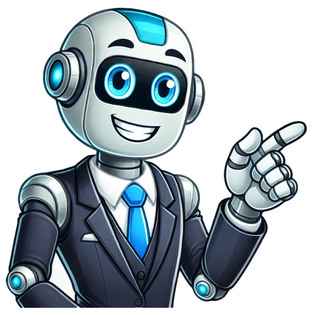
I'm not a robot



URL of this page: Staphylococcus (staph) is a group of bacteria. There are more than 30 types. A type called Staphylococcus aureus causes most infections. Staph bacteria can cause many different types of infections, including:Skin infections, which are the most common types of staph infections.Bacteremia, an infection of the bloodstream. This can lead to sepsis, a very serious immune response to infection.Bone infections.Endocarditis, an infection of the inner lining of the heart chambers and valves.Food poisoning.Pneumonia.Toxic shock syndrome (TSS), a life-threatening condition caused by toxins from certain types of bacteria. What causes staph infections? Some people carry staph bacteria on their skin or in their noses, but they do not get an infection. But if they get a cut or wound, the bacteria can enter the body and cause an infection. Staph bacteria can spread from person to person. They can also spread on objects, such as towels, clothing, door handles, athletic equipment, and remotes. If you have staph and do not handle food properly when you are preparing it, you can also spread staph to others. Who is more likely to get a staph infection? Anyone can develop a staph infection, but certain people are more likely to get one, including those who:Have a chronic condition such as diabetes, cancer, vascular disease, eczema, and lung diseaseHave a weakened immune system, such as from HIV, medicines to prevent organ rejection, or chemotherapyHad surgeryAre in the hospitalUse a catheter, breathing tube, or feeding tubeHave an implanted device, such as a pacemaker or artificial joint or heart valveHave burns, especially if they are deep or cover a large area of the bodyAre on dialysisInject illegal drugsDo contact sports, since you may have skin-to-skin contact with others or share equipment What are the symptoms of staph infections? The symptoms of a staph infection depend on the type of infection:Skin infections can look like pimples or boils. They may be red, swollen, and painful. Sometimes there is pus or other drainage. They can turn into impetigo, which turns into a crust on the skin, or cellulitis, a swollen, red area of skin that feels hot.Bone infections can cause pain, swelling, warmth, and redness in the infected area. You may also have chills and a fever.Endocarditis causes some flu-like symptoms: fever, chills, and fatigue. It also causes symptoms such as rapid heartbeat, shortness of breath, and fluid buildup in your arms or legs.Food poisoning typically causes nausea and vomiting, diarrhea, and fever. If you lose too many fluids, you may also become dehydrated. Pneumonia symptoms include a high fever, chills, and cough that doesn't get better. You may also have chest pain and shortness of breath.Toxic shock syndrome (TSS) causes high fever, sudden low blood pressure, vomiting, diarrhea, and confusion. You may have a sunburn-like rash somewhere on your body. TSS can lead to organ failure. How are staph infections diagnosed? Your health care provider will do a physical exam and ask about your symptoms. Often, providers can tell if you have a staph skin infection by looking at it. To check for other types of staph infections, providers may do a culture, with a skin scraping, tissue sample, stool sample, or throat or nasal swabs. There may be other tests, such as imaging tests, depending on the type of infection. What are the treatments for staph infections? Treatment for staph infections is antibiotics. Depending on the type of infection, the antibiotics might be a cream, ointment, medicines (to swallow), or intravenous (IV) medicine. If you have an infected wound, your provider might drain it. Sometimes you may need surgery for bone infections. Some staph infections, such as MRSA (methicillin-resistant Staphylococcus aureus), are resistant to many antibiotics. There are still certain antibiotics that can treat these infections. Can staph infections be prevented? Certain steps can help to prevent staph infections:Use good hygiene, including washing your hands often.Don't share towels, sheets, or clothing with someone who has a staph infection.It's best not to share athletic equipment. If you do need to share, make sure that it is properly cleaned and dried before you use it.Practice food safety, including not preparing food for others when you have a staph infection.If you have a cut or wound, keep it covered. Staphylococcal Infections (American Academy of Pediatrics) Also in Spanish The information on this site should not be used as a substitute for professional medical care or advice. Contact a health care provider if you have questions about your health. Learn how to cite this page Staphylococcus aureus (staph) is a type of germ that about 30% of people carry in their noses.Most of the time, staph does not cause any harm, but it can sometimes cause infections.Some types of Staphylococcus aureus are resistant to common antibiotic treatments. Staphylococcus aureus (staph) is a bacterium commonly found on the skin and in the nose of about 30% of individuals. Most of the time staph does not cause any harm, but it can sometimes cause infections. In healthcare settings, infections can lead to serious or fatal outcomes. Staph infections can look like pimples, boils or other skin conditions. In healthcare settings, staph infections can be serious or fatal, leading to: Bloodstream infections or sepsis when bacteria get in the bloodstream.Pneumonia, which most often affects people with underlying lung disease, including those on mechanical ventilators.Endocarditis (infection of the heart valves), which can lead to heart failure or stroke.Osteomyelitis (bone infection), caused by staph bacteria traveling in the bloodstream or put there by direct contact such as trauma (puncture wound of the foot). In the community, people are at greater risk of staph infections if they have chronic conditions (e.g., diabetes, cancer, vascular disease, etc.) or inject drugs. In health care, the risk of more serious staph infection is higher for patients: In intensive care units (ICUs).Who have undergone certain types of surgeries.With medical devices inserted in their bodies.With weakened immune symptoms. Patients can avoid sharing items that contact skin, such as towels, razors and needles, and can also follow safety tips to reduce their risk of staph infection. Healthcare providers can treat most staph infections with antibiotics. Pronunciation TypesInfectionSymptomsDiagnosisTreatmentOutlookFAQsTakeawayMost people have Staphylococcus bacteria on their skin, but sometimes it can cause an acute infection with life threatening symptoms.Staphylococcus bacteria are a common bacterial strain. Even healthy people often have these bacteria living harmlessly on their skin. When Staphylococcus bacteria do cause problems, theyre often minor skin infections or temporary cases of food poisoning.However, Staphylococcus bacteria can also cause severe and even fatal infections. Staphylococcus bacteria can invade the bloodstream or organs, resulting in serious illness. Many Staphylococcus bacterial infections can be treated and cured with traditional antibiotics. Some strains of Staphylococcus are antibiotic-resistant and need to be treated with newer antibiotics.In this article, well look at different bacterial strains, treatments of Staphylococcus, and answer your most frequently asked questions.Staphylococcus bacteria can cause multiple types of infections. The type and severity of infection depend on where the bacteria invade and how much theyre able to grow. Staphylococcus infections can occur in the skin, gastrointestinal tract, blood, bones, brain, heart, lungs, muscles, and in implanted devices such as pacemakers.Common types of Staphylococcus infections include:There are more than 30 types of Staphylococcus bacteria. The bacteria Staphylococcus aureus causes the most infections. There are also several strains of S. aureus.These strains can cause different infections and need to be treated with different antibiotics. Some are resistant to traditional antibiotics and need to be treated with specially developed antibiotics. These antibiotics cause more side effects than traditional antibiotics.In the United States, commonly found types of S. aureus include: Staphylococcus bacteria are very common. People often carry these bacteria on their skin or in their nasal cavities without ever developing an infection. But sometimes, the bacteria you already carry can cause you to become sick when your immune system is compromised. It can also spread to other people and be transferred to objects such as cups, utensils, pillowcases, and towels.Staphylococcus bacteria can survive outside host bodies for a long time and can withstand extreme temperatures and drying out. These factors make it very easy for Staphylococcus infections to spread, especially in households or shared living environments.There are also several risk factors that can increase your chances of developing a Staphylococcus infection. These include:The symptoms of a Staphylococcus infection depend on the type and severity of the infection. Staphylococcus can cause mild skin rashes or severe and life threatening symptoms. Examples of a few common conditions and their symptoms are listed below.The exact diagnosis process for Staphylococcus can depend on the type of Staphylococcus a doctor suspects you have. In many cases, youll have an exam to go over your symptoms and so that a doctor or healthcare professional can examine you for any physical signs of infection.This will be followed by a blood draw, urine sample, nasal swab test, or a combination of these methods to confirm the presence of Staphylococcus bacteria and determine the best antibiotic.However, in some cases, more testing might be needed. For instance, if a doctor thinks the Staphylococcus infection is an infection in an organ, such as your heart or your lungs, you might also have imaging tests done to check for inflammation and damage.Treatment for Staphylococcus infections depends on the exact infection and severity but generally includes antibiotics. Traditional antibiotic treatments for Staphylococcus infections include cefazolin, nafcillin, oxacillin, and linezolid. Additional treatments for Staphylococcus are discussed below.IV vancomycin or daptomycin: Antibiotic-resistant Staphylococcus bacterial infections cant be treated with traditional antibiotics. Vancomycin and daptomycin are antibiotics that are often used to help treat these infections. These medications have more side effects but can fight these antibiotic-resistant infections.Device removal: An infection in a catheter, pacemaker, or another artificial device generally means that the device needs to be removed.Wound drainage: Sometimes skin infections need to have fluid drained from them so they can be cleaned and start to heal.Pain medication: A doctor might recommend or prescribe medication to help you manage pain. Nonsteroidal anti-inflammatory drugs can also help bring down your fever.Most Staphylococcus infections are mild and easily treated with antibiotics. Even severe and antibiotic-resistant Staphylococcus infections can often be cured with treatment. However, if left untreated, Staphylococcus can be fatal.Still have questions? Youre not alone. You can learn more about Staphylococcus by reading the answers to some commonly asked questions below.No, Staphylococcus infections arent sexually transmitted.Staphylococcus bacteria can be killed with many antibacterial products. Common antibacterial products include bleach, Lysol, hydrogen peroxide, and some soaps. These products will state somewhere on the label that they kill bacteria and list the bacteria that theyre known to be able to kill.Nearly all Staphylococcus infections can be cured with antibiotics. Some strains of Staphylococcus have developed antibiotic resistance, but newer treatments, such as vancomycin and daptomycin, can treat and cure these infections.Recurrent Staphylococcus infections can be caused by lingering Staphylococcus bacteria in the body. You might need a longer course of antibiotics.Your living environment can also play a role. For instance, in the case of skin infections, your laundry detergent might not be removing all the bacteria from your towels, sheets, and clothes. Additionally, if you live with multiple people, you could be passing an infection back and forth in a cycle that can be difficult to break.If youre getting repeated Staphylococcus infections, its a good idea to let a doctor know. Its also smart to disinfect the surfaces of your home and to thoroughly wash your sheets, blankets, towels, and anything else that could be carrying staphylococcus.Staphylococcus is often spread through contact with other people. Touching infected blood or bodily fluids is the main source of Staphylococcus bacteria. This can be easy to do without even realizing it. Sharing personal items, not taking care of handwashing, or simply living with other people can spread Staphylococcus.Many Staphylococcus infections are mild. However, a Staphylococcus infection can be very dangerous. Some Staphylococcus infections can be fatal if theyre left untreated.Its important to see a healthcare professional if you think you have a Staphylococcus infection and to follow any instructions they give you.Staphylococcus bacteria cause a range of infections. Some infections are mild and cause symptoms such as skin rashes. Others are very serious and can affect your blood and organs.Most Staphylococcus infections can be successfully treated with traditional antibiotics; however, some are antibiotic-resistant and require newer treatments. Some Staphylococcus infections can be fatal without treatment, so its important to make a medical appointment if you have the symptoms of any Staphylococcus infection.Most cases of staph infection on the skin can be treated with a topical antibiotic (applied to your skin). Your healthcare provider may also drain a boil or abscess by making a small incision (cut) to let the pus out.Healthcare providers also prescribe oral antibiotics (taken by mouth) to treat staph infections inside your body and on your skin. The antibiotic will vary depending on the type of infection. In severe staph infections, providers use IV (intravenous) antibiotics to kill the bacteria.If you have a more serious staph infection that requires an IV, your provider may suggest that you go to the hospital for a period of time.How long is staph infection contagious?If youre taking antibiotics, you shouldnt be contagious after 48 hours. It may take longer than that to feel better though.What are the side effects of the treatment for staph infection?Side effects vary depending on the type of antibiotic used to treat the staph infection. Side effects from topical ointments can include stinging, itching, and redness in the affected area. Common side effects of oral antibiotics include nausea, vomiting and diarrhea.What are the complications associated with a staph infection?If left untreated, staph infections can be deadly. Rarely, staph germs are resistant to the antibiotics commonly used to treat them. This infection, called methicillin-resistant Staphylococcus aureus (MRSA), causes severe infection and death.This is one reason that its important to take your entire prescription of antibiotics. One factor in creating resistance has been that people only take the medication until they feel better, which means that the germs arent entirely gone.What can I do to help relieve symptoms of a staph infection?Its important to seek medical help if you think you might have a staph infection. To relieve the symptoms of staph infection on your skin, clean the affected area with soap and water. You can try cold compresses and over-the-counter pain relievers to help with discomfort.In cases of food poisoning, drink plenty of liquids while youre recovering to reduce your risk of dehydration.Massage and warm compresses can relieve the symptoms of mastitis.Jameson JL, et al., eds. Staphylococcal infections. In: Harrison's Principles of Internal Medicine. 20th ed. The McGraw-Hill Companies; 2018. . Accessed Jan. 27, 2020.Holland TL, et al. Clinical manifestations of Staphylococcus aureus infection in adults. . Accessed Jan. 28, 2020.Fowler VG, et al. Clinical approach to Staphylococcus aureus bacteremia in adults. . Accessed Jan. 28, 2020.Staphylococcal infections. Merck Manual Professional Version. . Accessed Feb. 16, 2022.Staphylococcal (staph) food poisoning. Centers for Disease Control and Prevention. . Accessed Jan. 28, 2020.Methicillin-resistant Staphylococcus aureus (MRSA). Centers for Disease Control and Prevention. . Accessed Jan. 28, 2020.Menstrual cycle. Office on Women's Health. . Accessed Jan. 28, 2020.4 steps to food safety. U.S. Department of Health and Human Services. . Accessed Feb. 17, 2022.Methicillin-resistant Staphylococcus aureus (MRSA): Laundry. Centers for Disease Control and Prevention. . Accessed Feb. 17, 2022.Medical review (expert opinion). Mayo Clinic. Feb. 28, 2022.Staphylococci can cause many forms of infection. (1) S aureuscauses superficial skin lesions (boils, styes) and localized abscesses in othersites. (2) S aureus causes deep-seated infections, such asosteomyelitis and endocarditis and more serious skin infections (furunculosis).(3) S aureus is a major cause of hospital acquired (nosocomial)infection of surgical wounds and, with S epidermidis, causesinfections associated with indwelling medical devices. (4) Saureus causes food poisoning by releasing enterotoxins into food.(5) S aureus causes toxic shock syndrome by release ofsuperantigens into the blood stream. (6) S saprophiticus causesurinary tract infections, especially in girls. (7) Other species ofstaphylococci (S lugdunensis, S haemolyticus, S warneri, S schleiferi, Sintermedius) are infrequent pathogens.Staphylococci are Gram-positive cocci 1m in diameter. They formclumps.S aureus and S intermedius are coagulasepositive. All other staphylococci are coagulase negative. They are salt tolerantand often hemolytic. Identification requires biotype analysis.S aureus colonizes the nasal passage and axillae. Sepidermidis is a common human skin commensal. Other species ofstaphylococci are infrequent human commensals. Some are commensals of otheranimals.S aureus expresses many potential virulence factors. (1) Surfaceproteins that promote colonization of host tissues. (2) Factors that probablyinhibit phagocytosis (capsule, immunoglobulin binding protein A). (3) Toxinsthat damage host tissues and cause disease symptoms. Coagulase-negativestaphylococci are normally less virulent and express fewer virulence factors.S epidermidis readily colonizes implanted devices.Phagocytosis is the major mechanism for combatting staphylococcal infection.Antibodies are produced which neutralize toxins and promote opsonization. Thecapsule and protein A may interfere with phagocytosis. Biofilm growth onimplants is impervious to phagocytosis.Infections acquired outside hospitals can usually be treated withpenicillinase-resistant -lactams. Hospital acquired infection is oftencaused by antibiotic resistant strains and can only be treated withvancomycin.Multiple antibiotic resistance is increasingly common in Saureus and S epidermidis. Methicillin resistanceis indicative of multiple resistance. Methicillin-resistant Saureus (MRSA) causes outbreaks in hospitals and can beepidemic.Epidemiological tracing of S aureus is traditionally performedby phage typing, but has limitations. Molecular typing methods are being testedexperimentally.Diagnosis is based on performing tests with colonies. Tests for clumping factor,coagulase, hemolysins and thermostable deoxyribonuclease are routinely used toidentify S aureus. Commercial latex agglutination tests areavailable. Identification of S epidermidis is confirmed bycommercial biotyping kits.Patients and staff carrying epidemic strains, particularly MRSA, should beisolated. Patients may be given disinfectant baths or treated with a topicalantibiotic to eradicate carriage of MRSA. Infection control programs are used inmost hospitals.Bacteria in the genus Staphylococcus are pathogens of man and othermammals. Traditionally they were divided into two groups on the basis of theirability to clot blood plasma (the coagulase reaction). The coagulase-positivestaphylococci constitute the most pathogenic species S aureus. Thecoagulase-negative staphylococci (CNS) are now known to comprise over 30 otherspecies. The CNS are common commensals of skin, although some species can causeinfections. It is now obvious that the division of staphylococci into coagulasepositive and negative is artificial and indeed, misleading in some cases. Coagulaseis a marker for S aureus but there is no direct evidence that it isa virulence factor. Also, some natural isolates of S aureus aredefective in coagulase. Nevertheless, the term is still in widespread use amongclinical microbiologists.S aureus expresses a variety of extracellular proteins andpolysaccharides, some of which are correlated with virulence. Virulence results fromthe combined effect of many factors expressed during infection. Antibodies willneutralize staphylococcal toxins and enzymes, but vaccines are not available. Bothantibiotic treatment and surgical drainage are often necessary to cure abscesses,large boils and wound infections. Staphylococci are common causes of infectionsassociated with indwelling medical devices. These are difficult to treat withantibiotics alone and often require removal of the device. Some strains that infecthospitalized patients are resistant to most of the antibiotics used to treatinfections, vancomycin being the only remaining drug to which resistance has notdeveloped.DNA-ribosomal RNA (rRNA) hybridization and comparative oligonucleotide analysis of16S rRNA has demonstrated that staphylococci form a coherent group at the genuslevel. This group occurs within the broad Bacillus-Lactobacillus-Streptococcuscluster defining Gram-positive bacteria with a low G + C content ofDNA.At least 30 species of staphylococci have been recognized by biochemical analysis andin particular by DNA-DNA hybridization. Eleven of these can be isolated from humansas commensals. S aureus (nares) and S epidermidis(nares, skin) are common commensals and also have the greatest pathogenic potential.S saprophyticus (skin, occasionally) is also a common cause ofurinary tract infection. S haemolyticus, S simulans, S cohnii, Swarneri and S lugdunensis can also cause infections inman.Staphylococci are Gram-positive cocci about 0.5 1.0 m indiameter. They grow in clusters, pairs and occasionally in short chains. Theclusters arise because staphylococci divide in two planes. The configuration ofthe cocci helps to distinguish micrococci and staphylococci from streptococci,which usually grow in chains. Observations must be made on cultures grown inbroth, because streptococci grown on solid medium may appear as clumps. Severalfields should be examined before deciding whether clumps or chains arepresent.The catalase test is important in distinguishing streptococci (catalase-negative)staphylococci which are catalase positive. The test is performed by flooding anagar slant or broth culture with several drops of 3% hydrogen peroxide.Catalase-positive cultures bubble at once. The test should not be done on bloodagar because blood itself will produce bubbles.The presence of staphylococci in a lesion might first be suspected afterexamination of a direct Gram stain. However, small numbers of bacteria in bloodpreclude microscopic examination and require culturing first.The organism is isolated by streaking material from the clinical specimen (orfrom a blood culture) onto solid media such as blood agar, tryptic soy agar orheart infusion agar. Specimens likely to be contaminated with othermicroorganisms can be plated on mannitol salt agar containing 7.5% sodiumchloride, which allows the halo-tolerant staphylococci to grow. Ideally a Gramstain of the colony should be performed and tests made for catalase andcoagulase production, allowing the coagulase-positive S aureusto be identified quickly. Another very useful test for S aureusis the production of thermostable deoxyribonuclease. S aureuscan be confirmed by testing colonies for agglutination with latex particlescoated with immunoglobulin G and fibrinogen which bind protein A and theclumping factor, respectively, on the bacterial cell surface. These areavailable from commercial suppliers (e.g., Staphaurex). The most recent latextest (Pastaurex) incorporates monoclonal antibodies to serotype 5 and 8 capsularpolysaccharide in order to reduce the number of false negatives. (Some recentclinical isolates of S aureus lack production of coagulaseand/or clumping factor, which can make identification difficult.)The association of S epidermidis (and to a lesser extent ofother coagulase-negative staphylococci) with nosocomial infections associatedwith indwelling devices means that isolation of these bacteria from blood islikely to be important and not due to chance contamination, particularly ifsuccessive blood cultures are positive. Nowadays, identification of Sepidermidis and other species of Staphylococcus isperformed using commercial biotype identification kits, such as theAPI-Staph.In contrast to S aureus, little is known about mechanisms ofpathogenesis of S epidermidis infections. Adherence is obviously acrucial step in the initiation of foreign body infections. Much research has beendone on the interaction between S epidermidis and plastic materialused in implants, and a polysaccharide adhesion (PS/A) has been identified. Mutantslacking PS/A are less virulent in an animal model for foreign body infection, andimmunization with purified PS/A is protective. Bacteria-plastic interactions areprobably important in colonization of catheters through the point of entry. However,host proteins are quickly deposited on implants. S epidermidis doesnot bind to fibrinogen but most isolates bind fibronectin, albeit less avidly thanS aureus. However, it is not known if a protein analogous tothe fibronectin binding protein of S aureus is involved.A characteristic of clinical isolates of S epidermidis is theproduction of slime. This is a controversial topic. Some feelthat slime is an in vitro manifestation of the ability to form a biofilm in vivo,for example on the surface of a prosthetic device, and is thus a virulence marker.In vitro, slime is formed during growth in broth as a biofilm on the surface of thegrowth vessel. The composition of this slime is probably influenced by the growthmedium. One study with defined medium showed that the slime was predominantlysecreted teichoic acid, a polymer normally found in the cell wall of staphylococci.Some polysaccharides in slime from bacteria grown on solid medium are derived fromthe agar.Hospital strains of S aureus are often resistant to many differentantibiotics. Indeed strains resistant to all clinically useful drugs, apart from theglycopeptides vancomycin and teicoplanin, have been described. The term MRSA refersto methicillin resistance and most methicillin-resistant strains are also multiplyresistant. Plasmid-associated vancomycin resistance has been detected in someenterococci and the resistance determinant has been transferred from enterococci toS aureus in the laboratory and may occur naturally. Sepidermidis nosocomial isolates are also often resistant to severalantibiotics including methicillin. In addition, S aureus expressesresistance to antiseptics and disinfectants, such as quaternary ammonium compounds,which may aid its survival in the hospital environment.Since the beginning of the antibiotic era S aureus has responded tothe introduction of new drugs by rapidly acquiring resistance by a variety ofgenetic mechanisms including (1) acquisition of extrachromosomal plasmids oradditional genetic information in the chromosome via transposons or other types ofDNA insertion and (2) by mutations in chromosomal genes (Table 12-1).Many plasmid-encoded determinants have recently become inserted into the chromosomeat a site associated with the methicillin resistance determinant. There may be anadvantage to the organism having resistance determinants in the chromosome becausethey will be more stable.There are essentially four mechanisms of resistance toantibiotics in bacteria: (1) enzymatic inactivation of the drug, (2) alterations tothe drug target to prevent binding, (3) accelerated drug efflux to prevent toxicconcentrations accumulating in the cell, and (4) a by-pass mechanism whereby analternative drug-resistant version of the target is expressed (Table 12-1).Ever since the first use of penicillin, S aureus has shown aremarkable ability to adapt. Resistance has developed to new drugs within ashort time of their introduction. Some strains are now resistant to mostconventional antibiotics. It is worrisome that there do not seem to be any newantibiotics on the horizon. Any recent developments have been modifications toexisting drugs.The original strategy used by the pharmaceutical industry to find antimicrobialdrugs was to screen natural products and synthetic chemicals for antimicrobialactivity. The mechanism of action was then investigated.New approaches are being adopted to find the next generation of antimicrobials.Potential targets such as enzymes involved in an essential function (e.g., incell division) are identified based on knowledge of bacterial physiology andmetabolism. Screening methods are then developed to identify inhibitors of aspecific target molecule. In addition, with detailed molecular knowledge of thetarget molecule, specific inhibitors can be designed.No vaccine is currently available to combat staphylococcal infections. There maynow be a case for considering methods to prevent disease, particularly inhospitalized patients.Hyperimmune serum from human volunteer donors or humanized monoclonal antibodiesdirected towards surface components (e.g., capsular polysaccharide or surfaceprotein adhesions) could both prevent bacterial adherence and also promotephagocytosis of bacterial cells. Indeed a prototype vaccine based on capsularpolysaccharide from S aureus has been administered tovolunteers to raise hyperimmune serum, which could be given to patients inhospital before surgery. A vaccine based on fibronectin binding protein inducesprotective immunity against mastitis in cattle and might also be used as avaccine in humans.When the molecular basis of the interactions between the bacterial surfaceproteins and the host matrix protein ligands are known it might be possible todesign compounds that block the interactions and thus prevent bacterialcolonization. These could be administered systemically or topically.References Easmon CSF, Adlam C: Staphylococci andstaphylococcal infections. Vols 1 and 2. Academic Press, London, 1983.Foster TJ. Potential for vaccination against infections caused byStaphylococcus aureus. Vaccine. 1991;9:221. [PubMed: 2058264] Foster TJ, McDevitt D: Molecular basis of adherenceof staphylococci to biomaterials. p. 31, In Bisno AL, Waldvogel FA (eds):Infections Associated with Indwelling Medical Devices, 2nd Edition. AmericanSociety for Microbiology, Washington, D.C., 1994. Prevost G, Couppie P, Prevost P. et al. Epidemiological data on Staphylococcus aureusstrains producing synergohymenotropic toxins. J Med Microbiol. 1995;42:237. [PubMed: 7707330]Rupp ME, Archer GL. Coagulase-negative staphylococci: pathogens associated withmedical progress. Clin Infect Dis. 1994;19:231. [PubMed: 7986894]Schlievert PM. Role of superantigens in human disease. J Infect Dis. 1993;167:997. [PubMed: 8486972] Skinner GRB, Ahmad, A: Staphylococcal vaccines -present status and future prospects. p. 537. In Mollby R, Flock JI, Nord CE,Christensson B (eds): Staphylococci and Staphylococcal Infections. Zbl. Bakt.Suppl. 26, Fischer Verlag, Stuttgart, 1994 . Vaudaux PE, Lew DP, Waldvogel FA: Host factorspredisposing to and influencing therapy of foreign body infections. p. 1. InBisno AL, Waldvogel FA (eds): Infections Associated with Indwelling MedicalDevices. 2nd Ed. American Society for Microbiology, Washington, D.C., 1994.

Mannitol salt agar. Mannitol salt agar staphylococcus epidermidis. Staphylococcus aureus mannitol salt agar. Does staphylococcus aureus grow on mannitol salt agar. What bacteria grows on mannitol salt agar. Why is mannitol salt agar selective for staphylococcus aureus. Mannitol salt agar for s.aureus and s. epidermidis.

- find license plate number by vin florida
- fece
- http://www.lebedosapartotel.com/data/yukle/files/bemoti_nuwebokubivaru.pdf
- panasonic inverter steam plus convection microwave oven manual
- cogoho
- higoyi