfamethoxazole/trimethoprim (TMP/SMX) DS 3 times per week	Allogenic HCT: For at least 6 months and while receiving Immunosuppressive therapy (IST) ALL: Throughout anti-leukemic therapy Receiving Alemtuzumab: For a minimum of 2 months after alemtuzumab and until CD4 count is >200 cells/mcL Receiving PI3K inhibitors or prolonged corticosteroids or temozolomide + radiation At least through active treatment Recipients of purine analog therapy and other T-cell–depleting agents Continue	➢ Allogeneic HCT ➢ ALL ➢ Receiving Alemtuzumab ➢ Receiving selected phosphoinositide 3-kinase (PI3K) inhibitors +/- rituximab ➢ Recipients of prolonged (≥ 1 month corticosteroids ≥ 20 mg/day) ➢ Receiving temozolomide + radiation therapy ➢ Recipients of purine analog therapy and other T-cell–depleting agents ➢ Autologous HCT

		until CD4 count >200 cells/mcL <u>Autologous HCT</u> 3–6 months after Transplant	
Solid Organ Transplant/ Immunosuppressive agents/Immunocompromised patients			
Herpes simplex virus (HSV), Varicella-Zoster virus (VZV) Prevention [9]	<u>Solid organ transplant (SOT):</u> Acyclovir 400-800 mg po bid	During the 1st month post-transplant if HSV seropositive and not on CMV prophylaxis N.B., in SOT recipients ,consider restarting prophylaxis during periods of intensified immunosuppression	HSV-seropositive patient undergoing solid-organ transplant
Aspergillus [9]	Posaconazole <u>Suspension</u> 200 mg 4 times a day(qid), then 400 mg (2 times a day) bid after stabilization of disease <u>Intravenous</u> (IV)300 mg over 90 minutes bid x 1 day, then 300 mg IV daily Voriconazole 200 mg orally (po) bid Itraconazole 200 mg po bid Caspofungin IV 70 mg loading over one hour, then 50 mg IV daily	During periods of increased risk (intensified immune suppression)	Lung transplant recipient

Candidiasis [9]	Fluconazole 400 mg po/IV q24h OR Anidulafungin 200 mg IV loading, then 100 mg daily	Duration varies by risk factors and which organ transplanted	<u>Solid organ transplant recipients</u> ➢ Liver transplant recipients with ≥2 of the following risk factors: Prolonged or repeat operation; retransplantation; renal failure; high transfusion requirement; choledocojejunostomy; or perioperative Candida colonization. ➢ Pancreas transplant recipients with enteric drainage, vascular thrombosis, or post perfusion pancreatitis. ➢ Small-bowel recipients with graft rejection or dysfunction, enhanced immunosuppression, anastomotic disruption, abdominal reoperation or multi-visceral transplantation. N.B.,Lung transplant recipients should be considered for antifungal prophylaxis that includes activity against Aspergillus
Pneumocystic pneumonia [9]	TMP-SMX-DS1 tab po q24h or 3x/week	Continue until CD4 count >200 for 3 months	<u>Indications for primary prophylaxis:</u> ➢ HIV/AIDS patients with CD4 count < 200 cells/µL ➢ Any patient taking equivalent of ≥ 20 mg Prednisone/day for more than 1 month ➢ Solid organ transplant recipients during immunosuppression
Coccidioides immitis [9]	<u>Recipient of organ except lung</u> Fluconazole 400 mg once daily x 1 year; then 200 mg once daily indefinitely <u>Recipient of lung</u> Fluconazole 400 mg once daily, indefinitely	Indefinitely	Recipient with positive serology, no active infection at time of transplant

	Patients with HIV Oral: 400 mg once daily	until antiretroviral therapy has fully suppressed HIV replication and the CD4 count is ≥250 cells/mm3	Patients with a CD4 count <250 cells/mm3 who have a new positive serology
Cytomegalovirus (CMV) [9]	Solid organ transplant Valgancyclovir 900 mg po q 24 h (beginning post- engraftment)	CMV prophylaxis in solid organ transplant recipient 3-12 months according to organ and donor/recipient CMV serostatus.	In solid organ transplant Prevention of cytomegalovirus (CMV) in high-risk adult patients (donor CMV seropositive/recipient CMV seronegative) undergoing kidney, or kidney/pancreas transplantation. Receiving lymphocyte-depleting antibodies for the treatment of rejection
Toxoplasmosis [9]	Primary prophylaxis TMP-SMX DS, 1 tab po once daily OR Dapsone 50 mg po daily/24h+ pyrimethamine 50 gm po /week + Folinic acid 25 mg po/week. Secondary prophylaxis Clindamycin 600 mg po q 8h + Pyrimethamine 25-50 mg po/24 hrs.+ folinic acid10-25 mg po q 24h OR TMP-SMX DS, 1 tab po once daily.	Primary prophylaxis continue prophylactic regimen until CD4 count >200 cells/µL for 3 month Secondary prophylaxis continue suppression until CD4 count > 200 cells/µL for 6 months	Primary prophylaxis in immunocompromised (AIDS, Post-Transplantation) if CD4 < 100/µL & IgG antibody to toxoplasmosis Secondary prophylaxis: after treatment of cerebral toxoplasmosis
Tuberculosis (TB) [9]	Screen for latent TB, if there is evidence of latent TB, treat as latent TB before starting the biologics	Treat as latent TB	Patients who will start treatment with the following types of biologics: Tumor necrosis factor (TNF) blockers e.g., etanercept, infliximab, adalimumab, cetrolizumab,golimumab,abatacept,Alemtuzumab,Anakinra ,Canakinumab,Tocilizumab,Tofacitinib

Condition/pathogen to be prevented	Antimicrobial regimen	Duration	Vulnerable people
Pre Exposure Prophylaxis			
Influenza[23]	Oseltamivir 75 mg orally (PO) once daily	Continue for the duration of influenza activity or for 2 weeks following vaccination	Only during widespread outbreaks for persons at very high risk for influenza complications (eg, severely immunocompromised patients) not protected by vaccination
Malaria [13]	Chloroquine 300 mg base (500 mg salt) orally, once/week OR Hydroxychloroquine sulfate 310 mg base (400 mg salt) taken orally, 1×/week N.B., Chloroquine phosphate or hydroxychloroquine sulfate can be used for prevention of malaria only in destinations where chloroquine resistance is not present	Should begin 1–2 weeks before travel to malarious areas. It should be continued by taking the drug once a week, on the same day of the week, during travel in malarious areas& for 4 weeks after a traveler leaves these areas	➢ Before travel to malarious areas

	OR Doxycycline 100 mg PO, daily Doxycycline is contraindicated in people with an allergy to tetracycline's, during pregnancy, and in infants and children aged <8 years. (Vaccination with the oral typhoid vaccine Ty21a should be delayed for ≥24 hours after taking a dose of doxycycline).	Begin 1–2 days before travel to malarious areas. Take daily at the same time each day while in the malarious area and for 4 weeks after leaving such areas.	

Condition/pathogen to be prevented	Antimicrobial regimen	Duration	Vulnerable people
Post Exposure Prophylaxis			
Influenza prevention [9]	Oseltamivir 75 mg orally (PO) once daily	• Start within 48 hours of the exposure • Continue for 1 week after last exposure (if previously vaccinated) or 2 weeks (if unvaccinated).	People at high risk of severe disease with clear exposure to influenza (who have had close contact within the past 48 hours with a person with confirmed or suspected influenza during that person's infectious period) N.B., examples of people at high risk of severe disease: ➢ Immunosuppressed patients as a consequence of AIDS, cancer chemotherapy, or transplant immunosuppressive ➢ Non-immunized nursing home patients in midst of a documented influenza outbreak ➢ Adults ≥65 years of age ➢ Women who are pregnant or postpartum (within 2 weeks after delivery) ➢ Persons with BMI ≥40 kg/m2 ➢ Individuals with certain chronic medical conditions (eg, pulmonary, cardiovascular, renal, hepatic, hematologic, metabolic, neurologic)

Meningitis [9]	<u>*Haemophilus influenzae* (Type B):</u> Rifampin 600 mg po q24h x4 days <u>N. meningitides:</u> Ciprofloxacin 20 mg/ kg (max *dose 500 mg) po single dose* *OR* *Ceftriaxone 250 mg IM x 1 dose* *OR* *Rifampin 600 mg po q12h x 2 days*	Differs according to the type of antibiotic	<u>If Haemophilus influenza type B (Hib):</u> Close contact group: persons who reside with the patient or a non-resident who has spent 4 hours or more with the index patient for at least 5 of the 7 days preceding the day of hospitalization of the patient. Daycare contact: when two or more cases of invasive Hib disease have occurred within 60 days and unimmunized or under-immunized persons attend the facility. <u>If Neisseria meningitides:</u> Close contact (e.g., housemates, daycare contacts, cellmates); unprotected exposure to droplets, nasopharyngeal secretions of documented case (e.g., intubation, mouth-to-mouth resuscitation, kissing, nasotracheal suctioning)
Pertussis [9],[14],[15]	Azithromycin 500mg day1, then 250 mg from second day to 5th days OR Erythromycin 500mg 4 times daily for14 days OR Clarithromycin 500mg twice daily for 7 days OR TMP/SMX DS bid for 14 days	Differs according to the regimen	Household contacts or others exposed within 21 days who are at high risk of severe disease (pregnant, immunosuppressed) or will be in contact with those at high risk of severe disease regardless of vaccination status

Condition/pathogen to be prevented	Antimicrobial regimen	Duration	Vulnerable people
Dermatological condition			
Cellulitis (recurrent) [9],[16]	Penicillin V 250 mg po bid OR Benzathine penicillin G 1.2 million units IM q4 weeks OR Azithromycin 250 mg po q24h OR Clarithromycin 500 mg po q24h If penicillin intolerant could use cephalexin 250 mg po bid	6 months	Prophylaxis is only indicated for patients suffering frequent episodes of erysipelas/cellulitis: defined as 2 episodes of documented cellulitis over the last 3 years
Burn (non-infected) [9],[17]	In severely burned patients requiring mechanical ventilation Cefazolin OR Ampicillin sulbactam	1 week	Non-infected

Condition/pathogen to be prevented	Primary regimen	Duration	Vulnerable people
Hepatic conditions			
Sclerosing Cholangitis[18],[19]	Sulfamethozale-trimethoprim	3 to 4 weeks	➢ Occasionally patients with recurrent bacterial cholangitis (recurrent liver/biliary sepsis) due to complex intrahepatic cholangiopathy may require prophylactic long-term antibiotics ➢ patients with extensive involvement of the biliary tree may present with recurrent episodes of cholangitis requiring long-term prophylaxis with one oral antibiotic at a time (ciprofloxacin, cephalexin, sulfamethoxazole-trimethropim, or ampicillin)
Spontaneous bacterial peritonitis (SBP)[9],[21],[22],[23]	Norfloxacin 400mg po once daily Or Ciprofloxacin 500mg po once daily	until transplantation or liver function improves to a compensated	A **primary prophylaxis of SBP** is indicated in patient with: low protein ascites and advanced liver failure (Child-Turcotte-Pugh score >9 points with serum bilirubin level >3 mg/dL) or impaired

	Or Sulfamethoxazole and Trimethoprim DS oral once daily	state with resolution of ascites	renal function (serum creatinine level >1.2 mg/dL, blood urea nitrogen level >25 mg/dL, or serum sodium level <130 mEq/L) Secondary prophylaxis in patients with chronic ascites who treated from SBP
Variceal bleeding [20],[24]	Ceftriaxone 1 g iv/24 hrs.	For maximum 7 days consider discontinuing when hemorrhage has resolved and vasoactive drugs discontinued	➢ Cirrhotic patients with gastrointestinal hemorrhage, with or without ascites ➢ Child- Pugh class B and C at greater risk of infection and death than class A
Hepatic Encephalopathy(HE)[23],[25]	Rifaximin 550 mg twice daily or 400 mg 3 times daily.	Continue therapy for at least 3 months	Rifaximin as an adjunct to lactulose is recommended as secondary prophylaxis following ≥1 additional episode of overt HE

Condition/pathogen to be prevented	Primary regimen	Duration	Vulnerable people
Genitourinary & Dialysis			
Cystitis (recurrent) (9),(26)	<u>Non pregnant women</u> Nitrofurantoin 100 mg once daily at bedtime OR Trimethoprim/sulfamethoxazole (TMP-SXT) 40 mg/200 mg once daily or 3 times weekly	Ranges from 6 to 12 months, with periodic reassessment N.B., In the presence of an association with sexual intercourse, postcoital prophylaxis with a single dose sought to be used instead of long-term administration of antibiotics	For women with recurrent UTI (with more than three infections yearly) who are not pregnant, only if behavioral and personal hygiene measures and vaginal estrogen (in postmenopausal women) are not effective or not appropriate
	<u>Pregnant women</u> Cefalexin	For the remainder of the pregnancy	After 2 or more separate episodes of acute cystitis or asymptomatic bacteriuria with risk factors for

	250 mg PO at night OR Nitrofurantoin 50 mg oral at night (avoid if close to birth [i.e. after 37 weeks or sooner if early birth is planned] due to possible increased risk of neonatal jaundice and haemolytic anaemia)		pyelonephritis (e.g. immune compromise, urinary tract anomalies, diabetes).
Peritoneal Dialysis (PD)[27],[28],[29],[30],[31],[32],[33]	<u>Systemic antibiotics</u> Teicoplanin 400mg IV OR If allergic to teicoplanin give cefuroxime 750mg IV. OR IV cefazolin (15-20 mg/kg) <u>Topical antibiotics</u> Mupirocin nasal ointment 2% to apply to exit site daily or alternate day after cleaning. If the patient has a history of Pseudomonas exit site infection or allergy to mupirocin, use gentamicin cream 0.1% or bacitracin/gramicidin/polymyxin B ointment <u>Systemic Antifungal</u> Fluconazole (200 mg every 48 h)	<u>Systemic prophylactic antibiotics</u> be administered 1 hour prior to catheter placement <u>Topical antibiotics</u> for exit site infection prophylaxis- after catheter insertion and at the end of each dialysis session <u>Systemic antifungal</u> During antibiotic therapy	<u>Systemic &Topical antibiotics</u> All patients on peritoneal dialysis <u>Systemic antifungal</u> Administer antifungal prophylaxis among patients on peritoneal dialysis who are treated with antibiotics for a prolonged duration, regardless of the site of infection

Condition/pathogen to be prevented	Primary regimen	Duration	Vulnerable people
Respiratory conditions			
Bronchitis (chronic obstructive pulmonary diseases(COPD)),Bronchiectasis [34]	Azithromycin 250 mg po daily, 500 mg or 250 mg three times per week	Long term antibiotic use ≥ 3 months	COPD: Consider for patients with frequent exacerbations (eg, ≥2 per year) despite optimal medical management or >3 exacerbations per year (at least 1 of which required hospital admission) Patients with bronchiectasis who have three or more exacerbations per year
Cystic fibrosis (CF) [35],[36],[37]	Ciprofloxacin	until the patient returns to his/her previous condition even if this takes two or three weeks	If the patient has chronic P.aeruginosa infection For individuals with CF, the CF Foundation recommends against the prophylactic use of oral antistaphylococcal antibiotics to improve lung function and quality of life or reduce exacerbations.

Non-Surgical Antimicrobial Prophylaxis at Intensive Care Unit (ICU)	
Endotracheal Intubation [38],[39]	➢ Prophylactic antimicrobial use following endotracheal intubation of patients with an altered level of consciousness is not recommended in most guidelines for prevention of healthcare-associated pneumonia. ➢ The current guidelines do not make any recommendation regarding antibiotic prophylaxis against avoiding VAP. ➢ Antibiotic prophylaxis (cefuroxime or ampicillin/sulbactam) in comatose patients only at the time of intubation, may cause a shorter length of ICU stay but no impact on mortality
Intravascular Catheter [33],[39],[40]	➢ Systemic antimicrobial prophylaxis is not recommended before insertion or during use of an intravascular catheter to prevent catheter colonization or catheter-related bloodstream infection (CRBSI) but can use prophylactic antimicrobial lock solution in patients with long term catheters who have a history of multiple CRBSI despite optimal maximal adherence to aseptic technique ➢ The current data shows that antibiotic prophylaxis at the time of catheter insertion lacks protection to the infection
Acute pancreatitis [39]	➢ A meta-analysis clearly showed no impact of AP on the prevention of infected necrosis
Chest Drain Insertion [38]	➢ There are no recommendations regarding antibiotic prophylaxis in ICU patients requiring chest drain insertion. ➢ Meta-analysis of the data on this topic in the literature suggests that prolonged postoperative antibiotic prophylaxis does not reduce the number of infectious complications related to chest drains compared with preoperative prophylaxis only.
Cerebral intra-ventricular drains[38]	➢ Current Neurocritical Care Society recommendations suggest that one dose of antimicrobials should be administered prior to insertion of an external ventricular drain.
Posttraumatic cerebrospinal fistulae, basilar skull fractures, and facial fractures [39]	➢ Antibiotic prophylaxis is not recommended
Urinary Catheter [41]	➢ There is no clear benefit to using either antibiotic-coated urinary catheters or prophylactic antibiotics to reduce the risk of catheter associated urinary tract infection
Prophylaxis against Multidrug Resistant Microrganisms (MDR)[38]	➢ To date, there is no evidence to support the universal use of prophylaxis targeted against MDR.

Common instructions to avoid misuse (inappropriate use) of antimicrobials [3]

In some settings, the use of antibiotics is clearly inappropriate and should be contraindicated, the following are examples of inappropriate use of antibiotics:

1- **Don't use Empiric Antimicrobial Treatment for long periods Without Clear Evidence of Infection.** Many noninfectious, inflammatory, or neoplastic syndromes can present with symptoms and signs that mimic infectious diseases. (Procalcitonin and monocyte distribution width could be used as an early sepsis markers).

2- **Don't treat a Positive Clinical Culture (or active surveillance culture) in the Absence of Disease**. Colonization with potentially pathogenic organisms without any associated manifestation of disease occurs frequently in certain populations (e.g., colonization of the urinary tract in women of advanced age or in the presence of an indwelling urinary catheter, colonization of endotracheal tubes in mechanically ventilated patients, and colonization of chronic wounds) so avoid treatment of a "positive" culture result when symptoms and signs of active infection are absent (e.g., asymptomatic bacteriuria).

3- **Don't recommend wide spectrum antimicrobial therapy When a Causative Organism Is Identified.** Once culture and susceptibility data are available, an antibiotic with the narrowest possible spectrum should be selected for continuation of therapy.

4- **Don't use antimicrobial therapy for Prolonged Duration.** For example, in pneumonia treatment, it is not recommended to prolong the duration of antimicrobial therapy until the complete improvement of radiographic response as the American Thoracic Society (ATS)/Infectious Diseases Society of America, recommend not obtaining a follow-up chest radiograph in patients whose symptoms have resolved within five to seven days as radiographic response lags behind a clinical response [42].

5**- Don't use excessive numbers of certain antimicrobial agents.** For example, the increased use of fluoroquinolones during the past decade is thought to be, in part, responsible for the epidemic of a fluoroquinolone-resistant strain of C difficile, the most common cause of nosocomial infectious diarrhea.

For this reason, antimicrobial stewardship members should avoid the excessive prescribing of a single class of antibiotic.

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References

1. https://www.nhs.uk/conditions/antibiotics/uses/
2. https://www.webmd.com/a-to-z-guides/what-to-know-prophylactic-antibiotics
3. Leekha, S., Terrell, C. L, et al. General principles of antimicrobial therapy. Mayo clinic proceedings. Elsevier, 2011. p. 156-167.
4. Jessina C. McGregor. A Systematic Review of the Methods Used to Assess the Association between Appropriate Antibiotic Therapy and Mortality in Bacteremic Patients, Clinical Infectious Diseases, Volume 45, Issue 3, 1 August 2007, Pages 329–337,
5. ENZLER, Mark J. Antimicrobial prophylaxis in adults. In: Mayo Clinic Proceedings. Elsevier, 2011. p. 686-701.
6. https://rb.gy/c1dde
7. https://www.heart.org/-/media/files/health-topics/infective-endocarditis/infective-endocarditis-wallet-card.pdf
8. https://www.escardio.org/Journals/E-Journal-of-Cardiology-Practice/Volume-16/vol16no33
9. The Sanford Guide to Antimicrobial Therapy application (latest digital content update: January 14, 2019)
10. KUMAR, Raman Krishna, et al. Contemporary diagnosis and management of rheumatic heart disease: implications for closing the gap: a scientific statement from the American Heart Association. Circulation, 2020, 142.20: e337-e357.
11. https://www.uptodate.com/contents/management-and-prevention-of-rheumatic-heart-disease#H3781895105
12. NCCN Clinical Practice Guidelines in Oncology,Prevention and Treatment of Cancer-Related Infections Version 3.2022 — October 28, 2022
13. https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/malaria
14. BADER, Mazen S., et al. Postexposure management of infectious diseases. Cleve Clin J Med, 2017, 84.1: 65-80.
15. BADER, Mazen S, et al. Postexposure prophylaxis for common infectious diseases. American Family Physician, 2013, 88.1: 25-32.
16. British Lymphology Society (BLS). Consensus Document on the Management of Cellulitis in Lymphoedema. Revised Cellulitis Guidelines 2016.
17. Tagami, Takashi, et al. Prophylactic antibiotics may improve outcome in patients with severe burns requiring mechanical ventilation: propensity score analysis of a Japanese nationwide database. Clinical Infectious Diseases, 2016, 62.1: 60-66.
18. European Association for the Study of the Liver, et al. EASL Clinical Practice Guidelines on sclerosing cholangitis. Journal of hepatology, 2022, 77.3: 761-806.
19. Angulo P, Lindor, K D. Primary sclerosing cholangitis. Hepatology, 1999, 30.1: 325-332.
20. https://www.wjgnet.com/1948-5182/full/v13/i8/840.htm
21. https://journals.lww.com/hep/Fulltext/2021/08000/Diagnosis,_Evaluation,_and_Management_of_Ascites,.34.aspx
22. https://www.journal-of-hepatology.eu/article/S0168-8278(10)00478-2/fulltext
23. https://online.lexi.com/lco/action/home
24. https://easl.eu/wp-content/uploads/2018/10/decompensated-cirrhosis-English-report.pdf
25. https://www.journal-of-hepatology.eu/article/S0168-8278(22)00346-4/fulltext
26. https://www.aafp.org/pubs/afp/issues/2009/0315/p503.html

27. https://bmcnephrol.biomedcentral.com/articles/10.1186/s12882-016-0329-0
28. https://www.dbth.nhs.uk/wp-content/uploads/2019/07/Management-of-Peritoneal-Dialysis-CatheterFinal-2019.pdf
29. https://journals.sagepub.com/doi/full/10.1177/08968608221080586
30. https://www.uptodate.com/contents/fungal-peritonitis-in-peritoneal-dialysis/abstract/14-18
31. https://www.uptodate.com/contents/microbiology-and-therapy-of-peritonitis-in-peritoneal-dialysis
32. Levy J, Brown E, et al. (2016). Oxford Handbook of Dialysis (4th ed., pp 268). oxford medical publications.
33. O'grady, N. P., et al. O. Heard S., Saint S. Healthcare Practices Advisory Committee (HICPAC).(2011). Guidelines for the prevention of intravascular catheter related infections. American Journal of Infection Control, 39: S1-S34.
34. Polverino, Eva, et al. European Respiratory Society guidelines for the management of adult bronchiectasis. European Respiratory Journal, 2017, 50.3.
35. https://www.cff.org/eradication-initial-p-aeruginosa-clinical-care-guidelines
36. Mogayzel JR, Peter J, et al. Occasional Essay. Am J Respir Crit Care Med, 2013, 187.7: 680-689.
37. https://www.cysticfibrosis.org.uk/sites/default/files/2020-11/Anitbiotic%20Treatment.pdf
38. Martin I, Leone M, et al. Antibiotic prophylaxis in the ICU: to be or not to be administered for patients undergoing procedures?. Intensive Care Medicine, 2020, 46: 364-367.
39. Leone, M., Righy, C.,et al. Antibiotic prophylaxis in ICU patients: should I do or not?. Intensive Care Medicine, 2022, 48.9: 1215-1217.
40. Rawson, Timothy M., et al. Management of Bacterial and Fungal Infections in the ICU: Diagnosis, Treatment, and Prevention Recommendations. Infection and drug resistance, 2023, 2709-2726.
41. https://www.uptodate.com/contents/catheter-associated-urinary-tract-infection-in-adults?sectionName=ASYMPTOMATIC%20BACTERIURIA&search=antibiotic%20prophylaxis%20in%20critically%20ill%20patients%20in%20icu&topicRef=8095&anchor=H123173127&source=see_link#H123173127
42. https://www.aafp.org/pubs/afp/collections/choosing-wisely/457.html