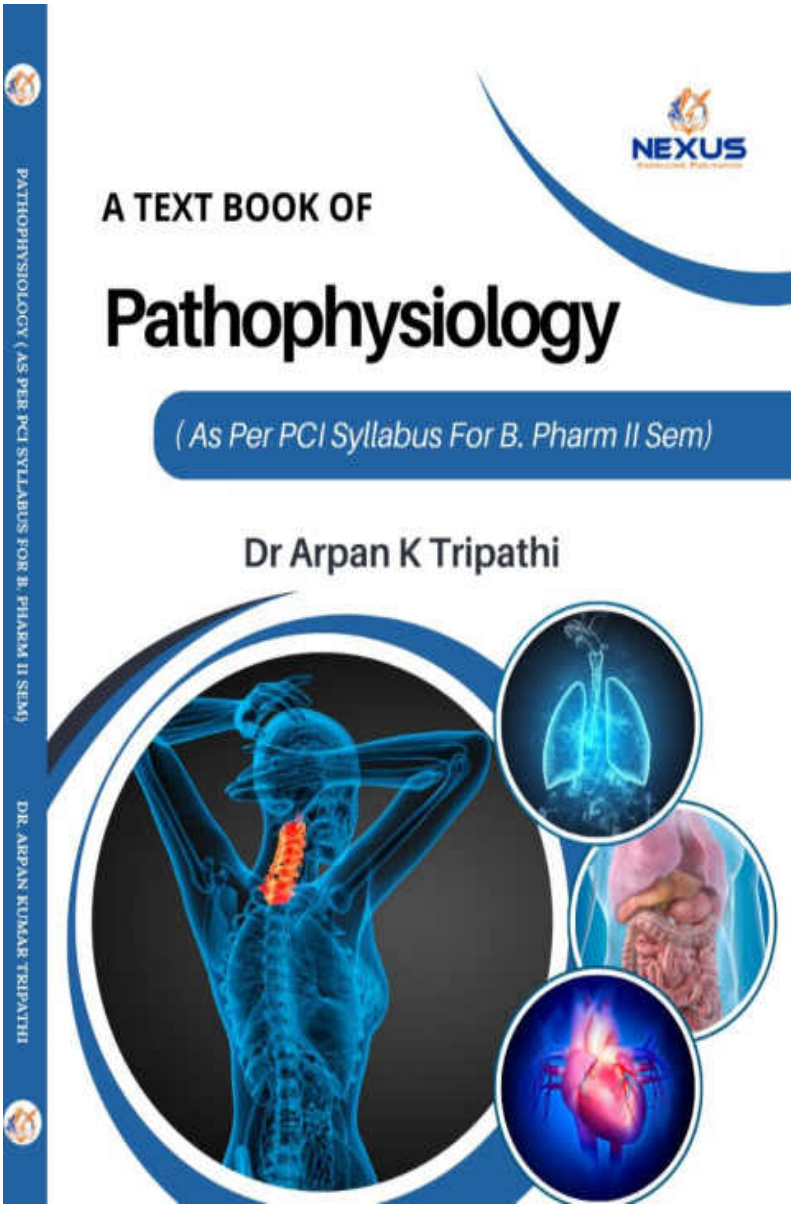
NEXUS KNOWLEDGE PUBLICATION
https://nknpub.com/index.php/1

A TEXTBOOK OF PATHOPHSIOLOGY

ISBN: 978-81-985724-1-7



DOI 10.5281/zenodo.15399027

Chapter- 5

Infectious Diseases and Urinary Tract Infections

MR. PRATEEK PANDEY
Assistant Professor
Institute address: United Institute of Pharmacy, UPSIDC Industrial Area, Naini, Prayagraj Pin: 211010

MR. VINEET SRIVASTAVA
Assistant Professor
Institute address: Faculty of Pharmacy, United University, Rawatpur, Jhalwa, Prayagraj, Pin 211012
Email: vineets.994@gmail.com

DR. NIDHI SOLANKI
Assistant Professor
Institution address: shree Swaminarayan University Kalol, Ghandhinagar. Pin: 382725
Email: nidhijsolanki20@gmail.com

DR. MOIDUL ISLAM JUDDER
Assistant Professor
Royal School of Pharmacy, The Assam Royal Global University, Betkuchi, Opp. Tirupati Balaji Temple, NH 37, Guwahati - 781035, Assam, India
Email - moonzodder@gmail.com

MS. VARSHA CHAUDHARY
Designation-Assistant professor
Institute address: Faculty of Pharmacy, United university, Rawatpur , Jhalwa, Prayagraj, Pin 211012
Email varsha@uniteduniversity.edu.in

Unit V…

INFECTIOUS DISEASES AND URINARY TRACT INFECTIONS

MR. PRATEEK PANDEY
Assistant Professor
Institute address: United Institute of Pharmacy, UPSIDC Industrial Area, Naini, Prayagraj Pin: 211010

MR. VINEET SRIVASTAVA
Assistant Professor
Institute address: Faculty of Pharmacy, United University, Rawatpur, Jhalwa, Prayagraj, Pin 211012
Email: vineets.994@gmail.com

DR. NIDHI SOLANKI
Assistant Professor
Institution address: shree Swaminarayan University Kalol, Ghandhinagar. Pin: 382725
Email: nidhijsolanki20@gmail.com

DR. MOIDUL ISLAM JUDDER
Assistant Professor
Royal School of Pharmacy, The Assam Royal Global University, Betkuchi, Opp. Tirupati Balaji Temple, NH 37, Guwahati - 781035, Assam, India
Email - moonzodder@gmail.com

MS. VARSHA CHAUDHARY
Designation-Assistant professor
Institute address: Faculty of Pharmacy, United university, Rawatpur , Jhalwa, Prayagraj, Pin 211012
Email varsha@uniteduniversity.edu.in

ISBN: 978-81-985724-1-7

5.1 Infectious diseases

Infectious diseases are illnesses that are caused by harmful microorganisms that infiltrate and multiply within the body. These microorganisms include bacteria, viruses, fungus, and parasites. The severity of these infections can range from moderate and self-limiting to severe and life-threatening, depending on the pathogen that is involved and the overall health of the individual. Infectious diseases can be passed on through a variety of channels, such as through direct contact, through contaminated food or drink, through vectors, and through airborne particles. An examination of individual infectious diseases, their causes, transmission processes, symptoms, and treatment choices is required in order to get an understanding of infectious diseases.

Infectious diseases are a wide range of disorders that are caused by dangerous bacteria that grow and infiltrate the body. These diseases are complex and varied. For example, bacteria, viruses, fungus, and parasites are all examples of microorganisms that have the potential to cause a wide variety of diseases, each of which might be of varied degrees of severity. Both the characteristics of the bacterium and the immunological response of the host are responsible for determining the severity of an infection, which can range from moderate to severe to even life-threatening.

Bacteria are organisms that are composed of a single cell and have the ability to sustain themselves in a wide range of conditions, including the human body. Pathogenic bacteria are bacteria that can cause significant diseases, such as tuberculosis, strep throat, and urinary tract infections. While many bacteria are innocuous or even useful, there are some bacteria that can cause major diseases. Antibiotics are often effective in treating bacterial infections; however, the proliferation of antibiotic-resistant strains has made it more challenging to treat some infections.

There are infectious agents known as viruses, which are considerably smaller than bacteria and require a host cell in order to proliferate. Once they have the ability to enter the host cell, viruses are capable of causing a broad variety of diseases. These diseases range from the ordinary cold and influenza to more serious conditions such as HIV/AIDS, hepatitis, and COVID-19. Due to the restricted availability of antiviral drugs, the treatment of viral infections is frequently more difficult than the treatment of bacterial infections. immunization is frequently the most effective technique for preventing viral infections through immunization.

ISBN: 978-81-985724-1-7

Fungi, which are another type of germ, are capable of causing infections that can range from superficial, like athlete's foot or ringworm, to systemic, which can be fatal, especially in those who are immunocompromised. It is possible to cure fungal infections with antifungal drugs; however, several fungi have acquired resistance to these medications, which makes treatment more challenging.

Biological creatures that live on or within a host organism and obtain their nourishment at the expense of the host are known as parasites. The transmission of parasitic diseases, such as malaria, is often carried out by vectors, such as mosquitoes. As a result, the implementation of prevention techniques, such as vector control, is essential for the management of these diseases. Despite the fact that the complexity of some parasite life cycles might make eradication difficult, antiparasitic medications are frequently used in the treatment process.

There are a number of different pathways by which infectious illnesses can be transmitted. Touching, kissing, or sexual contact with an infected person or animal are all examples of direct contact transmission. Direct contact transmission can also occur through sexual contact. There are a number of infectious diseases that can be transmitted through direct touch, including HIV/AIDS and herpes. It is possible for a person to become infected by indirect transmission when they come into touch with contaminated objects or surfaces, such as doorknobs or cutlery, which are known to host pathogens. Pathogens can cause infections such as salmonella or cholera when they contaminate food or water supplies. This type of transmission is known as foodborne and waterborne transmission.

Pathogens are transmitted from one host to another through the use of organisms known as vector-borne transmission. Examples of such species include ticks and mosquitoes. Malaria and Lyme disease are two examples of diseases that can be transmitted in this way. Airborne transmission refers to the transfer of infections through the air in the form of droplets or dust particles. This type of transmission is observed in diseases such as tuberculosis and the flu, where viruses are disseminated by activities such as coughing, sneezing, or talking.

The symptoms of infectious diseases can vary greatly based on the microorganism that is causing the infection as well as the location of the infection. Symptoms that are commonly experienced include fever, weariness, muscle aches, coughing, and problems in the gastrointestinal tract; however, certain diseases may present with symptoms that are more specific. A combination of clinical examination, laboratory testing, and imaging tests is

ISBN: 978-81-985724-1-7

frequently required for the diagnosis of infectious diseases. This is done in order to determine the pathogen that is responsible for the infection and to determine the severity of the infection.

Treatment options for infectious diseases are contingent upon the specific pathogen that is causing the sickness. In most cases, antibiotics are used to treat bacterial infections; nevertheless, it is essential to choose the proper antibiotic based on the sensitivity of the bacterium. There are antiviral drugs that can be used to treat viral infections; however, these medications are frequently specialized to their respective viruses and may not be successful in all instances. It is necessary to use antifungal and antiparasitic medications in order to treat fungal and parasitic illnesses, respectively; however, the treatment process can be complicated by the presence of drug resistance or the requirement for prolonged therapy.

Public health measures, vaccination programs, cleanliness, and education are all components that are included in the prevention of infectious diseases, which is an essential component of the management of infectious diseases. When it comes to avoiding diseases such as measles, polio, and influenza, vaccination has proven to be extremely effective. In addition, public health campaigns that encourage methods such as washing one's hands, handling food in a safe manner, and controlling vectors are also extremely important in preventing the spread of infectious diseases.

1. Meningitis.

It is an inflammation of the meninges, which are the protective membranes that coat the brain and spinal cord. Meningitis is a condition that affects women. Many other types of pathogens, such as bacteria, viruses, fungi, and parasites, are capable of causing this condition. Among the most prevalent bacterial causes, Neisseria meningitidis (also known as meningococcus), Streptococcus pneumoniae (also known as pneumococcus), and Hemophilus influenzae are the most common. Enteroviruses are the most prevalent cause of viral meningitis, which is typically less severe than other types of meningitis because of bacteria.

Meningitis is a serious medical disorder that is defined by inflammation of the meninges, which are the membranes that surround and protect the brain and spinal cord. The swelling that results from this inflammation can bring on a wide range of symptoms, such as a severe headache, fever, stiffness in the neck, sensitivity to light, and a change in mental status. Despite the fact that meningitis can afflict anyone of any age or gender, it is especially problematic in women

ISBN: 978-81-985724-1-7

because of the potential difficulties that can arise during pregnancy and the increased vulnerability that can occur under specific conditions.

The condition can be brought on by a wide variety of pathogens, such as bacteria, viruses, fungi, and parasites; each of these pathogens can bring about meningitis in a variety of flavors and degrees of severity. Meningitis caused by bacteria is an extremely severe condition that demands prompt medical attention. The bacteria Neisseria meningitidis (also known as meningococcus), Streptococcus pneumoniae (also known as pneumococcus), and Hemophilus influenzae are among the most frequently found to be responsible for the infection. It is well recognized that Neisseria meningitidis is responsible for epidemics, particularly in populations that are quite close together, such as college dorms. Streptococcus pneumoniae is another main cause, particularly in young children and the elderly. It is also capable of causing other dangerous illnesses such as pneumonia and sepsis, which are both potential outcomes of this pathogen. Prior to the development of the Hib vaccine, Hemophilus influenzae was a prevalent cause of meningitis, particularly in children. However, since the vaccine was developed, the prevalence of meningitis has greatly decreased.

There is nevertheless reason for concern regarding viral meningitis, despite the fact that it is typically less severe than bacterial meningitis. Enteroviruses, which are extremely abundant and can be transferred by respiratory secretions or feces, are the most common cause of this condition. Despite the fact that viral meningitis normally goes away without the need for special treatment and is typically less severe, it is nonetheless capable of causing significant discomfort and, in extremely rare instances, contributing to more catastrophic problems.

The severity of fungal meningitis can be more severe in immunocompromised persons, such as those who are living with HIV/AIDS, despite the fact that it is not very frequent. There are additional instances of meningitis being caused by parasites; however, these instances are extremely uncommon and often take place in particular geographical places where such parasites are endemic.

In order to diagnose meningitis, a comprehensive clinical evaluation is required. This evaluation typically includes a lumbar puncture to examine cerebrospinal fluid for the presence of infections, in addition to additional laboratory tests that are used to determine the underlying etiology of the condition. Meningitis caused by bacteria typically requires immediate antibiotic therapy, but meningitis caused by viruses is typically managed with supportive care. The treatment for meningitis varies accordingly, depending on the underlying infection. Vaccination

ISBN: 978-81-985724-1-7

is an essential component in the prevention of certain types of meningitis, particularly those that are brought on by Neisseria meningitidis, Streptococcus pneumoniae, and Hemophilus influenzae.

For the purpose of quick and efficient medical intervention, as well as for the prevention of long-term problems and the spread of this potentially life-threatening disease, it is vital to have a comprehensive understanding of the many causes, symptoms, and treatment choices for meningitis.

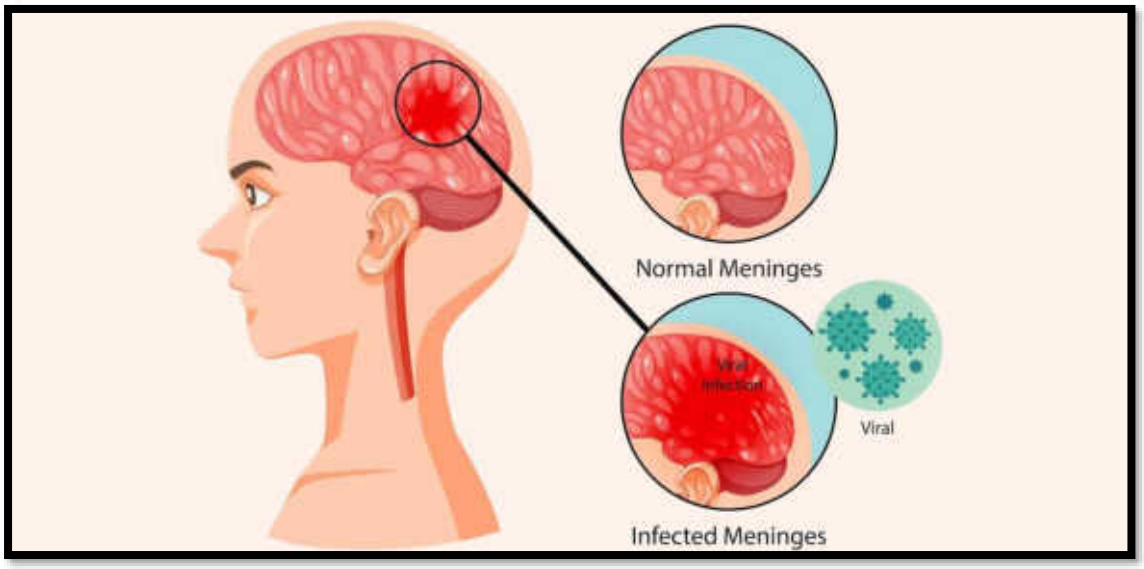


Figure 1: Meningitis

These respiratory droplets from an infected person are often the means by which bacterial and viral meningitis are transmitted from one person to another. A quick onset of fever, headache, stiff neck, nausea, vomiting, and sensitivity to light are some of the symptoms that are frequently associated with meningitis. It is possible for it to result in consequences such as damage to the brain, loss of hearing, or even death in extreme circumstances. The clinical examination is used to make the diagnosis, and the cerebrospinal fluid analysis that is obtained through lumbar puncture is used to confirm the diagnosis. When it comes to treatment, meningitis caused by bacteria requires the rapid administration of antibiotics, whereas meningitis caused by viruses typically requires supportive attention. There are vaccines available for certain bacterial causes of meningitis, such as the meningococcal and pneumococcal vaccines, which are essential for the prevention of meningitis.

ISBN: 978-81-985724-1-7

2. Typhoid fever:

To put it simply, typhoid fever is a systemic infection that is brought on by the Salmonella typhi bacterium. Consumption of contaminated food or water, which typically occurs in regions with inadequate sanitation and hygiene, is the conduit through which it is transferred. In addition to a protracted fever, abdominal pain, diarrhea or constipation, and occasionally a rash of rose-colored patches on the abdomen, typhoid fever is typically characterized by these symptoms. If the condition is serious enough, it can result in consequences such as perforation of the digestive tract or sepsis.

The confirmation of a diagnosis of typhoid fever can be achieved by the use of blood cultures or stool testing. In order to treat the infection, medications like ciprofloxacin or ceftriaxone are used. Among the preventative actions that can be taken are the enhancement of sanitation, the guarantee of safe food and water supplies, and vaccination. It is suggested that travelers who are going to endemic areas or people that are at high risk get the typhoid vaccine.

The Salmonella typhi bacterium is the causative agent of typhoid fever, a severe infection that affects the entire body. Ingestion of food or water that has been contaminated with the bacteria is the primary mechanism of transmission for this disease. This form of transmission is especially prevalent in areas where sanitation and hygiene practices are not as well developed as they should be. The bacteria are able to survive in either water or food, and once they are consumed, they move through the digestive system, penetrating the intestinal walls and spreading into the bloodstream on their way to the bloodstream. Because of this, Salmonella typhi is able to infect various organs, which makes typhoid fever a potentially life-threatening condition if it is not treated swiftly and appropriately.

The clinical manifestations of typhoid fever are unique however, they can differ from person to person according to the individual. A persistent high temperature, which may progressively grow over the course of many days, is often considered to be the initial symptom of the disease. Pain in the abdomen region, which may be widespread or localized, is frequently present in conjunction with this fever. This pain can be severe enough to be mistaken for other abdominal problems. It is not uncommon for people to experience gastrointestinal symptoms, such as diarrhea or constipation; however, the pattern of these symptoms might change depending on the stage of the disease occurring. The rash of rose-colored spots that can appear on the abdomen is a distinctive indication of typhoid fever that is commonly referred to as "rose

ISBN: 978-81-985724-1-7

spots." In some situations, individuals may acquire this rash. Small and slightly elevated, these patches normally disappear within a few days after they have been applied.

It is possible for typhoid fever to result in severe complications, such as perforation of the digestive tract and sepsis, if it is not treated with medication. A perforation happens when bacteria form ulcers in the intestinal walls, which then leads to a breach that permits intestinal contents to flow into the abdominal cavity. This results in peritonitis, which is an infection of the abdominal lining that can be fatal. Another significant effect is known as sepsis, which happens when the infection spreads via the circulation, resulting in extensive inflammation and the failure of organs. These problems call for immediate medical attention and have the potential to greatly raise the risk of death.

The diagnosis of typhoid fever is confirmed through laboratory tests, with blood cultures being the method that is considered to be the most trustworthy form of diagnosis. In order to develop Salmonella typhi in a laboratory setting, blood cultures require the collection of a sample of the patient's blood and the subsequent cultivation of the bacteria. An additional method of diagnosis is stool testing, which is particularly useful in situations in which blood cultures are negative or in the later stages of the disease, when the germs may be lost in the stools themselves. Additional diagnostic techniques, such as the Widal test, are occasionally utilized, despite the fact that they are less specific and have the potential to result in false positives.

A primary component of the treatment for typhoid fever is the use of antibiotics, which are used to remove the illness. There are a number of medications that are effective against Salmonella typhi, including ciprofloxacin and ceftriaxone, which are routinely used. The rise of antibiotic-resistant strains of the bacterium, on the other hand, has made treatment more difficult, and in certain instances, it has been necessary to employ alternative or combination therapy. It is essential to begin antibiotic treatment as soon as possible and in the appropriate manner in order to shorten the length of symptoms and prevent complications.

In order to prevent typhoid fever, there are a number of different measures that are targeted at lowering the likelihood of infection. Enhancing sanitation and hygiene habits is of the utmost importance, particularly in regions where the disease is endemic throughout the population. This involves ensuring that people have access to clean water, that food is handled safely, and that sewage is disposed of in the appropriate manner. In addition, vaccination is an essential preventative step, particularly for individuals who are at a high risk of exposure. This includes individuals who work in healthcare, people who live in places with inadequate sanitation, and

ISBN: 978-81-985724-1-7

people who travel to countries where the disease is endemic. Vaccines against typhoid fever are available in two different variants: an injectable vaccination and an oral vaccine. Although both offer protection against the disease, it is important to note that they are not completely effective, and individuals should still take additional steps to avoid becoming infected.

3. leprosy:

There is a chronic infectious condition called leprosy, which is often referred to as Hansen's disease. This disease is caused by the bacteria Mycobacterium leprae. Eyes, mucous membranes, peripheral nerves, and skin are the primary organs that are affected by this condition. Despite the fact that the precise process of transmission of leprosy is not completely understood, it is known that the disease is transmitted through respiratory droplets from an infected individual. A number of symptoms, including skin lesions, numbness in the affected areas, and muscle weakness, are associated with this condition.

Figure 2: Leprosy

There is a sluggish progression of leprosy, and it may take several years for symptoms to become apparent. When it comes to effective treatment and the prevention of consequences, early diagnosis is absolutely necessary. For the purpose of diagnosis, a clinical examination and skin biopsies are performed. Rifampicin, dapsone, and clofazimine are all components of multidrug therapy (MDT), which is a treatment option for leprosy. This treatment has the potential to cure the illness and prevent its spread. Leprosy is still a problem in certain portions of the world, despite the fact that it has been eradicated in a significant number of areas. Efforts

ISBN: 978-81-985724-1-7

are still being made to enhance the identification, treatment, and support systems for those who are impacted by the disease.

4. Tuberculosis (also known as TB):

Mycobacterium tuberculosis is the responsible agent for the bacterial infection known as tuberculosis. Lungs are the primary organs that are affected by this condition; however, it can also affect other sections of the body, including the kidneys, spine, and brain. TB is transmitted through the air by droplets that are released when an infected person coughs or sneezes. There are a number of symptoms that are associated with it, including a chronic cough, chest pain, fever, night sweats, and increased weight loss.

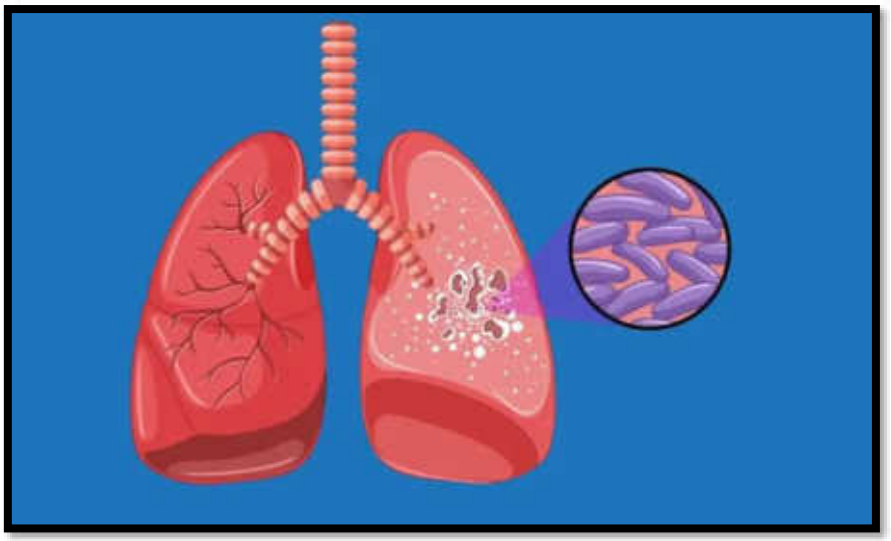


Figure 3: Tuberculosis (TB)

In tuberculosis, there are two types of the disease: latent TB, in which the bacteria are present but do not cause symptoms, and active TB, in which the bacteria are proliferating and producing illness. Chest X-rays, sputum testing, tuberculin skin tests, and interferon-gamma release assays are the kinds of diagnostic procedures that are generally used to confirm a diagnosis. A lengthy course of various antibiotics, such as isoniazid, rifampicin, ethambutol, and pyrazinamide, is required for the treatment of active tuberculosis. This is done to guarantee that the bacteria are completely eradicated and to prevent the formation of drug-resistant strains. To prevent the evolution of latent tuberculosis infection into active tuberculosis, fewer drugs may be required for treatment. When administered to children, the Bacillus Calmette-Guérin (BCG) vaccination offers a degree of protection against tuberculosis, particularly the more severe forms caused by the disease.

ISBN: 978-81-985724-1-7

❖ **UTIs, or urinary tract infections, are defined as:**

illnesses of the urinary system are common illnesses that arise when bacteria enter and multiply in the urinary tract, which consists of the kidneys, ureters, bladder, and urethra. Such infections can be caused by a number of different pathogens. Although Escherichia coli (E. coli) is the most prevalent cause of urinary tract infections (UTIs), other bacteria, including Klebsiella, Proteus, and Enterococcus, can also be responsible for these infections. Because women have shorter urethras, which makes it easier for bacteria to enter the body, they are more likely to suffer from urinary tract infections (UTIs).

Urination that is both painful and frequent, urgency, urine that is murky or smells bad, and pain in the lower abdomen are all symptoms of a urinary tract infection (UTI). Fever and back discomfort are two symptoms that may be present in extreme cases, which may indicate that the kidneys are affected by the condition known as pyelonephritis. A urinalysis and a culture of the urine are used to get a diagnosis. An antibiotic course, such as ciprofloxacin or trimethoprim-sulfamethoxazole, is often used as part of the treatment for this condition. It is important to take preventative steps like as drinking enough water, urinating after engaging in sexual activity, and practicing good personal hygiene.

❖ **Sexually transmitted diseases (STDs) at the sixth place:**

The term "AIDS" refers to the advanced stage of the HIV (Human Immunodeficiency Virus) infection, which is characterized by a highly compromised immune system. AIDS is also known as "acquired immunodeficiency syndrome." Cells known as CD4 cells, which are essential for immunological function, are targeted and destroyed by HIV. Sexual contact that is not protected, the sharing of needles, and transmission from mother to child during childbirth or breastfeeding are all ways that the virus can be passed on. Opportunistic infections, some malignancies, and extreme weight loss are some of the symptoms that may be experienced. An antiretroviral therapy, also known as ART, is the principal treatment for HIV infection management and for preventing the progression of HIV infection into AIDS.

To put it simply, syphilis is an infection that is transmitted by sexual contact and is caused by the bacterium Treponema pallidum. Primary, secondary, latent, and tertiary are the stages that it goes through along its progression. Symptoms of primary syphilis include the development of a sore or ulcer at the site of infection that is not accompanied by any pain. Symptoms of secondary syphilis include rashes on the skin, lesions on the mucous membranes, and

ISBN: 978-81-985724-1-7

symptoms similar to those of the flu. In the event that the infection is not treated, it has the potential to advance to the latent and tertiary phases, which could result in significant harm to organs such as the heart, brain, and nerve connections. In order to diagnose the condition, blood tests are performed, and the treatment consists of antibiotics, most commonly penicillin.

In addition to being a prevalent sexually transmitted disease (STD), gonorrhea is caused by the bacterium Neisseria gonorrhoeae and can affect the vaginal tract, the rectum, and the throat. Having sexual contact with an infected person is the means by which the disease is transmitted. Painful urination and discharge from the penis are among the symptoms that males may suffer. On the other hand, women may have vaginal discharge, pain during sexual activity, and pelvic pain at the same time. Leaving gonorrhea untreated can result in serious problems, including pelvic inflammatory disease (PID) in women and infertility in both sexes. These complications can be particularly dangerous for women. There is a confirmation of the diagnosis through the use of urine tests or swabs, and the treatment consists of antibiotics. Dual therapy is frequently indicated in order to address the possibility of co-infection with Chlamydia trachomatis.

In a nutshell, infectious diseases comprise a wide range of disorders that are brought on by a variety of pathogens, each of which has its own distinct mode of transmission, symptoms, and treatment methods. A comprehensive understanding of these disorders is necessary for the development of successful initiatives for public health, as well as for the prevention, diagnosis, and management of these diseases.

5.2 Sexually transmitted disease

The term "sexually transmitted diseases" (STDs) refers to infections that are largely transmitted by sexual contact. These infections are also referred to as "sexually transmitted infections. A wide variety of pathogens, such as bacteria, viruses, parasites, and fungus, are likely to be responsible for the development of these disorders. STDs are a major cause for concern in terms of public health because of their prevalence, the possible difficulties they might cause, and the impact they have on reproductive health. When it comes to controlling sexually transmitted diseases (STDs) and minimizing their transmission, effective prevention, early detection, and treatment are crucial.

A set of infections that are largely transmitted by sexual contact, including vaginal, anal, and oral intercourse, are referred to as sexually transmitted diseases (STDs), which are also referred to as sexually transmitted infections (STIs). There are many various types of pathogens that

ISBN: 978-81-985724-1-7

can cause these illnesses. Some of these pathogens include bacteria, viruses, parasites, and fungi. Each of these pathogens can create a different set of diseases and health concerns. To name a few, chlamydia, gonorrhea, syphilis, human papillomavirus (HPV), herpes simplex virus (HSV), human immunodeficiency virus (HIV), and trichomoniasis are among the most prevalent sexually transmitted diseases now in existence. The fact that sexually transmitted diseases (STDs) are caused by a wide variety of microorganisms makes it difficult to identify, treat, and prevent them. This is one of the reasons why they are considered to be a major public health concern on a global scale.

As a result of factors such as increased sexual activity, inconsistent use of protection, and a lack of understanding or education regarding safe sexual practices, the prevalence of sexually transmitted diseases (STDs) has been progressively increasing, particularly among younger populations. Not only is the high incidence of sexually transmitted diseases (STDs) concerning due to the sheer number of people who are infected by them, but it is also concerning due to the major health issues that can occur if these infections are not treated. It is possible for women to develop pelvic inflammatory disease (PID) if they do not receive treatment for chlamydia and gonorrhea. This condition can lead to infertility, chronic pelvic pain, and an increased risk of ectopic pregnancy. In a similar vein, syphilis that is not treated can result in serious systemic problems, such as damage to the nervous system and cardiovascular system, and it can even be fatal if it is not treated during the latter stages of the disease.

In addition to the immediate dangers to one's health, sexually transmitted diseases (STDs) also have a significant influence on one's reproductive health. Cancers, such as cervical cancer in women and oropharyngeal cancers in both men and women, have been causally related to the development of certain sexually transmitted diseases (STDs), such as the human papillomavirus (HPV). The immune system is weakened by sexually transmitted diseases (STDs) like HIV, which makes persons more susceptible to other infections and disorders. When an individual is diagnosed with a sexually transmitted disease (STD), the stigma and societal ramifications of the diagnosis can also lead to mental health issues such as anxiety, sadness, and social isolation, further exacerbating the difficulties that they are already experiencing.

In order to restrict the spread of sexually transmitted diseases (STDs) and to mitigate the impact that they have on both individual and public health, it is essential to have effective prevention, early detection, and treatment strategies. Condoms, which are extremely efficient in decreasing

ISBN: 978-81-985724-1-7

the transmission of the majority of sexually transmitted diseases (STDs), and vaccination, which is available for some viruses such as hepatitis B and HPV, are both examples of intervention measures that can be utilized. Not only are public health programs that attempt to raise awareness about sexually transmitted diseases (STDs), promote frequent testing, and encourage open discussions about sexual health crucial, but they are also essential in decreasing the stigma that is associated with these illnesses and empowering individuals to seek medical care in a timely manner.

Finding sexually transmitted diseases (STDs) early on is critical for avoiding consequences and putting a stop to the spread of infections. It is very necessary for sexually active persons to undergo screening on a regular basis, particularly those who have several partners or who engage in sexual activity without covering their bodies. It is essential to perform routine testing in order to discover infections before they develop into more significant health problems because many sexually transmitted diseases (STDs) can be asymptomatic in their early stages. The majority of sexually transmitted diseases (STDs) can be accurately and promptly diagnosed using modern diagnostic procedures, such as nucleic acid amplification tests (NAATs) and serological testing. This enables appropriate therapy to be administered.

The treatment for sexually transmitted diseases (STDs) differs according on the organism that caused the infection. Antibiotics are commonly used to treat bacterial diseases such as chlamydia, gonorrhea, and syphilis. However, antibiotic resistance is becoming an increasing problem, particularly with regard to gonorrhea. It is necessary to take antiviral medications in order to treat viral diseases such as HIV and herpes. These treatments can alleviate symptoms and lower viral load, but they are not curative. Antiretroviral therapy (ART) has the ability to suppress the HIV virus to undetectable levels, thereby delaying the progression of the virus to AIDS and offering a significant reduction in the risk of transmission to other individuals. In order to treat sexually transmitted diseases (STDs) caused by parasites and fungi, such as trichomoniasis and candidiasis, respectively, particular antiparasitic and antifungal drugs are commonly administered.

1. Acquired Immunodeficiency Syndrome, medically known as AIDS:

HIV (Human Immunodeficiency Virus) infection has progressed to its most advanced stage, which is known as AIDS. Cells known as CD4 cells, which are essential components of the immune system, are targeted and destroyed by HIV. Due to the fact that the immune system is becoming more and more impaired, individuals are becoming more and more susceptible to

ISBN: 978-81-985724-1-7

opportunistic infections and certain malignancies, which ultimately leads to the development of AIDS. The principal ways in which HIV is transmitted are through unprotected sexual contact with an infected person, the sharing of needles or syringes, and the transmission of the virus from a mother to her child through both breastfeeding and childbirth.

Asthma is characterized by a wide range of symptoms, the most common of which are persistent fever, loss of weight, chronic diarrhea, and night sweats. The confirmation of an HIV infection diagnosis is accomplished by the use of blood tests that identify antibodies or viral RNA. Despite the fact that there is currently no cure for HIV/AIDS, antiretroviral therapy (ART) has the potential to successfully manage the infection, in addition to improving quality of life and lowering the risk of transmission. As part of antiretroviral therapy (ART), a mixture of drugs is administered to limit viral replication. This enables the immune system to recover and function more efficiently.

2. Syphilis:

Treponema pallidum is the bacteria that is responsible for the chronic sexually transmitted disease known as syphilis. The progression of the disease can be broken down into four distinct stages: primary, secondary, latent, and tertiary. Syphilis is characterized by the emergence of a painless sore or ulcer at the site of infection, which is referred to as a chancre. This first stage of the disease is known as the primary stage. These systemic symptoms include skin rashes, mucous membrane lesions (also known as mucous membrane pemphigus), and symptoms that are similar to those of the flu. The secondary stage is characterized by these symptoms.

Figure 4: Syphilis

ISBN: 978-81-985724-1-7

It is possible for the infection to enter the latent stage if it is not treated, which means that it will remain dormant within the body without generating any symptoms. Late syphilis, also known as tertiary syphilis, can manifest itself years after the initial infection and can result in serious complications. These complications can include diseases of the cardiovascular system and the nervous system, such as neurosyphilis and aortitis. Treatment using blood tests that detect antibodies against Treponema pallidum is the method that is used to diagnose syphilis. The use of antibiotics, most often penicillin, is an effective method for treating the illness and preventing it from progressing to later stages.

3. Gonorrhea:

Neisseria gonorrhoeae is the causal agent of gonorrhea, a sexually transmitted disease (STD). It has an effect on the mucous membranes that are found in the throat, rectum, and genital tract. Gonorrhea is a sexually transmitted disease that can produce a variety of symptoms and is transferred by sexual contact with an infected person. Urination that is painful, purulent discharge from the penis, and pain in the testicles are some of the symptoms that typically occur in men. It is possible that women will experience symptoms that are less visible, although they may include abnormal vaginal discharge, pain during sexual activity, and pelvic pain.

Gonorrhea can result in serious complications if it is not treated, including pelvic inflammatory disease (PID) in women, which can lead to infertility, and disseminated gonococcal infection (DGI), which can lead to joint pain, skin lesions, and systemic illness. Both of these problems can be caused by improper treatment of gonorrhea. Urine tests or swabs taken from the affected areas are utilized in the diagnostic process most of the time. Antibiotics are used to treat gonorrhea, and dual therapy is indicated in order to address the possibility of co-infection with Chlamydia trachomatis, which is another frequent sexually transmitted disease (STD).

4. Chlamydia.

Chlamydia is a sexually transmitted disease (STD) that is caused by the bacteria Chlamydia trachomatis. Among the sexually transmitted diseases (STDs) that are reported the most commonly, it frequently affects the urethra, cervix, rectum, and throat. Chlamydia is a sexually transmitted disease that, in many cases, particularly in women, can be asymptomatic as well as spread through sexual contact. If symptoms do manifest themselves, they may include painful urination, abnormal discharge, and pelvic pain in females, and pain in the testicles or discharge from the penis in males. All of these symptoms may be present.

ISBN: 978-81-985724-1-7

Chlamydia, if left untreated, can result in serious consequences, including premenstrual dysphoric disorder (PID) in women and infertility in both men and women. The diagnosis is established with the use of urine tests or swabs, and the treatment consists of a course of antibiotics, such as azithromycin or doxycycline. In order to avoid long-term consequences and the transfer of the infection to sexual partners, prompt treatment is absolutely necessary.

5. Infection caused by the herpes simplex virus (HSV):

Viral infections produced by the herpes simplex virus (HSV) are caused by two different types of viruses: HSV-1, which is mostly responsible for oral herpes (cold sores), and HSV-2, which is primarily responsible for genital herpes. Oral or vaginal sores can be caused by either genotype of the herpes simplex virus (HSV). Oral contact or direct contact with infected skin or mucous membranes during sexual activity are the two ways in which the virus can be transmitted.

Vaginal herpes is characterized by a number of symptoms, including itching, blisters or sores in the vaginal region, and symptoms similar to those of the flu. Infections with HSV can last a lifetime, and outbreaks can occur at any regular interval. Clinical examination and laboratory testing, such as polymerase chain reaction (PCR) or viral culture, are used to make a diagnosis. Although there is currently no treatment for herpes, antiviral drugs such as acyclovir, valacyclovir, and famciclovir can assist in the management of symptoms, the reduction of the frequency of outbreaks, and the reduction of the risk of infectious transmission.

6. Infections caused by the human papillomavirus (HPV)

HPV, which stands for human papillomavirus, is a collection of viruses that includes more than one hundred different varieties, some of which are transmitted sexually. In addition to being connected to a number of cancers, including cervical, anal, and oropharyngeal cancers, human papillomavirus (HPV) is recognized to be the cause of genital warts. The human papillomavirus (HPV) is sexually transmitted, and the majority of infections do not cause any symptoms.

ISBN: 978-81-985724-1-7

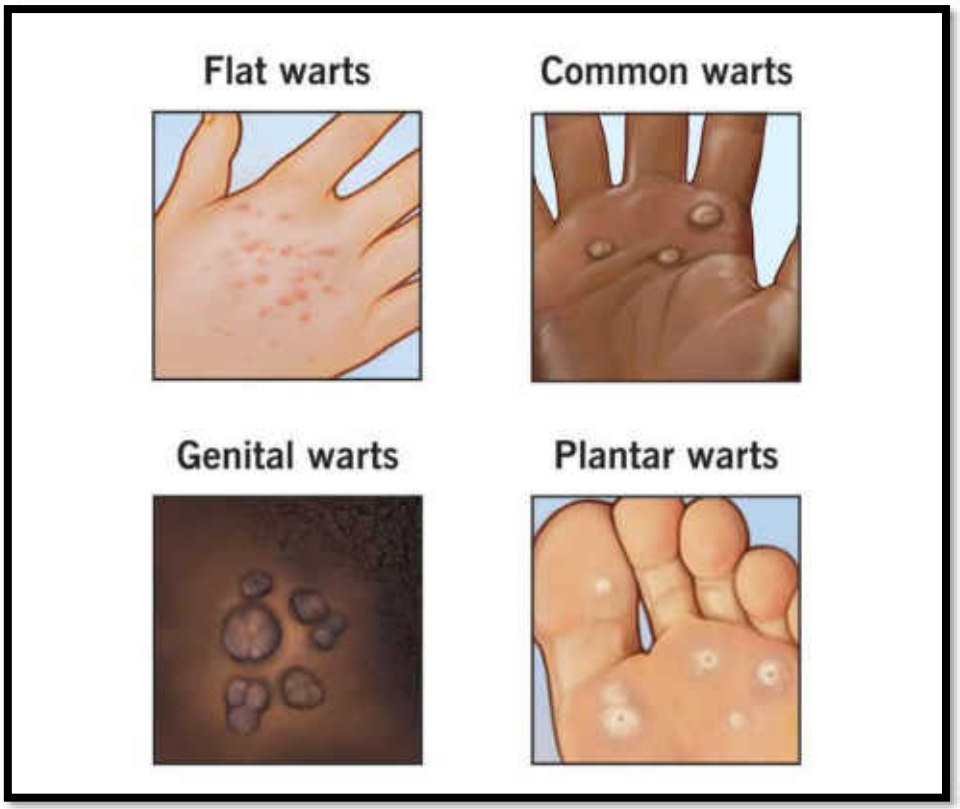


Figure 5: HPV (Human papillomavirus)

Certain kinds of high-risk HPV can cause precancerous alterations in the genital tract, which, if left untreated, can develop into cancer. These changes can eventually lead to cancer. Visual inspection of genital warts, Pap smears, and HPV DNA tests are the three methods that are utilized in the diagnosis of HPV infections. It is possible to prevent infection with the most prevalent kinds of HPV that cause cancer by receiving a vaccination with an HPV vaccine, such as Gardasil or Cervix. This vaccination is quite efficient. The elimination of genital warts can be accomplished through cryotherapy, topical medicines, or surgical removal.

To summarize, sexually transmitted illnesses include a wide variety of infections that can be caused by a variety of factors and can result in a variety of consequences. Prevention through safe sexual behaviors, early discovery, and provision of appropriate therapy are all essential components of effective management. Through education, immunization, and increased access to healthcare services, public health initiatives seek to minimize the prevalence of sexually transmitted diseases (STDs) and the health implications that are associated with them.

ISBN: 978-81-985724-1-7

References

1. Adapa, S., Aeddula, N. R., Konala, V. M., Chenna, A., Naramala, S., Madhira, B. R., ... & Bose, S. (2020). COVID-19 and renal failure: challenges in the delivery of renal replacement therapy. *Journal of clinical medicine research*, *12*(5), 276.
2. Adiamah, A., Skorepa, P., Weimann, A., & Lobo, D. N. (2019). The impact of preoperative immune modulating nutrition on outcomes in patients undergoing surgery for gastrointestinal cancer: a systematic review and meta-analysis. *Annals of Surgery*, *270*(2), 247-256.
3. Ahmed, M., & Ahmed, S. (2019). Functional, diagnostic and therapeutic aspects of gastrointestinal hormones. *Gastroenterology research*, *12*(5), 233.
4. Alam, A., Thelin, E. P., Tajsic, T., Khan, D. Z., Khellaf, A., Patani, R., & Helmy, A. (2020). Cellular infiltration in traumatic brain injury. Journal of neuroinflammation, 17, 1-17.
5. Alizadeh, A., Dyck, S. M., & Karimi-Abdolrezaee, S. (2019). Traumatic spinal cord injury: an overview of pathophysiology, models and acute injury mechanisms. *Frontiers in neurology*, *10*, 282.
6. Ansari, J., & Gavins, F. N. (2019). Ischemia-reperfusion injury in sickle cell disease: from basics to therapeutics. The American Journal of Pathology, 189(4), 706-718.
7. Arnett, D. K., Blumenthal, R. S., Albert, M. A., Buroker, A. B., Goldberger, Z. D., Hahn, E. J., ... & Ziaeian, B. (2019). 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Journal of the American College of Cardiology*, *74*(10), 1376-1414.
8. Arnett, D. K., Blumenthal, R. S., Albert, M. A., Buroker, A. B., Goldberger, Z. D., Hahn, E. J., ... & Ziaeian, B. (2019). 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*, *140*(11), e596-e646.
9. Ashley, C., & Dunleavy, A. (2018). *The renal drug handbook: the ultimate prescribing guide for renal practitioners*. CRC press.
10. Authors/Task Force Members:, McDonagh, T. A., Metra, M., Adamo, M., Gardner, R. S., Baumbach, A., ... & Waltenberger, J. (2022). 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology

ISBN: 978-81-985724-1-7

(ESC). With the special contribution of the Heart Failure Association (HFA) of the ESC. *European journal of heart failure*, *24*(1), 4-131.

11. Bagwe-Parab, S., Yadav, P., Kaur, G., Tuli, H. S., & Buttar, H. S. (2020). Therapeutic applications of human and bovine colostrum in the treatment of gastrointestinal diseases and distinctive cancer types: The current evidence. *Frontiers in Pharmacology*, *11*, 01100.
12. Barros, L. L., Farias, A. Q., & Rezaie, A. (2019). Gastrointestinal motility and absorptive disorders in patients with inflammatory bowel diseases: Prevalence, diagnosis and treatment. *World journal of gastroenterology*, *25*(31), 4414.
13. Bektas, A., Schurman, S. H., Sen, R., & Ferrucci, L. (2018). Aging, inflammation and the environment. Experimental gerontology, 105, 10-18.
14. Benfaremo, D., Manfredi, L., Luchetti, M. M., & Gabrielli, A. (2018). Musculoskeletal and rheumatic diseases induced by immune checkpoint inhibitors: a review of the literature. *Current drug safety*, *13*(3), 150-164.
15. Bennett, C. F., Latorre-Muro, P., & Puigserver, P. (2022). Mechanisms of mitochondrial respiratory adaptation. *Nature Reviews Molecular Cell Biology*, *23*(12), 817-835.
16. Berk, M., Köhler-Forsberg, O., Turner, M., Penninx, B. W., Wrobel, A., Firth, J., ... & Marx, W. (2023). Comorbidity between major depressive disorder and physical diseases: a comprehensive review of epidemiology, mechanisms and management. *World Psychiatry*, *22*(3), 366-387.
17. Biver, E., Berenbaum, F., Valdes, A. M., de Carvalho, I. A., Bindels, L. B., Brandi, M. L., ... & Rizzoli, R. (2019). Gut microbiota and osteoarthritis management: An expert consensus of the European society for clinical and economic aspects of osteoporosis, osteoarthritis and musculoskeletal diseases (ESCEO). *Ageing research reviews*, *55*, 100946.
18. Black, L. M., Lever, J. M., & Agarwal, A. (2019). Renal inflammation and fibrosis: a double-edged sword. *Journal of Histochemistry & Cytochemistry*, *67*(9), 663-681.
19. Bojar, R. M. (2020). *Manual of perioperative care in adult cardiac surgery*. John Wiley & Sons.
20. Bonanni, R., Cariati, I., Tancredi, V., Iundusi, R., Gasbarra, E., & Tarantino, U. (2022). Chronic pain in musculoskeletal diseases: Do you know your enemy?. *Journal of clinical medicine*, *11*(9), 2609.
21. Boothby, I. C., Cohen, J. N., & Rosenblum, M. D. (2020). Regulatory T cells in skin injury: At the crossroads of tolerance and tissue repair. *Science immunology*, *5*(47), eaaz9631.

ISBN: 978-81-985724-1-7

22. Calabrese, L. H., Calabrese, C., & Cappelli, L. C. (2018). Rheumatic immune-related adverse events from cancer immunotherapy. *Nature Reviews Rheumatology*, *14*(10), 569-579.
23. Carter, P., Lagan, J., Fortune, C., Bhatt, D. L., Vestbo, J., Niven, R., ... & Miller, C. A. (2019). Association of cardiovascular disease with respiratory disease. *Journal of the American College of Cardiology*, *73*(17), 2166-2177.
24. Castiglione, V., Aimo, A., Vergaro, G., Saccaro, L., Passino, C., & Emdin, M. (2022). Biomarkers for the diagnosis and management of heart failure. *Heart failure reviews*, 1-19.
25. Chavakis, T., Mitroulis, I., & Hajishengallis, G. (2019). Hematopoietic progenitor cells as integrative hubs for adaptation to and fine-tuning of inflammation. Nature immunology, 20(7), 802-811.
26. Chen, L., Deng, H., Cui, H., Fang, J., Zuo, Z., Deng, J., ... & Zhao, L. (2018). Inflammatory responses and inflammation-associated diseases in organs. Oncotarget, 9(6), 7204.
27. Chen, Y., Huang, T., Yu, Z., Yu, Q., Wang, Y., Hu, J. A., ... & Yang, G. (2022). The functions and roles of sestrins in regulating human diseases. *Cellular & Molecular Biology Letters*, *27*, 1-24.
28. Cheville, A., Smith, S., Barksdale, T., & Asher, A. (2021). Cancer rehabilitation. *Braddom's Physical Medicine and Rehabilitation*, 568-593.
29. Craig, E., & Cappelli, L. C. (2018). Gastrointestinal and hepatic disease in rheumatoid arthritis. *Rheumatic Disease Clinics*, *44*(1), 89-111.
30. Cristina, N. M., & Lucia, D. A. (2021). Nutrition and healthy aging: Prevention and treatment of gastrointestinal diseases. *Nutrients*, *13*(12), 4337.
31. Cruz, C. S. D., & Kang, M. J. (2018). Mitochondrial dysfunction and damage associated molecular patterns (DAMPs) in chronic inflammatory diseases. Mitochondrion, 41, 37-44.
32. Dainton, M. (2024). Acute kidney injury. *Renal nursing: care and management of people with kidney disease*, 115-131.
33. Dalili, D., Isaac, A., Bazzocchi, A., Åström, G., Bergh, J., Lalam, R., ... & Mansour, R. (2020, December). Interventional techniques for bone and musculoskeletal soft tissue tumors: current practices and future directions-part I. ablation. In *Seminars in Musculoskeletal Radiology* (Vol. 24, No. 06, pp. 692-709). Thieme Medical Publishers, Inc..
34. Damluji, A. A., Forman, D. E., Van Diepen, S., Alexander, K. P., Page, R. L., Hummel, S. L., ... & American Heart Association Council on Clinical Cardiology and Council on Cardiovascular and Stroke Nursing. (2020). Older adults in the cardiac intensive care unit:

ISBN: 978-81-985724-1-7

factoring geriatric syndromes in the management, prognosis, and process of care: a scientific statement from the American Heart Association. *Circulation*, *141*(2), e6-e32.

35. De Ligt, K. M., Heins, M., Verloop, J., Smorenburg, C. H., Korevaar, J. C., & Siesling, S. (2019). Patient-reported health problems and healthcare use after treatment for early-stage breast cancer. *The Breast*, *46*, 4-11.
36. Domínguez-Andrés, J., Dos Santos, J. C., Bekkering, S., Mulder, W. J., van der Meer, J. W., Riksen, N. P., ... & Netea, M. G. (2023). Trained immunity: adaptation within innate immune mechanisms. Physiological reviews, 103(1), 313-346.
37. Drewes, A. M., Olesen, A. E., Farmer, A. D., Szigethy, E., Rebours, V., & Olesen, S. S. (2020). Gastrointestinal pain. *Nature reviews Disease primers*, *6*(1), 1.
38. Dumitru, C., Kabat, A. M., & Maloy, K. J. (2018). Metabolic adaptations of CD4+ T cells in inflammatory disease. Frontiers in Immunology, 9, 540.
39. Ekinci, C., Karabork, M., Siriopol, D., Dincer, N., Covic, A., & Kanbay, M. (2018). Effects of volume overload and current techniques for the assessment of fluid status in patients with renal disease. *Blood Purification*, *46*(1), 34-47.
40. Elad, S., Zadik, Y., Caton, J. G., & Epstein, J. B. (2019). Oral mucosal changes associated with primary diseases in other body systems. *Periodontology 2000*, *80*(1), 28-48.
41. ElHawary, H., Baradaran, A., Abi-Rafeh, J., Vorstenbosch, J., Xu, L., & Efanov, J. I. (2021, August). Bone healing and inflammation: principles of fracture and repair. In Seminars in plastic surgery (Vol. 35, No. 03, pp. 198-203). Thieme Medical Publishers, Inc..
42. Elkon, K. B. (2018). Cell death, nucleic acids, and immunity: inflammation beyond the grave. *Arthritis & Rheumatology*, *70*(6), 805-816.
43. El-Tallawy, S. N., Nalamasu, R., Salem, G. I., LeQuang, J. A. K., Pergolizzi, J. V., & Christo, P. J. (2021). Management of musculoskeletal pain: an update with emphasis on chronic musculoskeletal pain. *Pain and therapy*, *10*, 181-209.
44. Enck, P., & Mazurak, N. (2018). The “Biology-First” Hypothesis: Functional disorders may begin and end with biology—A scoping review. *Neurogastroenterology & Motility*, *30*(10), e13394.
45. ESC guidance for the diagnosis and management of cardiovascular disease during the COVID-19 pandemic: part 2—care pathways, treatment, and follow-up." *Cardiovascular Research* 118, no. 7 (2022): 1618-1666.
46. Felgueiras, H. P., Antunes, J. C., Martins, M. C. L., & Barbosa, M. A. (2018). Fundamentals of protein and cell interactions in biomaterials. In *Peptides and Proteins as Biomaterials for Tissue Regeneration and Repair* (pp. 1-27). Woodhead Publishing.

ISBN: 978-81-985724-1-7

47. Fisher, L., Fisher, A., & Smith, P. N. (2020). Helicobacter pylori related diseases and osteoporotic fractures (Narrative Review). *Journal of clinical medicine*, *9*(10), 3253.
48. Gadiparthi, C., Hans, A., Potts, K., & Ismail, M. K. (2018). Gastrointestinal and hepatic disease in the inflammatory myopathies. *Rheumatic Disease Clinics*, *44*(1), 113-129.
49. Gerstein, H. C., Sattar, N., Rosenstock, J., Ramasundarahettige, C., Pratley, R., Lopes, R. D., ... & Branch, K. (2021). Cardiovascular and renal outcomes with efpeglenatide in type 2 diabetes. *New England journal of medicine*, *385*(10), 896-907.
50. Gragnano, A., Negrini, A., Miglioretti, M., & Corbière, M. (2018). Common psychosocial factors predicting return to work after common mental disorders, cardiovascular diseases, and cancers: a review of reviews supporting a cross-disease approach. *Journal of occupational rehabilitation*, *28*, 215-231.
51. Gusev, E., & Zhuravleva, Y. (2022). Inflammation: A new look at an old problem. International Journal of Molecular Sciences, 23(9), 4596.
52. Haanen, J., Ernstoff, M. S., Wang, Y., Menzies, A. M., Puzanov, I., Grivas, P., ... & Obeid, M. (2020). Autoimmune diseases and immune-checkpoint inhibitors for cancer therapy: review of the literature and personalized risk-based prevention strategy. *Annals of oncology*, *31*(6), 724-744.
53. Healy, L. M., Yaqubi, M., Ludwin, S., & Antel, J. P. (2020). Species differences in immune-mediated CNS tissue injury and repair: A (neuro) inflammatory topic. Glia, 68(4), 811-829.
54. Heerspink, H. J., Sjöström, C. D., Jongs, N., Chertow, G. M., Kosiborod, M., Hou, F. F., ... & Wheeler, D. C. (2021). Effects of dapagliflozin on mortality in patients with chronic kidney disease: a pre-specified analysis from the DAPA-CKD randomized controlled trial. *European heart journal*, *42*(13), 1216-1227.
55. Hines, R. L., & Jones, S. B. (Eds.). (2021). *Stoelting's Anesthesia and Co-Existing Disease E-Book: Stoelting's Anesthesia and Co-Existing Disease E-Book*. Elsevier Health Sciences.
56. Hollenberg, S. M., Warner Stevenson, L., Ahmad, T., Amin, V. J., Bozkurt, B., Butler, J., ... & Storrow, A. B. (2019). 2019 ACC expert consensus decision pathway on risk assessment, management, and clinical trajectory of patients hospitalized with heart failure: a report of the American College of Cardiology Solution Set Oversight Committee. *Journal of the American College of Cardiology*, *74*(15), 1966-2011.
57. Hong, Y., Wu, C., & Wu, B. (2020). Effects of resistance exercise on symptoms, physical function, and quality of life in gastrointestinal cancer patients undergoing chemotherapy. *Integrative Cancer Therapies*, *19*, 1534735420954912.

ISBN: 978-81-985724-1-7

58. Huang, K., Cai, H. L., Bao, J. P., & Wu, L. D. (2020). Dehydroepiandrosterone and age-related musculoskeletal diseases: Connections and therapeutic implications. *Ageing Research Reviews*, *62*, 101132.
59. Humphrey, J. D., & Schwartz, M. A. (2021). Vascular mechanobiology: homeostasis, adaptation, and disease. Annual review of biomedical engineering, 23(1), 1-27.
60. Inglis, J. E., Lin, P. J., Kerns, S. L., Kleckner, I. R., Kleckner, A. S., Castillo, D. A., ... & Peppone, L. J. (2019). Nutritional interventions for treating cancer-related fatigue: a qualitative review. *Nutrition and cancer*, *71*(1), 21-40.
61. Irani, S. (2020). New insights into oral cancer—Risk factors and prevention: A review of literature. *International Journal of Preventive Medicine*, *11*.
62. James, M. T., Levey, A. S., Tonelli, M., Tan, Z., Barry, R., Pannu, N., ... & Hemmelgarn, B. R. (2019). Incidence and prognosis of acute kidney diseases and disorders using an integrated approach to laboratory measurements in a universal health care system. *JAMA Network Open*, *2*(4), e191795-e191795.
63. Jansen, F. M., Vavricka, S. R., den Broeder, A. A., de Jong, E. M., Hoentjen, F., & van Dop, W. A. (2020). Clinical management of the most common extra-intestinal manifestations in patients with inflammatory bowel disease focused on the joints, skin and eyes. *United European gastroenterology journal*, *8*(9), 1031-1044.
64. Jentzer, J. C., Bihorac, A., Brusca, S. B., Del Rio-Pertuz, G., Kashani, K., Kazory, A., ... & Critical Care Cardiology Working Group of the Heart Failure and Transplant Section Leadership Council. (2020). Contemporary management of severe acute kidney injury and refractory cardiorenal syndrome: JACC council perspectives. *Journal of the American College of Cardiology*, *76*(9), 1084-1101.
65. Kalantar-Zadeh, K., Jafar, T. H., Nitsch, D., Neuen, B. L., & Perkovic, V. (2021). Chronic kidney disease. *The lancet*, *398*(10302), 786-802.
66. Kalantar-Zadeh, K., Lockwood, M. B., Rhee, C. M., Tantisattamo, E., Andreoli, S., Balducci, A., ... & Li, P. K. T. (2022). Patient-centred approaches for the management of unpleasant symptoms in kidney disease. *Nature Reviews Nephrology*, *18*(3), 185-198.
67. Katabathina, V. S., Menias, C. O., Khanna, L., Murphy, L., Dasyam, A. K., Lubner, M. G., & Prasad, S. R. (2019). Hereditary gastrointestinal cancer syndromes: role of imaging in screening, diagnosis, and management. *Radiographics*, *39*(5), 1280-1301.
68. Kostine, M., Rouxel, L., Barnetche, T., Veillon, R., Martin, F., Dutriaux, C., ... & Schaeverbeke, T. (2018). Rheumatic disorders associated with immune checkpoint

ISBN: 978-81-985724-1-7

inhibitors in patients with cancer—clinical aspects and relationship with tumour response: a single-centre prospective cohort study. *Annals of the rheumatic diseases*, *77*(3), 393-398.

69. Krueger, K. M., Ison, M. G., & Ghossein, C. (2020). Practical guide to vaccination in all stages of CKD, including patients treated by dialysis or kidney transplantation. *American Journal of Kidney Diseases*, *75*(3), 417-425.
70. Lahousse, A., Roose, E., Leysen, L., Yilmaz, S. T., Mostaqim, K., Reis, F., ... & Nijs, J. (2021). Lifestyle and pain following cancer: state-of-the-art and future directions. *Journal of clinical medicine*, *11*(1), 195.
71. Lam, G. A., Albarrak, H., McColl, C. J., Pizarro, A., Sanaka, H., Gomez-Nguyen, A., ... & Paes Batista da Silva, A. (2023). The oral-gut axis: periodontal diseases and gastrointestinal disorders. *Inflammatory bowel diseases*, *29*(7), 1153-1164.
72. Lameire, N. H., Levin, A., Kellum, J. A., Cheung, M., Jadoul, M., Winkelmayer, W. C., ... & Srisawat, N. (2021). Harmonizing acute and chronic kidney disease definition and classification: report of a Kidney Disease: Improving Global Outcomes (KDIGO) Consensus Conference. *Kidney international*, *100*(3), 516-526.
73. Larsson, S. C., & Burgess, S. (2021). Causal role of high body mass index in multiple chronic diseases: a systematic review and meta-analysis of Mendelian randomization studies. *BMC medicine*, *19*, 1-10.
74. Larsson, S. C., & Burgess, S. (2022). Appraising the causal role of smoking in multiple diseases: A systematic review and meta-analysis of Mendelian randomization studies. *EBioMedicine*, *82*.
75. Lee, P., Chandel, N. S., & Simon, M. C. (2020). Cellular adaptation to hypoxia through hypoxia inducible factors and beyond. Nature reviews Molecular cell biology, 21(5), 268-283.
76. Lewis, R., Gómez Álvarez, C. B., Rayman, M., Lanham-New, S., Woolf, A., & Mobasheri, A. (2019). Strategies for optimising musculoskeletal health in the 21 st century. *BMC musculoskeletal disorders*, *20*, 1-15.
77. Liem, R. I., Lanzkron, S., D. Coates, T., DeCastro, L., Desai, A. A., Ataga, K. I., ... & Mustafa, R. A. (2019). American Society of Hematology 2019 guidelines for sickle cell disease: cardiopulmonary and kidney disease. *Blood advances*, *3*(23), 3867-3897.
78. Luan, X., Tian, X., Zhang, H., Huang, R., Li, N., Chen, P., & Wang, R. (2019). Exercise as a prescription for patients with various diseases. *Journal of sport and health science*, *8*(5), 422-441.

ISBN: 978-81-985724-1-7

79. Luttrell, T. (2024). Trauma and Inflammation of Soft Tissue: Rehabilitation and Wound Healing and Remodeling of Collagen. In Foundations of Orthopedic Physical Therapy (pp. 2-37). Routledge.
80. Mandras, S. A., Mehta, H. S., & Vaidya, A. (2020, September). Pulmonary hypertension: a brief guide for clinicians. In *Mayo Clinic Proceedings* (Vol. 95, No. 9, pp. 1978-1988). Elsevier.
81. Mannes, M., Schmidt, C. Q., Nilsson, B., Ekdahl, K. N., & Huber-Lang, M. (2021, December). Complement as driver of systemic inflammation and organ failure in trauma, burn, and sepsis. In Seminars in immunopathology (pp. 1-16). Springer Berlin Heidelberg.
82. Marotto, D., Atzeni, F., Ardizzone, S., Monteleone, G., Giorgi, V., & Sarzi-Puttini, P. (2020). Extra-intestinal manifestations of inflammatory bowel diseases. *Pharmacological Research*, *161*, 105206.
83. Mata, R., Yao, Y., Cao, W., Ding, J., Zhou, T., Zhai, Z., & Gao, C. (2021). The dynamic inflammatory tissue microenvironment: Signality and disease therapy by biomaterials. Research.
84. Meduri, G. U., & Chrousos, G. P. (2020). General adaptation in critical illness: glucocorticoid receptor-alpha master regulator of homeostatic corrections. Frontiers in endocrinology, 11, 161.
85. Meizlish, M. L., Franklin, R. A., Zhou, X., & Medzhitov, R. (2021). Tissue homeostasis and inflammation. Annual review of immunology, 39(1), 557-581.
86. Modi, Z. J., Lu, Y., Ji, N., Kapke, A., Selewski, D. T., Dietrich, X., ... & Gipson, D. S. (2019). Risk of cardiovascular disease and mortality in young adults with end-stage renal disease: an analysis of the US renal data system. *JAMA cardiology*, *4*(4), 353-362.
87. Mullens, W., Damman, K., Testani, J. M., Martens, P., Mueller, C., Lassus, J., ... & Coats, A. (2020). Evaluation of kidney function throughout the heart failure trajectory–a position statement from the Heart Failure Association of the European Society of Cardiology. *European journal of heart failure*, *22*(4), 584-603.
88. Murphey, M. D., & Kransdorf, M. J. (2021). Staging and classification of primary musculoskeletal bone and soft-tissue tumors according to the 2020 WHO update, from the AJR special series on cancer staging. *American Journal of Roentgenology*, *217*(5), 1038-1052.
89. Nadim, M. K., Forni, L. G., Bihorac, A., Hobson, C., Koyner, J. L., Shaw, A., ... & Kellum, J. A. (2018). Cardiac and vascular surgery–associated acute kidney injury: the 20th

ISBN: 978-81-985724-1-7

international consensus conference of the ADQI (acute disease quality initiative) group. *Journal of the American Heart Association*, *7*(11), e008834.

90. Naik, S., & Fuchs, E. (2022). Inflammatory memory and tissue adaptation in sickness and in health. Nature, 607(7918), 249-255.
91. Nanchal, R., Subramanian, R., Karvellas, C. J., Hollenberg, S. M., Peppard, W. J., Singbartl, K., ... & Alhazzani, W. (2020). Guidelines for the management of adult acute and acute-on-chronic liver failure in the ICU: cardiovascular, endocrine, hematologic, pulmonary, and renal considerations. Critical care medicine, 48(3), e173-e191.
92. Natoli, G., & Ostuni, R. (2019). Adaptation and memory in immune responses. Nature immunology, 20(7), 783-792.
93. Ndumele, C. E., Rangaswami, J., Chow, S. L., Neeland, I. J., Tuttle, K. R., Khan, S. S., ... & American Heart Association. (2023). Cardiovascular-kidney-metabolic health: a presidential advisory from the American Heart Association. *Circulation*, *148*(20), 1606-1635.
94. Neag, M. A., Mocan, A., Echeverría, J., Pop, R. M., Bocsan, C. I., Crişan, G., & Buzoianu, A. D. (2018). Berberine: Botanical occurrence, traditional uses, extraction methods, and relevance in cardiovascular, metabolic, hepatic, and renal disorders. *Frontiers in pharmacology*, *9*, 557.
95. Neagu, M., Constantin, C., Popescu, I. D., Zipeto, D., Tzanakakis, G., Nikitovic, D., ... & Tsatsakis, A. M. (2019). Inflammation and metabolism in cancer cell—mitochondria key player. Frontiers in Oncology, 9, 348.
96. Niec, R. E., Rudensky, A. Y., & Fuchs, E. (2021). Inflammatory adaptation in barrier tissues. Cell, 184(13), 3361-3375.
97. Ogbechi, J., Clanchy, F. I., Huang, Y. S., Topping, L. M., Stone, T. W., & Williams, R. O. (2020). IDO activation, inflammation and musculoskeletal disease. *Experimental Gerontology*, *131*, 110820.
98. Oldroyd, A. G., Allard, A. B., Callen, J. P., Chinoy, H., Chung, L., Fiorentino, D., ... & Aggarwal, R. (2021). A systematic review and meta-analysis to inform cancer screening guidelines in idiopathic inflammatory myopathies. *Rheumatology*, *60*(6), 2615-2628.
99. Oliveira, C. B., Maher, C. G., Franco, M. R., Kamper, S. J., Williams, C. M., Silva, F. G., & Pinto, R. Z. (2020). Co-occurrence of chronic musculoskeletal pain and cardiovascular diseases: a systematic review with meta-analysis. *Pain Medicine*, *21*(6), 1106-1121.
100. Ostermann, M., Bellomo, R., Burdmann, E. A., Doi, K., Endre, Z. H., Goldstein, S. L., ... & Zarbock, A. (2020). Controversies in acute kidney injury: conclusions from a Kidney

ISBN: 978-81-985724-1-7

Disease: Improving Global Outcomes (KDIGO) Conference. *Kidney international*, *98*(2), 294-309.

101. Palmer, W., Bancroft, L., Bonar, F., Choi, J. A., Cotten, A., Griffith, J. F., ... & Pfirrmann, C. W. (2020). Glossary of terms for musculoskeletal radiology. *Skeletal radiology*, *49*, 1-33.

102. Paolino, S., Pacini, G., Patanè, M., Alessandri, E., Cattelan, F., Goegan, F., ... & Cutolo, M. (2019). Interactions between microbiota, diet/nutrients and immune/inflammatory response in rheumatic diseases: focus on rheumatoid arthritis. *Reumatologia/Rheumatology*, *57*(3), 151-157.

103. Pawa, S., Banerjee, P., Kothari, S., D'Souza, S. L., Martindale, S. L., Gaidos, J. K., ... & Burke, C. A. (2021). Are all endoscopy-related musculoskeletal injuries created equal? Results of a national gender-based survey. *Official journal of the American College of Gastroenterology| ACG*, *116*(3), 530-538.

104. Pearson, G. J., Thanassoulis, G., Anderson, T. J., Barry, A. R., Couture, P., Dayan, N., ... & Wray, W. (2021). 2021 Canadian Cardiovascular Society guidelines for the management of dyslipidemia for the prevention of cardiovascular disease in adults. *Canadian journal of cardiology*, *37*(8), 1129-1150.

105. Peiseler, M., Schwabe, R., Hampe, J., Kubes, P., Heikenwälder, M., & Tacke, F. (2022). Immune mechanisms linking metabolic injury to inflammation and fibrosis in fatty liver disease–novel insights into cellular communication circuits. Journal of hepatology, 77(4), 1136-1160.

106. Platz, E., Jhund, P. S., Girerd, N., Pivetta, E., McMurray, J. J., Peacock, W. F., ... & Study Group on Acute Heart Failure of the Acute Cardiovascular Care Association and the Heart Failure Association of the European Society of Cardiology. (2019). Expert consensus document: reporting checklist for quantification of pulmonary congestion by lung ultrasound in heart failure. *European journal of heart failure*, *21*(7), 844-851.

107. Qu, F., Guilak, F., & Mauck, R. L. (2019). Cell migration: implications for repair and regeneration in joint disease. *Nature Reviews Rheumatology*, *15*(3), 167-179.

108. Rajendran, P., Chen, Y. F., Chen, Y. F., Chung, L. C., Tamilselvi, S., Shen, C. Y., ... & Huang, C. Y. (2018). The multifaceted link between inflammation and human diseases. Journal of cellular physiology, 233(9), 6458-6471.

109. Ranasinghe, R., Mathai, M., & Zulli, A. (2022). A synopsis of modern-day colorectal cancer: Where we stand. *Biochimica et Biophysica Acta (BBA)-Reviews on Cancer*, *1877*(2), 188699.

ISBN: 978-81-985724-1-7

110. Rangaswami, J., Bhalla, V., Blair, J. E., Chang, T. I., Costa, S., Lentine, K. L., ... & American Heart Association Council on the Kidney in Cardiovascular Disease and Council on Clinical Cardiology. (2019). Cardiorenal syndrome: classification, pathophysiology, diagnosis, and treatment strategies: a scientific statement from the American Heart Association. *Circulation*, *139*(16), e840-e878.

111. Renzi, C., Kaushal, A., Emery, J., Hamilton, W., Neal, R. D., Rachet, B., ... & Lyratzopoulos, G. (2019). Comorbid chronic diseases and cancer diagnosis: disease-specific effects and underlying mechanisms. *Nature reviews clinical oncology*, *16*(12), 746-761.

112. Reyes-Hinojosa, D., Lozada-Pérez, C. A., Cuevas, Y. Z., López-Reyes, A., Martínez-Nava, G., Fernández-Torres, J., ... & Martínez-Flores, K. (2019). Toxicity of cadmium in musculoskeletal diseases. *Environmental Toxicology and Pharmacology*, *72*, 103219.

113. Ribaldone, D. G., Pellicano, R., & Actis, G. C. (2019). The gut and the Inflammatory Bowel Diseases inside-out: The extra-intestinal manifestations. *Minerva gastroenterologica e dietologica*, 309-318.

114. Rivera-Izquierdo, M., Cabeza, L., Láinez-Ramos-Bossini, A., Quesada, R., Perazzoli, G., Alvarez, P., ... & Melguizo, C. (2019). An updated review of adipose derived-mesenchymal stem cells and their applications in musculoskeletal disorders. *Expert Opinion on Biological Therapy*, *19*(3), 233-248.

115. Rosenstock, J., Perkovic, V., Johansen, O. E., Cooper, M. E., Kahn, S. E., Marx, N., ... & Carmelina Investigators. (2019). Effect of linagliptin vs placebo on major cardiovascular events in adults with type 2 diabetes and high cardiovascular and renal risk: the CARMELINA randomized clinical trial. *Jama*, *321*(1), 69-79.

116. Rossi, F., Tortora, C., Paoletta, M., Marrapodi, M. M., Argenziano, M., Di Paola, A., ... & Iolascon, G. (2022). Osteoporosis in childhood cancer survivors: physiopathology, prevention, therapy and future perspectives. *Cancers*, *14*(18), 4349.

117. Ryan, A. M., & Sullivan, E. S. (2021). Impact of musculoskeletal degradation on cancer outcomes and strategies for management in clinical practice. Proceedings of the Nutrition Society, 80(1), 73-91.

118. Sange, A. H., Srinivas, N., Sarnaik, M. K., Modi, S., Pisipati, Y., Vaidya, S., ... & Sange, I. (2021). Extra-intestinal manifestations of inflammatory bowel disease. *Cureus*, *13*(8).

119. Sardu, C., Gambardella, J., Morelli, M. B., Wang, X., Marfella, R., & Santulli, G. (2020). Hypertension, thrombosis, kidney failure, and diabetes: is COVID-19 an endothelial disease? A comprehensive evaluation of clinical and basic evidence. *Journal of clinical medicine*, *9*(5), 1417.

ISBN: 978-81-985724-1-7

120. Sarnak, M. J., Amann, K., Bangalore, S., Cavalcante, J. L., Charytan, D. M., Craig, J. C., ... & Conference Participants. (2019). Chronic kidney disease and coronary artery disease: JACC state-of-the-art review. *Journal of the American College of Cardiology*, *74*(14), 1823-1838.

121. Savira, F., Magaye, R., Liew, D., Reid, C., Kelly, D. J., Kompa, A. R., ... & Wang, B. H. (2020). Cardiorenal syndrome: Multi-organ dysfunction involving the heart, kidney and vasculature. *British journal of pharmacology*, *177*(13), 2906-2922.

122. Schieda, N., Blaichman, J. I., Costa, A. F., Glikstein, R., Hurrell, C., James, M., ... & Hiremath, S. (2018). Gadolinium-based contrast agents in kidney disease: a comprehensive review and clinical practice guideline issued by the Canadian Association of Radiologists. *Canadian journal of kidney health and disease*, *5*, 2054358118778573.

123. Serhan, C. N., Gupta, S. K., Perretti, M., Godson, C., Brennan, E., Li, Y., ... & Wolkenhauer, O. (2020). The atlas of inflammation resolution (AIR). Molecular aspects of medicine, 74, 100894.

124. Sharma, A., Zhao, X., Hammill, B. G., Hernandez, A. F., Fonarow, G. C., Felker, G. M., ... & DeVore, A. D. (2018). Trends in noncardiovascular comorbidities among patients hospitalized for heart failure: insights from the get with the guidelines–heart failure registry. *Circulation: Heart Failure*, *11*(6), e004646.

125. Silveira, E. A., da Silva Filho, R. R., Spexoto, M. C. B., Haghighatdoost, F., Sarrafzadegan, N., & de Oliveira, C. (2021). The role of sarcopenic obesity in cancer and cardiovascular disease: a synthesis of the evidence on pathophysiological aspects and clinical implications. *International journal of molecular sciences*, *22*(9), 4339.

126. Song, Y., Wu, Z., & Zhao, P. (2022). The function of metformin in aging-related musculoskeletal disorders. *Frontiers in Pharmacology*, *13*, 865524.

127. Stout, K. K., Daniels, C. J., Aboulhosn, J. A., Bozkurt, B., Broberg, C. S., Colman, J. M., ... & Van Hare, G. F. (2019). 2018 AHA/ACC guideline for the management of adults with congenital heart disease: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Journal of the American College of Cardiology*, *73*(12), 1494-1563.

128. Stout, K. K., Daniels, C. J., Aboulhosn, J. A., Bozkurt, B., Broberg, C. S., Colman, J. M., ... & Van Hare, G. F. (2019). 2018 AHA/ACC guideline for the management of adults with congenital heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Journal of the American College of Cardiology*, *73*(12), e81-e192.

ISBN: 978-81-985724-1-7

129. Sturgeon, K. M., Mathis, K. M., Rogers, C. J., Schmitz, K. H., & Waning, D. L. (2019). Cancer-and chemotherapy-induced musculoskeletal degradation. *JBMR plus*, *3*(3), e10187.

130. Suzuki, K. (2019). Chronic inflammation as an immunological abnormality and effectiveness of exercise. *Biomolecules*, *9*(6), 223.

131. Tsutsui, H., Isobe, M., Ito, H., Okumura, K., Ono, M., Kitakaze, M., ... & Yamashina, A. (2019). JCS 2017/JHFS 2017 guideline on diagnosis and treatment of acute and chronic heart failure—digest version—. *Circulation Journal*, *83*(10), 2084-2184.

132. Tucker-Bartley, A., Lemme, J., Gomez-Morad, A., Shah, N., Veliu, M., Birklein, F., ... & Upadhyay, J. (2021). Pain phenotypes in rare musculoskeletal and neuromuscular diseases. *Neuroscience & Biobehavioral Reviews*, *124*, 267-290.

133. Turakhia, M. P., Blankestijn, P. J., Carrero, J. J., Clase, C. M., Deo, R., Herzog, C. A., ... & Wanner, C. (2018). Chronic kidney disease and arrhythmias: conclusions from a kidney disease: improving global outcomes (KDIGO) controversies conference. *European heart journal*, *39*(24), 2314-2325.

134. Vaduganathan, M., Mensah, G. A., Turco, J. V., Fuster, V., & Roth, G. A. (2022). The global burden of cardiovascular diseases and risk: a compass for future health. *Journal of the American College of Cardiology*, *80*(25), 2361-2371.

135. VanWagner, L. B., Harinstein, M. E., Runo, J. R., Darling, C., Serper, M., Hall, S., ... & Hammel, L. L. (2018). Multidisciplinary approach to cardiac and pulmonary vascular disease risk assessment in liver transplantation: an evaluation of the evidence and consensus recommendations. *American Journal of Transplantation*, *18*(1), 30-42.

136. Varela, M. L., Mogildea, M., Moreno, I., & Lopes, A. (2018). Acute inflammation and metabolism. Inflammation, 41, 1115-1127.

137. Vasconcelos, D. P., Águas, A. P., Barbosa, M. A., Pelegrín, P., & Barbosa, J. N. (2019). The inflammasome in host response to biomaterials: Bridging inflammation and tissue regeneration. Acta biomaterialia, 83, 1-12.

138. Villeneuve, D. L., Landesmann, B., Allavena, P., Ashley, N., Bal-Price, A., Corsini, E., ... & Tschudi-Monnet, F. (2018). Representing the process of inflammation as key events in adverse outcome pathways. Toxicological sciences, 163(2), 346-352.

139. Weiskirchen, R., Weiskirchen, S., & Tacke, F. (2019). Organ and tissue fibrosis: Molecular signals, cellular mechanisms and translational implications. Molecular aspects of medicine, 65, 2-15.

140. Whelton, P. K., Carey, R. M., Aronow, W. S., Casey, D. E., Collins, K. J., Dennison Himmelfarb, C., ... & Wright, J. T. (2018). 2017

ISBN: 978-81-985724-1-7

ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Journal of the American College of Cardiology*, *71*(19), e127-e248.

141. Wiles, K., Chappell, L., Clark, K., Elman, L., Hall, M., Lightstone, L., ... & Bramham, K. (2019). Clinical practice guideline on

142. Wong, S. K., Chin, K. Y., & Ima-Nirwana, S. (2020). Berberine and musculoskeletal disorders: the therapeutic potential and underlying molecular mechanisms. *Phytomedicine*, *73*, 152892.

143. Yang, Y. J., & Kim, D. J. (2021). An overview of the molecular mechanisms contributing to musculoskeletal disorders in chronic liver disease: osteoporosis, sarcopenia, and osteoporotic sarcopenia. *International journal of molecular sciences*, *22*(5), 2604.

144. Zanelli, M., Pizzi, M., Sanguedolce, F., Zizzo, M., Palicelli, A., Soriano, A., ... & Ascani, S. (2021). Gastrointestinal manifestations in systemic mastocytosis: the need of a multidisciplinary approach. *Cancers*, *13*(13), 3316.

145. Zhang, Q., & Cao, X. (2021). Epigenetic remodeling in innate immunity and inflammation. Annual review of immunology, 39(1), 279-311.

146. Zhang, S., Miller, D. D., & Li, W. (2021). Non-musculoskeletal benefits of vitamin D beyond the musculoskeletal system. *International journal of molecularsciences*, *22*(4),

147. Zhang, S., Xing, M., & Li, B. (2019). Recent advances in musculoskeletal local drug delivery. *Acta biomaterialia*, *93*, 135-151.

148. Zhao, H. M., Xie, Y. X., Wang, C., Chinese Association of Rehabilitation Medicine, Respiratory Rehabilitation Committee of Chinese Association of Rehabilitation Medicine, & Cardiopulmonary Rehabilitation Group of Chinese Society of Physical Medicine and Rehabilitation. (2020). Recommendations for respiratory rehabilitation in adults with coronavirus disease 2019. *Chinese medical journal*, *133*(13), 1595-1602.

149. Ziade, N., El Khoury, B., Zoghbi, M., Merheb, G., Abi Karam, G., Mroue', K., & Messaykeh, J. (2020). Prevalence and pattern of comorbidities in chronic rheumatic and musculoskeletal diseases: the COMORD study. *Scientific reports*, *10*(1), 7683.

150. Zügel, M., Maganaris, C. N., Wilke, J., Jurkat-Rott, K., Klingler, W., Wearing, S. C., ... & Hodges, P. W. (2018). Fascial tissue research in sports medicine: from molecules to tissue adaptation, injury and diagnostics: consensus statement. British journal of sports medicine, 52(23), 1497-1497.

ISBN: 978-81-985724-1-7