

## Editorial

### Contents

■ Editorial	1
■ Mini review	2
■ Current Trends	4
■ In Profile	6
■ Relaxed Mood	8
■ Bug of the Month	9
■ Did You Know	11
■ Best Practices	13
■ In Focus	14

**Mini review section** – The imbalance of microbial composition and diversity in favor of pathogenic microorganisms combined with a loss of beneficial gut microbiota taxa results from factors such as age, diet, antimicrobial administration for different infections, other underlying medical conditions, etc. Probiotics are known for their capacity to improve health by stimulating the indigenous gut microbiota, enhancing host immunity resistance to infection, helping digestion, and carrying out various other functions.

The gut microbiome represents an intricate ecosystem where microorganisms and their metabolic products engage with host cells, exerting an influence on various bodily functions.

**Current Trends section** – Non-host organisms can establish long-term residence within or on the human body, a process known as colonization. This process starts at birth and eventually leads to the development of a relatively stable, complex group of organisms known as normal flora. The interrelationship between humans and colonizing microbes is highly nuanced; colonization is frequently a commensal or symbiotic relationship, but in other circumstances colonizing organisms can disrupt the normal balance and cause infection. *Staphylococcus aureus* because it is a common cause of surgical site infections (SSI) and of infections among patients hospitalized in intensive care units (ICU).

**In Profile Scientist** – Paul Ehrlich was one of the most influential scientists in the history of medicine, widely regarded as a pioneer in immunology, hematology, and chemotherapy. Born on March 14, 1854, in Strehlen, in what was then part of the Kingdom of Prussia, Ehrlich demonstrated an early interest in science, particularly in the staining of tissues, which would later become a cornerstone of his scientific contributions. His work not only transformed the understanding of how the human body fights disease but also laid the foundation for targeted drug therapy, an idea that continues to shape modern medicine.

**Bug of the month** – Nipah virus is a zoonotic virus, usually transmitted from animals to humans, but can also be transmitted through contaminated food or directly between people.

Nipah virus was first identified in 1998 during an outbreak among pig farmers in Malaysia. In 1999, an outbreak was reported in Singapore following the importation of sick pigs from Malaysia. No new outbreaks have been reported from Malaysia or Singapore since 1999. In 2001, Nipah virus infection outbreaks were detected in India and Bangladesh. In Bangladesh, outbreaks have been reported almost every year since. In India, outbreaks are periodically reported in several parts of the country, including the latest one in 2026. In 2014, an outbreak was reported in the Philippines with no new cases since then.

**Did You Know?** -- A new study suggests that when two widely used tests of kidney function do not align, patients may face a greater risk of kidney failure, heart disease, and death.

For many years, clinicians have relied on blood levels of creatinine to estimate how effectively the kidneys remove waste produced by muscle metabolism. More recent medical guidelines also recommend measuring cystatin C, a small protein produced by all cells in the body, as another indicator of kidney function. Because creatinine and cystatin C are affected by different biological factors, including illness and aging, evaluating both together can offer a more accurate picture of kidney health and the likelihood of organ failure than using either test on its own.

**Best Practices** – Your heart is crucial for your general well-being, and it does hard work as long as you are awake. Heart diseases are the leading cause of death worldwide. Several factors influence heart diseases; certain simple habits may also protect and prevent such occurrences.

Heart disease describes a number of conditions that affect the health of your heart. It can lead to arrhythmias or be the result of congenital defects in the heart itself. Genetics play a role in heart disease, but lifestyle changes can decrease your risk of heart problems.

Tickle yourself to enjoy the jokes in our **Relax Mood section**.

Our JHS team is thankful to all our readers for their ever-increasing appreciation that has served as a reward & motivation for us. Looking forward to your continuous support.

# Role of probiotics in managing various human diseases, from oral pathology to cancer and gastrointestinal diseases...contd.

The imbalance of microbial composition and diversity in favor of pathogenic microorganisms combined with a loss of beneficial gut microbiota taxa results from factors such as age, diet, antimicrobial administration for different infections, other underlying medical conditions, etc.

Probiotics are known for their capacity to improve health by stimulating the indigenous gut microbiota, enhancing host immunity resistance to infection, helping digestion, and carrying out various other functions.

The gut microbiome represents an intricate ecosystem where microorganisms and their metabolic products engage with host cells, exerting an influence on various bodily functions.

## Next-generation and genetically modified probiotics

The rapid evolution of high-throughput sequencing technology and the expanding field of bioinformatics have significantly deepened our understanding of the intricate relationship between the human microbiome, particularly in the gut, and a wide range of human diseases.

NGPs are specific strains of commensal microbes commonly found within the GIT, influencing the host's natural defences against gastrointestinal pathogens. NGPs comprise gut bacteria with specific nutritional requirements and oxygen sensitivity, including genera such as *Bacteroides*, *Clostridium*, *Faecalis bacterium*, and *Akkermansia*, as well as genetically engineered (GE) strains.

*Bacteroides* spp., such as *B. thetaiota* micron, play a crucial role as essential members, possessing a remarkable ability to metabolize complex polysaccharides, allowing them to interact with intestinal cells. Moreover, they can modulate host gene expression by inducing immunotolerance in dendritic cells. *B. fragilis*, which stands out due to its zwitterionic polysaccharide that enables it to stimulate the host's immune system.

*C. butyricum*, a Gram-positive, spore-forming, butyrate-producing anaerobe commonly found in human and animal intestines, is known for the beneficial effects of butyrate production on the host. *Faecalibacterium prausnitzii*, a non-spore-forming, Gram-negative, butyrate-producing anaerobe, is another key member of the gut microbiota. Its extremely oxygen-sensitive nature has made working within laboratory settings challenging.

## Probiotics as therapeutic tools:-

### Probiotics in gastrointestinal diseases

### Probiotics in diarrhoea and constipation

Probiotics treat acute diarrhoea as they activate immunological signalling pathways, produce anti-pathogenic factors, and cause the host to secrete them to combat enteric infections. *L. rhamnosus* GG (LGG) has demonstrated its effectiveness in

managing various types of diarrhoea, including infectious diarrhoea, ulcerative colitis, antibiotic-associated diarrhoea, and rotavirus-induced diarrhoea. It achieves this by stimulating the production of mucosal immunoglobulin A (IgA) and secretory IgA (sIgA).

## Benefits of Probiotics

Treatment of Diarrhoea

Prevents Dental Caries

Reduces Cholesterol

Prevents UTI

Immunity Booster

Prevents Chronic Bowel Disease

Reduce allergy & eczema

## Probiotics in *Helicobacter pylori* infection

*Helicobacter pylori*, often known as *H. pylori*, is a widely recognized pathogen that infects over 50% of the global population. This is a pathogenic microorganism that can cause health problems since it has several features that make it harmful and virulence genes that are associated with gastrointestinal issues. Additionally, it might potentially lead to immune thrombocytopenic purpura and elevate the risk of cardiovascular disease as acute coronary syndrome and neurological effects. *Lactobacillus reuteri* probiotic as an additional medication in managing individuals infected with *H. pylori* has been shown to be advantageous, as demonstrated by prospective, randomized, double-blind, placebo-controlled trials.

## Probiotics in oral diseases

One of the primary benefits of probiotics in the oral cavity is their ability to reduce inflammation. Probiotics play a role in preserving the health of gums and teeth by actively countering harmful microorganisms in the mouth. As a form of natural medicine, probiotics are generally considered safe and are not expected to yield adverse effects.

Notably, *L. acidophilus* and *B. lactis* have gained recognition for their effectiveness in combating fungal infections in the oral environment. The most common strains being a pillar in the probiotic's development are *Lactobacillus* and *Bifidobacterium* sp. Notable strains within the *Lactobacillus* sp. include *L.*

*acidophilus*, *L. johnsonii*, *L. rhamnosus*, *L. casei*, *L. reuteri*, and *L. gasseri*. These probiotic strains are associated with beneficial effects on oral health. They achieve this by engaging with toll-like receptor (TLR) signalling, which contributes to epithelial homeostasis by producing repair factors and immune regulation. This mechanism is crucial for protecting against epithelial injury. Furthermore, these probiotics play a role in regulating the release of inflammatory cytokines such as IL-1 $\beta$  and TNF- $\alpha$ , effectively reducing gingival inflammation.

#### **Probiotics in the treatment of urogenital infections**

The composition of normal vaginal commensals in healthy women can vary in premenopausal and postmenopausal stages. In healthy premenopausal women, *Lactobacillus* species typically predominate. These *Lactobacillus* species include *L. delbrueckii*, *L. brevis*, *L. crispatus*, *L. casei*, *L. jensenii*, *L. fermentum*, *L. plantarum*, *L. reuteri*, *L. salivarius*, *L. rhamnosus*, *L. gasseri*, and *L. vaginalis*.

Probiotics offer a promising approach to restoring the balance of commensal organisms in the vagina, which can disrupt the growth of pathogenic organisms and inhibit biofilm formation.

*Lactobacillus* sp. combat vaginal pathogens through various mechanisms, including the production of antimicrobial agents like bacteriocins and biosurfactants that alter the surface tension of the environment, preventing pathogen adhesion and further inhibiting their spread in the bladder. *Lactobacilli* also play a crucial role in maintaining vaginal pH.

#### **Probiotics in cancer prevention and treatment**

Various probiotic strains have exhibited their ability to combat different types of cancer. *Lactobacillus* strains (*L. paracasei* SR4, *L. casei* SR1, and *L. casei* SR2) have demonstrated anticancer effects against cervical cancer cells (HeLa) by increasing the expression of apoptotic genes like BAX, BAD, caspase-8, caspase-3, and caspase-9 while reducing the activity of the anti-apoptotic BCL-2 gene. A compound produced by *Enterococcus thailandicus* possesses significant anticancer properties, particularly against liver cancer cells (HepG2).

An aqueous extract of *Bifidobacterium* sp. has been shown to induce apoptosis in non-small cell lung cancer cells, effectively inhibiting the invasive behaviour of cancer cells. Various mixtures of probiotics, including *L. casei-01*, combined with dairy beverages, have demonstrated antiproliferative and apoptotic effects on human prostate cell lines.

Additionally, regular lactic acid bacteria consumption is considered a preventative measure against bladder cancer. They also contribute to the production of IgA and short-chain fatty

acids, which impede the adherence and proliferation of pathogens. *L. rhamnosus* GG (LGG) is a naturally occurring gut commensal bacterium known for its anti-inflammatory properties and has been a pioneer in oncology research. LGG maintains the equilibrium of the intestinal mucosa by neutralizing harmful pathogens and toxins, effectively preventing breaches in the mucosal barrier through a high-affinity binding system.

One of its key mechanisms involves regulating the production of IgA. LGG is also recognized for producing increased levels of geniposide, an anticancer molecule, and its potential as a beneficial adjuvant during cancer treatment.

#### **Probiotics in the treatment of anaemia**

Folic acid, a water-soluble B vitamin crucial for addressing and managing anaemia, is derived from probiotic bacteria, including *L. lactis*, *L. cremoris*, *B. pseudocatenumulatum*, *Candida famata*, *B. adolescentis*, *Candida glabrata*, *Candida guilliermondii*, *S. cerevisiae*, *Yarrowia lipolytica*, and *Pichia glucozyma*. These bacteria are harnessed to enhance the intestinal absorption of folic acids. In addition, *P. denitrificans* and *P. shermanii* have found utility in treating vitamin B12 deficiency.

Lactic acid-fermented foods are instrumental in increasing iron absorption and are employed in managing anaemic patients. They help optimize the pH of the digestive tract and activate the enzyme phytase, which plays a role in nutrient absorption. Furthermore, a combination of probiotic bacteria has been incorporated into food to treat megaloblastic anaemia.

#### **Probiotics in the treatment and prevention of obesity**

Obesity is a significant risk factor for various health conditions, including hypertension, coronary heart disease, and type II diabetes. Multiple factors contribute to obesity, including dietary choices, physical activity levels, age, genetics, and developmental stage.

Probiotics have demonstrated their potential to reduce weight gain and combat obesity effectively, regulating food intake and promoting prolonged feelings of satiety, reducing fat deposition in the body, enhancing energy metabolism, and increasing insulin sensitivity. Probiotics play a role in reducing serum cholesterol levels through mechanisms involving the production of short-chain fatty acids and the conjugation of bile salts.

Advancing our understanding of these innovative therapeutic strategies is of paramount importance. Additionally, evaluating modified probiotics' long-term safety and efficacy is vital for their sustained therapeutic benefits.

# Nasal decolonization: What antimicrobials and antiseptics are most effective before surgery and in the ICU

Non-host organisms can establish long-term residence within or on the human body, a process known as **colonization**. This process starts at birth and eventually leads to the development of a relatively stable, complex group of organisms known as normal flora. The interrelationship between humans and colonizing microbes is highly nuanced; colonization is frequently a commensal or symbiotic relationship, but in other circumstances colonizing organisms can disrupt the normal balance and cause infection. *Staphylococcus aureus* because it is a common cause of surgical site infections (SSI) and of infections among patients hospitalized in intensive care units (ICU).



Between 12% and 30% of humans are colonized by methicillin-susceptible *S. aureus* (MSSA) and 1%-3% are colonized by methicillin resistant *S. aureus* (MRSA). The nares and the throat are the most common sites of colonization, though the axillae, groin, and perianal region may also be colonized. When host defences are disrupted, *S. aureus* can invade or disseminate and cause severe infections such as bacteraemia, endocarditis, pneumonia and osteomyelitis. *S. aureus* colonization is an important risk factor for *S. aureus* infections.

## Strategies for decolonizing *S. aureus* carriers

- Snuffs containing penicillin, proflavine, lycopodium spores, or sulphathiazole with menthol were used to decolonize *Staphylococcus aureus* carriers, with subjects applying the snuff to the back of their hand and inhaling it into their nostrils, which temporarily decreased bacterial colony counts.
- Decolonization was attempted by aerosolizing methicillin in a hospital nursery, which led to a decrease in *Staphylococcus aureus* colonization; however, the frequency of methicillin-resistant strains of coagulase-negative *Staphylococci* increased, and the emergence of these resistant organisms likely discouraged further aerosol-based decolonization efforts.

## Mupirocin

Mupirocin, also known as pseudomonic acid A. Mupirocin inhibits bacterial protein and RNA synthesis through the binding

of bacterial isoleucyl-tRNA synthetase. It has activity against *Staphylococci* and *Streptococci*, and has some activity against *Neisseria*, *Haemophilus influenzae*, and *Bordetella pertussis*. The primary formulation is topical, typically delivered as a 2% ointment, and systemic absorption is minimal (less than 1%). When used for decolonization, mupirocin is usually applied to the nares twice daily for 5 days.



## Povidone-iodine

The element iodine has been used to treat wound infections in various forms since its discovery in the early 1800s, and the development of iodine solutions (iodophors) expanded its medical applications. One such agent is povidone-iodine (PI), a complex of iodine and polyvinylpyrrolidone, a synthetic polymer known as povidone. PI is most commonly available as a 10% solution that has broad antibacterial activity including coverage of both MSSA and MRSA. Studies suggest PI suppresses *S. aureus* growth for a short period of time but does not eliminate the organism. In contrast, mupirocin decolonizes a substantial proportion of patients.

## Bacitracin

Bacitracin, a mixture of cyclic peptides produced by *Bacillus licheniformis*, was discovered in 1945. This agent interferes with cell wall synthesis in gram-positive bacteria including *S. aureus*. Despite its initial promise, bacitracin is less effective than mupirocin. In addition, Bacitracin is frequently associated with allergic dermatitis. Given the data coupled with its side effect profile, Bacitracin is not recommended as a primary decolonization strategy.

## Retapamulin

Retapamulin, which was developed around 2006, binds to a unique bacterial ribosomal site resulting in broad-spectrum antibacterial activity, including activity against MSSA and MRSA. Since studies comparing retapamulin with mupirocin are lacking, retapamulin's niche is currently limited to decolonization of patients with persistent *S. aureus* carriage

despite mupirocin treatment, or to patients known to be colonized with mupirocin-resistant *S. aureus*.

#### Intranasal alcohol and other alternative agents for decolonizing *S. aureus* carriers

Intranasal alcohol-based antiseptics, with concentrations of 60%-90% alcohol, have broad bactericidal activity. A nasal antiseptic solution containing 70% ethanol reduced the CFUs of *S. aureus*. Single-dose application did not significantly reduce nasal MRSA CFU counts, while triple-dose application reduced MRSA CFU counts at 2 hours, but the effect disappeared at 6 hours.

Other therapies proposed for nasal decolonization includes tea tree oil, photodynamic therapy, lysostaphin, and omiganan pentahydrochloride.

#### Decolonization of surgical patients

There is strong evidence that nasal and skin decolonization prior to cardiac and orthopaedic surgery is effective at preventing SSIs especially caused by Gram-positive organisms that are susceptible to mupirocin and CHG. This is because SSIs are often endogenous, spreading from one body site (e.g., nose or skin) to the surgical wound of the same patient. Decolonization has been effective against both MRSA and MSSA SSIs.

Mupirocin use among non-general surgery patients (e.g., those undergoing cardiothoracic surgery, neurosurgery, or orthopaedic surgery) was associated with a reduction in SSIs. Conversely, mupirocin uses among general surgery patients (e.g., those undergoing gastrointestinal, oncologic, or gynaecologic surgery) did not reduce SSIs. Thus, mupirocin decolonization is recommended for clean non-general procedures but not for general surgical procedures that are associated with contamination from the gastrointestinal tract during the procedure.

Nasal alcohol products have bactericidal activity against most gram-positive and gram-negative bacteria but have a very short duration of activity.

#### Decolonizing patients in ICUs

Patients in ICUs have a higher rate of MRSA colonization than patients hospitalized on other units, which puts patients in ICUs at higher risk of *S. aureus* infections than other patients. Typically using daily chlorhexidine (CHG) bathing and nasal antiseptic (mupirocin or povidone-iodine)—is the most effective strategy to reduce infections, including MRSA and central line-associated bloodstream infections (CLABSI). This approach outperforms targeted screening and isolation, significantly decreasing ICU infection rates.

Nasal application of mupirocin (an antibiotic ointment) is considered the gold standard, though alcohol-based antiseptics or povidone-iodine are also used to reduce antimicrobial resistance risks.

This approach is crucial for high-risk ICU environments where patients are vulnerable to healthcare-associated infections (HAIs).

#### Bacterial resistance

Mupirocin resistance is likely a function of exposure. Some universal decolonization programs and some hospital-wide interventions have been associated with increasing rates of mupirocin resistance. Significant resistance to povidone-iodine has not been documented, presumably due to PI's multiple intracellular targets. Additionally, antibiotic cross-resistance has not been found following low-level exposure to PI.

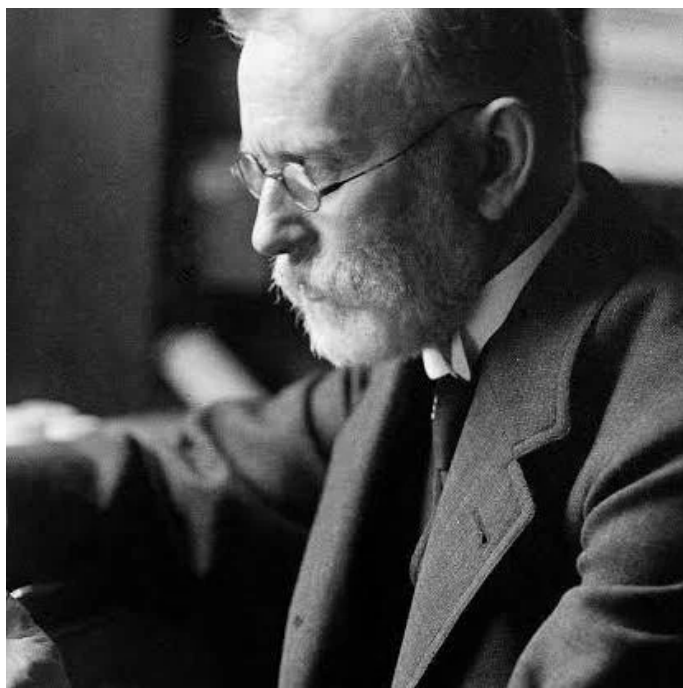
Mupirocin is the best studied nasal decolonization agent. It leads to high rates of decolonization and decreases the rate of *S. aureus* SSI after orthopaedic and cardiac surgical procedures, with the data most strongly supporting its use for orthopaedic procedures. Patients can become recolonized and may need to be decolonized before subsequent surgical procedures.

PI is bacteriostatic, it suppresses colonization rather than eliminating it. Since it rapidly suppresses *S. aureus*, it can be applied within the hour before a surgical procedure, making it much easier to implement than mupirocin-based decolonization protocols. PI may be better tolerated than mupirocin as well.

#### Comparison of mupirocin and povidone-iodine

	Mupirocin	Povidone-iodine (PI)
<b>Duration of efficacy</b>	Short/medium-term decolonization (days to months)	Transient suppression of bacteria (hours)
<b>Best studied pre-operative use</b>	2% ointment applied to nares 2x daily for five days before orthopaedic surgery (best data) and cardiac surgery (modest data)	1-2 applications of 10% PI solution to nares 1-3 hours before orthopaedic surgery
<b>Best studied ICU use</b>	2% ointment applied to nares 2x daily as part of targeted or universal decolonization strategy	Insufficient data supporting use in ICU setting
<b>Pros</b>	Abundant data demonstrating efficacy	Can be given immediately prior to surgery, improving adherence Slightly better tolerated than mupirocin
<b>Cons</b>	Multi-step protocols lead to low adherence Cannot be completed before urgent or emergent procedures Widespread use has been associated with resistance	Effect is transient Less effective in the ICU* setting than mupirocin Published studies in surgical populations are all single center

## Paul Ehrlich



Paul Ehrlich was one of the most influential scientists in the history of medicine, widely regarded as a pioneer in immunology, hematology, and chemotherapy. Born on March 14, 1854, in Strehlen, in what was then part of the Kingdom of Prussia, Ehrlich demonstrated an early interest in science, particularly in the staining of tissues, which would later become a cornerstone of his scientific contributions. His work not only transformed the understanding of how the human body fights disease but also laid the foundation for targeted drug therapy, an idea that continues to shape modern medicine.

Ehrlich studied medicine at several universities, including Breslau, Strasbourg, Freiburg, and Leipzig. During his studies, he became fascinated with the way chemical dyes could be used to stain cells and tissues. This interest was more than aesthetic, it allowed him to observe biological structures in unprecedented detail. At the time, the use of dyes in microscopy was still in its infancy, and Ehrlich's innovations greatly improved the ability of scientists to distinguish between different types of cells. His staining techniques enabled the identification of various blood cells, contributing significantly to the development of hematology as a scientific discipline.

One of Ehrlich's earliest major contributions was his work on blood cells. By using specific dyes, he was able to differentiate between types of white blood cells, such as lymphocytes, eosinophils, and neutrophils. This classification was critical in understanding the immune system and diagnosing diseases. His meticulous approach and attention to detail earned him a reputation as a brilliant experimentalist.

Ehrlich's work soon expanded into immunology, where he sought to understand how the body defends itself against pathogens. He developed the "side-chain theory," which proposed that cells have specific receptors (side chains) that bind to toxins or

antigens. According to this theory, when a toxin binds to a receptor, the cell produces more of those receptors and releases them into the bloodstream as antibodies. Although later refined, this concept was groundbreaking and provided a theoretical framework for understanding the immune response.

In collaboration with other scientists of his time, Ehrlich also contributed to the development of antitoxins, particularly for diseases such as diphtheria. He worked on standardizing antitoxin sera, ensuring that treatments were consistent and effective. This was a crucial step in making immunotherapy a reliable medical practice. His efforts in this area earned him significant recognition and ultimately contributed to his receiving the Nobel Prize in Physiology or Medicine in 1908.

Perhaps Ehrlich's most famous contribution came in the field of chemotherapy. He introduced the idea of a "magic bullet," a compound that could specifically target disease-causing organisms without harming the host. This concept was revolutionary, as most treatments at the time were either ineffective or highly toxic. Ehrlich believed that it was possible to design drugs that would selectively attack pathogens based on their chemical properties.

This vision led to his work on arsenic-based compounds for the treatment of syphilis, a devastating disease in the early 20th century. After testing hundreds of compounds, Ehrlich and his colleague Sahachiro Hata discovered compound 606, later named Salvarsan. Introduced in 1910, Salvarsan became the first effective treatment for syphilis and is often considered the first modern chemotherapeutic agent. Although it had side effects and required careful administration, it represented a breakthrough in medicine and demonstrated the potential of targeted therapy.

Ehrlich's approach to drug development was systematic and methodical. He emphasized the importance of testing large numbers of chemical compounds and carefully documenting their effects. This approach laid the groundwork for modern pharmaceutical research and drug discovery. His laboratory methods and principles continue to influence how new medications are developed today.

In addition to his scientific achievements, Ehrlich was also a skilled administrator and leader. He served as the director of the Royal Institute for Experimental Therapy in Frankfurt, where he oversaw a wide range of research projects. Under his leadership, the institute became a center of excellence in biomedical research, attracting scientists from around the world.

Despite his many successes, Ehrlich faced challenges and controversies throughout his career. Some of his ideas were initially met with skepticism, and the use of toxic compounds like arsenic in medicine raised ethical and safety concerns. However, his persistence and commitment to scientific rigor ultimately earned him widespread respect.

Ehrlich's legacy extends far beyond his own discoveries. His work helped establish the fields of immunology and chemotherapy as major branches of medical science. The concept

of the “magic bullet” continues to inspire researchers in the development of targeted therapies for diseases such as cancer and autoimmune disorders. Modern treatments, including monoclonal antibodies and precision medicine, can trace their conceptual origins back to Ehrlich’s ideas.

He passed away on August 20, 1915, but his influence remains deeply embedded in the fabric of modern medicine. Today, he is remembered not only for his groundbreaking discoveries but also for his visionary approach to science. Ehrlich believed that chemistry and biology could be combined to solve some of the most pressing medical challenges, a belief that has proven to be remarkably prescient.

In conclusion, Paul Ehrlich was a towering figure in the history of science whose contributions revolutionized the understanding and treatment of disease. From his early work in staining techniques to his pioneering efforts in immunology and chemotherapy, Ehrlich’s innovations have had a lasting impact on medicine. His concept of targeted therapy, embodied in the idea of the “magic bullet,” continues to guide scientific research and medical practice today. Through his dedication, creativity, and scientific insight, Ehrlich helped pave the way for a new era in medicine—one in which diseases could be understood at a molecular level and treated with precision and effectiveness.



# Jokes



Friend: Did you start going to the gym?

Me: Yes, I go every day.

Friend: Wow, seeing results?

Me: Yeah... I lost my motivation.

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Mom: Why is your room so messy?

Me: I like to express myself.

Mom: Express yourself cleaner.

Me: That's not my vibe.

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Teacher: Why are you late?

Student: There was a man who lost a ₹500 note.

Teacher: So you helped him find it?

Student: No, I was standing on it.

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Friend: Why don't you answer calls?

Me: I like to keep people guessing.

Friend: Guessing what?

Me: If I'm alive or not.

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Boss: Why are you always late?

Employee: Traffic, sir.

Boss: You live next door.

Employee: Exactly... too much traffic near office.

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Doctor: You need to stop using Google for medical advice.

Me: Why?

Doctor: Because now you think you have 7 diseases.

Me: Wait... only 7?

# Nipah virus



For some people, Nipah virus infection may be asymptomatic. However, most people develop a fever, and symptoms involving the brain (such as headache or confusion), and/or the lungs (such as difficulty breathing or cough). Other organs can also be affected. Frequent other symptoms include chills, fatigue, drowsiness, dizziness, vomiting and diarrhoea.

Severe disease can occur in any patient but is particularly associated with people presenting with neurological symptoms, with progression to brain swelling (encephalitis) and, frequently, death. Careful supportive care and monitoring during this period is critical.

Most people who survive make a full recovery, but long-term neurologic conditions have been reported in approximately 1 in 5 people who recovered from the disease.

Nipah virus is a zoonotic virus, usually transmitted from animals to humans, but can also be transmitted through contaminated food or directly between people.

Nipah virus was first identified in 1998 during an outbreak among pig farmers in Malaysia. In 1999, an outbreak was reported in Singapore following the importation of sick pigs from Malaysia. No new outbreaks have been reported from Malaysia or Singapore since 1999. In 2001, Nipah virus infection outbreaks were detected in India and Bangladesh. In Bangladesh, outbreaks have been reported almost every year since. In India, outbreaks are periodically reported in several parts of the country, including the latest one in 2026. In 2014, an outbreak was reported in the Philippines with no new cases since then.

## Transmission

Fruit bats from the Pteropodidae family are considered the natural host of Nipah virus and are present in different parts of Asia and in Australia. African fruit bats of the genus *Eidolon*, family Pteropodidae, have been found to have antibodies against Nipah and Hendra viruses, indicating that these viruses might also be present within the geographic distribution of Pteropodidae bats in Africa. Infection with Nipah virus does not appear to cause disease in fruit bats.

Transmission of the virus to humans can occur from direct contact with infected animals like bats, pigs or horses, and by consuming fruits or fruit products, such as raw date palm juice, contaminated by infected fruit bats. The virus can also cause severe disease in farming animals such as pigs. Nipah virus can also spread between people. It has been reported in health-care settings and among family and caregivers of sick people through close contact. In health facilities, the risk of spread can increase in overcrowded, poorly ventilated hospital environments with inadequate implementation of infection prevention and control measures (such as the use of personal protective equipment, cleaning and disinfection, and hand hygiene).

## Signs and symptoms

The incubation period is the time from infection to the onset of symptoms ranges from 3 to 14 days. In some rare cases incubation of up to 45 days has been reported.

## Diagnosis

It is difficult to distinguish Nipah from other infectious diseases, or other causes of encephalitis or pneumonia, without laboratory testing. The main diagnostic test is real time polymerase chain reaction (RT-PCR) of respiratory samples, blood or cerebrospinal fluid (a spinal tap). Blood antibody detection via enzyme-linked immunosorbent assay (ELISA) may also be used.

Samples collected from patients are a biohazard risk. Laboratory testing on non-inactivated samples should be conducted under maximum biological containment conditions. Samples taken from people and animals with suspected Nipah virus infection should be handled by trained staff working in suitably equipped laboratories.

## Treatment

While there are no specific treatments for Nipah, early diagnosis will promote early supportive care. For all severe viral infections, high-quality supportive medical care can prevent deaths, and includes: identifying any complications (brain swelling, pneumonia, other organ damage); personalizing treatment to account for patients' other health conditions; treating with oxygen when required; applying specific organ support therapies as needed (such as ventilation, renal dialysis); and ensuring adequate rehydration and nutrition with frequent monitoring.

There are currently no approved drugs or vaccines for Nipah virus infection. WHO has identified Nipah virus infection as a priority disease for the WHO Research and Development Blueprint. A range of candidate products are under different stages of development.

## Prevention

Reducing the risk of infection in people  
Raising awareness of the risk factors for infection and on measures people can take to protect themselves and prevent transmission is critical. WHO recommends taking measures as noted below.

#### Reducing the risk of bat-to-human transmission

Efforts to prevent transmission should first focus on decreasing bat access to date palm sap and other fresh food products. Keeping bats away from sap collection sites by using protective coverings may be helpful. Freshly collected date palm juice should be boiled, and fruits should be thoroughly washed and peeled before consumption. Fruits with any sign of bat bites should be discarded.

#### Reducing the risk of animal-to-human transmission

Gloves and other protective clothing should be worn while handling sick animals such as pigs or horses, and during slaughtering and culling procedures. In areas where the virus is present, when establishing new pig farms, considerations should be given to the presence of fruit bats in the area and in general, pig feed and pig sheds should be protected against bats when feasible.

#### Controlling Nipah virus in pigs

In past outbreaks of Nipah involving pig farms, several measures were implemented to reduce transmission including: routine and thorough cleaning and disinfection of farms; quarantining animal premises in the case of suspected cases; culling of infected animals, with close supervision of burial or incineration of carcasses; and restricting or banning the movement of animals from infected farms to other areas. For more information, see the World Organization for Animal Health (WOAH) webpage on Nipah virus infection.

#### Reducing the risk of human-to-human transmission

People experiencing Nipah-like symptoms should be referred to a health facility, as early supportive care is key in the absence of licensed treatment. Close unprotected physical contact with sick people should be avoided. Regular hand washing should be carried out after caring for or visiting sick people along other preventive measures.

#### Controlling infection in health-care settings

WHO advises health-care workers to implement standard precautions for infection prevention and control at all times, for all patients:

suspected or confirmed cases of Nipah virus infection should be placed in a single-patient room; when caring for patients, WHO advises the use of contact and droplet precautions including a well-fitting medical mask, eye protection, a fluid-resistant gown, and examination gloves; airborne precautions should be implemented during aerosol-generating procedures, including placing the patient in an airborne-infection isolation room and using a fit-tested filtering facepiece respirator instead of a medical mask; and for family members and caregivers visiting patients with suspected or confirmed Nipah virus, similar precautions should be applied. WHO continues to monitor any upcoming new evidence to ensure recommendations remain up to date.

# A Simple Blood Test Mismatch May Predict Kidney Failure, Heart Disease, and Death



A new study suggests that when two widely used tests of kidney function do not align, patients may face a greater risk of kidney failure, heart disease, and death.

For many years, clinicians have relied on blood levels of creatinine to estimate how effectively the kidneys remove waste produced by muscle metabolism. More recent medical guidelines also recommend measuring cystatin C, a small protein produced by all cells in the body, as another indicator of kidney function. Because creatinine and cystatin C are affected by different biological factors, including illness and aging, evaluating both together can offer a more accurate picture of kidney health and the likelihood of organ failure than using either test on its own.

## A gap that predicts future disease

Researchers from NYU Langone Health found that large differences between the two test results are common, particularly among people who are already unwell, and that these gaps may signal future health problems. In the international study, more than one-third of hospitalized participants showed cystatin C based estimates of kidney function that were at least 30 percent lower than estimates based on creatinine. “Our findings highlight the importance of measuring both creatinine and cystatin C to gain a true understanding of how well the kidneys are working, particularly among older and sicker adults,” said study co-corresponding author Morgan Grams, MD, PhD. “Evaluating both biomarkers may identify far more people with poor kidney function, and earlier in the disease process, by covering the blind spots that go with either test.”

## Why accurate kidney assessment matters

The study was recently published in the *Journal of the American Medical Association* and was presented at the American Society of Nephrology’s annual Kidney Week conference at the same time. Accurate measurement of kidney function is not only

essential for detecting disease but also for determining safe and effective doses of medications, including cancer treatments, antibiotics, and many commonly prescribed drugs, said Grams, the Susan and Morris Mark Professor of Medicine at the NYU Grossman School of Medicine.

In a separate study released on the same day, the research team reported that chronic kidney disease now affects more people worldwide than ever before and has become the ninth leading cause of death globally. Dr. Grams, who is also a professor in the Department of Population Health at NYU Grossman School of Medicine, said that improving methods for early detection could allow patients to begin treatment sooner and reduce the need for more intensive measures such as dialysis or organ transplantation.

## Global data reveal long-term risks

For the recent investigation, the research team analyzed health care records, blood tests, and demographic data collected from 860,966 men and women of a half-dozen nationalities. All participants had their creatinine and cystatin C levels measured on the same day and received follow-ups 11 years later on average. The team considered factors unrelated to kidney function that influence the biomarkers’ readings, such as smoking, obesity, and history of cancer.

Performed as part of the international Chronic Kidney Disease Prognosis Consortium, the study is the largest to date to explore differences between the two tests and whether they may signal potential health problems, the authors say. Established to better understand and treat the condition, the consortium provides evidence for global definitions of chronic kidney disease and related health risks.

According to the new findings, those whose cystatin C-based measures of kidney filtration were at least 30% lower than their creatinine-based measures were at higher risk for death, heart disease, and heart failure than those who had a smaller difference

between the two metrics. The former group was also more likely to be diagnosed with severe chronic kidney disease that required dialysis or an organ transplant. The same was found for 11% of outpatients and seemingly healthy volunteers.

#### **Closing the testing gap**

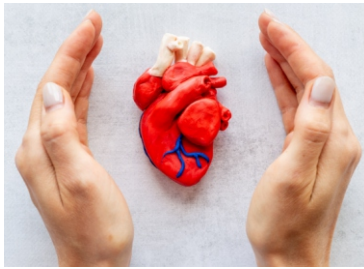
Grams notes that while cystatin C testing was first recommended in 2012 by the international organization kidney disease — Improving Global Outcomes, a 2019 survey revealed that less than 10% of clinical laboratories in the United States performed it in-house. The two largest laboratories, Quest Diagnostics and Labcorp, now offer the test.

“These results underscore the need for physicians to take advantage of the fact that more hospitals and health care providers are starting to offer cystatin C testing,” said study co-corresponding author Josef Coresh, MD, PhD, director of NYU Langone’s Optimal Aging Institute. “Physicians might otherwise miss out on valuable information about their patients’ well-being and future medical concerns.”

Coresh, who is also the Terry and Mel Karmazin Professor of Population Health at NYU Grossman School of Medicine, cautions that among the hospitalized Americans in the study, less than 1% were tested for cystatin C.

# Heart health: Cardiologist-approved simple habits to protect your heart

Your heart is crucial for your general well-being, and it does hard work as long as you are awake. Heart diseases are the leading cause of death worldwide. Several factors influence heart diseases; certain simple habits may also protect and prevent such occurrences.



Heart disease describes a number of conditions that affect the health of your heart. It can lead to arrhythmias or be the result of congenital defects in the heart itself. Genetics play a role in heart disease, but lifestyle changes can decrease your risk of heart problems.

**10 easy ways you can modify your existing routines and have a healthy heart**

## How to Protect Your Heart



Actively exercise at least 150 minutes per week



Follow an overall well-balanced diet



See your primary care physician for a yearly physical



Stay hydrated by drinking at least 64 oz. of water daily



Sleep 6-8 hours a night

### 1. Include A Healthy Breakfast for everyone and Feel Energized to Kickstart the Day!

Having a healthy breakfast will prepare your body for greater undertaking while simultaneously boosting your heart health. Foods such as oats, idli, poha, whole grains, and fresh fruits are all great fibre-rich options.

Having fried items and sugar breakfasts should be avoided on all occasions as these foods have beyond harmful impacts on blood sugar and cholesterol levels.

Home-prepared meals are typically lower in sodium, added sugars and saturated fat, which supports healthier blood pressure, lipid profiles and have higher diet quality compared to others.

### 2. Incorporate Something Active to do Everyday

Movement is crucial for heart health. Incorporating some movement into your daily life is extremely important. It is even important to walk after your meals. Even short 10–15minute walks after eating, reduce post meal blood sugar compared with sitting. Lower glucose spikes protect blood vessels and reduce long-term cardiovascular risk.

Going for a morning walk, a jog or doing stretches is a great way to circulate blood and relax the heart. This simple habit could significantly reduce your risk of heart.

### 3. Increase the Amount of Fruits and Veggies You Eat Ration-wise and Rejoice

Incorporating fruits and vegetables into your diet is important to

improve your heart health. Eating plenty of vegetables and fruits provides your body with the essential nutrients necessary for protecting your heart. Aim to have at least half of what you are feeding yourself with fruits and fresh vegetables, like carrots, bananas, oranges as well as spinach.

### 4. Limit Sugar and Salt Intake

Obesity and diabetes, tidal waves of salt, and rising blood pressure are huge threats to heart disease. Moderation is the key, sugar or sweeteners like honey/jaggery can be used in moderation while cooking, in place of salt, use herb and natural spices.

### 5. Stay Hydrated

The smooth flow of blood circulation is dependent on water and staying hydrated. During your daily journey keep your water bottle handy. Sugary drinks harm your health, especially your heart. Sugar-sweetened beverages raise blood glucose, insulin, triglycerides, and blood pressure. Water lowers calorie intake and improves triglycerides and markers.

### 6. Eliminate Smoking and Alcohol Consumption

Smoking is one of the most modifiable factors when it comes to heart disease. The sooner you quit, the sooner your heart health changes for the better. Alcohol consumption should be kept to a minimum, one drink a day for women and two for men max.

### 7. Manage Stress Effectively

Chronic stress, producing excessive tension can also lead to high heart rates and unhealthy hearts. Integrate into your life alternative methods of relaxation such as yoga, meditation and deep breathing exercises. Another simple habit that will keep heart disease at bay is relaxing your shoulders and deep breaths.

Slow breathing shifts the nervous system toward parasympathetic control, improving blood pressure regulation and heart-rate variability. Stress can be managed at regular walking at parks and Yoga centres that provide relief.

### 8. Prioritize Quality Sleep

Sleep is underrated when it comes to your overall health. If you're not getting enough sleep, it wreaks havoc on the rest of your body, including your heart. Aim for about 7-8 hours of sleep per night.

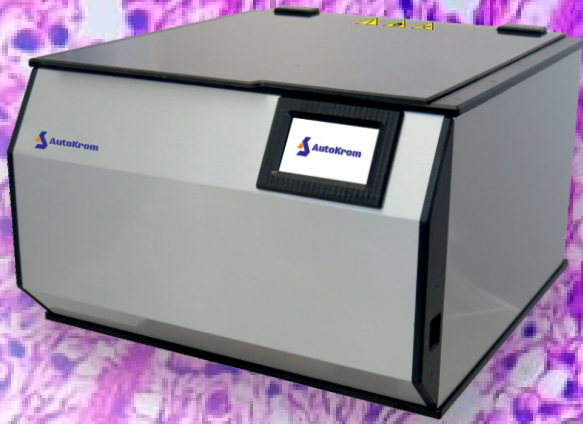
### 9. Conduct Regular Health Monitoring Check-ups

Regular basis monitoring your health can help you detect potential problems with your heart at an early stage. During your check-up, monitor your blood pressure, cholesterol, and sugars levels as well.

### 10. Keep Your Weight Under Control

The heart is an important organ in the body and must be looked after properly. Therefore, keeping excess weight off is important as it takes a toll on the heart. With a healthy and balanced diet along with regular exercise will help in managing the weight. You can consult the nutritionist or fitness trainer if required.

Remember, it's the little things done daily that leads to improvements over a long period of time. Start now and your heart would be grateful.



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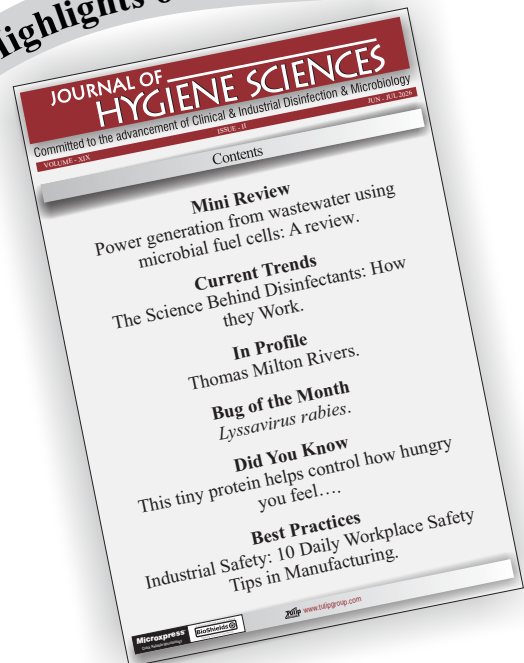
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