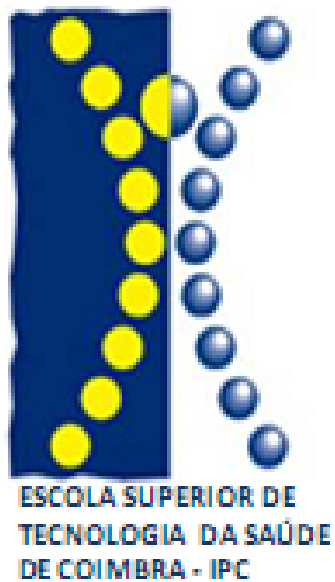


ESTeSC – Coimbra Health School

Abstract Book

Poster Week 5/16

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SCIENTIFIC COMITEE

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TITLE: ISCHEMIC STROKE AND THERAPEUTICS**Authors: Carlos Silvestre, Diana Santos, João Coelho, Rui Cruz****Affiliations: Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal**

The stroke is defined as an abrupt neurological deficit caused by ischemia or bleeding located in central nervous system that persists at least for 24 hours. It is a very prevalent condition in developed countries, like Portugal, with high rates of mortality and morbidity^{1:2}.

The therapy that is applied to a patient with stroke depends upon the disease state. Therefore exists three levels of treatments: preventive, acute and rehabilitation. The preventive therapeutic is based on the reduction of risk factors and the attenuation of pathological process. In acute therapy it's intended the fast dissolution of blood clots or the stagnation of cerebral bleeding. While the rehabilitation therapy depends of the damage caused by the stroke, evaluated after the acute therapy, and is usually linked to psychomotor exercises².

In acute therapy, the pharmacotherapy of first line currently used is r-tPA (Actilyse-alteplase). The r-tPA is also known as recombinant tissue plasminogen activator and it's a drug that destroys the clot and instantly clears the artery. It must be used in the first hours of ischemic stroke and it should never be used in bleeding stroke³.

Although the existing therapies, the prevention therapy must be the main acting factor about the condition. The monitorization of hypertension and diabetes, as well as cholesterol and weight are important factors. In some cases is also needed the smoking cessation, as well as sedentary life and stress cessation. In the most of the times is also needed dietary guidance and the use of some drugs³.

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TITLE: ASTHMA**Authors: Iris Carvalho; Jéssica Guerreiro; Liliana Rodrigues; Rita Pereira; Rui Cruz****Affiliations:** *Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal*

Asthma is a chronic inflammatory disease of airways, characterized by episodes due to coughing, wheezing, chest's tightness and breathing difficulty. Generally, It is spontaneously reversible or under drug therapy. Asthma affects about 1 million Portuguese's. [1,2,3]

Factors such as the mites' presence, tobacco smoke, animals' feathers, pollen, humidity, air pollution, temperature changes and some drugs' use can cause this condition. [4]

Asthma's diagnosis is based on medical history evaluation, respiratory functional evaluation, objective examination (bronchial obstruction signals), atopy assessment and exclusion situations that can be confused with asthma. [5]

Pharmacological treatment used in this pathology is based in anti-asthmatics and bronchodilators. The most used drug is Salbutamol, classified as beta adrenergic agonist.

It is a bronchodilator with short duration of action that acts as a β -adrenergic stimulant with a selective action on the β_2 -adrenergic receptor and has stimulant action on the β_2 receptors in the smooth muscle of the bronchi. [6,7]

Thus, it relax the muscle walls of the small airways of the lungs, helps its opening and allows the relief of chest tightness and coughing, making easier breathing of the patient. However, its most common side effects are tremor, headache and tachycardia. [8]

To conclude, it is important to note that only 57% of asthma patients in Portugal have their disease controlled, nearly 300,000 Portuguese with active asthma need better intervention so that their disease can be controlled. [9]

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TITLE: HIV/AIDS- DEFINITION AND TREATMENT

Authors: Ana Luís; Elisa Ferreira; Vera Saraiva; Rui Cruz

Affiliations: *Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal*

The objective of this study is to clarify what is the HIV infection / AIDS and its pharmacological therapy.

AIDS (Acquired Immune Deficiency Syndrome) is a well-defined set of signs and symptoms that can occur in individuals with HIV infection.

After HIV transmission occurs the asymptomatic phase; where the infected person has no symptoms and feel well. The specific analyses are the only detection method. At this stage of the disease is said that the individual is HIV-positive.

In the evolution of HIV infection there is a progressive destruction of the immune system (immunosuppression condition) that enables the appearance of opportunistic infections and certain types of tumours. When one of these opportunistic infections or tumours occurs, the individual passes from HIV positive to AIDS carrier.

HIV is treated using a combination of drugs. This treatment is called combination antiretroviral therapy (ART), it is not a cure but a virus control method.

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<https://www.aids.gov/hiv-aids-basics/just-diagnosed-with-hiv-aids/treatment-options/overview-of-hiv-treatments/>

TITLE: PNEUMONIA**Authors: Ana Francisco; Laetitia Barroca; Liliana Oliveira; Rui Cruz****Affiliations:** *Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal*

In humans, the most common types of infection are respiratory tract infections, among which viral infections predominate.¹ On an international scale, Pneumonia is one of the leading causes of death and a leading cause of hospitalizations is community-acquired pneumonia (CAP).²

Pneumonia is a formidable challenge for both the patient and the physician. For the patient, it is a life-threatening illness. Indeed, for many of us who may be fortunate enough to live to an old age (80 or more years), pneumonia is often the final common pathway for a number of illnesses that can result in one's demise. For the physician, the challenge is that the causative agent of the pneumonia is often unknown and that there are a large number of agents that could be causing the pneumonia.³

Moreover, many patients progress from uncomplicated pneumonia to severe pneumonia and even to pneumonia-related septic, shock despite adequate antibiotic therapy.⁴

This article discusses epidemiological and clinical aspects, and the appropriate empiric antibiotic therapy.

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TITLE: DIABETES MELLITUS**Authors: David Almeida; Joana Louro; Bruno Matias; Rui Cruz****Affiliations:** *Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal***Pathology Definition:** Diabetes mellitus (DM) belongs to a group of heterogeneous diseases characterized by an increased blood glucose associated with an missing or inadequate insulin secretion by the pancreas.⁽¹⁾ According to the World Health Organization (WHO), there are four different clinical types: type 1 diabetes, type 2 diabetes, gestational diabetes and other specific types of diabetes.⁽²⁾**Symptoms:** The lack of insulin, leads to status of polyuria, polydipsia, polyphagia, blurred vision and weight loss, in extreme cases, hyperglycaemia can lead to severe ketoacidosis.⁽³⁾**Diagnostic:** The WHO defined as diagnostic criteria for DM: blood glucose values equal or higher than 126 mg/dl; glycaemia values equal or above than 200 mg/dl two hours after the Oral Glucose Tolerance Test.**Pharmacological treatment:** In Portugal are currently six classes of oral antidiabetic agents for treatment of type 2 DM: absorption inhibitors (inhibitors of alpha-glucosidase), drugs that fight insulin resistance (biguanides and glitazones) and medications that increase insulin production (sulfonylureas, metaglinides and incretins GLP1 and GIP).^{(1),(4)}**Main Medicine:** Metformin is a biguanide recommended as 1st line treatment of type 2 DM.^{(1),(2)} It features anti-hyperglycaemic effect, lowering both basal plasma glucose and postprandial.^{(2),(5)} Their action results in an increase sensitivity of the body to insulin, reducing insulin resistance, particularly in the liver and muscles. Rarely causes hypoglycaemia and improve the lipid profile of patients.^{(5),(6)}**Side effects:** The most common in this therapy are: taste changes, gastrointestinal disorders such as nausea, vomiting, diarrhoea, abdominal pain and loss of appetite.⁽⁵⁾**References:**

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TITLE: CHRONIC OBSTRUCTIVE PULMONARY DISEASE**Authors: Andreia Pestana; Joana Dias; Pedro Loureiro; Rui Cruz****Affiliations:** *Polytechnic Institute of Coimbra, ESTESC-Coimbra Health School, Pharmacy, Portugal*

The Chronic Obstructive Pulmonary Disease (COPD) is a persistent obstruction of the airways caused by emphysema or chronic bronchitis. Emphysema is a dilatation of alveoli and destruction of their walls. Chronic bronchitis manifests as a persistent chronic cough that produces sputum.¹ The cause of the abnormal inflammatory response of the lungs is due to noxious particles and gases.² The most common symptoms are chronic cough, sputum and chronic dyspnea.³

The diagnosis is performed by an examination called spirometry, evaluates lung function which, or measures the volume of air which enters and leaves the lungs.²

The pharmacological treatment of COPD depends on the symptoms and severity of disease.³ The drugs used as first-line treatment are inhaled bronchodilators of short-acting inhaled bronchodilators and long duration of action, alone or in combination. In more severe situations it may also be necessary to use oxygen or for short periods during the increase, either continuously when there is chronic respiratory failure.⁴

Bronchodilators (β -adrenergic agonists, anticholinergics, methylxanthines) and glucocorticoids are the main drugs used in the treatment of COPD.⁵

The bronchodilators, β -2 adrenoceptor agonists, active in receptor β -2 adrenergic causing relaxation of smooth muscle, causing bronchial dilation, relieving bronchospasm.⁶ The association of inhaled corticosteroids is effective for its anti-inflammatory action at the level of the bronchial mucosa (by inhibiting the formation, release and activity of inflammation mediators), for contributing to the reduction of edema and mucus secretion in the airways and because they are bronchodilators indirect way, by increasing the sensitivity of beta-2 receptors to sympathomimetics.^{7,8}

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TITLE: ACE INHIBITORS IN THE TREATMENT OF HYPERTENSION: A REVIEW**Authors: Carina Almeida; Cátia Costa; Diana Silva; Rui Cruz****Affiliations:** *Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal*

The blood pressure (BP) is the force with which the blood flows inside the arteries. However when this pressure is high chronically, it is called Hypertension (HTA).⁽¹⁾ Hypertension affects about 40% of the global population aged from 25 years and it is implicated in about half of the deaths from stroke or cardiovascular disease.⁽²⁾ The aim of this review is to describe the hypertension, identify his causes and the treatment focus on the action of the ACE inhibitors. The methodologies used were bibliographic review of books and online research at google scholar with the keywords: hypertension, treatment, ACE inhibitors. The individual treatment should take into account various factors such as the presence of previous cardiovascular events and concomitant diseases like diabetes and renal failure. Despite drug therapy is the most effective treatment, there are other non-pharmacological. These measures as well as helping to reduce blood pressure, increase the effectiveness of anti-hypertensive drugs.⁽³⁾ One of the most prescribed drugs for the treatment of hypertension are ACE inhibitors. This medicines act as an inhibitor for the enzyme responsible for the conversion of angiotensin, leading to decreased levels of angiotensin II which will cause vasodilation and decreased of aldosterone. This drugs are able to reduce blood pressure without increased heart rate.^{(3) (4)} It has been recognized for decades, the importance of detecting, treating, and controlling hypertension. The prescribing of the right medicine is crucial but the changes in the lifestyle are also very important.⁽⁵⁾

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TITLE: PSYCHOSES - EPILEPSY: HOW CAN WE TREAT IT?**Authors: Adriana Ferreira; Andreia Figueiredo; Mariana Carvalho; Rui Cruz****Affiliations:** Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal

Introduction: Recent epidemiological studies show that psychiatric disorders are today the main cause of disability and a major cause of mortality. Epilepsy is characterized as a brain disorder caused by abnormal electrical discharges, its main characteristic recurrence of seizures and can change their pathophysiological characteristic according to the area of the brain affected.

Objective: Systematic review of epilepsy, symptoms and diagnostic methods. Importantly throughout the study the pharmacology of first-line drugs used in this pathology.

Material and methods: The literature search was conducted in Pubmed and Scholar database to identify articles in English language related to epilepsy, focusing on the treatment used. Keywords: psychoses, epilepsy, drug therapy and antiepileptics.

Results: There are several groups of drugs used in the control of different forms of epilepsy, thus, the efficacy of antiepileptic therapy depends in part on the type of seizures. Some drugs are given only in a kind of crisis and not in others and may even aggravate them. The phenobarbital, phenytoin, carbamazepine and valproate are some examples of the drugs used in the treatment of this disease.

Conclusion: In 50-80% of patients, antiepileptic drugs are completely effective in controlling seizures. These drugs bring great benefits to patients, so the obedience to pharmacological treatment is the way most commonly used to prevent seizures and their consequences for the health of the person.

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TITLE: *ESCHERICHIA COLI* AND MINCED MEAT

Authors: *Ana Rita Almeida, Beatriz Sargaço, Francisca Maques, Maria Laura Santos e Mariana Afonso*

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Escherichia coli is a rod-shaped bacteria that colonizes the gut of healthy people and warm blooded animals. Mostly is harmless, however some strains have negative effects, for example, some may cause urinary tract infections, others produce enterotoxin that cause traveler's diarrhea and occasionally severe foodborne diseases.

Minced meat favors the growing of this bacteria, because it have factors that promote the development of microorganisms, such as a high value of water activity and a pH almost neutral. The meat may contain contaminants that reflect the hygienic conditions of the slaughter and of the processing to which it was submitted. Contamination may occur during the milling because the cuts used are excessively manipulated. After this process, the meat has a higher exposed surface area, and even if kept cool, the spoilage microorganisms continue to evolve.

Transportation, cooling failures, inadequacies in the divisions of parts, environmental exposure, inadequate hygiene, packaging and storage may favor the exposure to the bacteria. Thus it is necessary to act on the confection, allowing the meat to reach a temperature of 70°C for at least 5 minutes.

With this work we aim to raise awareness of the risks present in this type of meat processing. Nowadays, it is a major cause of diarrhea in the world. In 1996 about 9,000 people in Japan became ill and seven died as a result of infection by *E. coli*, associated with poor cooked meat and drink unpasteurized.

Keywords: *Escherichia coli*, bacteria, minced meat, contamination

TITLE: STAPHYLOCOCCUS AUREUS AND FOOD SAFETY

Authors: *Carolina Lucas; Cláudia Teixeira; Cristina Santos; Inês Silva; Sara Leal*

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Staphylococcus aureus is a Gram-positive bacterium which belongs to the Micrococcaceae family. This bacterium can be found everywhere for example in water, air, dust, milk, sewage and ground surfaces, however the main source and habitat is man and animal's nose, throat and skin. When is in favourable conditions, produces enterotoxins that are responsible for food poisoning. These toxins are water-soluble and heat resistant, remaining active after pasteurization. These bacterium need some conditions such as temperature, pH, water activity, the relation with oxygen and irradiation. The foods most affected by *Staphylococcus aureus* are those that were manipulated after processing and subjected to storage's temperatures between 10 and 45 °C before consumption. The most common symptoms are nausea and vomit, sometimes accompanied by diarrhoea and abdominal pain that disappear after 48 hours, but in severe cases can occur shock and collapse due to dehydration. The fish is one of the most common foods to be contaminated easily with *Staphylococcus aureus* from environment or infected handlers like an infection in his hands, a cold or a sore throat. To prevent poisoning by *Staphylococcus aureus* must be a high maintenance of hygienic standards, a reduction in food handling and greater control of temperature. In the restaurant area are necessary some precautions because it needs just a worker that present any health problems to contaminate food that will later be served to customers.

Keywords: *Staphylococcus aureus*; Heat resistant Enterotoxins; Manipulation.

TITLE: NOROVÍRUS AND GASTROENTERITIS: AN OVERVIEW

Authors: *Carolina Reis, Daniela Couto, Jéssica Gonçalves, Joana Tomás, Patrícia Moreira*

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Norovirus, previously referred to as Norwalk-like virus, is the most common etiological agent of acute gastroenteritis and is often responsible for outbreaks in a wide spectrum of community and healthcare settings. These positive-sense, single-stranded, non-enveloped RNA viruses belong to the family *Caliciviridae*. The most common symptoms of infection in humans are nausea, vomiting, cramping, malaise and diarrhoea.

Foods, such as fruits and molluscs, can be easily contaminated by norovirus, and numerous point-source outbreaks are attributed to improper handling of food by infected food-handlers, or through contaminated water sources where food is grown or cultivated, but also through person-to-person contact. The easy transmission, with a low viral dose, along with a short incubation period, environmental persistence, and lack of durable immunity following infection, enables norovirus to spread rapidly through confined populations.

Norovirus infections are seen in all age groups, although severe outcomes and longer durations of illness are most likely to be reported among the elderly, children and hospitalized persons.

There is currently no vaccine available for norovirus and, generally, no medical treatment is offered for norovirus infection. Thus, the prevention of the spread of this virus relies mainly on community and personal hygiene measures.

Thus, this work aims to expand general knowledge about Norovirus, as well as its direct relation with gastroenteritis outbreaks, in order to increase the information provided to the population.

Keywords: Norovirus; *Caliciviridae*; gastroenteritis; diarrhoea.

TITLE: PRIONS AND FOOD

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A prion is a protein molecule that acquired an abnormal form. This change of structure makes it an infectious agent capable of causing neurodegenerative diseases - spongiform encephalopathies, such as the Creutzfeldt-Jakob disease, the human version of the commonly known mad cow disease.

These proteins are unique pathogens once they have infectious capacity without the presence of any nucleic acid and thereby differ from other known infectious agents.

It is known that the consumption of food contaminated with prions, such as beef, is associated with its transmission, and the mechanisms of the disease have recently been discovered to reach the brain cells. After the ingestion of these kind of food, prions accumulate in the intestines, after passing into the spleen and lymph nodes, where they may remain for several years, the estimated period for incubation of the disease. These protein particles with infectious capacity cannot be destroyed by boiling, alcohol, acid, standard autoclaving methods, or radiation.

Since there is no cure for prion diseases, it is necessary to take control measures to prevent the spread of disease in animals, especially those that are a source of food and other products for humans.

With this work, we intend to introduce the relationship between prions and food and also address the various diseases caused by the same infectious agent.

Keywords: Prions, protein, pathogen, food

TITLE: LISTERIOSIS IN PREGNANCY BY CHEESE CONSUMPTION

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Contamination by *Listeria monocytogenes* was always a concern for public health, especially for children, pregnant, elderly and immunocompromised, considered as a risk group. During pregnancy the pathogenic effect is chiefly harmful to the fetus and may lead to premature birth, meningitis, neonatal sepsis, birth of dead baby and abortion. The infection can be asymptomatic or associated with fever, chills, gastrointestinal symptoms and muscle pain. The contamination can also occur in healthy adults, however the evidence shows minor damage.

The *L. monocytogenes* is considered one of the most important foodborne agent and transmitted through food. The importance in this area focuses in its capacity to resist in particular conditions, such as refrigeration temperatures. The transmission of this bacteria is often related with bad manipulation and/or cooking of foods, whether it is from animal or vegetable origin. Some of the reported listeriosis outbreaks indicate that it occur by consumption of dairy products, for example cheese made with unpasteurized milk. The cases where the cause is consumption of pasteurized cheese are justified by cross contamination during the cheese manufacture.

Due to the serious consequences of infection during pregnancy, it is important and recommended a special care in the selection of the food that will be eaten, such as unpasteurized cheese.

With this work, we pretend to introduce the bacteria *Listeria monocytogenes* and its relationship with unpasteurized cheese. We also pretend to show the relevance of listeriosis during pregnancy associated with cheese consumption.

Keywords: *Listeria monocytogenes*, listeriosis, cheese, pregnancy.

TITLE: TAPEWORMS AND FOOD

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There are several species of tapeworms, but only three affect human beings: *Taenia solium*, *Taenia saginata* and *Diphyllobothrium latum*, each of which is characteristic of a particular animal, respectively, porcine, bovine and fishes. These three animals are the intermediate host, and the humans are the definitive host. The *Taenia saginata* is prevalent in countries where there's beef consumption, such as Africa, Mexico, USA, Argentina and Europe. As for pork, there is often contamination of *Taenia solium* in Southeast Asia, the Philippines, Central and South America. Contamination by *Diphyllobothrium latum* is more common in countries where raw fish intake is usual such as Japan, China and Korea.

The transmission is due to the fact that the intermediate host consumes contaminated water and/or vegetables, and is subsequently subjected to a bad cooking process that enables the transmission of tapeworm. People should pay particular attention to typical dishes based on raw food.

When the tapeworm is in the larvae state it can develop into cysticercus (*Taenia solium*) which causes cysticercosis, or in sparganum (*Diphyllobothrium latum*), which causes sparganosis. In general, patients are asymptomatic but may show a variety of events.

The taeniasis is diagnosed by examining the faeces or with the aid of X-ray.

There are various methods of treatment such as pharmacologic, surgical and natural (with pumpkin seeds) treatments.

The objective of this work is to demonstrate that a defective cooking of previously contaminated food may lead to the presence of tapeworms in the human body.

Keywords: Tapeworm, *T. solium*, *T. saginata*, *Diphyllobothrium latum*, defective cooking.

TITLE: BRUCELLOSIS AND FOOD CONTAMINATION

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Brucellosis is an infectious disease caused by bacteria of the gender *Brucella*, whose main species are *Brucella mellitensis* in goats, sheep and camels; *Brucella abortus* in cattle; *Brucella suis* in pigs and *Brucella canis* in dogs.

Personal transmission is rare, however *Brucella* is the bacteria that most commonly cause infections in laboratories. It is transmitted by contact with infected animals and is also associated with the consumption of them, when undercooked. Milk is one of the dairy products most consumed by the Portuguese population, adapted to the needs of various age groups, and so there's a strict legislation and food control. Milk intake unpasteurized and its derivatives from infected animals are one of the main vehicles of infection.

With this work we intend to relate the action of *Brucella* in contamination of milk, its derivatives and meat and gathering information about their treatment and respective symptoms.

Keywords: *Brucella*, pathogenic microorganism, milk pasteurization.

TITLE: *ASCARIS LUMBRICOIDES* AND FOOD SAFETY

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Ascaris lumbricoides is a species of nematode in the ascarididae family, commonly called roundworm. This parasite is the cause of an infectious disease known as Ascariasis. The infection can occur through ingestion of contaminated food or water containing roundworm eggs. After infective eggs are swallowed, the larva hatch, penetrate the intestinal mucosa and are carried via the blood stream to the lungs (they may also migrate to the liver or heart). After a while, the larva moves from the respiratory system and returns to the small intestine, where it matures to an adult male or female worm. Upon reaching the small intestine, the worms obtain an enabling environment for their survival and multiplication. When developing into adult worms they can reach up to 40 cm long.

A female may lay approximately 200,000 eggs per day. Overnight they migrate to the perianal region and lay eggs which are passed with the feces. The symptoms may include the occurrence of nausea, vomiting, abdominal cramps and weight loss.

With this work, we intend to provide information about the parasite *Ascaris lumbricoides* and to demonstrate the importance of food safety in the prevention of an infection caused by this parasite.

Keywords: *Ascaris lumbricoides*, Ascariasis, food safety, parasite, roundworm.

TITLE: *VIBRIO PARAHAEMOLYTICUS* AND THE SUSHI

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The marine ecosystem is the natural habitat for bacteria such as the *Vibrio parahaemolyticus*, an important pathogenic agent which causes human gastroenteritis associated to the consumption of sea food. The infections caused by this organism have been associated to the consumption of raw or hardly cooked fish, seafood and seaweeds. The incorrect refrigeration of contaminated food by this organism allows its proliferation, which increases the possibility of infection.

The *Vibrio parahaemolyticus* are thin and short bacilli, motile with a single polar flagellum, which confers it an advantageous mobility in the aquatic environment.

Sushi is a culinary practice increasingly appreciated worldwide, however, given the circumstances of its preparation, going from the absence of cooking to the frequent handling of fish and algae, the susceptibility of contamination and propagation of the pathogen is increased. However, assessments claim that the *Vibrio parahaemolyticus* dies at temperatures inferior to 5°C and is inactivated by cooking food at 65°C. This way, the risk of unsafety food could be decreased if hygiene practices are adopted during the handling of the foods and, if possible, cooking them before their consumption.

The main objective of this study is to disclose information of this bacteria, as well as the causes and effects caused by its contamination, especially in the case of sushi as a susceptible way to disseminate, thereby promoting good hygiene practices that contribute to the quality and food security.

Keywords: *Vibrio parahaemolyticus; Sushi; Seafood; Food Safety; Contamination.*

TITLE: TOXOPLASMOSIS AND PREGNANCY

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Toxoplasmosis, congenital or acquired, is an infectious disease caused by the protozoan *Toxoplasma gondii*, present in most birds and mammals, although the cat is the only one capable of allowing sexual reproduction of the parasite.

The human being may acquire *Toxoplasma gondii* by one of four routes: *oral*, through the ingestion of food contaminated by sporulated oocysts or undercooked meat, especially lamb and pork that contains cysts; *congenital*, by vertical transmission from infected mother to child; *blood transfusion* or *transplant organs* and *accidental bites to health professionals*.

Epidemiologically, this zoonosis, is quite aggressive in individuals with compromised immune systems and pregnant women, the latter being the most worrying population, given that fetal infection can cause abnormalities in the developing embryo, capable of causing fetal death or birth children with severe diseases of the brain or ophthalmic disorders.

Prevention is an objective to be achieved in order to minimize the contraction and proliferation of the microorganism, performing the Food Microbiology and Dietetics an important role with regard to the study and implementation of forms of food preservation; cooking modes and prevention of nutritional disorders; increase of hygiene and food safety and prevent risks to public health.

With this work we intend to show the possible ways of contracting this disease, alert for the consequences that might be severe and encourage people to take preventive measures.

Keywords: Toxoplasmosis, *Toxoplasma gondii*, Pregnancy, Food Microbiology.

TITLE: BCG VACCINE**Authors: Inês Cortês; Isa Penas; Jéssica Gouveia; Jorge Balteiro****Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

Tuberculosis is caused by the bacterium *Bacillus Koch* (BK), it may reach any part of the body even though the lungs are the most affected organs. In the most severe cases of pulmonary tuberculosis symptoms pass by difficulty in breathing, loss of large amounts of blood, lung collapse and inflammation of the pleura.

To treat this disease are taken antibiotics. With regard to prevention is used BCG (*Bacille Calmette - Guérin*) to immunize newborn children that weigh more than two kilograms. Except for these children, it should be performed skin test for tuberculosis (tuberculin test), which reveals whether the person has been infected by the bacteria. A positive result is a contraindication to administration of BCG.

BCG is a live attenuated vaccine derived from mycobacteria *Mycobacterium bovis*. The application of this vaccine replaces the natural infection - severe - with an artificial infection - harmless - by inoculating live attenuated bacilli, creating body resistance against possible infection with bacillus. Protects mainly against the blood spread, responsible for the most severe forms of the disease.

The administration of this vaccine is made preferably in the right arm and may stay with a scar, characteristic of the injection.

Currently there are some problems in the distribution of the vaccine, as there are many countries that need its administration and its production is done only in a Danish laboratory.

OMS suggests that Portugal meets sufficient criteria for suspending the universal vaccination, and the immunization shall be made only in risk groups.

Keywords: BCG; tuberculosis; *Bacillus Koch*; vaccine; vaccination

TITLE: HORMONAL CONTRACEPTION ADMINISTERED BY A NON-ORAL WAY**Authors: *Bárbara Cruz; Damiana Chumbinho; Inês Silva; Jorge Balteiro*****Affiliations: *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal***

The contraception is, according to OMS, a contraceptive method that should be effective and reversible.

Nowadays, there is a wide range of contraceptive methods that prevent a more or less reliable way an unwanted pregnancy, without, however, they are irreversible, that is, don't prevent the transmission of life after stopping the application of the method.

There are barriers or mechanical methods that act as a physical barrier between the sperm and the oocyte, preventing fertilization, and chemical and hormonal methods that prevent ovulation or destroy sperm. Before ovulation occurs a significant increase in the concentration of LH and FSH hormones, stimulating follicle development and thus ovulation. The administration of hormonal contraceptives will inhibit the synthesis of hormones by the hypophysis, preventing the development of follicles with sex cells, a negative feedback mechanism.

The hormones used in contraception are responsible for inhibition of ovulation, preventing fertilization and that way preventing a pregnancy. These hormones generally try to imitate the hormones released by the ovaries of women, or are similar to this hormone, that complicates the conception and implementation of the egg in the uterus.

The choice of contraceptive methods depends on a voluntary decision and informed about the safety, efficacy, cost, side effects and reversibility of the methods available.

In this work we intend to address hormonal contraception administered by a non-oral way, such as a vaginal ring, implants, injectable, patch and SIU.

Keywords: Contraception; contraceptive method; hormonal contraception; non-oral way; safety

TITLE: NEW ADVANCES IN THERAPY OF HEPATITIS C**Authors: Cláudia Fernandes; Tânia Lourenço; Telma Faria; Jorge Balteiro****Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

Hepatitis C is an infectious disease that is caused by the hepatitis C virus (HCV) which affects mainly the liver. It is manifested in two forms, acute or chronic. The last one may lead to fibrosis and later to cirrhosis, liver failure and hepatocellular carcinoma. It's a silent epidemic, because the infected people couldn't have any symptom in the first 10-20 years.

According to the WHO, it's estimated that there are 130-150 millions of people infected with chronic hepatitis C in the entire world, which 9 millions in Europe and 150 thousand in Portugal, with Africa and Asia the most affected areas.

HCV is transmitted mostly by blood-borne, being drug addicts a risk group. In which concerns to symptoms it stand out the fatigue, lethargy, concentration and appetite decrease, nausea, vomiting, abdominal and joint pain, gastrointestinal disorders, dark urine, gray faeces and jaundice. The diagnostics could be gotten by radiological and invasive examinations and laboratory tests.

The treatment administered into the adult patients with chronic hepatitis C depends on the viral genotype of each person and may exist 6 different genotypes. The dose, duration and treatment response are conditioned by their expression.

Recently marketed drugs includes Sovaldi® - prodrug, being Sofosbuvir their active principle and the used for excellence in pathology. Their therapeutic effect is raised in combination with other drugs. Therefore, one of the mainly associations is with Ledipasvir, with commercial name Harvoni®.

However, it's noted that there are other therapeutic alternatives that are still under investigation.

Keywords: Hepatitis C; HCV; viral genotypes; Sofosbuvir; Ledipasvir

TITLE: THERAPEUTIC USE OF IMMUNOGLOBULINS IN DISEASES THAT AFFECT CENTRAL NERVOUS SYSTEM**Authors:** *Dina Mendes; João Santos; Pedro Vieira; Jorge Balteiro***Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

Immunoglobulins (Ig) are glycoproteins synthesized and secreted by plasma cells derived from B lymphocytes, plasma cells, found in plasma, tissues and secretions, which attack foreign proteins to the body, called antigens, thus realizing the body's defense (humoral immunity).

The immunoglobulin preparations are derived from human plasma. Current preparations include formulations for intravenous and subcutaneous use, allowing latter home use in infusion pump.

They are essentially two pathways: replacement therapy, as a source of antibodies in individuals with diseases associated with deficient endogenous antibody production and immunomodulation therapy in subjects with severe autoimmune diseases.

Autoimmune diseases are a group of disorders characterized by an exacerbated response, abnormal immune anywhere in the body in the Central Nervous System (CNS) is included.

The most common autoimmune diseases that affect the CNS are myasthenia gravis and severe multiple sclerosis.

Multiple sclerosis is a chronic autoimmune inflammatory CNS disease characterized by inflammation and destruction of myelin, which covers and insulates nerve fibers and speeds electrical signals carried through them.

Myasthenia gravis is a neuromuscular disease that causes abnormally rapid weakness and fatigue of voluntary muscles. The weakness is caused by a defect in the transmission of nerve impulses to the muscles.

Such diseases are chronic and require care throughout life. Corticosteroids and intravenous immunoglobulin therapy are used to try to reduce immune disorders.

Keywords: Immunoglobulins; humoral immunity; immunoglobulin therapy; central nervous system; autoimmune inflammatory

TITLE: UTILIZATION OF METHOTREXATE IN THE TREATMENT OF PSORIASIS ON PLAQUES**Authors: Anabela Lopes, Paula Silva, Rita Peixoto; Jorge Balteiro****Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

Psoriasis is an inflammatory and chronic disease of the skin which is very common and affects around 2-3% of the worldwide population. It consists on an hyper-proliferation of the keratinocytes and formation of agglomerates of leucocyte on epidermis, especially on derm, which expand through vessels and modify the cytokine production. This disease is hard to explain, even though there is a prevalent theory that it is an auto-immune disease.

Through the analysis of various sources, it was verified that there is no cure for psoriasis and the treatment strategy focus in diminishing the symptoms and ameliorate the quality of life. Our objective is to clarify the utilization of methotrexate in the treatment of psoriasis on plaques, which is the most common form of this disease, affecting around 80% of the people, the utilization of this drug is important because of its immunomodulating properties, that stimulates the production of IL-1 and decreases the density of the Langerhans cells on the epidermis. It also has effect on the antigen presenting cells.

This type of psoriasis can appear on any part of the body, but it shows mostly on elbows, knees, back and scalp. It expresses by the appearance of lifted and round plaques red-colored, covered by some superficial and dry scales.

Keywords: Psoriasis on plaques; treatment; methotrexate; Langerhans cells; IL-1

TITLE: PLACEBO EFFECT: PROS AND CONS**Authors: Ana Portásio; Andreia Acúrcio; Bianca Pessoa; Jorge Balteiro****Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

The word placebo comes from the Latin, from the verb *placere*, which means "I shall please". The placebo effect stands for a non-specific effect that doesn't derive directly from a pharmacological action of a particular drug. According to the *Houaiss Dictionary* of the Portuguese Language, it consists in a "neutral preparation given in substitution of a drug, to control the reactions of a psychological nature."

There is a positive effect when the patient shows improvement and a negative effect when the side effects appear. Here, the placebo is called *nocebo* (from the Latin *nocere*, which means causing damage).

The pros are: psychological boost, which means, the person's positive attitude is important for recovery; it can be a measure for the change in behavior affected by a belief in the treatment; better evaluation of clinical relevance; reduced sample and lower study costs. In contrast, changes related to the placebo may be underestimated once in chronic pain conditions or mood disorders, patients may have a spontaneous improvement; the patient, wanting to please the doctor, may report improvement when it didn't happen (courtesy effect); the placebo, by definition, is considered as an effective treatment - however, is presented to the patient as potentially effective; loss of confidence in health professionals since the clinical improvement hasn't occurred; it raises ethical problems.

The conviction that the patient has to be treated is crucial for the occurrence of psychological and behavioral changes.

Even though it's really important in clinical trials, the use of placebo is controversial.

Keywords: Placebo; nocebo; clinical trials; ethical problems; psychological boost

TITLE: PHOSPHODIESTERASE - 5 INHIBITORS (IPDE5)**Authors:** *Mariana Ramos; Vânia Silva; Rúben Santos; Jorge Balteiro***Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

Erectile dysfunction is a disease characterized by the inability to initiate and maintain an erection firm enough to provide a satisfactory sexual performance. This condition has several causes and different severity levels, so has different treatments.

The oral drug therapy is based on the use of phosphodiesterase-5 inhibitors (IPDE5) which are the safer and more effective drugs. They act by inhibiting this enzyme that is responsible for muscular contraction of penis arteries, causing vasoconstriction and, subsequently a penile flaccidity, which leads to increased erection's time.

The oral medication should be ingested 30 minutes before the beginning of sexual activity, however the erotic stimulus is required to the effect be more effective. Nowadays, have four IPDE5 available, approved by the EMA, for the treatment of erectile dysfunction. They are Sildenafil (Viagra®), Vardenafil (Levitra®), Tadalafil (Cialis®) and Avanafil (Spedra®).

It is known that IPDE5 have a lower response rate in older men than in younger patients, however, it has advantages as regards to facility to use and excellent safety profile in the elderly.

The treatment of erectile dysfunction using IPDE5 or using alternative therapies is a widely discussed topic.

Keywords: Erectile dysfunction; IPDE5; Sildenafil; Tadalafil; Vardenafil

TITLE: CLOMIPHENE CITRATE

Authors: *Ana Catarina Rodrigues; Ana Margarida Silva; Mariana Mendes; Jorge Balteiro*

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Infertility is increasingly a reality that affects the lives of many people of female and male, it should be less healthy lifestyles, to the fact that currently women put motherhood on second place, depending on their professional life, or malfunctions associated with the reproductive system.

Thanks to the advancement of science and of medicine, nowadays, there are numerous hormonal treatments that make the dream of procreation a possible reality to reach for these individuals.

Clomiphene citrate is used for treating female infertility caused by ovarian dysfunctions or unexplained cause, corresponding to the first line hormonal treatment.

This drug, responsible for the induction of ovulation, acts as a competitive antagonist, stimulating the secretion of sex hormones and, consequently, the growth of follicles and ovulation.

Keywords: Infertility; reproductive system; hormonal treatments; clomiphene citrate; ovarian dysfunctions

TITLE: PHARMACOGENETICS AND PHARMACOGENOMICS: “DRUGS EFFECTIVENESS”**Authors:** *André Marote; Bruna País; Rui Duarte; Jorge Balteiro***Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

The development of science applied to the Pharmacy is increasing and is becoming more and more notorious. Focusing in genetics related to drugs , we have two recognized terms, "Pharmacogenomics " that is understood as the science that studies the role of drugs in a genetic perspective, focusing at genetic characteristics of the individuals and "pharmacogenetics ", recognized as the science that studies the influence of genetic variation in biological response to drugs .

Both factors are important in the process of absorption, metabolism, distribution, excretion and at the binding of drug-target, having thus farther a variation of its effectiveness.

The variation in biological responses to a specific drug is related to factors such as gender, age, physiology and genetic variety. These factors mean that we are going to have different responses to a drug in different individuals, even if the dose remains the same.

To the genetic variability of performance targets we can focus on the enzymes. Its variety is also related to the change of races and ethnicities, exemplifying the Chinese people that have less capacity in alcohol metabolism , in another case it is also possible mutation of the receptor that will completely change the availability and the link drug-target. .

At present, the laboratories are strait to what is related to the process of testing drugs, seeking to focus at genetics, to avoid harm the users of those drugs, ensuring the safety and efficiency of medical prescriptions.

Keywords: Pharmacogenomics; pharmacogenetics; drugs; safety; effectiveness

TITLE: DRUG MONITORING IN NEWBORNS**Authors:** *Gonçalo Lima; Inês Dias; Tânia Borges; Jorge Balteiro***Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

The monitoring of drugs is, first of all, a preliminary assessment of certain parameters such as dosage and toxicity. Furthermore, determines the serum concentration of a drug.

In pediatrics there are many pharmacokinetic differences: renal function decreased, change of plasma proteins, volume of distribution increased, permeability of the blood-brain barrier increased, among others. And yet to add rapid tissue growth. And in this age group the individual differences, instability and complexity decrease the predictability of the dose should be taken into account blood concentrations obtained by certain drugs.

In children, sensitivity to drugs and the number of receptors are different from an adult and, as such, affect the relationship between the dose and the therapeutic response obtained, explained generally, by the immaturity of the mechanisms that govern the nature, intensity and duration of action of drugs.

Thus, we can find several reasons for monitoring of drugs in neonatology, such as bioavailability, drugs with narrow therapeutic index, the pharmacokinetic behavior and pharmacodynamics, liver or kidney insufficiency, perinatal period, among others.

In conclusion, all these features are dependent on the age of the child and determine the therapeutic response. Of these, it should be noted the immaturity of most organs and the very high fluid balance in the first weeks of life, bearing in mind the interdependence that characterizes them.

Keywords: Drug monitoring; newborns; pharmacokinetics; individual differences; therapeutic response

TITLE: ANTIOXIDANTS: THE NEW TREND OF VITAMINS**Authors:** *Catarina Lourenço; Karina Garcia; Marlene Silva; Jorge Balteiro***Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

Vitamins are organic compounds fundamental in small quantities although very important in many processes of our body. According to the solubility, they can be classified as fat-soluble or water-soluble, existing in both, vitamins which the main function is antioxidant such as vitamins D, E and K in the fat-soluble and ascorbic acid (vitamin C) in the water-soluble.

The antioxidant vitamins act by blocking oxidation reactions, protecting against the action of free radicals that are highly reactive molecules which attack others, capturing electrons. This reaction results in the modification of the chemical structures that favors, for example, the cellular aging.

Lately, there has been a growing interest in the study of these vitamins as a solution for anti-aging therapeutics, being common the publicity to vitamin supplements or food supplemented with antioxidants. However antioxidants and oxidants have a similar chemical nature and engage in the same type of reactions. Antioxidants can, in some circumstances, have a pro-oxidant action, such as when in excessive quantities. That's why a diet with too much antioxidants may be prejudicial.

In this way and because of the complexity of these reactions, it is found that the inadequate or excessive use of antioxidant vitamin supplements may lead to adverse consequences for the organism homeostasis.

Keywords: Vitamins; antioxidants; vitamin supplements; oxidation reactions; anti-aging therapeutics

TITLE: NERVOUS ALOPECIA VS DRUG ALOPECIA**Authors: Cátia Silva; Mariana Couras; Marta Pedro; Jorge Balteiro****Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

Alopecia is a partial or total decrease of pelage or hairs in a particular area of the skin. It can have different causes and may develop gradually.

Trichotillomania / Nervous Alopecia is characterized by being a psychological disorder in which, impulsively, patients pluck the hair in order to control the nervousness and anxiety felt at the moment. Some people wrap the stands of hair on his fingers to pull it later, being able to give large gaps in the scalp. The main causes are nervous depression, obsessive-compulsive disorder and generalized anxiety disorder. It may also be associated with low self-esteem, impulsiveness and insecurity, and might have genetic trends. The main treatment for trichotillomania is a training of habits reversion.

In case of Drug Alopecia, the hair loss is caused by the administration of drugs or medication, usually manifested 3-6 weeks after the consumption of the substance. It is called effluvia, divided into telogen effluvium (when it comes to the loss of large amounts of relatively synchronized hair and it is in the telogen phase of the growth cycle) and anagen effluvium (it happens when the hair is in anagen phase of the cycle).

Being this type associated with cancer patients, they present the possibility of their hair become faint due to adverse effects of the treatments of radiation and/or chemotherapy. This happens because oncologic drugs kill healthy cells of the mucous and epithelium capillary, which have similar characteristics to the tumor cells.

Keywords: Nervous Alopecia; Drug Alopecia; psychological disorder; telogen; anagen

TITLE: HEMOPHILIA**Authors:** *Maria Lebre; Sofia Morais; Valentyna Fita; Jorge Balteiro***Affiliations:** *Pharmacy Department, Coimbra Health School (ESTeSC), Polytechnic Institute of Coimbra (IPC), Coimbra, Portugal*

Hemophilia consists on a chronic illness and organic congenital disability that attacks the blood clotting process due to the dwindling coagulant activity of factor VIII (Hemophilia A) or factor IX (Hemophilia B). This disease is caused by the changes in the genes encoding these factors located on the long arm of the sexual chromosome X. Becoming a disease that attacks almost exclusively males.

Hemophilia A features VIII deficit and reach 85% of patients. On the other hand, Hemophilia B (also known as Christmas Disease) corresponds to the deficit of the factor IX and reaches 15% of patients. It is important to note that information based only on clinical evaluation does not allow distinguishing the Hemophilia A from the Hemophilia B since they have similar haemorrhagic charts.

This disease causes frequent bleeding in severe hemophilia, mainly on the muscular and headset level, requiring attention and prior treatment to not cause the aggravation of the situation and avoiding possible irreversible physical disabilities.

Although there are various types of treatment, hemophilia cannot be cured. However studies in the field of gene therapy gives successful expectations, bringing closer the idea of partial cure or even total cure of the disease. Inducing the cells that contain the genes encoding the factors to produce the factor lacking, leading to a gradual increase of concentration in the blood factor. Although there are many obstacles and possible hazards ahead, hemophilia is probably going to be the first genetic disease to be treated with gene therapy.

Keywords: Hemophilia; factor VIII; factor IX; chromosome X; gene therapy

TITLE: CROSSMATCH TESTS IN TRANSFUSION MEDICINE

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Crossmatching makes part of pre-transfusion testing. It consists in adding receiver's serum or plasma with the donor's red cell, aiming to verify *in vitro* red cells compatibility between donor and receiver, in other words, the presence of antibodies against the antigens of blood groups present in the donor's red cells.

Through compatibility tests it should be possible to detect mismatches caused by clinically significant antibodies, in particular ABO system, due to the severity of transfusion reactions caused.

The compatibility tests are performed using Anti-Human Globulin, among other mediums, between the serum or plasma of the patient and the donor's red cells. This is performed by the Indirect Antiglobulin Test method at 37°C, looking for evidence of a reaction that would indicate incompatibility.

Traditionally, the final step in providing safe blood is to carry out a serological crossmatch between the patient's serum/plasma and a sample of red cells from the units of blood selected for transfusion.

The patient's pre-transfusion blood sample is tested to determine the ABO and Rh groups and the plasma is screened for the presence of red cell alloantibodies capable of causing transfusion reactions.

Through cross matching it is possible to detect: ABO typing errors of the donor and receiver; clinically significant irregular antibodies not detected in Indirect Antiglobulin Test of the receiver; antibodies against low frequency antigens present on donor's red cells.

TITLE: CROSSMATCH TESTS IN TRANSFUSION MEDICINE

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In the transfusion medicine it's crucial to perform pre-transfusion tests which ensure the success of blood transfusion taking into account the compatibility between donor and receptor, preventing hemolytic transfusion reactions. Therefore, the mandatory laboratorial tests to perform are ABO/Rh grouping, irregular antibody screening (IAS) and crossmatch. The ABO is the most immunogenic system, and consequently one of the most important tests, since the natural antibodies against antigens A and B can be found in the receptor's bloodstream. Typing this group is possible by cell test and by the reverse group. The Rh group, is the most complex system with major clinical interest due to its role in hemolytic transfusion reactions. For their antigenic variability, it's divided into D antigen, the most important to detect, and C, c, E and e antigens. The irregular antibody screening (IAS) is based on detecting the presence of irregular alloantibodies against red blood cell antigens, as it can influence the lifetime of the erythrocytes causing transfusion reactions or gestational complications. Last but not least, there's the crossmatch which is based on adding the donor's red blood cells to the receptor's serum in order to screen the antibodies against the donor's blood type antigens. This method allows the detection of irregular antibodies not detected by IAS, of ABO grouping errors on both individuals involved and the presence of antibodies against low frequency antigens. Through our work we'll focus on all those referred pre-transfusion tests in order to describe their methodologies, analyses of the results and demonstrate their importance.

Title: CROSSMATCH TESTS IN TRANSFUSION MEDICINE

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Text: The main goals of pre-transfusion tests are to ensure the compatibility between donor and recipient, providing the best possible results from a blood transfusion, and the safety to the recipient, avoiding lesions due to immunological incompatibility, known as hemolytic transfusion reactions. The pre-transfusion tests commonly performed in laboratory practice are ABO groupage, Rh typing, irregular antibodies screening, direct antiglobulin test (DAT) and compatibility tests. The ABO group is the most important to be determined before blood transfusion due to the possible occurrence of transfusion reactions if compatibility is not respected. The ABO typing includes the cell test and the serum test. Any discrepancy between both tests should be noticed, since there must be an exact correspondence between these to allow the attribution of the group. The Rh group is the second most important in blood transfusion because of its immunogenicity and involvement in hemolytic transfusion reactions. The screening for irregular antibodies, both in the donor and recipient, is essential to identify clinically important antibodies that may also induce transfusion reactions. The crossmatch tests are performed to predict antibodies' ability to cause hemolysis. In the crossmatch, the donor erythrocytes are incubated with recipient serum and the presence of hemolysis or agglutination are indicative of incompatible tests results.

TITLE: CROSSMATCH TESTS IN TRANSFUSION MEDICINE

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Compatibility testing are part of pre-transfusion testing, in which the blood compatibility between a receiver and a donor is verified *in vitro*.

In order to do this tests, it is important to study beforehand the clinical history of both the patient and the donor, to see if there have been previous antibodies identified or other anomalies in the serum.

This laboratorial study consists in a crossmatch test in which the patient's serum, where the antibodies can be found, is tested against the erythrocytes of the blood donor, where the antigens are.

This procedure is done by using test tubes (standard method) or card and using human antiglobulin or saline solution or by immediate centrifugation if there is no sign of previous antibodies with clinical relevance found after performing detection of irregular antibodies.

It is mandatory to confirm the AB0/Rh phenotype of all donors and receivers' blood that is needed to transfuse, therefore AB0/Rh typing is included in this testing. Besides AB0/Rh, other blood systems are tested, such as Kell, Kidd, Duffy, among others.

Once agglutination or hemolysis is observed or when the testing proves the presence of alloantibodies clinically relevant it means that there's no compatibility and the transfusion can't be done between those blood entities.

TITLE: CROSSMATCH TESTS IN TRANSFUSION MEDICINE**Authors: Alice Gonçalves; Andreia Pereira; Margarida Lopes and Fernando Mendes****Affiliations:** *Instituto Politécnico de Coimbra, ESTeSC – Coimbra Health School, Departamento de Ciências Biomédicas Laboratoriais, Coimbra, Portugal.*

The blood compatibility tests are crucial in transfusional medicine, being performed when patients need a blood transfusion. Incorrectly transfusions lead to adverse reactions in the receptor of the transfusion, such as agglutination of the erythrocytes which can result in rejection that can lead to vessel occlusion. In the worst case scenario the patient can die from the complications. Therefore, the main purpose of this project is how to do a blood transfusion safely, preventing all the risks of a transfusional reaction.

These pre-transfusional tests consist in three steps. First is the ABO, Rh and the Kell systems determination (extended Lewis, MNSs, Diego, Xg, Lutheran, P, Duffy, Kidd systems if needed) of the patient. Second, the indirect antiglobulin test (IAT) which is the screening of irregular antibodies in patient plasma. At last the so called cross-match that consists in the combination of the erythrocytes belonging to the donor and the plasma of the patient. An absence of agglutination indicates compatibility.

In conclusion, our Poster tries to show the importance of knowing the outcomes of transfusions errors and how the tests are executed in laboratory while dealing with transfusion.

TITLE: LABORATORY STUDY FOR COMPATIBILITY TESTS

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The compatibility test or crossed tests are part part of the pre-transfusional tests and are used to verify *in vitro* the erythrocyte compatibility between the donor and the receptor through anti human antiglobulin. The receiver's serum is mixed with the donor's erythrocytes, with the goal of finding in the serum or plasm of the receiver, the presence of antibodies against the antigens of blood groups present in the erythrocytes of the donor.

A blood transfusion with an incompatible ABO system can lead to dangerous transfusional reactions and even death, and with an incompatible Rh can lead to red cells hemolysis certain cases.

These tests are used not only for transfusions, but also for transplants, to avoid immuno-haemolytic transfusional reactions or rejections.

Our main goal is to understand the importance of the compatibility tests before transfusions and transplants.

TITLE: CROSSMATCH TESTS IN TRANSFUSION MEDICINE

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Crossmatch tests make a part of pre-transfusion study, with the objective to verify the compatibility between the donor's erythrocytes and the patient's blood, making sure that the transfusion represents the minimal risk and preventing a haemolytic response from the patient.

To proceed with the analysis it's required a pre-study of the ABO system, being the most relevant due to his immunogenicity. The ABO classification is obtained through direct and indirect test. There is still a need for the study of the Rh system on every transfusion due to the clinical relevance of this system, for example, in cases of haemolytic responses to transfusions and haemolytic autoimmune anaemias.

The search for irregular antibodies should be performed in every case in which there is a chance of transfusion, as it can prevent that a patient with clinically relevant antibody receive *RBCs that present the matching antigen.

The compatibility pre-transfusion test is the most relevant of all pre-transfusion tests, being the last confirmation between the donor's and the patient's blood, this confirmation is achieved by mixing the patient's serum with the donor's erythrocytes. It's this test that can disproof mistakes made previously on the ABO/Rh classifications, and can even find antibodies clinically relevant that have been overlooked on past studies.

*RBC's. Red Blood Cells;

TITLE: LABORATORY STUDIES IN COMPATIBILITY TESTING

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Compatibility testing, in immunohematology, are a serie of procedures designed to ensure the safety of blood transfusion. The goal is to verify the erythrocyte compatibility in order to obtain an acceptable survival of transfused red blood cells and minimal destruction of recipient's own erythrocytes.

To perform the compatibility tests, it is required to execute AB0 and Rh typing of all blood samples to be transfused in order to prevent transfusion reactions, when incorrectly administrated. The next step is the irregular antibody screening, which could be substituted by a compatibility test with immediate spin or electronic compatibility, if used a valid informatics system, when there is no significant clinical antibodies. Crossmatch is the final and most important stage. It is the final check for AB0 compatibility between donor RBCs and patient plasma (or serum) and to detect clinically significant antibodies that may have been missed by the antibody screening test.

To carry out the compatibility tests (in tube) the techniques used are Antihuman globulin or gel, saline (ambient temperature and 37°C), albumin, enzymatic and PEG (an additional medium).

To prevent errors that may occur in transfusion therapy, we need to guarantee that we execute the right test, with the right sample to obtain the right results, assuring the right component transfusion to the right patient.

TITLE: PULMONARY FUNCTION TESTS

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Pulmonary function tests help to evaluate patients and detect lung problems. Specific problems require specific tests. Generally pulmonary function tests are held if the patient is or was a smoker, feels hypoxaemia, needs self-force to breathe, has difficulties making physical exercise or has apnoea.

These tests measure inhaling or exhaling capacity, lung volume, bronchial obstruction and gas exchange. Spirometers are devices that measure the amount of air lungs may contain and the exhale speed. Modern spirometers also measure lung capacity (stiffness and elasticity of the lungs and ribcage).

Spirometric criteria can define obstructive and restrictive lung disease. Pulmonary obstructive disease is characterized by airway obstruction. Restrictive disease restricts lung expansion, resulting in a reduced lung volume, increased work of breathing and inadequate ventilation and / or oxygen. For example, by measuring respiratory rate we can know the degree of narrowing or obstruction of the airways.

Tiffeneau index is the percentage of vital capacity that can be breathed out in one second after a maximal inspiration. It is calculated by the forced expiratory volume in one second divided by vital capacity and multiplied by 100.

TITLE: ASTHMA MECANISMS**Authors: Catarina Aleixo, Gabriella Santos, Fábio Pereira, Cláudia Torre, Luís Mota.****Affiliations:** *Polytechnic Institute of Coimbra, ESTeSC - Coimbra Health School, Physiotherapy Dept, Coimbra, Portugal.*

Asthma is a chronic lung disease that inflames and narrows the airways, due to the growth of the bronchia reactivity, as a consequence of many stimuli that lead to inflammation, causing recurring periods of wheezing, chest tightness, shortness of breath, and coughing. In fact, the airways tend to react strongly to certain inhaled substances and particles that may provoke allergic reactions or irritate the airways, such as: virus, microorganisms, pollens and moulds, tobacco smoke, chemical irritants.

In allergic asthma bronchial inflammation is largely dependent on IgE sensitization. At the first contact of the allergen with the body, it is presented in the context of the major histocompatibility complex to T lymphocytes which synthesize cytokines that promote the differentiation of B lymphocytes into plasma cells producing IgE specific to the sensitizing allergen, binding to receptor mast cells. The second contact after the body is sensitized, that is, already produces IgE specific for one or more of these allergens, presents an immediate hypersensitivity response in the airway mucosa to inhale the substances. The connection of the allergen to the IgE on the membrane of the mast cells in bronchial mucosa and submucosa, leads to activation and degranulation of these cells, releasing inflammatory mediators such as histamine, leukotrienes and prostaglandins. The effects are vasodilation, edema, mucus secretion and bronchoconstriction.

As the clinic intervention through corticoids and bronchodilators, physiotherapy is important too. During a crisis, physiotherapists should show the adequate posture, techniques in order to breath and most importantly to ease the anxiety.

TITLE: ERYTHROPOIETIN - PHYSIOLOGY AND PATHOPHYSIOLOGY OF ABUSE**Authors: *Carolina Pita, Daniela Pereira, Inês Costa, Margarida Letra, Tatiana Costa*****Affiliations: *Escola Superior de Tecnologias da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.***

Erythropoietin is a glycoprotein, codified by a gene located in the chromosome 7, and is the main regulator factor of erythropoiesis. It is a cytokine for erythrocyte precursors of the bone marrow. It is produced mainly in the kidney and in a small amount in the liver.

Hypoxia, caused by respiratory or heart failure, anemia or other conditions, is the main trigger for its production. After hypoxia detection renal cells the production of erythropoietin. Erythropoietin, at the bone marrow matter, will then promote the synthesis and differentiation of NRBC. Afterwards, these cells suffer a process of multiplication and differentiation at the bone marrow, and enter in bloodstream as erythrocytes.

Erythropoietin is used in the treatment of anemia (reducing the need for blood transfusions), in the treatment of hepatitis, chronic renal failure, hematological diseases, among other conditions. High EPO levels in the bloodstream stimulate a more active lifestyle, improve some symptoms of Alzheimer's disease and can have a beneficial effect on the mood.

The excessive use of EPO leads to an increase in the blood density, increasing the risk of blood clotting and blockage of blood vessels, which can originate a stroke or a heart attack. It can also cause hypertension, convulsions and cause congestive heart failure, renal toxicity and compromise the immune system.

This glycoprotein is used as a drug to enhance the performance of athletes (doping). As it rises the levels of blood erythrocytes, it increases the exchange of oxygen, resulting in a greater resistance to exercise.

TITLE: HEMOPHILIA

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Hemophilia is an X-linked congenital bleeding disorder caused by a deficiency of coagulation factor VIII, in hemophilia A, or factor IX, in hemophilia B. The deficiency is the result of mutations of the respective clotting factor genes. Hemophilia A is more common than hemophilia B, representing 80-85% of the total hemophilia population. People with hemophilia, don't have enough clotting factor, therefore will produce an abnormal clot, developing the same symptoms in A and B types: big bruises, bleeding into muscles and joints, spontaneous bleeding, prolonged bleeding after a cut, removing a tooth, or having surgery, bleeding for a long time after an accident, mainly after an injury to the head.

The transmission of hemophilia happens hereditarily. It's a recessive transmission, so is enough one healthy X chromosome to produce an adequate number of factors. Therefore, most of those affected are men, but women are the main carriers. Hemophilia gained importance due to its existence in the European monarchy, when Queen Victoria transmitted the disease to offspring. Through political marriages, the royal families of other countries were affected.

Hemophilia is diagnosed by collecting a blood sample for measuring the blood level of activity factors. A coagulogram (test set) evaluates whether coagulation is normal. The main tests are the prothrombin activation time (PAT) and activated partial thromboplastin time (APTT). It can be treated with the administration of the deficient clotting factor after a situation that has caused bleeding or by administering various doses of the coagulation factor in order to prevent bleeding.

TITLE: AUTOIMMUNE DISEASES

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Autoimmune diseases reflect the loss of self-tolerance. That tolerance is an immune status of non-responsiveness that can be induced both by self-antigens and non-self-antigens.

The immune system is able to tolerate the antigens of the host and respond to stranger antigens. For that, there are several processes actively acquired where the self - reactive lymphocytes are excluded from the squad or inactivated after finding self-antigens. These processes can be induced on central lymphoid organs or peripheral tissues. Therefore there is central or peripheral tolerance. Autoimmunity may be systemic or organ specific and results of a failure on the general mechanisms that keep self-tolerance along with the factors that contribute to the development of autoimmunity.

There are different autoimmunity mechanisms involved on the development of the autoimmune diseases : mistake on the clonal deletion mechanism (example: failure on the apoptosis by abnormalities on FAS or FAS-L); loss of energy of the T cell that may occur on inflammation processes, infections and tissue necrosis, where are the activated APCs that may present self-antigens to the lymphocytes and express costimulatory molecules; polyclonal activation of lymphocytes (example: infection with superantigens production); cross reaction between self-antigens and microbial antigens (mimicry); release of sequestered antigens (example: inflammatory processes); flaw on the Th1 and Th2 lymphocytes' regulation; and failure on the T supressor lymphocyte.

Many factors as genetic, hormonal and environmental factors and immunological changes are involved on the triggering of those diseases like rheumatoid arthritis, type I diabetes.

TITLE: DIABETIC NEPHROPATHY AND DIALYSIS

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Diabetic nephropathy is a kidney disorder that results from damage due to Diabetes Mellitus. Initially, the disease is asymptomatic or with urinary tract manifestations, tissues and minimum structures of the kidney. Later, it affects the functioning of this body, reaching the kidney filter and consequent loss of protein in the urine. There are increases in blood pressure, leading to kidney failure, besides swelling in the extremities or foamy appearance of urine.

The diagnosis is done through urinalysis-Microalbuminuria (in the presence of disease may exist traces of protein in the urine). The presence of urea or creatinine occurs when the kidney loses more than 50% of its capacity.

There are only two treatments for this disease: kidney transplant and dialysis (hemodialysis and peritoneal dialysis). In hemodialysis, the blood is extracted from the body and pumped to the inside of a device that filters toxic products and excess water in the body. After this filtering, the purified blood returns again to the body. In peritoneal dialysis, is introduced into the abdominal cavity, a liquid consisting of a special blend of glucose and salts that drags toxic substances from the tissues, acting as a filter for the blood. Later, the liquid is extracted and downloaded.

Note-If the following risk factors: Hyperglycemia, hypertension, proteinuria, smoking, high weight and genetic predisposition. Drugs that block the effect on Renin-angiotensin-aldosterone system is a strategy to avoid the development of microalbuminuria, delaying progression to more advanced stages of Nephropathy and reducing cardiovascular mortality.

TITLE: CUSHING DISEASE**Authors: Filipe Alves; Luís Silva; Marcela Sampaio; Michael Viegas; Sabrina Medeiros.****Affiliations:** *Escola Superior de Tecnologias da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

The Cushing disease is a disease caused by the high concentration of the cortisol hormone in the body.

Cortisol is a hormone produced in fasciculata region of the adrenal cortex. The amount of cortisol in the blood undergoes variation in the various phases of the day, with higher levels in the morning and the lowest level during the night. This hormone triggers metabolic responses, causing the increase in lipid and protein metabolism, increase in blood glucose and glycogen storage at the cellular level; It operates in tissue maturation and development of receptor molecules epinephrine and norepinephrine, but also has anti-inflammatory actions. The control cortisol secretion is done by ACTH released by the anterior pituitary, which in turn is controlled by CRH released by the hypothalamus. ACTH stimulates the secretion of cortisol.

There are two main reasons why cortisol levels may be abnormally high, excessive corticosteroid drugs used to treat diseases and excessive production of the hormone by the body itself.

Some of the main symptoms of Cushing's disease are purple scars on the face or abdomen, sensitivity of the skin and bones, fragile and slow healing; hypertension, hyperglycemia and hypercortisolism.

And so, physical therapy has an important role in accomplish a plan of physical and aerobic exercises, towards the goal of maintain muscle mass and bone mass, as well as to prevent the weight gain. It's also relevant that you should also educate patients to avoid possible falls, in order to reduce the risk of bone fractures.

TITLE: HORMONAL FUNCTION OF GONADS: TESTOSTERONE VS PROGESTERONE**Authors: Bastos E., Coutinho F., Flores G., Moura J., Munteanu G., Sotero J.****Affiliations:** *Escola Superior de Tecnologias da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

Gonads are the male testicles and the female ovaries that are responsible for producing hormones that influence the development of sex secondary characteristics. The female sex hormones are estrogen and progesterone, while the male hormones are testosterone and androsterone. Each sex has a predominance of one or other pair of hormones.

Progesterone is mostly made by the ovaries. On females it ensures the development and function of the breasts and reproductive tract. In the brain, progesterone exerts a calming, sedating effect. It is diuretic and enhances the sensitivity of the body to insulin and the function of the thyroid hormones. It builds bone and benefits the cardiovascular system by blocking plaque formation in the vessels. Progesterone increases libido and contributes to the efficient use of fat as energy.

The testosterone enhances libido and sexual response. It strengthens ligaments, builds muscle and bone, assists brain function, and is associated with assertive behavior and a sense of well-being. The level of testosterone influences both stamina and restful sleep.

Both gonads are regulated by FSH and LH from the pituitary stimulated by GnRH and secreted by the hypothalamus. In males, FSH stimulates spermatocytes leading to the maturation of sperm cells. LH stimulates production of androgens which promotes the production of sperm and masculine characteristics. In females, FSH and LH stimulate development of egg cells in follicles, and LH stimulates hormones that prepare the body for pregnancy. Both of them stimulate other hormones involved in the female reproductive system.

TITLE: DIABETIC FOOT**Authors: Santos F., Ribeiro H., Domingues J., Freitas J., Paiva J.****Affiliations:** *Escola Superior de Tecnologias da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

Diabetes is a metabolic disorder in which the amount of glucose in the bloodstream has high values as result from a deficiency at insulin production. In diabetes type 1 the immune system destroys the insulin-producing cells, and in diabetes type 2 there is a resistance to insulin effects.

Type 2 diabetics may suffer from some complications in their feet, mainly characterized by peripheral neuropathy and angiopathy.

Hyperglycemia makes the nerves saturated in glucose causing damage to the myelin sheath of neurons affecting the communication between neurons and leading to a progressive axons degeneration.

Peripheral neuropathy may be sensory if associated with loss of pain sensitivity. Motor neuropathy is associated to atrophy of the intrinsic muscles of the foot, resulting in osteoarticular deformities. Autonomic neuropathy leads to a reduction or complete absence of sweat secretion resulting in a dry and cracked skin.

Macroangiopathy is characterized by atherosclerosis in large veins. In microangiopathy endothelial cells are damaged by hyperglycemia and the walls of peripheral vessels are thicker and weaker what decreases the speed of blood flow causing ischemia. Sometimes blood clots occur and oxygen and nutrients arrival to certain cells and tissues gets blocked leading to the death of such tissues (gangrene).

Nutrients and oxygen decrease affect nerves (neuropathy), due to lack of oxygen, and decreases the power of healing, since hyperglycemia reduces the efficiency of the inflammatory response by changes in neutrophil, macrophages and lymphocytes functions, which may contribute to infections and ulcers on the feet that could lead to amputation.

**TITLE: THE INFLUENCE OF ENVIRONMENTAL EXPOSURE TO ENDOCRINE DISRUPTORS
IN THE GROWTH AND DEVELOPMENT OF CHILDREN AND ADOLESCENTS**

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Endocrine disruptors (ED) are exogenous substances to the human body and that interfere with the synthesis, secretion, transport, metabolism or elimination of various hormones. These substances are very heterogeneous group that includes multiple products, from synthetic chemicals to other substances.

Some of these compounds can maintain their chemical properties in nature for many years contaminating the air, water and soil, being accumulated in plants, animals and man. Many are potentially harmful to health because they are difficult to excrete and may accumulate in the body causing changes in all systems, especially in the endocrine system.

EDs are present in pregnant women, young children and adolescents. Children's exposure to the actions of endocrine disruptors is particularly worrying, children often have contact with the soil and plants, taking hands and objects in the mouth, drink, eat and breathe proportionately more than adults, and their faster metabolism makes them particularly susceptible to the toxic action of these products.

The heightened awareness of the potential effects of EDs on foetal and child development has coincided with the increase in rates of childhood obesity, premature birth and low birth weight, and disorders of sexual development.

In summary, there is strong evidence about the harmful effects of endocrine disruptors and especially the influence of the development of the growth of children and adolescents.

Keywords: endocrine disruption, child and adolescent development, environmental exposure, synthetic chemicals, endocrine system

TITLE: RECREATION AREAS AS A SOURCE OF MICROBIAL CONTAMINATION

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The recreation areas are seen as a safe space where children, teens and adults can attend, however, there is a problem that is not visible and can develop complications in the public health area.

The presence of pathogenic microorganisms in the soil of these places is more common than you might imagine. The location of the parks in open spaces, where the access to domestic and wild animals is facilitated because the facilities do not have functional physical barriers, is a contributing factor to this type of contamination, as well as poor hygiene of the place.

The objectives for this work correspond to the identification of the most common microorganisms, the dangers to public health that they can develop and research measures to be able to control this type of contamination.

The methodology of this work boils down to the study of several scientific articles conducted in Portugal. The following paper studies the presence of pathogenic microorganisms in the soil, the amount, and the causes of their presence and identification of possible diseases that can be transmitted to users of these spaces.

Throughout this work we can see that most of the microorganisms present in the soil are zoonotic potential of parasitic class as well as the presence of intestinal origin bacteria called *E. coli*.

Considering the playgrounds are structures created to serve the child population in the social sphere to provide this age group safe recreational conditions, is explicit the need to meet the stipulated by law in order to control these sites and provide adequate maintenance.

Keywords: recreation area, pathological microorganisms, public health, *E. coli*, parasites.

TITLE: ALTERAÇÕES CLIMÁTICAS E O SEU IMPACTO NO HOMEM

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Lately, climate change has been a major environmental concern, since it interferes with the natural rhythm of the planet. With the advent of industrialization, production processes had the need to use more and more energy sources. From there, the process of global warming has remained constant and intense at the same time, in increasing quantities. Because of this, the occurrence of extreme weather events became common whose consequences have been many different, this aggravating environmental risks, as well as its implications in diverse sectors of society. With the increasing occurrence of these situations, there is a greater concern with climate risks and possible impacts on society.

In this work, my aim is to identify the main factors causing climate change, understanding how they can affect humans and the consequences that might ensue. The study is based on a review of this issue, where we can observe the effects caused in humans by illustrative graphics. In conclusion, action is required to fight against this global problem. The Earth is the only home we have and it's essential to preserve the resources it offer us. This is not just a task, but also a must do for all of us. Being conscious and rational users of the available resources is the key to both sustainable development and reduction of greenhouse gases emitted into the atmosphere. This is the challenge that global warming leaves us to do, as citizens.

Keywords: Climate change, environmental, Earth, health, sustainable

TITLE: QUALIDADE DO AR NO INTERIOR DE VEÍCULOS AUTOMÓVEIS

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The population of industrialized countries such as the ones of the European Union spends over an hour a day in vehicles. In this regard, several studies, so far, are directed to air pollution that comes from traffic, but very few things are known about the quality of indoor air in vehicles and the influence that it may have on the health of their passengers. This article aims to summarize recent studies that address exposure to several particles potentially dangerous to human health inside a car, which is considered a closed site.

The methodology of this study was based on analysis of several scientific articles using the Google Scholar platforms and B-on.

The results of this study demonstrate that unpleasant substances such as benzene, ozone and nitrous oxide and others, have been observed at higher levels than outdoor, exceeding sometimes what the Environmental Protection Agency considers safe and that in healthy people, exposure can affect the ability to perform exercise, vision, manual agility and learning.

We can conclude from this study that the quality of the car's indoor air can be improved through procedures such as opening windows, the correct use of fans or automatic air conditioning systems and the regular exchange of air filter.

Keywords: Quality of indoor air, health, pollution

TITLE: SUSTAINABLE DEVELOPMENT OF AQUACULTURE IN COASTAL SYSTEMS**Authors: *Patrícia Simões; Pedro Simões; Samuel Gutbub*****Affiliations:** Polytechnic Institute of Coimbra, ESTeSC - Coimbra Health School, Environmental Health Department, Coimbra, Portugal

Bivalve, organisms that feed by filtration, can accumulate in their tissues bacteria and pathogenic viruses that may occur in the waters of the production areas, being the main source the untreated or poorly treated municipal sewage. Consumption of raw or insufficiently cooked organisms harvested in areas of contaminated water can cause diseases such as gastroenteritis and even lead to outbreaks of infectious diseases.

The objective is to observe the health risks of three bivalve production areas, located in the Mondego river, Tejo river e Ria Formosa, carrying out the characterization of the microbiological contamination of the area of catch / culture and combining information on the sources of pollution from point and diffuse source, land use characteristics, breeding farms, wildlife, boats, meteorological characteristics in the area and exotic species. The methodology used a literature review of several scientific articles based on search engines "Google Scholar", among others.

As a result , in both its ascertained that the production of bivalve estuaries near the sources of pollution should be reconsidered or established a minimum distance between them and the production area in order to avoid the production of bivalve bacteriological contamination by metals heavy or influences of exotic species in the ecosystem , and consequently their consumption and production.

In short, aquaculture products are safe if used all the methodologies that promote the sustainability and therefore food security for the population.

Keywords: Bivalve, contaminated, health risks, aquaculture, pollution.

TITLE: HYGIENE AND FOOD SECURITY

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Food Safety is a topic that is currently of great importance given that the improper handling of food can cause foodborne outbreaks by pathogenic microorganisms, which may constitute a danger to public health. The food-borne disease outbreaks can adversely affect trade and tourism, and food deterioration and lack of hygiene utensils can interfere with consumer confidence. When confectioning meals, food quality and its processing are indispensable factors to ensure a final product safe for consumption. Thus, it is essential that there are some rules to promote good hygiene practices and food security in all establishments.

The **aim** of our work is to evaluate the hygienic conditions and the quality of food. In this sense we make a **systematic review** and will use scientific articles to ascertain if the most correct manipulation techniques are used in order to make sure that food can be considered safe.

Given the **results**, it is necessary to meet the minimum requirements of hygiene in order to prevent contamination of food and opt for the teaching of food handlers concerning good hygiene practices and food safety.

Keywords: *Hygiene, food, consumer, food handler*

TITLE: MICROORGANISMS: SOURCE OF FOOD CONTAMINATION

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Foodborne diseases were defined by WHO as a disease of infectious or toxic nature caused by consumption of food or water, which is recognized as the major cause of mortality and international economic loss. There are several factors that contribute to the appearance of foodborne diseases as is the case of raw contaminated ingredients, inadequate storage and poor hygiene of food handlers and facilities.

This paper aims to identify what types of foods are more likely to cause infectious or toxic diseases as well as checking the main factors that cause food contamination.

For our research we used as a methodology the reviewing of scientific articles already published on the topic to be studied.

After the analysis of a case study, we found that in 2007, in the European Union, were reported a total of 5,609 outbreaks of food contamination, involving 39,727 people, resulting in 3,291 hospitalizations and 19 deaths. The main foods involved were eggs and egg products (14.6% of the cases), meat (13.2% of the cases), fish and fish products (6.4% of the cases) and pastries (4.8% of the cases).

In summary, it can be concluded that there are foods that are more likely to cause outbreaks of food contamination. It is important to establish good hygiene practices when handling food and to ensure the correct storage of food as well.

Keywords: food contamination; foodborne diseases; food handling

TITLE: THE USE OF DIETARY SUPPLEMENTS

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The consumption of dietary supplements has been widely purchased, especially for teens who attend the gym. Supplementing was losing nutritional tool function due to indiscriminate and reckless use, being motivated by the pursuit of an ideal body.

The use of these products, with the lack of knowledge about its effects, may represent a public health problem, especially with the lack of conclusive studies on this topic because many are contradictory.

Even though these are used to assist in weight loss or increasing muscle mass, most of these substances are not prescribed by specialists. These are sold in pharmacies, health food stores and on the Internet, and only advised by those who sell them, and in most cases, no specific training to do so.

The aim of this study is to critically review the use, benefits and adverse effects of dietary supplements used.

The methodology used for this study was a literature survey, conducted over the past six years, through Google Scholar and B-on.

In **conclusion**, we need more scientific studies on the signs and effects of the supplements on health, since the consumption of such products is increasingly significant in this population. Those who enjoy this substance should be cautious, because despite having some benefit during exercise, may cause harmful health effects, and recommended the use of these substances is prescribed by nutritionists.

Keywords: Dietary supplements; Public health; Consumption

TITLE: AROMATIC PRODUCTS - WHEN THE AROMAS SILENTLY KILL!

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Aromatic products: It looks like something simple to identify, control, because its name "enchants" in the term: aromatic. But is all that simple? So beautiful and so "fragrant" as it seems?

These products have various categories, of which I highlight the incense, scented candles, air freshener sprays and liquid air fresheners or essences.

Goals: With the preparation of this work I aim to explore and bring to understanding, the area still little explored of aromatic products. I want to verify whether there is legislation on this subject in Portugal or any Regulation or European Directive on the subject, study and weigh the benefits versus harms of the use of aromatic products, investigate whether the use by the consumer takes into thought the rules for the use of a chemical, and evaluates whether the products by burning, in particular, bring injurious to human health, and which ones.

Methothology: systematic review

Results: Some studies (highlighting the DECO PROTESTE one), indicate that incenses, essences, and scented candles contain different chemicals, which some are potentially more harmful to health than others, regardless of its utilization.

Incense is burned incorrectly, especially indoors, significantly increasing the inhalation of high toxic substances released.

Incense began to be used for religious reasons, and went widening. Nowadays, it's used in meditation therapies, houses, to exhale the scent of incense and replace bad smells, or just perfume.

It's necessary to "open the door" and let the "air" run on this matter, the harm will be certainly much smaller.

Keywords: aromatic products, human health, incense, scented candles, essences, air quality.

TITLE: SILICOSIS AS A RESULT OF OCCUPATIONAL EXPOSURE TO CRYSTALLINE SILICA BREATHING**Authors:** *Joana Ramos***Affiliations:** Polytechnic Institute of Coimbra, ESTeSC - Coimbra Health School, Environmental Health Department, Coimbra, Portugal

The occupational health raises increasing attention, particularly the need to continually assess the health of workers. In this article there is talk of the respiratory system which is the main interface between Human being and the environment. Of course, any significant inhalation exposure may cause short or long-term damage. One of damage that can occur is silicosis resulting from inhalation of dusts containing silica as the silica dioxide (SiO₂) in respirable fraction.

Goals: This article aims to get to know as silicosis occupational exposure disease and its effects in the short and long term, therefore, there were workplaces where this may be present.

Methodology: As methodologies were analysed scientific articles taken from the B-on and Google Scholar platforms.

Results: It is known to silicosis and lung disease, diffuse interstitial fibronodular and various types of occupational exposure can trigger. Stand out work in mining, ceramics, rock drilling, construction and work with dentures. It was found that not a tight evaluation of the control of occupational exposure, silicosis is a serious disease that can take quality of life for affected workers.

Conclusion: we observed that it is easy to carry out studies and monitoring of the affected workers simple medical tests, such as imaging and analysis of respiratory function thus preventing any disease only discover later and without return hypothesis for this will have to do more studies in this area.

Keywords: Silicosis, silica, occupational exposure, occupational health

TITLE: TAKING ANTIDEPRESSANTS AND THE PROVISION OF WORKER AT WORK

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Aim: This research seeks to establish a link between taking antidepressants and the provision of the worker in the workplace.

Methodology: systematic review

Results: Depression is a psychiatric disorder caused by a change in mood. In XIX century, it appears the drug praise as true antidote to the malaise of modernity. On the one hand, favouring the emergence of a united world in which barriers of individuality attenuate, giving rise to collective behaviour that reduce the misery of loneliness and helplessness, and, on the other hand, providing the narcissistic welfare of self-sufficiency , omnipotence, reducing insecurity, protecting the individual from his inability and weakness toward life. Depressive episodes often cause changes in physiological and somatic level. The motor slow, memory complaints and lack of concentration, anorexia, fatigue and lack of energy, loss of interest or pleasure, guilt and worthlessness ideas, low self-confidence, sleep disturbances are some of the effects of the administration of antidepressants. Thus the provision of the worker is impaired. The work involved is not done in the same way, due to the effect of the drug.

Keywords: antidepressants, depression, job, instalment, effects, worker.

TITLE: LEACHATES IN LANDFILL AND EFFECTS TO HUMAN HEALTH

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Physical, chemical and biological decomposition of solid waste in landfills results in the production of a liquid of dark colour, called leachate. This liquid contains high concentration of organic matter and inorganic substances, being its very complete composition and variable since, although depend on the characteristics of the waste deposited, is influenced by environmental conditions, the form of landfill operation and especially by dynamics of decomposition processes that occur.

This study aimed to analyse treatment processes of leachate produced in a sanitary landfill in order to understand the various risks to human health.

The methodology was based on the analysis of several scientific articles using the Google Scholar platforms and B-on.

The results of this study indicated that processes such as Reagent Fenton, photo-Fenton Solar and Biological Treatment have great quality in the treatment of leachates.

In this study **we can conclude** that there are effective methods of treating leachates, preventing that they remain contaminated landfill after its formation in order to prevent possible diseases to human health.

Keywords: Leachates; Landfill; Human Health

TITLE: FOOD MICROBIOLOGY**Authors: *Elsa Resende; Patricia Coelho e Tânia Batista*****Affiliations: *Polytechnic Institute of Coimbra, ESTeSC - Coimbra Health School, Environmental Health Department, Coimbra, Portugal***

The World Health Organization says that millions of people become ill each year due to the ingestion of contaminated food. Food microbiology is the part of microbiology that studies the processes through which microorganisms influence the characteristics of the products used in human or animal food consumption.

The methodology in the preparation of this study was the review of scientific articles.

Results: After reviewing several studies, we noted that the poor storage and handling of food can lead to various poisonings, toxic infections and food infections. Food poisoning, results from the ingestion of a preformed toxin. Toxic food infections occur when ingested microorganisms settle in the intestine and produced toxins that interfere with the functioning of body organs. In food infections, pathogenic microbes are ingested with food and settle in the intestines. These microbes may or may not invade the mucosal cells. To improve the management of potential sources of contamination and microbial growth, a system of Hazard Analysis and Critical Control Points (HACCP) was developed. It aims to prevent food hazards by controlling factors that can impair the quality of food. In conclusion, it is important to know the concept of safe food, to minimize the harm to the consumer resulting from consumption of contaminated food. Microbiological analysis of food is necessary to establish its safety during all phases, from production, processing, storage and distribution to consumption and to minimize the risk contaminated food poses to human and animal health.

TITLE: THE FARMING AND THE IMPACT ON THE ENVIRONMENT

Authors: *Ana Azul; Carolina Moreira; Margarida Pocinho*

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In recent years, agriculture has contributed to the problem of environmental changes, particularly the water contamination, the soil and air destruction and biodiversity loss. Although this area of the primary sector is responsible for the production of products, something that is crucial to our surviving as well as other living beings, the current form of production is seen as unsustainable and derogatory.

For this study, the **methodology** that we used was based on a review of scientific articles and other sources of information about this subject.

Therefore, this work is intended to meet the main impacts of this activity, which is very common in Portugal. The point is trying to **aims** to raise awareness among populations in order to draw their attention to the problems that affect the environment but also, in more in indirectly way, the health of populations. We want to enumerate, between economic activities that involve raising animals for slaughter and subsequent human consumption, the main factors causing environmental degradation.

Conclusions: With all the knowledge provided by our research, we believe that is extremely important that producers develop new methodologies aimed at environmental awareness, protecting natural resources for the next generations.

Keywords: agriculture; environmental impact

TITLE: HUMANIZE AND ADMINSTRATE HEALTH SERVICES IN PORTUGAL

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Humanization in health services is recognized as an aspect of quality, as well as the administration of the same. Over time, these terms have been increasingly used and practiced not only by the need to reduce costs as well as the satisfaction of patients. Hence the need of humanization and quality always go together, since interpersonal relationships and respect for others is on par with professional competence.

The main objective of this work is to draw attention to the quality of health services in Portugal, since it depends on how these services and their level of humanization are administered.

The methodology used in this work involves analyzing several scientific articles and studies in order to understand how health services operate in our country.

As a result we expect to see how they are administered and the degree of professionalism in health facilities, as these characteristics have a great influence on health and recoverability of hospitalized patients.

In short, we note that if health services are carried out with respect, quality and preserving humanity, is guaranteed the quality of care.

KeyWords: Respect, Quality, Attention, Courtesy, Management, Humanization, Health Services

TITLE: PORTUGUESE HEALTH SERVICE - ORGANIZATIONAL DYNAMICS

Authors: *Diana Barreira, Margarida Videira, Miriam Caldeira*

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The Portuguese Health Service (SNS) is an aggregation of institutions and services, dependent on the Ministry of Health, with the mission of ensure the access of all the population to health care, within the limits of the human, technical and financial resources available.

The objective of this essay is to approach the Portuguese Health Service (SNS), namely its organization. The transformations and evolutions of this system that resulted in significant improvements to the health of the Portuguese population.

The methodology was based on the systematic review of scientific articles, essays about the thematic and also other information sources about the theme. For this article we had as a base the article about SNS: characterization and challenges.

The results show that the Portuguese Health System suffered over the years several changes to improve the system and oversee the needs of the population. Recently, imposed by austerity measures and budgetary constraints were implemented a set of measures to impose expenditure restraint, and policies to control the expenses in the sector more efficiently.

We conclude that in the near future the challenge for the government will be to ensure an equilibrium between the necessity to provide quality health care to the population with a growing demand for health care, aging of the population and technological developments, all of which form financial sources of pressure to the system.

KeyWords: National Health Service, Organization, Evolution

TITLE: HEALTH QUALITY IN PORTUGAL

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The Portuguese health system was the more evolved in the last 30 years. The National Health Service (NHS) in response to the need for more extensive coverage and equitable services and greater access to all the Portuguese to better health care, having been instrumental in improving the quality of life of citizens. The objective of this essay goes from approaching the thematic Health Quality in Portugal, explaining its evolution in a very synthetic way, as well as the advantages that originated from there.

The methodology is based in the systematic review of scientific articles, essays and other sources of information about the theme.

The results show that the Quality is a theme of much value and, highlighting the quality indicators (Structure Indicators, of process, outcome and satisfaction) to meet the patients Safety. We can also highlight the importance that is given to the Hospital Accreditation (Quality Certification) in the case of a voluntary evaluation method, periodic and reserved to the institutional resources of each Hospital to ensure the quality of care through pre-defined standards.

We conclude that the increasing demands of the population and potentialities of interaction with the new technologies of information and of communication converge in favor of new ways of organization and management focused in the same, facilitating the improvement of the health Quality.

TITLE: BENCHMARKING**AUTHORS: Catarina Bordalo; Gonçalo Oliveira; Liliana Loureiro****Institution:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

Benchmarking is a management tool, which is defined as a continuous and systematic process that makes the comparison between processes or functions of a particular company in order to achieve greater profitability and efficiency in the internal organization of the company. It is defined by continuity, performance assessment, performance in products, services and practices and continuous improvement. Thus, their use by the NHS (National Health Service) hospital institutions aims to improve access and quality of service to users service as well as the economic and financial performance of the institution. This work aims to approach the use of this tool in hospital institutions, as well as the advantages of its implementation and the added value for users, particularly the quality and health safety. The methodology was based on the systematic review of scientific articles, as well as work in this area and other sources of information on the subject. The results of this management tool are reflected in access to care performance, security, volume and use and economic and financial productivity. This tool is in search of better management practices as a way to gain competitive advantage. It makes use of reference points that already exist and work well, instead of creating something new.

Keywords: Benchmarking, Profitability, Tool.

TITLE: ECONOMICS RANGE ON HEALTH

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The application of economic instruments to strategic and operational issues in the health sector, as well as the study and systematic research constitute an interconnection between "Economy" and "Health", however, ethics in these two areas are very different due to the fact that while the health professions focus on individualistic ethics, the economy concentrates only on ethic of the common wellness or from social ethics.

The Health Economy comes in 1960 with the significant increase in investment of families and States with health care, that is, with the growing importance of health services in society.

In health economy it is necessary to make choices about the needs that have to be satisfied, given the available resources. The health sector is very important in terms of economic significance and the economic analysis is essential to understand the functioning of this sector. Health economy tries to understand the meaning of the needs of health services and the relationship between supply and demand.

With this work we intend to better understand what is the link between health and economy and its current situation about the financial sustainability of the National Health System (NHS).

Keywords: Health Economics, Integration, Sustainability

TITLE: ORGANIZATIONAL BEHAVIOR**Authors: Ariana Nunes, Emanuel Lourenço, Ricardo Santos****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

The organizational behavior is a multidisciplinary field of human knowledge sensitive to certain characteristics that exist in organizations and their environment. It depends on the environmental context of the characteristics of the organization's business, its internal processes, the intellectual capital involved, but mainly of the characteristics of people who participate in each organization. This is important in the dynamics of maintenance and improvement of people management processes by limiting the work of leaders and gives them the possibility to predict, and especially avoid individual or collective problems among workers, as well as structuring methods of leadership and strategies of effective management to the achievement of goals and desired outcomes.

This paper aims at the perception of the influence that this discipline has on health in Portugal and to accomplish this work was carried out a literature review on the subject where he paid particular attention to the most sensitive areas of health facilities, such as unit emergency, intensive care units and designed to terminal illnesses.

With this work we conclude that the assessment of organizational behavior also aims to bring greater understanding of the business healthcare gaps in the behavioral sense, cultural and environmental aiming the continuous development.

Keywords: mental process, organizational behavioral dynamics

TITLE: ORGANIZATION OF PORTUGUESE NATIONAL HEALTH SYSTEM**Authors: Anabela Morgado, Catarina Belchior, Marta Cunha****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

Health is now seen as a system with different levels of intervention, with specific organization at every level, having suitable financing models, specific evaluation methods and objectives in terms of effectiveness, efficiency and quality of health care. The fundamental program of a health system is oriented towards achieving goals and values clearly defined by the society, which will be the starting point for the strategic challenges of medium and long term. *Serviço Nacional de Saúde (SNS)* or National Health Service is a set of Portuguese institutions and services, dependent on the Portuguese Ministry of Health, whose mission is to ensure access of all citizens to health care within the limits of the available human resources, technical and financial. This service also includes private establishments and health professionals in liberal regime, with which they have been entered into contracts or agreements, which guarantee the right of access of users on similar lines to those offered by the SNS. This service is structured with respect for the principles of complementarity of private and social sectors with the public sector, working in a coordinated way to ensure the continuity and consistency of protection and health promotion activities. When their supplies are insufficient to ensure coverage of some kind of health care to the population of a specific area, the Health Public Sector may use the services provided by the private sector.

Keywords: National Health System, Structure, Skills

TITLE: ANTIHISTAMINES

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Antihistamines, also known as antiallergic, are a category of drugs that are frequently used in the treatment of hypersensitivity reactions that could be administered in a variety of ways, such as, syrup, pills, nasal sprays or eye drops. The main function of antihistamines is to inhibit histamine. The inflammatory response is instigated by histamine. Histamine could be produced through many body cells, such as, basophils, mast cells and platelets. If the skin is damaged and the immune system detect a strange component, the mast cells will release histamine that binds to receptors from another cells. That induce a chain reaction that causes an increase of permeability of blood vessels in the area. This response could lead to redness, swelling and itch. These symptoms occur due to an allergic reaction that comes from an increase of histamine released by mast cells. To reduce the symptom, we use antihistamines that decrease the reaction in the organism to strange components.

Some antihistamines have low specificity and an anti-muscarinic action, this will cause some secondary effects just like sleepiness, sedation, dry mouth, blurred vision and fluid retention.

There are two types of antihistamines: first generation and second generation. First generation antihistamines are drugs that lower the symptoms of allergy but pass through the blood brain barrier very easily. Hydroxyzine and Clemastine are two examples of that type of drugs. The second generation is non-sedative because have difficulty to pass through the blood brain barrier. Cetirizine and Desloratadine are examples of second generation antihistamines.

In the majority of people the immune reaction to that strange components it's normal and opportune but in allergic persons the response is excessive.

TITLE: BIOLOGIA DO VÍRUS HIV-SIDA-ANTI-RETROVÍRICOS

Authors: *Ana Salomé Simões; Carolina Santos; Fabiana Santos; João Santos; Levi Alves; Teresa Alves*

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The Human Immunodeficiency Virus (HIV) is a cause of AIDS (Acquired Immunodeficiency Syndrome), a condition in humans that promote a progressive deterioration of the immune system enables the development of opportunistic infections and potentially malignant tumors.

HIV infects vital cells of the immune system as helper T CD4 + lymphocytes, macrophages and dendritic cells, causing a decrease in the number of CD4 + T lymphocytes through various mechanisms including apoptosis of satellite cells, direct viral cell death and killing of infected CD4 + lymphocytes by cytotoxic T CD8 , which recognize infected cells . Multiply rapidly after infection of cells by storing their genetic material (RNA) and turning it into DNA.

Its replication cycle, due to its genome structure and involves a cycle of four distinct phases: cell penetration, replication, transcription and recombination.

The therapeutic by anti- retrovirals (drugs such as NRTIs - nucleotide reverse transcriptase inhibitors), NNRTIs (non- nucleotide reverse transcriptase inhibitors) , the protease inhibitors and fusion inhibitors , aim to attempt to eliminate the retrovirus inhibiting viral replication, slowing the progression of immune deficiency and restore as much as possible, immunity, increased time and the quality of life of the infected person .

TITLE: SGLT2 INHIBITORS

Authors: *Ana Filipa Rodrigues; Inês Gomes; Mariana Casegas; Mónica Caseiro; Raquel Mendes; Tiago Monteiro*

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The SGLT2 (sodium-glucose linked transporter 2) is a membrane protein present on the renal proximal tubule, whose function is to regulate the reabsorption of filtered glucose in the kidney. About 90% of the glucose present in the renal interstitial fluid is reabsorbed by the action of SGLT2, while the remaining 10% is reabsorbed by the SGLT1.

Associated to a metabolic dysfunction of the glucose develops type 2 diabetes, which is a chronic disease characterized by high blood concentration of this compound in the blood (when the glucose concentration reaches approximately 180-200 mg/dl, renal tubules exceed the capacity of reabsorption of the substance).

SGLT2 inhibitors are used to treat this disease and act by blocking the action of SGLT2 in the kidneys. By inhibiting the action of SGLT2, these medicines increase the elimination of glucose in the urine and consequently reduce blood glucose levels.

In order to regulate the disorder, one resorts to SGLT2 inhibitors, which in addition to reducing the concentration of glucose in the blood also reduce blood pressure, blood lipid and weight, presenting a major role in reducing or delaying complications associated with diabetes. Their effect focuses on the inhibition of a protein responsible for the simultaneous passage of glucose and sodium into the cell.

Currently are available as a therapeutic way, several drugs that belong to the class of gliflozins, such as dapagliflozin, canagliflozin and empagliflozin. As side effects, the more frequent are thirst, urinary tract infections and increased urination.

Keywords: SGLT2 inhibitors, kidneys, diabetes and gliflozins

TITLE: RENIN ANGIOTENSIN ALDOSTERONE SYSTEM/ ACE AND AT1 RECEPTOR INHIBITORS

Authors: *Adriana Santos, Cátia Lopes, Lisandra Joaquim, Mário Vintém, Regina Freire, Sara Martins*

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The renin-angiotensin-aldosterone system (RAAS) is a neuroendocrine complex system that regulates the modulation of salt and water homeostasis, and the regulation of blood pressure.

The components and the sources of this biochemical system includes renin, renin substrate, derived from the liver, called angiotensinogen and angiotensin converting enzyme (ACE), released primarily by capillary endothelium of the lungs.

Blood pressure is regulated by RAAS. When there is a drop in blood pressure recorded by the *macula densa* there is stimulation of granule cells to secrete renin, a kidney enzyme. In turn, renin cleaves angiotensinogen, releasing angiotensin I, which is converted to angiotensin II by the action of ACE.

Angiotensin II causes contraction of the muscular walls of the small arteries (arterioles), increasing blood pressure. Angiotensin II also triggers the release of the hormone aldosterone by the adrenal glands, causing the salt retention (sodium) and potassium excretion. Sodium promotes retention of water and thus causes the expansion of the total volume of blood circulating in the body and therefore increased blood pressure.

Since the introduction of ACE inhibitors, these substances play an important role in the therapy of hypertension and in cardiovascular diseases. This medication prevents Angiotensin I being converted into angiotensin II by avoiding narrowing of blood vessels. If the blood vessels are more relaxed, blood can flow where it is needed without causing too much stress to the heart.

The hormone aldosterone also acts on the central nervous system, more specifically to receptors in the hypothalamus by increasing the production of vasopressin (ADH). ADH acts directly in the collecting duct, increasing its permeability to water and therefore resorption.

TITLE: METABOLISM OF CHOLESTEROL AND STATINS; NAFLD.

Authors: *Daniel Silva, Diana Pereira, Diogo Silva, Duarte Melo, Fábio Santos, Joana Teixeira.*

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Cholesterol is essential for all organisms. It can be obtained either by diet or by synthesis in the organism itself. In liver, the acetyl-CoA is a precursor of the cholesterol synthesis chain producing HMG-CoA which subsequently will lead to the formation of mevalonate through the HMG-CoA reductase. Other various reactions are followed until the squalene is formed which by action of O₂ and NADPH makes cholesterol. It is subdivided in two lipoproteins with different functions: LDL (bad cholesterol) transports it to all parts of the body, which may accumulate in the arterial walls. And HDL (good cholesterol) removes excess of cholesterol in the tissues.

Sometimes this natural balance mechanism is not sufficient and recourse to drugs which help in the treatment of hypercholesterolemia, such as the statins which have the ability to inhibit HMG-CoA reductase enzyme, thereby limiting the formation of cholesterol in the liver, preventing cardiovascular diseases.

The accumulation of lipids and triglycerides in liver cells - hepatocytes - by people who do not consume alcohol is known as NAFLD. It is usually associated with obesity, diabetes mellitus, hypertension, protein malnutrition and use of hepatotoxic drugs. The fat accumulation can lead to cell death, and even take the patient to die from a cardiovascular disease. An indicator of this disease is the increase in liver volume. Currently there is no specific pharmacological treatment for patients with NAFLD. The disease has four stages, being the progression to cirrhosis the most severe of them all.

TITLE: INCRETINS, DPP-IV INHIBITORS AND GLP-1 ANALOGS

Authors: *Carolina Sousa; Daniela Pires; Fátima Fernandes; Marcos Lima; Raquel Ferreira; Vânia Silva;*

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The incretin hormones are produced in the small intestine and regulate glucose metabolism. These include GLP-1 (glucagon-like-peptide-1) and GIP (glucose-dependent insulin tropic polypeptide).

GLP-1 is produced by L-neuroendocrine cells of the intestinal mucosa, found primarily in the ileum and colon, and GIP are secreted by K-cells located in the duodenum and in the proximal part of the jejunum.

The function of GLP-1 is the enhancement of insulin secretion in pancreatic β cells, making them more susceptible to recognition of glucose, therefore glucose is considered the primary driver of insulin segregation. This effect is called incretin effect (increased of insulin production). Associated with this effect arises DDP-4 enzyme, which inhibits the action of GLP-1, preventing this phenomenon from occurring. DPP-IV inhibitors (Sitagliptin, Vildagliptin) and GLP-1 analogs (Liraglutide, Dulaglutide and Exanetide) have the function of preventing its degradation or replacing this hormone.

The type 2 diabetes (T2DM) is characterized by the resistance of cells to insulin action, despite the pancreas still produce. Therefore it is required to work more and more until the produced insulin becomes insufficient and the body has more difficulty to absorb food glucose.

One form of treatment of T2DM is based on GLP-1 analogs and DPP-IV inhibitors, which have shown excellent results in improving glycemic control compared with existing oral antidiabetic agents. They improve the function of the cells, have a low risk of hypoglycemia since they stimulate insulin secretion only during hyperglycemia and are beneficial or neutral in body weight.

TITLE: ORAL ANTIDIABETICS

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Diabetes mellitus type 2 is a long term metabolic disorder caused by high blood sugar, insulin resistance, and relative lack of insulin.

In general oral antidiabetics treat diabetes mellitus by lowering glucose levels in the blood in diabetes mellitus type 2 since it doesn't requires the injection on insulin like diabetes mellitus type 1. These drugs fits on one of these categories: (1) agents that increase the amount of insulin secreted by the pancreas, (2) agents that increase the sensitivity of target organs to insulin, or (3) agents that decrease the rate at which glucose is absorbed from the gastrointestinal tract.

There are different classes according to the effect made by the drug: Sensitizers (insulin resistance), Secretagogues (increase of insulin production on the pancreas; Nonsulfonylurea secretagogues close the potassium channels on the pancreatic beta cells, open the calcium channels, enhancing the production of insulin), Alpha-glucosidase inhibitors (These agents slow the digestion of starch in the small intestine, so that glucose from the starch of a meal enters the bloodstream more slowly), Peptide analogs and Glycosurics (SGLT-2 inhibitors block the re-uptake of glucose in the renal tubules, promoting loss of glucose in the urine. This causes a mild reduction in blood sugar levels).

Examples of drugs are: the acarbose acts in the intestines and slows the absorption of carbohydrates; the Sulfonylureas and the Nateglinide acts on the pancreas stimulating the secretion of insulin; the metformins and the glitazones will reduce the peripheral resistance and production of insulin in the liver.

TITLE: VITAMIN K AND COAGULATION

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Vitamins are nutrients needed for metabolism and for the protection of diseases. Our body isn't always able to synthesize vitamins in appreciable amounts, so they must be obtained through nutrition. Vitamin K is a lipophilic, hydrophobic vitamin, produced by the bacterial flora that may appear in the form of phyloquinone, menaquinone, dihidrofiloquinona or menadinona. It's also obtained through the diet by the consuming of dark green leaf vegetables, such as broccoli, watercress and lettuce. Its absorption occurs in the small intestine and is transported via lymphatic pathways. Therefore, it's necessary to have correct levels of bile and pancreatic juice flow and an adequate level of fat, to be effectively absorbed and operate properly. This vitamin is involved in the regulation of 3 physiological mechanisms: blood coagulation, bone metabolism and vascular biology. Moreover, is also essential for the formation of Prothrombin, a protein that converts Fibrinogen into Fibrin (the main component of blood clots, by action of the enzyme Thrombin). The Prothrombin Time Activity (PTA) is a blood test that measures the time it takes the blood to clot after an hemorrhage. The Activated Partial Thromboplastin Time (APTT) involves measuring the time it takes for a clot to form in a plasma sample, (that received the addition of calcium and thromboplastin). An abnormal result of the APTT test may be caused by vitamin K deficiency. Therefore, this vitamin prevents the occurrence of internal bleeding and help in the healing and prevention of tumors and heart disease, and allows the formation of other proteins involved in the regulation of blood. In the absence of vitamin K, protein factors are synthesized, but aren't functional.

Warfarin, as opposed to Vitamin K, inhibits the coagulation factor and is the most commonly used oral anticoagulant that prevents thromboembolic events. These drugs increase the risk of bleeding and a diet rich in vitamin K can reverse its action.

Keywords: Vitamin K, coagulation.

TITLE: THYROID DISEASES

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All functions and activities of our organism are coordinated and integrated by the nervous and endocrine systems. The thyroid is one of the largest endocrine glands, weights approximately 20 grams and is located in the central and lower part of the neck.

It is composed by two lobes linked by a narrow bridge of the thyroid tissue and is responsible for the production of three important hormones, triiodothyronine (T3), tetraiodothyronine or thyroxine (T4) and calcitonin, which have significant effects on the metabolism. In overall, the main hormones produced by the thyroid (T3 and T4) are metabolic stimulants. The production and secretion of T3 and T4 hormones are regulated by a negative feedback mechanism. When something abnormal happens in this regulation some disturbances can appear.

Hypothyroidism is the lack of thyroid hormones which can cause decreased metabolic activity, low body temperature, cold intolerance, among others. The most common way of hypothyroidism is Hashimoto's disease that might cause a low level of hormones.

On the other hand, hyperthyroidism results from an increased level of thyroid hormones in which can increased metabolic activity might cause a high body temperature and heat intolerance. The most well known cause is Graves' disease that causes inflammation in thyroid.

The thyroiditis might be associated with hypothyroidism as well as hyperthyroidism.

The nodules and thyroid cancer as well as goiter are three other disorders related to thyroid. Thyroid nodules are small tumores that can be solid or contain a liquid substance that may be cancerous.

The thyroid cancer is uncommon, but there are four types: papillary, follicular, medullary and anaplastic. Goiter is visible increase in thyroid, it used to be more often due to iodine deficiency, but today our diet contains salt, so goiter is not as frequent as it was.

TITLE: HORMONAL FUNCTION OF THE ADIPOSE TISSUE - ADIPOCYTOKINES**Authors: *Inês Neto, Mariana Marques, Mariana Serra, Núria Coelho, Pedro Mendes*****Affiliations: *Escola Superior de Tecnologias da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.***

The adipose tissue is an organ which performs, among others, endocrine functions, releasing a wide variety of active peptides known as adipokines/adipocytokines, produced in the adipocytes, cells that constitute the adipose tissue. Besides this, it has countless receptors that allow it to respond to afferent signals coming from endocrine organs and the central nervous system.

Leptin is an adipokine whose action on the hypothalamus promotes hunger reduction, increase of energy expenditure, fats and glucose's metabolism and neuroendocrine function's regulation, being secreted in higher concentrations when the adipose tissue's mass increases. Therefore, obese people have a higher appetite, once they have a resistance to leptin due to the lower quantity of that hormone's receptors. Besides this one, other biological active substances have since then been identified, such as adiponectin, resistin, TNF- α , Interleukin-6 and others.

Adiponectin has an important role in the increase of insulin sensitivity and endothelium's protection, having anti-inflammatory and anti-atherosclerotic effects, protecting our arteries from oxidative stress. Contrary to what happens with leptin, a gain in body weight lowers the concentration of this hormone significantly. However both have complementary actions, being even able to have additive effects.

Adipokines originated from the adipose tissue modulate several metabolic parameters, such as food ingestion control, energy balance and peripheral sensitivity to insulin. This way, the modified secretion of these peptides could have complex metabolic effects, being even able to exist a relation between them and the pathophysiological process of obesity, endothelial dysfunction, inflammation, atherosclerosis, type 2 diabetes mellitus and even cancer.

TITLE: BROWN ADIPOSE TISSUE

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The adipose tissue is a conjunctive tissue, present in mammals, which divides in two types: Brown Adipose Tissue (BAT) and White Adipose Tissue.

The main BAT depots are located in supraclavicular, neck and spine regions. The main function of the BAT is to maintain the body heat, through energy expenditure, in animals or newborns which don't tremble. The BAT proportion in relation to body weight in a newborn is maximum at birth, because the thermogenesis is essential in this life stage and over the years occurs its involution. There are two types of thermoregulation: cold-induced and induced through feeding. When it's required an increase of the energetic metabolism, a signal is transmitted to the brown adipocytes, through the sympathetic nervous system, mediated by a releasing of adrenaline and stimulating the β -adrenergic receivers.

This tissue is constituted by brown adipocytes that contain numerous small lipid particles and a much more mitochondria that gives the brown color to the adipocytes, and have the capacity to oxidize fat, producing energy for cellular processes. The energy that results of fat oxidation is released in the form of heat. This process works as a protection mechanism against the uncontrolled accumulation of energy reserves.

BAT in human adults might consist of classic brown adipocytes and also beige adipocytes), phenotypically different. The development of beige adipocytes in WAT (so called 'browning') reduces adverse effects of WAT and helps to improve metabolic health. This browning is induced by cold, adrenalin and muscle hormones that act in adipose tissue and increase body heat and energetic expenditure. It also could be used as a therapy to fight obesity.

TITLE: MECHANISMS OF INSULIN RESISTANCE

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Despite regulating on carbohydrate, protein and lipid metabolism, insulin exerts a central effect on the regulation of glucose homeostasis. It is responsible for the entrance of glucose in several tissues and organs, so that it can be used as an energy source. Insulin action essentially provides an integrated set of signals that allow us to balance nutrient availability and demands.

Insulin resistance is a complex metabolic disorder in which the normal levels of insulin are unable to grant a normal answer to insulin in adipocytes, myocytes, and hepatocytes. In order to fix this resistance, the organism releases a large amount of insulin, leading to a high concentration of insulin and glucose in the blood (hyperglycemia), which can result in a prediabetes or diabetes state. Beyond that, insulin resistance has a key role in the pathogenesis of obesity, polycystic ovarian syndrome, hyperandrogenism, and possibly hypertension.

Insulin resistance is often associated with overweight, a sedentary lifestyle, and physical inactivity. There is also an association between the circulation of free fatty acids and the development of insulin resistance, since free fatty acids are involved in inflammatory reactions that may lead to this disorder. Furthermore, myokines are very likely to be involved in the crosstalk between skeletal muscle and other tissues, such as liver, adipose tissue, pancreas and gut. Thus, their endocrine, paracrine and autocrine effects in metabolic regulation may induce insulin resistance.

The investigation of these mechanisms allows us to develop new ways to prevent and to medicate people with this pathology.

TITLE: AGE'S (ADVANCED GLYCATION END PRODUCTS) IN FOODS. GLYCEMIC INDEX

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Methylglyoxal (MG) is a highly reactive compound derived mainly from glucose and fructose metabolism and is the precursor of quantitatively important advanced glycation end products (AGEs). AGEs are naturally form inside the body when proteins or fats combine with sugars (glycation). This affects the normal function of cells, making them more susceptible to damage and premature aging.

The body naturally rids itself of harmful AGE compounds, but it doesn't eliminate them effectively when too many are ingested through food. A diet rich in heat-processed food, grilled or roasted meat, or other highly processed foods, especially with high sugar contents, would lead to a high exposure to AGEs.

The advanced glycation end-products (AGEs) occur at an accelerated rate in the hyperglycemic state of diabetes.

In the ranking of carbohydrate foods suppliers, depending on the glycemic response and insulin production, is given the name of Glycemic Index.

Foods with high glycemic index cause a greater rise in blood glucose, leading to increased insulin production.

TITLE: SATIETY MECHANISMS

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The control of appetite is moderated by psychological factors, such as hunger perception, thirst, the pleasure of eating and hedonic sensations; as well as behavior factors, like intake of energy and macronutrients, size and frequency of meals; and peripheral metabolic and neuronal events at the hypothalamus level. These factors interact with each other, regulating the hunger and appetite in order to keep the energetic homeostasis.

Four nucleuses are involved in the mechanisms of satiety, located in the hypothalamus, namely: lateral, arcuate, ventromedial and paraventricular; as well as two groups of neuropeptides: orexigenic and anorexigenic peptides.

In this system, the amount of energy and nutrients ingested are carried to the brain through afferent signals, mainly by the vague nerve. This information is part of a class of "satiety signals" that are responsible for controlling our appetite, which is mostly regulated by leptin produced on adipose tissue.

This process starts once food reaches the gastrointestinal tract, with the help of mechanoreceptors and chemoreceptors present in the guts. It is also here that a number of hormones influencing the digestion of nutrients are released, among them are: cholecystokinin (CCK), secretin, gastrin, peptide YY (PYY) and gastrin inhibitory polypeptide, ghrelin. From all of these hormones, CCK has great importance in the digestive processes and satiation and is one of the most abundant neuropeptides in the brain.

Overall, in a short-term, the control of food intake is made through the determination of hunger and satiety sensations by ghrelin, insulin and CCK, while long-term satiety regulation is made by the action of leptin.

TITLE: BARIATRIC SURGERY

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The bariatric surgery is one of the new strategies to combat morbid obesity. The morbid obesity is a serious health condition that can interfere with basic physical functions. This type of surgery is applied on people with BMI > 40 kg/m² or BM > 35kg/m² that already had health problems due to overweight, as type II diabetes, hypertension or sleep apnea, and none of the others techniques gave them the wanted results. It also controls the blood's glucose and improves the insulin resistance.

There are three types of bariatric surgery: the restrictive surgeries, the malabsorptive surgeries and the combination of both techniques. The most common bariatric surgery procedures are gastric bypass, sleeve gastrectomy, adjustable gastric band, and biliopancreatic diversion with duodenal switch.

The Roux-En-Y Gastric Bypass is now considered as the bariatric surgery's "gold standard" technique and it's the more practiced in the world. It consists on a set of procedures that reduce the gastric capacity and interfere with the digestion.

The Sleeve Gastrectomy is another form of weight loss surgery. In the operation, the surgeon removes about 75% of the stomach. What remains is a narrow tube or sleeve, which connects to the intestines.

This sort of surgery isn't the cure for obesity, but it helps to overcome it when associated to a nutritional education and regular physical activity.

Keywords: Bariatric surgery, stomach reduction, morbid obesity, metabolic diseases, BMI, roux-en-y, sleeve gastrectomy, weight loss, digestion, intestine

TITLE: PRACTICING SPORTS WITH HEARING AIDS

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The technology related to hearing aids has been developing over the past few years. In recent years a water proof hearing aids was developed, enabling individuals to be rehabilitated, which allowed them to regain the possibility of playing their favorite sport, including water sports. According to the literature review the present work intends to study if hearing aids are an obstacle for the practice of sports, and if some type of hearing aids narrows the choice of which sport to practice (or vice versa). Various scientific databases were used to gather relevant papers in this field, in particular, B-On, Google Scholar and PubMed. There are several types of hearing aids appropriate for all age groups, taking into account the hearing loss and lifestyle. Therefore, all athletes can use the hearing aid that best suits them, so that they feel more confident, without fear that the hearing aids will drop or come apart during sports. Moreover the development of water-proof hearing aids allows people who practice nautical sports to experience the best of this activity. We can conclude that hearing aids can substantially improve the quality of life for all athletes, helping them to enhance their skills, so that they do not feel disadvantaged in competition, creating equal opportunities.

Key-words: Hearing Aids. Sports. Aural Rehabilitation.

TITLE: RECEIVER IN THE EAR (RITE) AND RECEIVER IN THE CHANNEL (RIC) VERSUS BEHIND THE EAR (BTE)

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Introduction: Hearing aids are essential to improve the quality of people's life with hearing loss. Due to the variety of this models you can re-enable several types and degrees of hearing loss which is an alternative for most of people. **Objective:** Based on literature's review, we intend to compare the differences and similarities between Receiver In the Channel (RIC) and Receiver In The Ear (RITE) hearing aids analyzing inequalities with the Behind The Ear (BTE) and define their clinical applications. We made a research in a few companies' webpages who provide hearing aids. **Results:** RIC hearing aids are suitable for light to severe losses. Don't need to ear mold and his electronic components are in the small case that fits behind the ear, except the receiver which is in the channel. Can be adapted on the first day in the hearing center, saving patient's time. RITE hearing aid is similar to both as traditional BTE and RIC in the piece which fits behind the ear that has all electronic components and don't need to ear mold too. Is applied for the same hearing losses than RIC. On the other hand BTE, that are indicated from light to profound hearing losses and has the electronic components in the case behind the ear but require ear mold. **Conclusion:** We conclude these hearing aids' styles can be adapted for conductive and sensorineural hearing loss as well but RIC/RITE have advantages on shape and technology. BTE has more power and hearing loss degrees variety.

Keywords: Hearing loss; Hearing aids; BTE (Behind The Ear); RIC (Receiver In the Channel); RITE (Receiver In The Ear)

TITLE: HYBRID COCHLEAR IMPLANT

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The cochlear implant is a device that stimulates the nervous fibers allowing the transmission of the electric signal to the audio nerve, being then, decoded in the cerebral cortex. It's a new technology that comes from the conventional cochlear implant, combining electric stimulation with acoustic stimulation, been known as "electroacoustic stimulation". This device is indicated on partial deafness (of the acute frequencies), been so the high-pitched sounds are electrically stimulated and low-pitched sounds are amplified in an acoustic way. Through the systematic revision of literature, resorting to scientific search methods like b-On, Academic Google, PubMed and basing on scientific articles we seek to understand the functioning of the hybrid cochlear implant and its clinical applications. The hybrid implant stands out by its ability to preserve the external ciliated cells present in the apical cochlea area, being applied the electrode beam only on the basal area, which corresponds to the decoding of the high-pitching areas. Nowadays there are two hybrid implants available: the Electric Acoustic Stimulation and the System Hybrid. This implant is applied only on people which present a severe or profound hearing loss on high-pitching frequencies who shows the cochlear area of the low-pitching frequencies more preserved. And enhancing the hybrid cochlear implant does not replace the cochlear implant once it is indicated to a specific kind of patient allowing a positive improvement on life quality of this patient allowing this way to maintain the hearing in a natural way, which the traditional cochlear implant does not allow.

Keywords: hybrid cochlear implant, sensorineural hearing loss, electroacoustic stimulation.

TITLE: BONE ANCHORED HEARING AID (BAHA): CONNECT SYSTEM E ATTRACT SYSTEM

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Introduction: BAHA (Bone Anchored Hearing Aid) is an bone integrated implant, by conduction, indicated for cases of conductive or mixed bilateral hearing loss and unilateral sensorineural hearing loss. **Objective:** To study the different types of existing BAHA and its clinical application, through articles and by a literary revision. **Methodology:** Was consulted the online database, b-on. **Results:** There are two kinds of BAHA, Connect and Attract. Connect, also known as Conventional, it presents an esthetic difference to Attract, having one visible portion of the hearing aids , while in the other type of implant, this doesn't happen for the fact that to be all inside, intern. BAHA Attract consists in a processor of speak inside of the endoderm. This implant is constituted of Processor of Speak, Abutment, that is a species of titanium component that served of intermediary between the implant and, finally, the Titanium Implant. Both of them present a lot of benefits in relation to the Hearing Aids. **Conclusion:** The main advantage of this type of implant is the way as it passes unobserved, since the reason of many people refuses to use hearing aids is the fact aesthetic to be very visible. Relating the two types of BAHA, the Attract becomes more advantageous because it can be used in contact with water, for the facto of being total internal. In relation with the quality life of the sick people, will go to be beneficial in the hearing quality of the patient.

Key-Words: Bone Anchored Hearing Aid (BAHA), Hearing Loss, BAHA Connect, BAHA Attract.

TITLE: COCHLEAR IMPLANTS IN CHILDREN WITH MENINGITIS

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Introduction: Meningitis is a central nervous system infection caused by inflammation of the meninges. There are three types of meningitis: viral, bacterial and fungal. Bacterial meningitis is the main cause of acquired sensorineural hearing loss, in which the patient can simultaneously have, physical, visual and vestibular disabilities, language disorders and learning disabilities. Objective: Through a systematic review of the literature, we intend to determinate the urgency of cochlear implantation after meningitis in children. We used the following databases: Mendeley, b-on and Google Scholar. Results: In post-meningitis deafness, an early intervention allows a proper hearing rehabilitation through cochlear implant, which may not be possible in a later stage of the disease evolution. Ossification is common in children with this kind of disability and is a bad influence to cochlear implantation, resulting in a greater number of complications and higher number of partial implant insertions. In simultaneous bilateral cochlear implantation, both implants are held in the same surgery. This type of implantation is more recommended than sequential bilateral implantation, due to the ossification high risk of the second implanted cochlea. Conclusion: With an early detection of hearing loss and immediate bilateral cochlear implantation, affected children have a better prognosis for language development. As early as the diagnosis is, the less likely is to occur ossification, allowing to implant the entire cochlea.

Keywords: *Meningitis, simultaneous bilateral cochlear implant, children, ossification of the cochlea, hearing rehabilitation.*

TITLE: FM SYSTEMS

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Introduction: The FM system is a wireless technology that helps people better understand speech in situations where there is noise, echo or when the speaker is distant. FM systems generally work together with hearing aids and cochlear implants, although there are FM systems for people with normal hearing (such as people with attention difficulties, auditory processing disorders, hyperactivity, etc). Objectives: Based on a systematic review of the literature, this paper aims to present the new existing FM technologies on the market, usage needs, as well as addressing the advantages and disadvantages of this system. Results: Conventional hearing aids, cochlear implants and Bone Anchored Hearing Aids (BAHA), despite having all the technological advances of the last decades, often fail to fully reproduce the natural ability of human hearing to distinguish, select and understand certain sounds, mainly of speech in noisy environments. It is exactly in this context that the use of an FM system becomes beneficial and essential because it allows the focus and the amplification of the emissions from the sound source selected by the user. Conclusion: Scientific studies and clinical experience of professionals working in the field of hearing health indicate that the use of FM system is essential for children in the classroom.

Keywords: FM systems; Support Systems listening; Quality of life; Perception of speech;

TITLE: SURVEILLANCE IN PUBLIC HEALTH

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Public health is the science that promotes health, knowing that it is a process that involves the physical, mental, spiritual and social well-being. The Public Health is based on the knowledge that health is a fundamental feature of the individual, the community and society as a whole and should be supported by a strong investment in living conditions that create, maintain and protect health.

With this work we intend to alert and inform the population about the importance of the issue in public health surveillance.

For the study was conducted a systematic review of literature through research in different databases such as Pubmed and B-on (eg.).

The health surveillance purpose is the permanent observation and analysis of the population's health situation, is associated with actions to control reasons, risks and damage to the health of people living in certain territories, ensuring all the attention, which includes both individual and collective approach to health problems. Surveillance in occupational health is characterized by being a set of activities for the promotion, protection, recovery and rehabilitation of workers subject to the risks that come from working conditions. A key aspect of health surveillance is the total care about the health of the population through health promotion. This policy promotes the quality of life, encouraging people to reduce vulnerability and the health risks related to its cause and conditions.

To conclude, the health surveillance concept includes: surveillance and control of communicable diseases, noncommunicable, surveillance of health status, environmental, occupational health and health with a view to disease prevention and health promotion.

TÍTULO: *CLIMATE CHANGE AND IMPLICATIONS ON HEALTH IN PORTUGAL*

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Climate change is the greatest environmental threats of the twenty-first century, with profound consequences that span multiple areas of society: economic, social and environmental. Climate change always existed. The problem is that the pace of these climate variations have been strong acceleration and the tendency is to take even greater proportions if no action is taken.

This study aimed to address the impact of climate change on health and mention some preventive measures for preservation of the ozone layer.

In this work we proceed to carry out questionnaires to assess knowledge on the subject and proceeded to the systematic review of literature through research in different databases such as Pubmed and B-on.

With the results, it was observed that the vast majority of respondents know what is climate change and that is a problem caused by man with serious consequences on health and environment. The climate problem in Portugal, although not the most serious in the world, already has consequences that can be felt by the population.

It is essential to inform society about the implications that climate change has on health and how we can minimize their effects, which have been increasing dramatically in recent years.

TITLE: PERCEPTION OF CITIZENS IN THE FACE OF PUBLIC HEALTH SERVICES

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Public health aims to combat the conditioning factors of the spread of disease, maintaining control of impacts on the populations through surveillance activities and state investigations. Its responsibility also manage all resources, thus ensuring the necessary services to the general population, that is, should not offer cutting-edge services for some people over others.

This work aimed to evaluate the perception of citizens from the public health services.

The completion of the work was based on existing literature review on the topic and the application of a questionnaire about the public health services.

From the results it was found that most people 84.6%, unaware of what are public health services and what they can offer to the population.

Respondents also mentioned that unaware that recently have been made by these services any informational and mitigating actions of risk factors for health.

In short, there is an emerging need to match the state as promoter of quality of life of its citizens, promote dissemination of health services, which are an asset to the health of the population.

TITLE: CHRONIC DISEASES TRANSMITTED NOT CONSTITUTE A PUBLIC HEALTH PROBLEM

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The Chronic Noncommunicable Diseases are multifactorial diseases (diseases that involve various factors), which develop later in life and are long lasting. These diseases are nowadays considered a serious public health problem, and now account for about 63% of deaths worldwide, according to the World Health Organization.

To carry out this work, a systematic review of literature through research in different databases such as Pubmed and B-on.

It was found that chronic diseases are examples of non-communicable cancer, diabetes, hypertension and autoimmune diseases. With the evolution that has occurred in recent years, these diseases have been worsened due to exposure to increasingly risk factors that lead to disease. A poor diet by consuming fast food, among others, leads to appear more cases of diabetes. The stress of everyday life leads to more hypertensives and changing technologies, to cause an increase in the amount of emitted radiation may facilitate the appearance of cancers.

We conclude that it is important to bring some types of chronic non-communicable diseases is also realize how the Public Health intervenes in these cases and how to prevent the emergence of new cases of disease.

TITLE: SMOKING, SEDENTARY LIFESTYLE AND BAD EATING HABITS

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We live in a society in which the image is fairly valued, what starts dictating new standards. So, we have witnessed a reversal of roles, in that advertising begins to exert a positive effect, the fads or habits of yore are now taking a new direction.

The objective was to evaluate the eating habits, smoking and sedentary lifestyle of young people, in order to understand the evolution of the adoption of a healthy lifestyle.

The methodology used was the application of a questionnaire conducted online and the bibliographic review on the topic. The questionnaire consisted of questions simple and quick response, with the purpose of predicting the smoking habits, food consumption and exercise of the young Portuguese.

Of the 50 young respondents aged between 18 and 25 years, it was found that despite the greater access to fast-food products and tobacco, 50 claim to consume fast food sometimes, 62 drink water five or more times a day; 24 consider themselves smokers and 74 exercise. Although there are points to improve, young people are in a good way when it comes to a healthy life.

We can conclude that there is an increase with the concern of physical well-being, whether it is the practice of physical exercise, consumption of healthier foods or even greater control of some vices that are important for a healthier life.

TITLE: INFECTION BY VIRUSES ZIKA, A PUBLIC HEALTH PROBLEM

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The disease Zika virus is caused by a virus transmitted by Aedes mosquitoes that usually causes rash, mild fever, conjunctivitis and muscle pain. In a pregnant woman, the virus is able to reach the placenta, amniotic fluid and the baby. While there is research going on, what is known so far is that there is a relationship between infection zika in pregnancy and neurological malformations such as microcephaly (the baby is born with the head unless the default).

The aim of the study was to address the disease and the public health implications.

For the study was made a systematic review of literature through research in different databases such as Pubmed and B-on

For protection against mosquito bites there are some measures, such as avoiding standing water in outdoor containers; coat the domestic water tanks so that mosquitoes can not enter; prevent the accumulation of waste; use screens and mosquito nets on windows and doors to reduce contact between mosquitoes and people.

The Zika virus is diagnosed by PCR (polymerase chain reaction) and isolation of the virus in blood samples. In the past, Zika virus had a geographical and demographic distribution very limited, however, in the current surge in South America, have reported several severe cases with several complications, which in some cases have resulted in death.

We can conclude that this disease is a public health problem and as there is no specific treatment for the disease or vaccine, it is considered that the best form of prevention is protection against mosquito bites and is important to the dissemination of preventive measures the population.

TITLE: THE IMPORTANCE OF AIR QUALITY IN PUBLIC HEALTH

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The poor air quality has represented a problem over the years to the health of people, not only inside buildings, where the situation is very complicated, especially in places where people are debilitated or are very young, such as hospitals, homes and schools, but also abroad to air pollution by the particles in suspension.

The aim of the study was to address the importance of evaluation of air quality and its commitment in terms of public health.

For the study was made a systematic review of literature through research in different databases such as Pubmed and B-on

We present a study conducted by the University of Aveiro where mention that the air quality in the 1st cycle classrooms affect respiratory health of children. The lack of ventilation, the too large classes to the size of the rooms, choice without criteria of materials for the furniture, cleaning products and the rooms rehabilitation works are among the culprits for environments with pollutants rates far exceeding otherwise required by law.

We conclude that the assessment of air quality is necessary and essential for good health.

Title: Diseases transmitted by vectors

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Vector-borne diseases are one of the leading causes of death in the world. The vectors are artozoários that transmit the infection through sting when they are carriers of pathogens, such as viruses and parasites. Just one bite can transmit diseases, such as malaria, dengue, leishmaniasis, among others.

This work was intended to address the diseases transmitted by vectors and the implications for public health.

The completion of the work was based on a review of existing literature on the subject.

It was noted that research into the prevention and treatment of these diseases has worried Governments and scientists worldwide, with progress in some of the same. "Simple Measures to protect you and your family" is the motto of the World Health Organisation and aims to promote measures to combat this type of diseases. If, for some of them, there is medical treatment, such as vaccines, for most, control measures are complex involving different transmission chain links. Other measures through the use of insect repellents, using clothes that cover most of the body, the use of protective nets on the Windows and doors and the Elimination of possible breeding grounds for mosquitoes.

We conclude that despite these diseases occur mostly in tropical areas or in places where access to drinking water or basic sanitation can be a problem, in recent years, there has been a scattering to other geographical areas. The key element of the action is to disseminate information and in this way, prevention for this type of diseases become more effective.

TITLE: ELECTROMAGNETIC FIELDS AND IONIZING RADIATIONS

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Electromagnetic radiation can be classified into two types: ionizing and non-ionizing radiation, based on their ability to own ionizing and ionizing atoms break links. Ultraviolet and higher frequencies, such as x-rays or gamma rays are ionizing radiation, and these represent their own special risks. The electrical currents that flow through electrical outlets have associated frequency electromagnetic fields.

This work was intended to address the issue of radiation and its effects on health.

For the accomplishment of this work was carried out a systematic review of the literature by different research databases such as Pubmed and B-on.

We saw that very strong radiation can induce current capable of causing an electric shock to persons or animals. Also can overwhelm and destroy electrical equipment. The induction of currents by oscillating magnetic fields is also the way in which solar storms disrupt the operation of electrical and electronic systems, causing damage and even the explosion of power distribution transformers, blackouts and interference with electromagnetic signals (e.g., radio, TV, and telephone signals).

One of the main characteristics that define an electromagnetic field is their frequency or its corresponding wavelength. The fields of different frequencies interact with the body in different ways. One can imagine electromagnetic waves as a series of very regular waves that travel at tremendous speed, the speed of light. The frequency simply describes the number of oscillations or cycles per second, while the term wavelength describes the distance between a wave and another. Hence wavelength and frequency are inseparably intertwined: the higher the frequency, the smaller the wavelength.

It is concluded that the population should be informed about this issue with a view to protecting their health.

TITLE: TOBACCO CONSUMPTION AND PREVENTION IN BRAZIL AND PORTUGAL

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Smoking is an epidemic disease that causes physical, psychological and behavioral dependence. Tobacco use is the leading cause of non-communicable chronic disease and death today. Therefore the global joint approach with measures focused on prevention of initiation of consumption, the cessation of concomitant smoking promotion with protection from exposure to smoke by passive individuals is of paramount importance.

The aim of this work was to elaborate a comparative study between Portugal and Brazil about the tobacco consumption and prevention.

The applied methodology to the realization of this study was the review of scientific articles about the theme, which were consulted in several online databases.

By Equating Portugal and Brazil, it is found that, in Portugal, according to the National Health Survey of 2005/2006, the smoking percentage reached 20,9%. In 2014 that number dropped to 20%. Enshrines the creation of the National Program for Prevention and Tobacco control (2012-2016), with aims to reduce the prevalence of tobacco consumption by at least 2% until 2016, and eliminate exposure to environmental tobacco smoke.

In Brazil, according to the Health Portal and National Cancer Institute the percentage of smokers in 2005/2006 amounted to 15,6%. In 2014 this rate dropped to 10,8%. All of this are results of the Framework Convention for Tobacco Control, held in 2005 and the Anti-Smoking Law ratified and signed in 2014.

These data prove how much substantial is campaigning for the decline of this smoking indicator, by alerting and educating the society about the problems arising with the tobacco consumption.

TITLE: *Influence of physical exercise on the sodium appetite in puppies sedentary rats*

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Proper maintenance of the volume of body fluids is necessary to maintain the constancy of the internal environment through sodium regulation, because this ion is an important determinant of osmolarity and plasma volume. Therefore, the body has regulatory mechanisms that increase the intake of water in deficiency of body fluids, which is called thirst and to increase the intake of sodium, which is called sodium appetite. The preference to sodium is increased in situations where there is a hidromineral imbalance, such as administration of diuretics accompanied by a low sodium diet, water deprivation, hemodialysis, pregnancy and exercise. Exercise is an example of stimulus that may cause a change in hidromineral balance, but still few studies show a direct analysis of physical exercise and sodium appetite related to heredity in rats. According to WHO, hypertension contributes to about 9.4 million deaths annually from cardiovascular diseases in the world, this reflects the eating behavior of the population and the effect that consumption of foods high in sodium has caused to public health. For this reason, it is interesting research on the hereditary effects of sodium appetite related to exercise, assess their implications for the hydroelectrolytic balance changes, and analyze the influence of these variations in salt intake in the population health.

Keywords: sodium appetite, sodium intake, exercise, hidromineral balance.

TITLE: Food handlers - training in food safety

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The food hazards associated with the improper handling in the food sector establishments are increasingly a matter to have in account, especially when the matter is the consumer's health. As so, minimizing the occurrences of incorrect food handling have a major impact on public health and it should be a concern for all stakeholders.

In the food sector, training plays a key role in ensuring food safety. The top management as to realize that is essential to invest in the training of the food handlers in order to comply food safety regulations and reduce the risk of foodborne diseases, thereby protecting the consumers.

The objective of this study is to clarify and underline the importance of training in food safety to all the intervenients in the food sector, not only for the food handlers, but also to the top management, emphasizing their essential role in public or collective restaurants.

Keywords: food safety, training, food handlers, top management, consumers

TITLE: Checklist's in Food Safety

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In recent decades, the Food Safety acquired a global importance due to problems such as the rise of foodborne diseases. Thus, to reduce the transmission of any risk to the client's health as much as possible, it's essential to supervise all stages of the food handling process.

To check the food hygiene in a restaurant unit or in food production sector, it's necessary to periodically check the good hygiene practices, the layout of the facilities and equipment and pre-requisites applied program.

The control to avoid contamination of any food is an extremely important step in the food production process, requiring particular attention of those responsible for a catering establishment. As such, a checklist is a useful tool to ensure that all processes, tasks and control procedures are carried out within the food safety standards.

A checklist is a list of pre-established premises in which, at the time of an internal audit, to these premises is attributed to compliance or non-compliance or, if not possible, it's marked as not auditable or not applicable.

In short, a checklist is the most simple and efficient way to control food safety, allowing to evaluate the risks involved and to resolve the nonconformities.

The aim of this paper is to know the purpose of the checklists on Food Safety, as well as what they are, how to elaborate them, what should be in and which are the most used in Portugal.

Keywords: checklist, food safety, food production, verification

TITLE: CODEX ALIMENTARIUS AND FOOD SAFETY

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A healthy diet and quality food have been considered the key to promote health and prevent disease. Food contamination affects not only public health but also the suppliers' credibility and the consumer's confidence which brings inevitable economic consequences. Food safety has become increasingly important especially in the Restoration area, where customers look for quality products, which should always be ensured in order to avoid possible contaminations, potentially harmful to health.

With technological advances new food products have emerged, leading to an international sale of goods and products, always aiming food security criteria. The need to standardize and regulate the quality and safety of products led to the creation of the *Codex Alimentarius*, which aims to ensure safety, nutrition and food quality throughout the process, from production to food consumption, thereby protecting the health of consumers. This code consists in a set of international standards, recommendations and codes of good practice, thus ensuring fairness in the international food trade. The *Codex* covers various topics such as labelling, additives, contaminants, nutritional values, among others.

With this work we intend to explore the different aspects relating to this international code and reflect on how it ensures food security in Restoration.

Keywords: Food Safety, *Codex Alimentarius*, Food Control, Restoration

TITLE: A INFLUÊNCIA DO MÉTODO DE PNF NA INTERVENÇÃO DO FISIOTERAPEUTA

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Introduction: The method of PNF (Proprioceptive Neuromuscular Facilitation) was created by Dr. Herman Kabat and it consists of global treatment method. Therefore it is not directed for just one single problem or specific corporal segment. PNF benefits from physical and psychological human domain and the main objective is to achieve the full range of functional potential of the individual by re-education.

This method is essential in rehabilitation. We will approach and show its effect on sporting performance in the jump, in individuals with stroke and in Guillain-Barré syndrome.

Goals: It is to search for information and conclude about the influence (positive or negative) of PNF in the intervention of the physiotherapist in these cases.

Methodologies: To realize this poster of scientific review, we consulted the data bases PUBMED and Google Scholar, using the keywords: Proprioceptive Neuromuscular Facilitation, PNF, stroke, AVC, jump, sports e Guillain-Barré Syndrome (GBS).

Expected Results: They are related with the influence of the PNF method in the referred situations (jump, stroke and GBS), hoping that in all of them a positive effect.

Conclusion: When talking about stroke, this method showed efficient in many aspects, such as: balance, posture, walk and decrease of the risk of falling. About the jump, the results are not that conclusive, some studies conclude that this method is efficient, but, in other studies, we can see the opposite. When referring to Guillain-Barré Syndrome this concept provides tools for the therapist to help the patients gain efficient motor function and increased motor control.

Keywords: Proprioceptive Neuromuscular Facilitation; PNF; stroke; AVC; jump; sports; Guillain-Barre Syndrome (GBS).

TITLE: THE INFLUENCE OF THE BOBATH CONCEPT IN THE RECOVERY OF GAIT POST STROKE

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Introduction: According to the World Health Organization, a stroke or CVA is defined as a quick development of clinical signs of focal (or global) disturbance targeting brain functions lasting 24 hours or longer, or leading to death, with no apparent cause other than of vascular origin.

According to some authors, approximately 70 % to 80 % of people who have survived a stroke can walk only short distances at regular floors and less than 20% roam without limitation in the community.

Physiotherapy is known to be an effective intervention in the recovery of people who have suffered strokes and it is the physiotherapist's role to allow individuals with central nervous system injury (CNS), full participation in life. Within the physiotherapy intervention approaches used in the patient after a neurological disease, the Bobath Concept is the most used.

Objective: To explain the Bobath concept influence in post-stroke gait recovery.

Methodology: For the realization of this poster were consulted databases B-on, PubMed, PEDro and Google Académico and analysed all the items that had digital identifier.

Results: The results of the study showed that the application of Bobath method allows an improvement in post-stroke period of gait parameters.

Conclusion: It is concluded that a rehabilitation program based on the Bobath concept is effective in gait rehabilitation in individuals who have suffered strokes.

Keywords: stroke; Bobath; gait; Physiotherapy; rehabilitation.

TITLE: THE INFLUENCE OF RESPIRATORY PHYSIOTHERAPY TECHNIQUES IN LUNG DISEASE TREATMENT

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Respiratory physiotherapy focuses on prevention, treatment and rehabilitation of people (children, adults and elderly) at risk or who developed acute or chronic respiratory problems, with commitment to their well-being, functional capacity and quality of health-related life.

In healthy subjects, production and mucus transport are the airways' effective defense mechanisms. In the presence of a pulmonary disease that causes increased mucus production or changes in secretion transport, the risk of infection is increased, which is associated with a rapid decline in pulmonary function.

The physiotherapist uses strategies, tools and noninvasive techniques that aim to optimize the oxygen transport system, increasing the ventilatory capacity of the patient's lungs (airway secretions release), thus helping to prevent, reverse or minimize dysfunction to this level, providing maximum functionality and quality of life of users.

The main purpose of this poster is to present a research review on the importance of respiratory therapy and manual techniques of bronchial hygiene in the treatment of lung diseases.

Keywords: Physiotherapy; Respiratory; Techniques; Bronchial; hygiene; Treatment.

TITLE: THE RELEVANCE OF PHYSICAL THERAPY IN PREVENTION AND TREATMENT OF RUNNERS INJURIES

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Introduction: Nowadays running is one of the most common practices of exercise in our society, that happens because you can run in any environment: in the form of hiking, walking or competition. During any type of race, speed or resistance race, there will always be muscle groups involved. And it's easy to have injuries in our musculoskeletal tissue as runners, such as, plantar fasciitis, the iliotibial band syndrome, and tendinitis of the Achilles tendon, among others. And this is the moment where we realize the relevance of the physiotherapy.

Physical therapy aims to develop, maintain and restore maximum movement functional capacity throughout life, working to achieve this purpose through the “spheres” of promotion, prevention, treatment / intervention, qualifications and rehabilitation. We aim at prevention through postural correction and running technique correction; or, already in case of injury, we can assess, diagnose and hold a treatment plan. **Objectives:** This review aims to emphasize the benefits of the physiotherapist guidance for runners which is very important in promotion as it is in prevention. It also pretends to evince the effectiveness of the treatments for the injuries caused by running (plantar fasciitis, iliotibial band syndrome, Achilles tendinitis, “tibial periostitis” ...). These injuries may have a better recuperation through an individualized and a well thought intervention. **Methodologies:** This revision work has as primordial objective understand the relevance and importance of physical therapy in prevention and treatment of injuries in runners. In order to that, we search for scientific articles with resource to the online database, PubMed, Academic Google, ScienceDirect and PEDro. **Results:** According to the articles that we analysed, we denote that through specific exercise plans for warming up and stretching, put into practice with the help of a physical therapist, we can observe a lower incidence of injuries in athletes that are clinically monitored in relation to others. And besides, we also realize that the “skeletal-muscle” injuries that are treated by physical therapists have an exponential evolution and result (in almost all cases) in improvement of muscle strength and flexibility, what means there was a maximum gain of functionality. **Conclusion:** Once collected all this information, is easy to understand that the intervention of a physical therapist, monitoring and controlling activities, due to theoretical and practical knowledge, has a tremendous value and undeniable effectiveness, speaking of both "spheres" of prevention and treatment itself. Physical therapy brings stability and security to all those athletes.

Keywords: Runners, physiotherapy, injuries, prevention, treatment

TITLE: MÁ POSTURA NO TRABALHO E CONSEQUENTES PATOLOGIAS

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The pressure for results, the desire to do well and the excitement can lead to not paying attention to the way you sit or position yourself on chairs and tables. But this does not only happen at work but also in leisure time, whether playing or just surfing the internet.

In addition to home and work, it is necessary to maintain proper posture in places like school. There are several cases of students who develop diseases due to their poor posture while in class or writing, because they eventually forget that a correct posture is essential and relax. Later this will bring consequences, since the diseases that come from poor posture because great discomfort.

Back pain is one of these diseases and according to the World Health Organization (WHO), more than 80% of people will have at least two crises in life. The list of diseases caused by poor posture is extensive, but some are more common, like fatigue, eye pain, back pain, Repetitive Strain Injury (RSI), tenosynovitis, thoracic kyphosis.

Work ergonomic is the best way to prevent these diseases, especially those who use the computer for most of the day and are always in the same position. Many of the problems arise when the right tools, for each person, are not used. There are several items that need to be adjusted individually. The chair, for example, must have a high back with armrests, and needs to be on the same height as the keyboard, and be positioned exactly in the lumbar curve, causing the spine to remain supported at all times. The table needs to be adjustable, the measure should be about 75cm tall, but the keyboard has to be 68cm at the elbow height. The top of the monitor should be at eye level, measuring a minimum distance of one arm, so that you keep the head upright. When using the mouse, the whole arm should be used and not just the wrist. Ideally it would have a support for the arm and the wrist.

It is important to follow these tips to maintain a correct posture while working, because the probability of developing a disease (like the above) will be smaller or almost none existing.

Keywords: posture; pathologies; ergonomics; Job; Prevention

TITLE: THE BENEFITS OF PHYSIOTHERAPY IN MULTIPLE SCLEROSIS

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Introduction: Multiple sclerosis (MS) is a chronic, progressive, degenerative disease that affects the central nervous system (brain and spinal cord). Highly variable and unpredictable, the evolution may be slow and benign, with mild symptoms and little inability or may be so rapid, leading to severe disability or death within a few years. Exercises used in MS are aerobic, coordination and balance, muscle strengthening and also techniques like PNF, Bobath, Hufschmit's, Cryotherapy, Kinesiotherapy and Hydrotherapy. The benefits includes improvement of balance, coordination and walking, muscular fortification, increase of range of motion, pain relief, decreases spasticity, improvement of well-being sensation and fatigue.

Aim: The aim of this study is to understand the influence of physical therapy in MS, showing the existing techniques, as well as its concept and the results that causes in individuals with MS.

Methods: For its realization an article search was conducted through databases as PubMed, HubMed, SciELO, PEDro and Google Scholar. Review articles and articles with case series were used, all from 2010 to present.

Results: By articles, we notice that physiotherapy practice has significant effects on improving symptoms of multiple sclerosis as well as the quality of life of these patients.

Conclusion: The main goal for these patients, since there is no cure, is to control the disease and slow her down as well as the symptoms. So by using physiotherapy the patients will see symptoms be improved and they should not stop because with that, the symptoms will return and they'll not have a good quality of life.

Keywords: Multiple sclerosis, physiotherapy, exercise therapy, quality of life.

TITLE: EFFECTS OF HYDROTHERAPY IN PATIENTS WITH PARKINSON'S DISEASE

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Introduction: Neurodegenerative disease of the central nervous system (CNS), in which there is progressive loss of neurons in the pars compacta of the substantia nigra, leading to a decrease of dopamine production.

Results in movement disorders such as bradykinesia, tremor, rigidity, posture changes, balance and gait.

Hydrotherapy is a resource commonly used in Parkinson's disease, due to the physical properties of water, which in conjunction with physical exercise, preventive bring benefits, sensory and motor. Some of their applicability are, for example, pain relief and muscle spasm, relaxation, functional gait activity, improvement in muscle strength, mobility and balance.

Aim: The aim of this study is then analyze the effects of hydrotherapy in subjects with Parkinson's disease.

Methods: A systematic review of articles was performed in databases such as PubMed, SciELO and Google Scholar. The conducted case studies are scarce, and those that exist have a very significant sample, however, the existing research shows that most hydrotherapy brings benefits for these individuals.

Results: The results of the study showed that the use of hydrotherapy allow an improvement in patients with Parkinson's.

Conclusion: Thus, with Parkinson's disease with no cure, must increase the range of treatment hypotheses that can at least help in increasing the quality of life of these patients. Consequently, it was found that the rehabilitation of patients with Parkinson through hydrotherapy is effective.

Keywords: hydrotherapy; Parkinson; Neurodegenerative

TITLE: PHYSIOTHERAPY IN DEMYELINATING DISEASES

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Demyelinating diseases are diseases of the nervous system (central and peripheral) characterized by inflammation and destruction of the myelin sheath of neurons.

The myelin sheath is a fundamental structure of the system for conveying electrical signals, involves the axons acting as an electrical insulator, ensuring rapid propagation of the nerve impulse. The loss of myelin promotes devastating effects on neuronal signalling.

The cells that produce and maintain myelin are the oligodendrocytes in the central nervous system, and Schwann cells in the peripheral nervous system.

If myelin is impaired or destroyed, the nerve impulses become increasingly slower or they are not transmitted. This destruction can cause damage to the sensory level; Cognition; movement; physiological functions and other functions, depending on the nerves or areas involved.

Demyelinating diseases may be autoimmune, hereditary, and metabolic or induced by viruses.

Physical therapy plays a major role in the lives of individuals with demyelinating disease, acting at the level of neurofunctional rehabilitation, trying to restore the compromised function, reduce inflammation, prevent pain and promote recovery in the post-operative period. Also acts at the level of maintenance of the functions of muscles and joints, seeking to improve or maintain aspects such as posture, gait, flexibility, balance, muscular strength and endurance, preventing or slowing in some cases, the appearance of new outbreaks and symptoms.

Physical therapy contributes to a better quality of life of patients also aiming at their reintegration in the social environment, with the participation of family and society.

Keywords: Demyelinating, Prevention, Physiotherapy

TITLE: INCIDÊNCIA DE LESÕES NO FUTEBOL

Authors: *Cláudio Matos, Daniela Rojão, José Miguel Carvalho, Maria João Ferreira, Patrícia Sousa*

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Football has suffered changes due the increasing of physical demand in competition, forcing players to work on their limits of exhaustion increasing the risk of injury (that are disabling and have direct implications in sports performance of players and the team). The aim of this study is to find incidence of the most important injuries in football players, what causes those and how they can be prevented. **Methods:** We analysed seven original articles that were found on various online platforms and databases, including LILACS and Scielo, which addressed issues of: the incidence of musculoskeletal and orthopaedic injuries in football players, postural modifications, the flexibility analysis of segments and the prevalence of injuries according to age, an epidemiological study and the incidence of injury in various football teams. **Results:** After analysis of the articles, it was found that most injuries are muscle related, like contractures and contusions. The most susceptible anatomical locals are the lower limbs, especially the thigh and knee. In some studies, it is also referred to the ankle as a possible injured joint. Regarding to the most affected field position, the position *midfield* was mentioned in most articles, then the *striker* position. **Conclusion:** The importance of finding the incidence of the most important injuries in football players is notorious, as it allows identifying the anatomic sites with bigger susceptibility and the field position most affected, which is very important, so that medical staff can prepare prevention interventions.

Keywords: Incidence, Injuries, Sport, Football, Prevention, Physiotherapy

TITLE: THE HYDROTHERAPY OF BENEFITS AS A RESOURCE THERAPEUTIC

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Introduction: Hydrotherapy is the use of water for different treatments and it's probably a method more ancient than the humanity. This is integrated in the system of natural medicine, that assure that with variables temperatures, adequate deep, favourable external environment and a qualified healthcare professional, a physiotherapist, can produce different effects in different systems of the body. The benefits includes muscular fortification, increase of range of motion, improvement of circulation and cardiorespiratory operation, pain relief, oedema decrease, decreases postural problems and stands out muscular relax and well-being sensation. This method is very used in neurologic patients, low back pain, strokes, and rheumatic patients, lesions of athletes, respiratory qualifications, pregnant and in other areas.

Objectives: This review aims to highlight the objectives of hydrotherapy as a therapeutic resource, particularly in the reduction of oedema, muscular strength gaining, muscular flexibility and restoration of range of movement.

Methodologies: This revision work has as objective estimate the benefits of hydrotherapy as therapeutic resource, like research was adopted the search of scientific articles, with resource to the online database, Academic Google, B-on, PubMed, ScienceDirect and PEDro.

Results: The results of scientific articles are coincident, shows that hydrotherapy is benefit as a therapeutic resource. In relation to oedema, reveals that activity in water reduces significantly the postural oedema in all postures work evaluated; with regard to relaxation, knowledge of certain characteristics, such as pulse, temperature and turbulence of the water can have a major effect on muscular relaxation; and also helps to gain muscular strength and flexibility that provide the restoration of ROM.

Conclusion: In this analysis it is concluded that this technique has proved to be always clinically effective, since it confirms reduction of problems and symptoms and increased muscular strength, feeling of relaxation and well-being, ultimately improving the quality of life and functionality.

Keywords: Hydrotherapy, physiotherapy, muscle strength, oedema, functionality

TITLE: PHYSIOTHERAPY IN CEREBRAL PALSY

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Introduction: Cerebral Palsy or Chronic Encephalopathy Non Progressive of the Childhood is characterized by an injury in one or several parts of the human brain, caused by insufficient levels of cellular oxygenation during pregnancy or after birth. This kind of injury leads to cognitive and motion disorders. During clinic observation, one must consider the extension and intensity of such motion disorder, as well as the brain areas affected, which lead to the CP's characterization as either spasticity, dyskinesia, ataxia or mixed. The most common muscle-skeleton deformity is Dropfoot.

Main Goal: The main goal of this document is to study the advantages of the Physical Therapy treatment relative to muscle-skeleton deformities, applied to children with Cerebral Palsy in order to achieve better independency of motion.

Material and Methodology: This revision is based in scientific references from Academic Google, dated from 13 years until now.

Results: The possible Physical Therapy treatments regarding muscle-skeleton deformities in children are quite embracing, providing several corrections and/or reductions in articulation disorders, allowing the treated subjects to use their full motion capabilities and perform more functionally and independently the daily routine activities.

Discussion: It is concluded that Physical Therapy has a fundamental role in CP rehabilitation, especially if conducted in an early stage. It promotes joint relaxation and mobilization through hydrotherapy; seeks the recovery of sensory, motion, cognitive and behaviour damage by resorting to hippotherapy and improves the physical conditioning aiming for the child's inclusion by using kinesiotherapy.

Keywords: Cerebral Palsy; Physical Therapy; independency; muscle-skeleton deformities.

TÍTULO: THE IMPORTANCY OF REFERENCIES IN FOOD SAFETY IN A RESTORATION ESTABLISHMENT

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Currently the food security presents a great importance to consumers, to the regulatory bodies and in General for all links in the food chain. In this way, the certification of food safety plays an important role, guaranteed as soon as their products are produced, handled, packaged, distributed and delivered safely and in compliance with requirements set by the HACCP standards.

The objective of this work was to analyze the way the HACCPISO 22000 system are implemented in a catering establishment, demonstrating the benefits and the importance of these to control the possible dangers.

The methodology used was bibliographical review about the theme and the completion of a survey applied to the owner of the establishment, in order to realize the advantages of certification.

As a result we found that there is some improvement with the implementation of these systems, listing some possible advantages, namely the guarantee of food safety and consumer health, reducing losses of raw materials and products, trusted vendor selection, identification and control of the causes of loss of quality and the occurrence of hazards in foods, and increased productivity.

We can conclude that the certification allows so the correct compliance with the current legislation, the improvement in the quality of products and services, promote customer trust, as well as provide customer insurance products, responding to your needs and requirements.

TITLE: FOOD CERTIFICATION - STEPS AND ADVANTAGES

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Certification involves a written guarantee given by an independent and impartial certification body which proves that the product complies with the requirements defined by technical standards or certifications. As such it is a tool that allows the company to demonstrate an impartial and credible quality, reliability and performance of their products.

The objective of this work involves addressing the issue of food certification, its advantages for companies as well as the steps required to obtain a certification in this area and to make known the situation of Portugal.

The methodology was based on the systematic review of scientific papers, work in this area and still other sources of information on the subject. In this case also highlight the fact that we analyzed a certification barometer at the national level.

The results are expressed according to the "Barometer Certification" referring to this that in Portugal there are more than 400 certified entities in accordance with ISO 22000. Some studies conducted in this area claim that after obtaining a certification, be it quality or food safety, companies see their efforts rewarded with sales growth and the possibility of entering into hitherto restricted markets.

We conclude that getting a certification in this case food, is a process that in addition to lengthy is also expensive, but it brings advantages for businesses. Further highlighting the growing participation of Portuguese companies, not only in relation to this type of certification as others.

TITLE: A THE IMPORTANCE OF FOOD CERTIFICATION

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Daily we bought food and drinks questioning if these food kinds are in excellent condition consumption. These concerns have to be taken into account by producers and manufacturers, distributors, transporters, suppliers and service providers. They all have the responsibility to ensure consumer confidence in the products they distribute and ensure that the dangers are identified and controlled.

The food security is related with the presence of dangers associate with food and the food safety management system should integrate the principles of HACCP and the steps present in the Codex Alimentarius.

For this work it was made an analysis of several scientific articles to better understand what it is the Food Certification and what its importance in our society is.

The results of the implementation are increasingly notorious since to occur this implementation there are infrastructures necessities to be more improved as well as work conditions present in each place, the consumer already questions if in fact the place has certified to be assured the quality of everything that might consume.

With this work we can conclude that it is through food certification that is achieved in a better way dangers control and accomplishment legal requirements. Certification may be considered as a complete set of services to monitor and optimize food security programs across the supply chain.

TITLE: A THE IMPORTANCE OF FOOD CERTIFICATION

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Currently the type of life leads to radical change in their eating habits. The movement of people to large population centers, the distances between their homes and workplaces lead to demand for ready-to-eat products. Therefore there is a greater accountability of all personnel of the food industry, ensuring flawless quality from producers to consumers.

The ISO (International Organization for Standardization) is a worldwide Federation of national standards bodies, with headquarters in Geneva, the ISO has representatives of institutes for standardisation of 157 countries, following the principle of one representative per country.

The present work aimed to check the advantages and disadvantages of implementation of ISO 22000.

For the accomplishment of this work was made a review of scientific articles and a short interview. We can see that the ISO standard 22000, refers to the requirements for any organization that operates in the food chain (e.g., food manufacturers, distributors, transporters, suppliers of packaging, equipment and raw materials). This standard intends to manage in an effective way your food safety system, ensuring that the dangers to consumer health are eliminated or reduced to acceptable levels.

In conclusion this benchmark allows combining the HACCP principles with other control measures, as the prerequisite programs and other relevant documents in the food sector.

TITLE: PRINZMETAL'S ANGINA

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Prinzmetal's Angina is a type of ischemic coronary pain, described for the first time in 1959 by Dr. Myron Prinzmetal, occur in rest.

The pain is associated with coronary artery vasospasm, many times related with an artery previously sick. The incidence of the episodes occur at night and morning's beginning and can be frequent in middle aged people and smokers, without others risks to coronary disease.

The episodes may dure until 30 minutes, with an abrupt beginning and repeat over the time. the pain ends spontaneously or with the administration of sublingual nitrates and calcium blocker channels. The more common symptoms are chest pain/discomfort felt as burn or pressure in the anterior thoracic region and can be irradiated to arms, neck, shoulders and back.

Sometimes, this episodes are related with Raynaud disease, headpain or drugs (cocaine, cannabis, alcohol and amphetamines).

The key to the Prinzmetal's angina diagnosis is a transitory elevation of ST segment during pain and as the pain goes away, the pathologic elevation of ST returns to normality. Coronary angiography is a complementary diagnosis exam which confirms vasospasm.

Key-words: vasospasm, angina, Prinzmetal

TITLE: 2nd DEGREE ATRIOVENTRICULAR BLOCK TYPE HIGH

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The atrioventricular block results from an abnormality in the electrical conduction system of the heart. Thus, the conduction of atrial electrical stimulation to the ventricles is delayed or simply not occurs. A change in the atrioventricular node or in the His bundle are the main deformity leading to this disease, although the AV block may be caused by other diseases in cardiac structures or metabolic disturbances such as hyperkalemia.

The 2nd degree AVB type high arises from the 2nd degree Mobitz I or II AV block and, in the most cases progresses to 3rd degree AV block. Relativity to 2nd degree Mobitz II AVB, this one has more difficulty in passing stimulus from the atria to the ventricles. The etiology is itself, similar to the 2nd degree Mobitz II AVB and 3rd degree AV block, emphasizing the EAM, Lev and Lenegre syndrome, acute myocarditis, digitalis intoxication or congenital causes.

Electrocardiographically, the 2nd degree AVB type high is reflected in the appearance of several blocked P waves consecutively without widening of the PR interval. It shows a ratio P:QRS of 3:1 or more, in other words, there are three P waves to one QRS complex, that is for every three pulses generated in the atria only a stimulus reaches the ventricles, and the other two are blocked by the atrioventricular node or along the His bundle. Still seems exist some relationship between the P waves and QRS complexes, with no AV dissociation (which is typical of the 3rd degree AV block because there is no evidence of synchrony between the contraction of the atria and the contraction of the ventricles).

Patients may or may not reflect a set of signs and/or symptoms after developing 2nd degree AV block. Then there are two types of patients: the asymptomatic and the symptomatic ones. The latter may experience dizziness, syncope, chest pain, irregular heart rhythm, bradycardia, hypotension and therefore hypoperfusion.

The 2nd degree AVB type high, such as Mobitz II and 3rd degree AV block usually requires pacemaker implantation for the treatment to this one be definitive. However, before this procedure, reversible causes of AV block should be discarded, such as the use of pharmacological drugs for example beta-blockers or antiarrhythmic agents.

TITLE: WPW SYNDROME

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Wolff-Parkinson-White syndrome is characterized by the presence of an abnormal accessory electrical conduction pathway between the atria and the ventricles which predisposes patients to the occurrence of tachyarrhythmias.

The most frequent is the atrioventricular reentrant tachycardia. Atrial fibrillation is present in about one third of patients, if the accessory pathway has a short anterograde refractory period can generate a rapid ventricular response, degenerating into ventricular fibrillation and sudden death. The accessory pathways can have several positions along the circumference of the atrioventricular valves and can even be multiple.

Most patients are young and do not have structural heart disease. In relation to prevention of sudden death is important to evaluate patients individual risk, in order to conduct a targeted approach. Therefore, the electrocardiographic and electrophysiological studies have greater significance in identifying the location of accessory pathway, its conduction characteristics and their role in the arrhythmia. Symptomatic patients and those with high risk occupations are indicated for accessory pathway ablation.

TITLE: LEFT POSTERIOR FASCICULAR BLOCK**Authors: *Inês Penas, Joaquim Pereira*****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

The normal intrinsic electrical conduction system of the heart allows the electrical propagation to be transmitted from the sinoatrial node through both of the atria all the way to atrioventricular node. The normal physiology permits the propagation, from the atrioventricular node to the ventricles through bundle of His. The bundle of His is a bifurcated structure that originates the right and left branches, the left branch is split into two fascicles, the left anterior fascicle and the right posterior fascicle.

The left posterior fascicular block (also known as left posterior hemiblock – LPHB) is a cardiac pathology where the impulses are conducted to the anterolateral and superior region of the left ventricle through the left anterior fascicle, instead of left posterior fascicle as occurs in normal cases. The isolated commitment of this fascicle of the left branch is rare. When it happens, it's usually associated to the disease of one of the others two branches of the bundle of His, in other words, it's often related to bifascicular block.

TITLE: MYOCARDIAL NECROSIS AND FIBROSIS

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The EKG is a complementary diagnosis exam which immediately offers vast information about the diagnosis as well as the level of myocardial suffer. The diagnosis is provided by the waves present in the EKG wich are the result of electrical potentials variations in the heart.

Hense, under the EKG point of view, a myocardial tissue with necrosis is incapable of being electrically active. This inability to generate action potentials is the consequence of a blood supply deficit to the heart muscle - the myocard- due to a blockage in the coronary arteries.

This occlusion is is frequently caused by blood clots.

Before tissue death is definite there is a lesion process in which the muscle enters in ischemia caused by the low coronary flow. The reduction of said flow is so great and prolonged that the body isn't able to revert the process with existing organic reserves. The consequences of this process are: the cell stops producing vectors; the cell cannot depolarize nor polarize; the cell doesn't contract and only conducts the stimulus. Because all this there is an EKG standard to the detection of necrosis. On an individual with necrosis there are Q waves that can inform us about the location of necrosis

The faster the prognosis lesser the evolution of the disease and consequently, less affected muscle area there will be and easier it's therapy.

TITLE: VENTRICULAR ANEURYSM IN ELECTROCARDIOGRAM**Authors: Ana Carolina Filipe, Joaquim Pereira****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

The ventricular aneurysm is a localized dilatation of the ventricular wall, with a transmural fibrotic scar, well defined, without muscle (thin and fibrous tissue) and with loss of contractile function (akinetic wall) or with paradoxical systolic expansion (dyskinetic). In most cases, it is caused by occlusion of an artery, which will lead to prolonged ischemia and fibrosis of that region followed by dilation and loss of contractile function.

The anterior apical region is the most affected due to the blood supply of anterior wall of the left ventricle be highly dependent on the anterior descending artery, while the right coronary and circumflex contribute to the irrigation of the left ventricle posterior wall.

The diagnosis is confirmed by additional tests, such as a chest x-ray, ventriculography and two-dimensional echocardiography. The symptoms experienced by the patients correspond to recurrent chest pain, heart failure, arrhythmias, thromboembolism, dyspnea, hypotension, etc. The ventricular aneurysm is a severe complication of acute myocardial infarction, with an incidence of 5-38%. Other adjacent causes are: coronary artery disease, heart failure, bacterial endocarditis, congenital malformations, trauma or cardiac surgery.

TITLE: SILENT MYOCARDIAL ISCHEMIA

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Coronary heart disease presents itself in a broad spectrum of clinical manifestations that can be distinguished, roughly, as stable angina and unstable angina. If in one hand the stable angina, despite requesting some adjustments in the physical and / or emotional activity, is compatible with everyday life. The unstable angina requires the immediate medical admission. However there are case reports in which the patient, despite never suffering any type of angina related pain, is a carrier of coronary atherosclerosis with ischemic pain.

Studies reveal that there are patients with no symptoms that are seen as normal. There are aswell patients with symptoms that have asymptomatic episodes. These facts are proven by routine tests such as EKG or Holter.

TITLE: LEFT VENTRICULAR HYPERTROPHY AT SPORTS

Authors: *Ana Tavares; Joaquim Pereira*

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Sports, when practiced regularly and intensely, may lead to cardiovascular adaptations as a consequence of the demands placed on the body by the effort.

The athlete's heart will thus present a variety of morphologic and functional modifications in order to improve the functioning of the heart as a pump and the cardiovascular capacity of providing oxygen to the muscles. Modifications will vary depending on the type (considering its isotonic and isomorphic components), duration, regularity and intensity of the athletic conditioning.

Left ventricular hypertrophy is, usually, one of the first evidences of the cardiac remodelling in systematic training, detectable in EKG by the prevalence of multiple criteria.

Left Ventricular Hypertrophy in athletes is a case of study due to the difficulties in defining borders on which is acceptable for athletes and which is pathologic - hypertrophic cardiomyopathy- recognized as the commonest non-traumatic cause of sudden death in young athletes.

Keywords: sports, left ventricular hypertrophy, EKG

TITLE: ECG CHANGES IN ELECTROLYTE DISORDERS**Authors: Marisa Marques, Joaquim Pereira****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

The cardiac contraction is preceded by an electrochemical activity, that is produced in each cardiac muscle cell, the myocyte, which allows contraction of the heart muscle, the myocardium. The ions are essential for the occurrence of action potentials, the base of the electrical activity of our hearts. Ions such as K^+ , Ca^{2+} , Na^+ and Mg^+ are fundamental for the occurrence of transmembrane action potential (PAT), which consequently form the outline of the peripheral ECG, which allows us to evaluate the electrical activity of the heart. To create a normal transmembrane action potential it is necessary the normalization of the ions concentrations in the cardiac muscle. Changes in intra and extracellular concentrations of these ions, may cause disorders with influence on cardiac activity which are noticeable through the ECG, and may have negative consequences for the patients.

The most common electrolyte disorders perceptible on the ECG are: Hypokalaemia ((decrease of K^+ concentrations)), Hypoerkaemia (increase of K^+ concentrations), Hypocalcaemia (decrease of Ca^{2+} concentrations) and hypercalcaemia (increase of Ca^{2+} concentrations).

TITLE: PERICARDIAL EFFUSION**Authors:** *Ana Ferreira, Joaquim Pereira***Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

Pericardial Effusion consists in an abnormal amount of liquid between the heart and the membrane that surrounds it, the pericardium. In this pathology, the accumulation of liquid causes an increase in intrapericardial pressure, which can negatively affect the cardiac function, being the major complication.

In terms of the ECG, inherent to this pathology are three alterations that characterize it: low voltage, ST elevation and electrical alternans of QRS. Low voltage QRS complexes may be due to short-circuiting of cardiac potentials by the pericardial fluid surrounding the heart, while electrical alternans, which is uncommonly seen, describes a beat-to-beat variation in the QRS axis and amplitude, which may also involve the P wave and T wave.

It is of extreme importance to mention that despite the ECG may show pericardial effusion characteristics, the echocardiogram is the specific exam to detect the effusion and evaluate the hemodynamic significance.

Following this subject, I present a patient, a woman with 48 years, who showed progressive shortness of breath associated with intermittent chest discomfort over the last three months, presenting sinus tachycardia at 105 bpm and a blood pressure reading of 100/60 mmHg, to whom was diagnosed pericardial effusion.

Keywords: Pericardial effusion, low voltage, electrical alternans, ST elevation, ECG

TITLE: LEFT BUNDLE BRANCH BLOCK (EI- LBBB) INDUCED BY STRESS**Author:** *Paula Costa, Joaquim Pereira***Affiliations:** Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.

Left bundle branch block (EI- LBBB) induced by stress is an uncommon phenomenon. It is an intraventricular conduction disturbance in which the electrical impulse originating from the atrioventricular node does not pass through the left branch of the His bundle delaying or even jeopardizing the contraction of the left ventricle. Thus, the QRS duration is greater than or equal to 0.12 s, and in the case of being less than 0.12s, it is a disturbance in the left branch intraventricular conduction level of the His bundle, the reinforcing idea of a delay in conducting the level of this branch.

Inherent in this issue present two patients with angina pectoris who developed EI-LBBB during exercise tolerance test. The first patient with typical angina had significant coronary artery obstructive disease (CAD) requiring percutaneous coronary intervention multiple injuries, including the placement of drug-eluting stents. The second patient had atypical chest pain without CAD signals. EI- LBBB occurred at a heart rate of 80 bpm and 141 bpm in the first and second patient respectively and remained visible through the test to the recovery period in the first patient to a heart rate of 83 bpm and disappeared at 96 bpm in the second patient.

Keywords: Angina pectoris, electrocardiogram, stress test, left bundle branch block, coronary artery disease.

TITLE: BIVENTRICULAR HYPERTROPHY

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To preserve an efficient cardiovascular function when hearts are exposed to a chronic blood volume and/or pressure overload, ventricles tend to increase their applied electrical forces by thickening their cardiac walls. This process is defined as “hypertrophy” and consists in a morphological and adaptive response in order to surpass the abnormal imposed resistances. Multiple pathologies potentiate the commitment of both ventricles like congenital heart diseases, pulmonary hypertension and thromboembolism among others. However, it’s important to emphasize that commonly every biventricular hypertrophy (BVH) initiates with a left pathology which involves the right ventricle, in an advanced phase.

The electrocardiogram and its high sensibility to the variation of the electrical potential are used to detect left or right ventricular hypertrophy. In contrast, the diagnosis of BVH based on the electrocardiogram can be difficult or even impossible. This is because of the increased electrical forces, due to right and left ventricular hypertrophy cancelling each other. The diagnosis requires the presence of both types of hypertrophy criteria in the precordial leads, being one type and its pattern (right or left ventricular hypertrophy) more evident.

Aiming to present a first diagnosis based on an electrocardiogram, a clinical case from a ten year old patient has been analyzed. The patient shows pronouncedly criteria for right ventricular hypertrophy and slight signs of a left hypertrophy, which is concluded to be more frequent in this age group. Additionally the high sensibilities of other complementary diagnostic methods such as the echocardiogram and also x-Rays have been proved too.

TITLE: STANDARD IN CEREBRAL ELECTROCARDIOGRAM**Authors:** *Liliana Resende, Joaquim Pereira***Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

The cerebral pattern in the EKG appears as a consequence of disorders in the central nervous system that lead to cardiac abnormalities. The main factor for such abnormalities is the serum potassium disorder. The autonomic nervous system disorders which are secondary to neurological disease, promotes an excess of catecholamines such as norepinephrine, epinephrine and dopamine who flow in the blood, attached to plasmatic proteins and are released by the adrenal gland during stress or hypoglycemia; activation of calcium channels leads to an increase in cytosolic calcium, inside the mitochondria, and the release of free radicals. All this factors combined result in necrosis of the contraction band and are reflected in the EKG. The appearance of "brain T-waves", that is, carrying a negative character with diffuse large amplitude, are characteristic of brain injury. Usually it is accompanied by a depression of the ST segment and increased QT interval. Normalizing the tracing involves treating the main cause of changes: neurological disease.

TITLE: CANNABINOIDS' EFFECT ON EPILEPSY**Authors: *Sónia Santos*****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

Epilepsy is a chronic neurological disease manifested by recurrent seizures due to the imbalance of excitation/inhibition of neuronal networks. The majority of new diagnoses occur during childhood and in the elderly. Some of the first reveal themselves refractory to all treatments, including antiepileptic drugs, ketogenic diet, high doses of steroids and surgery.

Recently, cannabinoids (CBD) have been suggested as potential therapeutic alternatives for some patients with refractory seizures (as of December 2015, there are 19 clinical trials in progress that are evaluating CBD for epilepsy).

The most abundant components in cannabis plant are Δ^9 -tetrahydrocannabinol (THC), which has been shown to be proconvulsant and cannabidiol which isn't associated with any hallucinogenic or ataxic activities, as it is a prominent phytocannabinoid with minimal psychoactive properties and poor affinity for cannabinoid receptor type 1 (CB1R). Additionally, it has shown significant potential for CB1R independent antiepileptic effects.

Regardless of centuries of medicinal use of cannabis, only within the last few decades, our understanding of the mechanisms of the cannabinoid system and their potential benefits began to be clear. In fact, it is being used to treat a variety of nervous system conditions.

Despite all of the controversial challenges of medical marijuana as a potential therapy for epilepsy, what is not disputed is the need for scientific investigation to prove or disprove CBD safety and efficacy for epilepsy therapy. Since the mechanism of CBD's seizure protection is unknown, characterization of mechanisms driving anticonvulsant efficacy are critical for facilitating the identification of other potential treatment options.

TITLE: CHILDHOOD ABSENCE EPILEPSY**Authors: Ana Filipa Ribeiro, Anaís Magalhães****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

Childhood absence epilepsy (CAE) is a genetic generalized epilepsy with seizures beginning in school age (between 4 and 10 years old), often in an otherwise normal child. CAE occurs in 10–17% of all childhood onset epilepsy, making it the most common pediatric epilepsy syndrome. The seizures, sometimes in the hundreds per day, last around 10 seconds and are characterized by a transient impairment of consciousness (with abrupt onset and offset) accompanied by one or more other features such as staring, behavioral arrest, eyelid fluttering, or hand/face automatisms. In fact, a recent study of 339 seizures in 47 children reported an average ictal duration of 9.4 ± 7 seconds.

The ictal EEG - which is the primary tool for diagnosis - features 2.5 – 3.5 Hz generalized spike-and-wave, i.e., synchronous, symmetrical and present in bi-hemispherical leads.

The genetics features are thought to involve mutations in calcium voltage-gated channel subunit alpha 1 H and in genes that code for subunits of GABA receptors. These mutations cause increased channel activity and associated increased neuronal excitability. Seizures are believed to originate in the thalamus, where there is an abundance of T-type calcium channels such as those encoded by CACNA1H.

The treatment is pharmacological and resides in the use of first line antiepileptic drugs such as sodium valproate (VPA), ethosuximide (ETX) and lamotrigine (LMT) in mono or politherapy.

Despite this well-defined electroclinical picture, the diagnosis and management can be challenging, which, over time can lead to cognitive sequelae, reflecting in low academic and social performance.

TITLE: CREUTZFELDT-JAKOB DISEASE**Authors: Ana Costa, Bruno Malta, Mariana Silva****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.*

Proteins were described as distinct biological molecules and their significance in cellular processes was recognized as early as the 18th century. At the same time, Spanish shepherds observed a strange disease affecting Merino sheep that caused abnormal behavior such as altered gaits, excessive licking and intense itching that compelled sheep to scrape against fences, a defining clinical sign that led to the disease being named scrapie. In the early 20th century, pathologists Creutzfeldt and Jakob described a neurodegenerative disease that would later be included with scrapie into a group of diseases known as transmissible spongiform encephalopathies.

Prion diseases (PrDs), i.e., Creutzfeldt-Jakob disease (CJD) is a rare neurodegenerative condition with a rapid disease course and mortality rate of 100%. The cause is the posttranslational conformational change of a normal cellular protein, termed the prion protein (PrP^C) into a disease causing abnormal protein, called PrP^{Sc}, in which 'Sc' stands for Scrapie. PrP^{Sc} is partially protease-resistant (PrP^{res}) and can induce a conformational change of PrP^C, resulting in the production of more PrP^{Sc} in a selfpropagating manner, thereby accumulating PrP^{Sc} throughout the brain.

Several forms of the disease have been described, being the sporadic type the most common. The most challenging aspect of this disease is its diagnosis - the gold standard for definitive diagnosis is histopathological confirmation - but newer tests are providing means for an antemortem diagnosis in less invasive ways. Imaging studies, electroencefalography, and biomarkers are used in conjunction with the clinical picture try to make the diagnosis of CJD.

TITLE: PHYSICAL EXERCISE AND EPILEPSY: A COMPATIBLE REALITY?**Authors: *Diogo Fraga, João Alves, Ricardo Simões*****Affiliations: *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal.***

Epilepsy is a chronic disorder characterized by recurrent seizures, which may oscillate from a brief lapse of attention, to severe and prolonged convulsions. These seizures are triggered by sudden, usually brief and self-limited, disproportionate electrical abnormalities in neuronal populations. People with epilepsy are often advised against participating in sports and exercise, mostly because of fear, overprotection and ignorance about the specific benefits and risks associated with such activities. Recent available evidences suggests that physical exercise and active participation in sports may favorably affect seizure control, in addition to producing broader health and psychosocial benefits, such as increased self-esteem, socialization, and improvement in long-term general health. Additionally it doesn't alter the metabolism or absorption of antiepileptic drugs, thus not appearing to increase the susceptibility to seizures. In most cases, it has a beneficial influence on this disease course and may be considered a possible adjuvant in its treatment.

The International League Against Epilepsy (ILAE) recently recommended sports being divided into three categories based on potential risk of injury or death should a seizure occur: group 1, sports with no significant additional risk; group 2, sports with moderate risk to PWEs, but no risk to bystanders; and group 3, sports with major risk. Nevertheless, literature on this subject is still scarce and most of the published studies were based on a small number of patients. An effort should be made to reduce the stigma associated with epilepsy, so that quality of life of people with epilepsy can continue improving.

TITLE: EEG SIGNAL: NEUROPHYSIOLOGICAL BASIS AND EPILEPSY DIAGNOSIS**Authors: Mariana Lopes, Sofia Matos****Affiliations:** *Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC), Instituto Politécnico de Coimbra, Coimbra, Portugal*

Electroencephalography (EEG) is a graphic representation of the difference in voltage between two different cerebral locations over time. The EEG signal is generated by cerebral neurons and it is obtained due the process of current flow through the tissues between the electrical generator and the recording electrode, which is called volume conduction.

The basic mechanisms that give rise to potentials recorded outside the central nervous system elements are generally known as field potentials. A potential gradient develops along the nerve cell membrane, as in the case of the excitatory postsynaptic potentials genesis. This causes, in the extracellular space, a flow of cations from the subsynaptic region to the surrounding portions of the membrane. An inverse process develops in the intracellular space. The ion fluxes are of paramount significance in the generation of field potentials, allowing signal propagation within the brain.

The EEG is a non-invasive, low-cost and reproducible method, systematically used in the investigation of epilepsy as it permits recording hyperexcitability of the cerebral cortex, pathognomonic of epileptic events, playing a crucial role in the diagnosis and therapeutic orientation.

Epilepsy is a chronic neurological disease manifested by recurrent seizures. An epileptic seizure is a paroxysmal phenomenon, caused by an abnormal and excessive neuronal discharge which, due to the temporo-spatial involvement of several brain areas, can present itself in multiple clinical pictures.

The EEG between seizures -inter-ictal- can be of normal characteristics in epileptic patients, and so, it is crucial to understand the 'pearls, perils and pitfalls' of this neurophysiological method.

TITLE: AROMATASE AND BREAST CANCER

Authors: *Melanie Martinho; Telma Almeida; Ana Cristina Girão*

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Breast cancer constitutes a public health issue because it is the most common cause of cancer death among women worldwide. More than 70% of breast cancers occur in women aged between 40 and 69 years old and the majority of postmenopausal breast cancers are estrogen receptor positive.

The estrogen is an important hormone to regulate the breast development. Estrogen is mainly produced in the ovary of premenopausal women but after menopause the adipose tissue becomes the major source of estrogen.

Aromatase is responsible for a key step in the biosynthesis of estrogens and obesity results in the secretion of inflammatory factors that stimulate the expression of this enzyme.

In postmenopausal women the estrogen synthesis occurs mainly in the fatty tissue, therefore obesity is positively correlated with a higher risk of developing breast cancer.

Aromatase inhibitors are a recent treatment that reduces the serum estrogen levels in postmenopausal women with estrogen-dependent breast cancer. However, various side effects have been observed, such as cardiovascular incidents and osteoporosis, thus, the search for novel therapies is essential.

TITLE: CHANGES IN PHYSICAL PERFORMANCE AND HEART RATE VARIABILITY IN FUTSAL ATHLETES

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Introduction: Although heart rate variability has been applied in order to predict cardiac sudden death, recent studies have suggested that can be applied to development and adaptation of physical training of athletes.

Objectives: The aim of this study is to understand the relationship between level of physical performance, obtained through the maximal multistage 20 meters shuttle run test, and the results of heart rate variability and the conventional electrocardiogram.

Methods: To achieve this objective was realized a study where collected data from 38 subjects, all futsal players in the district competition in levels of senior, junior and juveniles. Three evaluations were carried out in three stages, in three moment along the sport season, of heart rate variability and a physical fitness test.

Results: The VO₂max shows no significant changes throughout the season in three echelons. However presents significant differences between different echelons, particularly when we compare the values between the seniors and the others echelons. The FC goes down gradually over the season in three ranks, however this descent is significant only in the junior rank. Are also found significant changes when we compared the values of juveniles with the other ranks, presenting higher values. The indices of vagal VFC (SDNN and RMSSD) increase over the season at all levels, with significant levels of seniors and juniors, and also when we compare the values from the begin of the season with the end of the season. Significant differences are found only among the junior and juveniles levels, where the juniors feature indices higher.

Conclusions: The HRV is a method that can assist with the development and adaptation of physical training of athletes. Despite their variations are not comparable with the VO₂max values since the VO₂max remains invariant throughout the season, these changes of the HRV parameters seem to be related to the changes in the values of FC, however these relationships must be better broken down. In addition to these variations there are also significant changes of the variables under study between different levels, which require a more detailed study of these links and the various factors that can influence, in order to can make use of the HRV in the monitoring of the athletes with different ages.

TITLE: CARDIOVASCULAR ADAPTATIONS IN ATHLETES – STUDY IN VOLLEYBALL PRACTITIONERS, SOCCER AND SWIMMING

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Introduction: Since always, has sparked great interest the cardiovascular adaptations in athletes. Consequently there is a large number of studies that assesses and refer some of these adaptations including electrocardiogram, echocardiogram and heart rate variability.

Objectives: The main objective was the study of cardiac remodeling in a group of athletes comparing them with a control group of healthy young people without sports.

Methods: Data were collected from a 12-lead EKG at rest, a transthoracic echocardiogram and still HRV in twenty-nine athletes, all male, three types modalities, Soccer, Volleyball and Swimming, classified as dynamic exercise, and twenty individuals with similar features, healthy but sedentary characteristics.

Results: The highest echocardiographic values in the athletes were the LV diastolic diameter, interventricular septum thickness in systole, shortening fraction, left ventricular mass as well as the LV mass indexed to the body surface and the diameter of the left atrium. Most common electrocardiographic changes in athletes were HR lower, an increase in QT interval and duration R-R. For the parameters of heart rate variability, high values were found in athletes group: Max RR, SDNN, RMSSD and HRV triang index. It can also be seen that thickness of PPd and WTR (wall thickness relative) are related inversely with the Sokolow-Lyon index, ie the greater the PPd and WTR LV lower the value of Sokolow-Lyon index.

Conclusions: It was in athletes, an increase of the values of LV diastolic diameter, interventricular septum thickness in systole, shortening fraction, left ventricular mass at diastole and systole, LV mass indexed to body surface area in diastole and in systole and also the diameter of the left atrium, as compared to subjects of the control group. In the EKG, have a lower HR with increased QT and R-R. Despite the HRV results have given significant average values for the parameters Max RR, SDNN, RMSSD and HRV triang index, literature HRV shows no differences except for HR and BP compared to non-athletes.

TITLE: MICROBIOLOGICAL LETTUCE QUALITY RATING: 3 DIFFERENT FORMS OF PREPARATION

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The foodborne diseases (FBD) are a major public health problem, and involving high social and economic costs by affecting consumers' health. The FBD may be caused by microorganisms such as bacteria, molds, viruses and parasites, which could cause toxicoinfection to human through the intake of water and food contaminated.

It is essential the microbiological surveillance of food to ensure their safety and wholesomeness, preventing the FBD, and ensuring that these are in the best conditions for human consumption. Currently the application of control of food safety in the food industry and restoration is mandatory to ensure the quality of food served. This study aims to compare the microbiological quality in lettuces.

The presence of microorganisms was investigated in 3 different lettuces: 1 - packaged lettuce and prewashed (ready to eat); 2 - lettuce washed and subjected to a 10 minute bath with vinegar; 3 - lettuce without any treatment. Using the plating method VRLB to search coliforms, the number of colonies was counted.

In these results, the purchase lettuce ready to eat presented 130 CFU/g, being considered only as acceptable, according to the guideline values established by INSA. The other two samples of lettuce showed analytical values of 40 CFU/g and 70 CFU/g, respectively, which grant them the satisfactory rating for their analytical quality.

According to these results, it is appropriate to strengthen the control of food hygiene, as well as guiding and educating food handlers and the community in general for the precautions to take, from production to consumption of food, through their conservation and handling, good manufacturing practices and the risks associated with contaminated food.

Keywords: Food quality, control, lettuce, microorganisms, prevention.

TITLE: THE INFLUENCE OF NUTRITION IN GASTROESOPHAGEAL REFLUX IN SINGERS AND WIND PLAYERS

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Gastroesophageal Reflux Disease (GERD) is more prevalent in singers and wind instrument players than other people. The diaphragm is a muscle with an important respiratory and anti-reflux function, often used by singers and wind instrument players to control their respiration. Musicians use the diaphragm repeatedly, in a quick way, every day and for many years. Therefore, this muscle becomes weak.

91 singers and wind instrument players, between 15 and 50 years, were investigated. The evaluation included a preliminary presentation about the project's methods and topics, nutritional and anthropometric measurements and two questionnaires, a GERD-HQRL symptomatic survey and a food frequency survey.

There was a major GERD prevalence and GER typical symptoms in singers when compared to wind instrumental players, which compromised their performance. The people identified correlations between food and symptoms, namely coffee, milk, alcohol and fat. There was also identified an association between obesity and GER symptoms.