Minecraft wood house tutorial

Sterilization is the complete elimination of microorganisms and forms of residence (spores). The microbiology laboratory sterilizes all the material and media used for the cultivation of microorganisms. Waste from the laboratory or patients who may contain pathogenic micro-organisms must also be sterilised before it is dumped from the refuse collection service or passed on. It includes all physical, mechanical and preferably chemical procedures, which are used to destroy pathogenic germs. As a result, the surgical materials and the patient's skin reach a state of disinfection that prevents operational contamination. Chemical methods Ethylene oxide. It is an alkylating agent that binds to compounds with unstable hydrogen, such as those carboxyl groups, amino, sulfhydriles, hydroxyles, etc. It is used in gas sterilization, usually in the pharmaceutical industry. It destroys all microorganisms, even viruses. It is used to make thermosensive material such as disposable (rubber, plastic, paper, etc.), electronic equipment, cardiorespiratory pumps, metal, etc. It is very dangerous because it is highly flammable and explosive, and also cancer. Aldehydes. They are alkylating agents that act on proteins, which cause irreversible modification in enzymes and inhibit enzymatic activity. These compounds are destroying the tracks. Glutaraldehydes. It consists of preparing a 2% alkaline solution and immersing the material that should be sterilized for 20 to 30 minutes, and then a rinse of 10 minutes. This method has the advantage that you are fast and the only cold is effective sterilizer. It can sterilize plastic, rubber, glass, metal, etc. Formaldehyde. Paraformaldehyde tablets are used, which can be available at the bottom of a box wrapped in gauze or cotton, which can then be exposed to heat for rapid sterilization (formaldehyde gas action). They can also be used in Formol Stoves, which are double bottom boxes, where the tablets are placed and heated to 60oC and can sterilize latex materials, rubber, plastics, etc. Formalin tablets at room temperature sterilize in 36 hours. Gas plasma sterilization of hydrogen peroxide It is a sterilization process at low temperatures that consists of the transfer of hydrogen peroxide in plasma phase (state between liquid and gas), which exerts the biocidal action. Physical methods. The use of this method and its effectiveness depends on two factors: exposure time and temperature. All microorganisms are sensitive, to varying degrees, to the action of heat. Heat causes protein denature, fusion and membranes and/or irreversible oxidizing processes in microorganisms. Wet heat. Wet heat produces denaturation and protein clotting. These effects are mainly due to two reasons: -Water is a highly reactive chemical species and many biological structures are produced by reactions that remove water. -Water vapour has a much higher heat transfer coefficient than air. Autoclave Sterilization is carried out by pressure water vapor. The most commonly used model is Chamberland. Sterilizes at 120o to a pressure atmosphere (these conditions may vary) and the material is left behind for 20 to 30 minutes. Tyndization Sterilization by discontinuous action of water vapor, is based on the principle of TyndalTM Bacteria that are resistant to a heating session, created under certain conditions, can be destroyed when the same operation is repeated at separate intervals and in different sessions. It happens through the Chamberland autoclave, making the outlet open, that is, working under normal pressure. It can also be carried out at lower temperatures, 56o or 80o ocú to prevent the degradation of the substances from being sterilized, by high temperatures. Dry heat. Dry heat produces cell drying, this is toxic from increased electrolyte levels, membrane fusion. These effects are due to the transfer of heat from the materials to the microorganisms that are in contact with them. The destructive effect of heat on proteins and lipids requires a higher temperature when the material is dry or the water activity of the medium is low. Stoves. Double chamber, hot air generated by a resistance, circulates through the main cavity and through the space between the two chambers, at a temperature of 170oC for metal instruments and at 140oC for drum content. A stable temperature is maintained by metal thermostats, which, when dilated by heat, cut the electrical circuit. Ionising. They produce free ions and radicals that alter the basis of nucleic acids, protein and lipid structures and essential components for the viability of microorganisms. They have high penetrability and are used to thermolabile (thermosensitive) materials such as disposable syringes, probes, etc. They are used on an industrial scale for their costs. Ultraviolet rays. They affect the DNA molecules of microorganisms. They are scarce and are used for surfaces, they are used for sterilization in operating theatres. Gamma rays. Its use is based on knowledge about atomic energy. This type of sterilization applies to thermolabic products or materials and is of great importance in the field You have antibiotics, vaccines, food, etc. Filtration makes it possible to remove all microorganisms present in a liquid or gas by storing them on the surface of a material. Filtration is used for fatty emulsions or thermolabile solutions. It is used to sterilize oils, some types of ointments, ophthalmic solutions, intravenous solutions, diagnostic drugs, radiopharmaceuticals, media for cell cultures, and solutions of antibiotics and vitamins. Deep filters or depth filters. They consist of a fibrous or granular material pressed, folded, activated or glued into the power channels. In this type of filters, the retention of particles is caused by a combination of absorption and mechanical retention in the matrix. Filter membranes. They have a continuous structure, and retention is mainly due to particle size. Particles smaller than pore size are stored in the filter matrix due to electrostatic effects. Nucleation footprint filters (Nucleoporo). They are very thin polycarbonate films that are pierced by joint treatment with radiation and chemicals. They are filters with very regular holes that go vertically through the membrane. They work as seven, preventing the passage of each particle. This article aims to conduct a brief review of the main concepts on which infection prevention and control measures are based. Antiseptics consists of the set of techniques for the total (sterilization) or majority (disinfection) of germs that infect a medium. Both procedures should be preceded by a cleanliness of the medium where they are to be applied. Disinfection is carried out by means of biocides or germs, antimicrobial chemicals whose mechanisms of action and resistance are very similar to those of antibiotics. This similarity raises concerns about the possibility of crossing genetic information that exacerbates the problem of bacterial resistances. Most biocidal products can act as antiseptics, applied to skin and tissues, or disinfectants, on inanimate materials. The spectrum of germination depends on the characteristics of the product and verifiable external factors: temperature, concentration, exposure time, etc. Sterilization techniques are mainly physical in nature, through autoclaves that expose the material to steam or sterilize gas. The greatest progress is in low-temperature exposures with shorter exposure times, parallel to technological advances in instrumentation with materials that are not resistant to high temperatures and with rotations of high, because of the welfare pressures. This article aims to be a brief review of the main concepts on which infection prevention and control are based. Antisepsis consists of a series of techniques aimed at total sterilization, or at most, disinfection, the removal of germs that pollute an environment. Both procedures should be preceded by an environmental clean-up at the site where they intend to be applied. The disinfection is carried out using biocides or germs. Antimicrobial chemicals, which have mechanisms of action and resistances very similar to antibiotics, generate concern because of the possibility of crossing genetic information that exacerbates the problem of bacterial resistance. Most biocidal products can act as antiseptics, and applied to skin tissue, or disinfectants on hunger materials. The spectrum of action of germ icides depends on the product itself and external verifiable factors: temperature, concentration, exposure time, etc. Sterilization techniques are mainly physical, by exposing the material to steam, or sterilizing gas, using autoclaves. Important progress is the use of low temperatures with shorter exposure times, in parallel with technological advances in instrumentation to avoid high temperatures and high use rotations due to workload. General conceptsThe prevention and control of communicable diseases were closely linked to procedures such as salting, smoking, cooking, etc., even without understanding the mechanisms by which these activities prevented the transmission of infections. The discovery of microbes understood the cause of infectious diseases and their transmission mechanisms, and gradually new methods emerged to prevent such transmission. English surgeon Joseph Lister was the first to realize the importance of asepsis in the surgical field, and first developed the idea to prevent surgical wound infections with the use of antiseptic methods1. The term asepsis refers to the use of procedures that prevent the access of pathogenic micro-organisms to a free agent, for example by hand washing, the setting up of barrier techniques or the usual cleaning. Antipsypsy is the set of procedures or activities aimed at inhibiting or destroying potentially pathogenic microorganisms. Biocides are used for the implementation of antiseptics, both in human skin and in tissue (antiseptics) and in objects, surfaces or environment (disinfectants). The therapeutic revolution that involved the discovery of antibiotics caused biocides to move into the background. The emergence of the serious problem of bacterial putting us in a pre-antibiotic era, causing to gain importance. Sterilization, another cornerstone of antiseppsy, is intended to eliminate any microorganism, harmful or not. BiocidesBiocides are substances that can destroy, counteract, neutralise or exert a control effect on a harmful organism by chemical or biological means2. A simpler and clearer definition has recently been proposed that a biocide is an active chemical molecule in a product to inhibit or destroy bacteria. Antimicrobial activity is the lethal or inhibitory effect of both a biocidal and an antibiotic3. The evaluation of antimicrobial activity presents difficulties in the large number of studies available to assess the efficacy of biocidal studies and the lack of consensus for standardisation of methods for some phases of studies. In Europe, the European Committee for Standardisation (CEN) has set up the Technical Committee 216 (TC216) for the standardisation of tests for the assessment of efficacy for antiseptics and disinfectants4. Member States should adapt their national standards, UNE-EN standards in the case of Spain, to European standards. Despite attempts at harmonisation, there are gaps; For example, there are currently no European standards for testing biofilm disinfectants for healthcare applications3. Biocidal products for health use must comply with applicable legislation in each country. In Spain, disinfectants specifically used with medical devices are considered class IIA medical devices and must bear the CE5 marking, requiring a notified body to intervene to inspect and check the quality of the product before granting the CE mark. Disinfectants of environments and surfaces, as well as antiseptics for healthy or intact skin used in clinical or surgical areas, shall not be considered as a medical device, but shall require a health authorisation as disinfectants granted by the Spanish Agency for Medicinal products and Health Products (AEMPS) and must display on their label the authorisation number 'n-des' corresponding to that authorisation. Disinfectants intended to be applied to wounds, mucous membranes or damaged skins shall be considered as pharmaceutical specialities and shall have been granted the corresponding marketing authorisation by AEMPS. Spectrum and mechanism of actionThe mechanisms of action of biocides are aimed at changing the structure of the micro-organism, either preventing the entry and exit of vital elements for the microorganism or changing structures. Targets are placed in the cytoplasm membrane, or cytoplasm6. For the selection of a biocidal take into account various factors of biocidal, germ and exposure, as its effectiveness will depend on it (Table 1). The concentration of the biocidal product and contact time are crucial and the combined effect is determined by the CT parameter (contact time), which is expressed as mg-min/l and determines how a disinfectant affects a type of microorganism and under specific conditions. CT is used to compare the effectiveness of different biocides. Other important factors include the stability of active compounds of biocides in the environment, the temperature of the environment (at low temperatures the effectiveness is lower) or the presence of disturbing substances, such as proteins or organic matter, as well as the presence of biofilms3,7.Table 2 shows the most notable characteristics of biocidal products most commonly used as antiseptics and/or disinfectants. Resistance The interest in bacterial resistance to biocides is proportional to the increased use of these products in the light of the emergence of bacterial antimicrobial resistances. Early studies that referred to this problem described emergencies of bacterial resistance to biocides due to misuse or poor storage (and subsequent contamination) of biocides8,9. More recent studies have described the ineffectiveness of biocides used in hospitals on microorganisms that grow and multiply in surface biofilms and medical devices, leading to the failure to control these reservoirs for the prevention of health care-related infections (IRS)10.11. Anyway, most of the evidence on biocidal power comes from laboratory tests. The concentration of biocides is considered the most relevant factor for the definition of bacterial resistance to them. Many of the biocidal studies base their findings on minimal inhibitory concentration (CMI). The use of this parameter for this purpose is debatable, because in practice much higher concentrations are used and a reduction in the number of bacteria due to a high WCC is unlikely. Therefore, the minimum bactericide concentration (CBM) is currently considered the parameter of the best efficacy result of a biocidal biocide, as it is possible to compare lethality between a standard strain and those studied. On the other hand, determining the lethality of a biocide with the concentration of use will indicate whether the bacterial strain is susceptible (intrinsic or natural resistance) or resistant compared to standard3. Tandem bacterial and biocidal resistances have 2 aspects bacterial resistance to biocides on the one hand, and the role of biocidal product in the induction of bacterial resistance to antibiotics. The resistance of a microorganism to a particular biocidal is a natural trait (intrinsic or innate), and then there is non-sensitivity, or acquired resistance. In general, the most commonly described innate resistance mechanism lies in cell membrane marks; its nature and composition depend on the type of organism and can act as a barrier in which absorption can be reduced. This circumstance may have practical relevance in bacterial spores, especially for some species such as Clostridium difficile3,6,12,13. Figure 1 shows several microorganisms that have been ordered based on their natural resistance level for disinfectants. As in antibiotics, resistance can also be acquired and the mechanisms are in both cases very similar. It can arise from mutation or by the acquisition of genetic material in the form of plasmids or transposons. Although the acquisition of resistance genes has been documented, the available information on the effect of biocides on the transmission of genetic determinants is scarce and sometimes with opposite results according to the biocide studied. For example, when studying the effect of using biocides at subremite concentrations, the result may in some cases be inhibitory and in others amplifier on resistance transfer3,14. Table 3 gives an overview of the main bacterial mechanisms for biocidal resistance. Another point of interest is cross-resistance between biocides and antibiotics. The EU-funded project Confronting the clinical relevance of biocide induced antibiotic resistance (BIOHYPO) examined the partnership between widespread use of biocides and antibiotic resistance in human pathogens. To this end, 4 biocidal products were analysed for human pathogens: benzalkonium chloride, chlorhexidine, triclosan and sodium hypochlorite. These tests have determined the ecological cut-off points (ECOFF) of WCC and CBM of biocides14-16. In general, and except in very specific cases, no significant link has been observed between the low sensitivity of pathogens to biocides and antibiotic resistance. However, researchers expect changes in the future and it will be imperative to be alert to the progress of the available evidence15.16.From a practical point of view, bacterial resistance is described in almost all biocidal drugs, but the clinical effect is considered irrelevant, supported by the fact that the concentrations used in practice are significantly higher than the CMI of strains with reduced sensitivity3.16–18.Antiseptics on the skin, mucous membranes and tissuesThe antiseptics are one of the most powerful weapons in infection control. Its availability is limited by the toxicity of some or by the easy contamination of others. The most common antiseptics in healthcare are chlorhexidine, alcohol and povidone iodada. The selection of one or the other, as well as the concentration and solution, will depend on the purpose of application. Intact skinThe povidone iodized as such lacks activity until the iodo, a real agent of antiseptic activity, is released. It is used at concentrations of 1, 7.5 and 10%, can cause hypersensitivity in some people with iodo allergies and should not be used in pregnant women, neonatates or people with goiter. Chlorhexidine works quickly and has a great bactericide activity. Applies to a concentration of 0.5%. 70% alcohol is a fast-acting bactericide, in which 90% of the bacteria is removed from the skin by 2 min if air drying is allowed; cotton rubbing destroys a maximum of 75%19.In recent years a broad scientific production has emerged, generally with results favorable for chlorhexidine, although many of them hide an overvaluation of the alcohol included in the solution20,21. In general, when a long-lasting effect is needed chlorhexidine is preferred, and when looking for an immediate effect, better povidone iodada22. The package described by the Institute for Healthcare Improvement (IHI) for the prevention of catheter-related infections proposes the antisepsis recommendation of the 2% chlorhexidine insertion site into alcoholic solution. Other guidelines are less restrictive in the recommendation, given that when the catheter peripheral venous one of the 3 antiseptics can be used with the same effectiveness, and in the central venous or peripheral arterial catheters, alcoholic chlorhexidine should be used in concentration over 0.5% 23.24. No conclusive results appear to show from studies on skin preparation for surgical incision on the superiority of one antiseptic over another, although an advantage in the use of antiseptics in alcoholic solution, also at high concentrations 21,25,26, seems to be obvious. The use of these solutions should be properly applied, as they are flammable and can lead to side effects with electrical appliances. With regard to pre-intervention shower or bath, such as prevention of surgical site infections, the results find no differences between antiseptics, and even between them and the use of neutral soap and water27. One of the measures for epidemic control by Staphylococcus (SARM) and Enterococcus sp. vancomycin resistant (ERV) in healthcare institutions; the usefulness of using body hygiene decolonisation with soap chlorhexidine solution was described at 2%28, and the recommendation has been extended to other multidrug-resistant germs (GMR)29.Non-intact skinIn general, the use of antiseptics is not recommended because they are cytotoxic, healing and more harmful than beneficial when not used in appropriate concentrations. However, the use of antiseptics at the right concentrations is effective and well tolerated, recommending their cessation of use when the first clinical signs of improvement begin to be detected. As a general recommendation, the solutions used are watery. Ijoded povidone is at concentrations of 2.5%, or 10% if it is in impregnated bandages. In the case of chlorhexidine for disinfection, the concentration is 0.5%. In a recent study on chronic venous ulcers, the only available evidence suggests the use of 0.9% iodine cadomom, a product consisting of the binding of a dextranomer, chemical debridement-enhancing agent, and iodo30. Some germs that are currently invading our institutions, such as Pseudomonas sp., with increasing resistance profiles and which are also a common cause of colonization and infection of wounds, may benefit from not very common antiseptic alternatives, such as acetic acid at concentrations equal to or greater than 0.5% in saline solution for irrigation or over soaked compress31. Mucous membranes, 2 basic indications. Oral hygiene with chlorhexidine by 0.12% or 0.2% reduces the incidence of fan-associated pneumonia32, so it has become a fundamental part of target prevention bundles in this type of infection. Another application is vaginal preparation for a cesarean section with iuffed povidone solutions that reduces the risk of posterior endometritis33. Disinfection on instruments, surfaces and environmentThe cleanliness, as a chronological step prior to disinfection, is a priority interest. Incorrect or defective cleaning will have a negative effect on the successive stages of the anti-sepsy/disinfection or sterilization process. The disinfection process, unlike sterilization, is only able to remove most (but not all) pathogenic germs. In addition, the disinfected material loses this property quickly due to the characteristics of the procedure because it lacks the packaging factor that protects it from contamination. The spectrum of germs on which a disinfectant is effective varies from one to another, or in the same disinfectant, depending on concentrations and exposure time. Depending on the level of coverage achieved by a disinfectant, it can be classified as high level when it includes bacterial spores at intermediate level when it includes mycobacteria but no traces, or low-level when it contains neither mycobacteria or spores7. The criteria for choosing to process the sanitary material with disinfection, at different levels, or with sterilization, was outlined by Spaulding in 1968, and the classification of devices remains effective depending on the level of risk of such materials development 7.34. The 3 categories he described are:•Criticism: any material contaminated with a germ that has a high risk of developing infection. It contains material that comes into contact with sterile cavities or vascular system.•Semimicrític: material that comes into contact with mucous membranes or non-intact skin. These devices should be free of microorganisms, although a small number of bacterial spores may be allowed, because mucous membranes (lungs, gastrointestinal, etc.) generally have resistance to infection by ordinary bacterial spores.•Non-critical: material used on intact skin. Critical material must be sterilized before use. The semi-synthetic material must be disinfected for high-level use. It is in practice the most at risk because they have discovered more infections related to health care than with critics or non-critical ones. The first because they are subjected to sterilization, and the latter because of their low intrinsic risk. Glutaraldehyde, hydrogen peroxide, orthophenyldehyde (OPA), peratic acid, hydrogen peroxide and chlorine are considered high-level disinfectants. The reprocessing of semi-synthetic sanitation for disinfection takes place through contact with disinfectant and can be manual or automatic. Contact time varies from 8 to 45 min at temperatures between 20 and 25oC. Automatic reprocessing by disinfectants minimizes human error, prevents contact of professionals with toxic substances and does not require special ventilation systems35,36.Within the category semi-synthetic material, special mention deserves the processing of endoscopic material. Flexible endoscopes, by the type of cavity in which they penetrate, acquire high microbial load, and although numerous guides and recommendations for endoscope reprocessing have been published, their compliance has important areas of improvement. In this context, the introduction of new technology has become very important, both in disinfectants and in the improvements of automatic processors. About this all models have disinfection and rinse cycles, and some also clean with detergent, alcohol evaporation and/or forced air drying cycles; however, not all are compatible with all high-level disinfectants or all endoscope manufacturers on the market, so selection should be taken into account. Due to the impact that procedures with this type of endoscopic material have on patient safety, the need for microbiological controls in the monitoring of this material is currently being discussed. A new control method is based on adenosine-triphosfat (ATP) bioluminescence for cleaning monitoring, the main cause of failure of the effective disinfection process36–38.Non-critical material, as opposed to critical and semi-critical material, requires medium or low level disinfection. Although it does not pose a risk in itself, they can act as a factor in transmission, due to infection by hands or colonized skin. The most commonly used products as mid-level disinfectants are phenols and chlorine compounds with a contact time of at least one minute. Under the low level, we find added to the previous quaternary ammonium compounds, with the same recommended contact time35.36.SurfacesThe role of contaminated surfaces has a growing familiarity with the emergence of MRMs. In most cases, the most effective biocide sodium hypochlorite at concentrations of 1,000ppm39.40.EnvironmentAlike on surfaces, the emergence of GMR and proven persistence in the environment have led to an update of methods that have long been discarded, such as space spraying. The technology has modernised the environmental evaporation of a disinfectant, in this case hydrogen peroxide, more harmless than those used long ago. Efficacy has been shown to be effective for methicillin-resistant Staphylococcus aureus, Clostridium difficile, Serratia sp., Acinetobacter sp. and others34,41.Sterilization Sterilization is defined as the process by which all viable microorganisms on an object or surface, including bacterial spores, are destroyed. The concept of infertility expresses an absolute condition: a particular object or surface is sterile or non-sterile. Since infertility cannot be fully demonstrated without causing the complete destruction of all sterilised units, in probabilistic terms and a critical product is considered sterile when the probability that a sterile unit contains a microorganism active or latent is equal to or less than 1 in a million (SAL [sterility security level] or sterility security coefficient of 10-6)42.The pre-step and essential for proper sterilization is a thorough cleaning of the material to be sterilised. By means of a mechanical process, visible dirt and organic matter are removed from a surface or object, reducing the number of microorganisms and protecting instruments from corrosion and wear. The purpose of the packaging is to keep the instrument isolated from any source of contamination, preserving the sterility achieved in the sterilisation process. The packaging must be suitable to allow the penetration of the sterilisation agent according to the chosen sterilisation method, depending on the characteristics and use of the materials to be sterilised and the required sterility time43. Sterilization of medical and surgical devicesAlthing a large majority of the medical and surgical devices used in healthcare are heat resistant, since the 1950s there is a growing tendency to use medical devices and surgical instruments made of heat-sensitive materials, what has made it necessary to develop low-temperature sterilisation technologies, such as ethylene oxide, hydrogen peroxide plasma or vapour, ozone, etc.7.La choice of some sterilisation method is not arbitrary, but according to RD 1591/2009, the manufacturer must specify in the datasheet whether etc.7.La particular material is reversible, as well as the method and conditions for its proper reprocessing. Table 4 refers to the different methods of sterilisation most commonly used in the hospital, with their pros and cons44. Steam sterilization is the method that has the highest safety margin for its reliability, consistency and lethality. Steam destroys microorganisms by irreversible clotting and denaturation of structural enzymes and proteins. The basic principle of sterilization in steam car claven is the exposure of the material to the required temperature at a certain pressure for a certain period of time. To achieve the penetration and dispersal of steam in the room, it is necessary to remove the air from the room in advance. This can be achieved passively, by gravity (gravitational autoclaves), or actively, by steam pulses and extraction by a vacuum pump, which is often used by autoclaves in the Hospital. Bowie&Dick testing is used to detect air leakage or insufficient air extraction from the chamber that would result in ineffective sterilization cycles. The most commonly used temperatures for steam sterilization are 121 and 132-134oC. The pressure must be higher to reach higher temperatures (e.g. 1.05bar for 121oC and 2bar for 134oC). From the point of view of the duration of the cycles to achieve sterilization, at higher temperature it is necessary to reduce the exposure time (at 121oC the required exposure time is 20 min and 134oC, 3.5 min), and at constant temperatures the exposure times vary depending on the type of material, whether the material is packaged or not and the type of steriliser. In order to minimize the duration of cycles and to be able to use the material in the shortest possible time, the Flash cycles were defined. This type of sterilization is a modification of conventional steam sterilization whereby the material to be sterilised is placed unwrapped in an open tray or in a specially designed container or wrapper to allow rapid penetration of water vapour7. Sterilization methods at low temperatures should be used to process critical heat or moisture-sensitive material. These methods cause the death of microorganisms by the action of chemical agents, either by chemical oxidation (mechanism used by peroxides, peratic acid or hydrogen peroxide plasma gas), or by alkylation (mechanism used by ethylene oxide or formaldehyde). Ethylene oxide has been used as a low-temperature sterilization agent since the 1950s. It has excellent microcidal activity, great diffusion power and penetrability, and is relatively economical. Operational ranges are gas concentration (450-1,200mg/l), temperature between 37-63oC, relative humidity 40-80% and exposure time of 1-6h. Within certain restrictions, increasing the temperature and concentration of the gas may reduce the exposure time needed to achieve sterilization7. Hydrogen plasma gas peroxide is a technology that began to be sold in 1993. The mechanism of action is based on a first phase of diffusion of hydrogen peroxide gas and subsequent generation in a vacuum chamber, by radio frequency or microwave energy, free radicals that can interact with the essential components of cells (enzymes, nucleic acids) by micro-organisms 7,44,45.The mechanism of action of evaporated hydrogen peroxide is based on the spread of hydrogen peroxide in dry steam phase. It does not necessarily require vacuum chamber44.45.Vacuum chamber control ensure the sterilisation process required to monitor the physical parameters of the cycle (physical controls), check the critical parameters in the containers (chemical controls) and certify the lethal capacity of the sterilisation cycle (biological controls). Table 5

specifies the controls indicated for each type of sterilization46. Sterilization of material contaminated with prions Creutzfeldt-Jakob disease (CJD) is a neurodegenerative disease that can spread through infected instruments previously used in an infected patient. Only 4 cases involving neurosurgical instruments have been reported worldwide, but the detection of abnormal priginal protein in other organic tissues has extended the risk of infection to a wide range of medical and surgical procedures. Conventional sterilization and disinfection methods are inadequate in reducing prion infectivity, and World Health Organization recommendations are often inconfidional. Through mathematical models it has been established that after 6 cycles of cleaning and conventional disinfection transmission is unlikely. Basic prevention strategies include the use of disposable instruments where possible and quarantine non-disposable instruments until diagnostics have been checked, and the use of special methods to process instruments on suspicion of HRJ47,48. The choice of the processing of disinfection or sterilisation material will depend on 3 factors: the risk of disease of the patient (patients with a confirmed diagnosis or high suspicion), the infectivity of the tissue involved in instrumentation (brain, spinal cord, eye and pituitary gland) and the intended use of the material. Instruments should be kept moist after use and until disinfection has started, which will be as soon as possible after use. The high resistance of prions to standard methods requires special procedures (Table 6) in both sterilization for critical devices and disinfection for semi-criticals that have come into contact with high-risk tissues of high-risk patients49. Conflict of interestThe authors declare that they have no conflict of interest.