ESTeSC – Coimbra Health School

Abstract Book

Poster Week 2/14

December 1-5, 2014

ESCOLA SUPERIOR DE TECNOLOGIA DA SAÚDE DE COIMBRA - IPC

POSTER WEEK

ESTeSC-Coimbra Health School

UNITED NATIONS enable

International Day of Persons with Disabilities, December 3rd

SCIENTIFIC COMITEE

Anabela Correia Martins
Célia Margarida Alcobia Gomes
Cristina Sofia dos Reis Santos
Fernando José Figueiredo Agostinho d' Abreu Mendes
Joaquim Alberto Pereira
Paulo Nuno Centeio Matafome
Rui Santos Cruz

EMAIL

posterweek@estescoimbra.pt

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SUSTAINABLE DEVELOPMENT: THE PROMISE OF TECHNOLOGY
Disability-Inclusive Sustainable Development Goals

Joaquim, I., Mateus, A., Rodrigues, R., Sousa, P., Teodósio, J., Martins, A.C.[1]
[1]Theory and Practice of Physiotherapy Course Coordinator
Polytechnic Institute of Coimbra, ESTeSC – Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

The United Nations assumes that technologies are fundamental to promote functioning. The International Classification of Functioning, Disability and Health (ICF) is based on the functioning and allows to describe the characteristics of each person in different domains, in interaction with their physical, social and attitudinal environment by the selection a set of categories that document the profile of activities and participation (WHO, 2001).

Sustainable development directed to the technology involves a long process of improvement, in order to improve the quality of life of current and future generations, being one of its goals the promotion of a socially equitable development, realizing the full and equal participation of all individuals in society (UN Conference Development, in a General Assembly, 2009, 2011)

The photography reflects two athletes next the finish line, one of which uses lower limb prostheses. The athlete with the prostheses is what lies ahead. In this case, the photography shows a real situation in which functioning, promoted by technology, incites inclusion and equality of circumstances, considering same the capabilities of both athletes.

Therefore, the technology promotes inclusion and functioning, in order to obtain higher levels of well-being and quality of life. So, it is intended sensitize people to the creation of equal opportunities and awareness of equality as a universal right.

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DIFFERENT TACTICS, SAME FUNCTIONALITY

Benta, H., Rocha, P., Simões, J., Martins, A.C.[1]

[1]Theory and Practice of Physiotherapy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

In this work we will discuss the life case of Aron Ralston. Ralston was always a person closely linked to sport and someone who loved the contact with nature. But there was a day when something did not go for the best and his physical condition has changed.

The overall aim of the International Classification of Functioning, Disability and Health (ICF) is to provide a unified and standard language as a framework for describing health and health-related states. As classification, the ICF systematically groups different domains of a person with a particular health condition (e.g. what a person with a disease or disorder does or can do). Thus, the classification allows the user to record useful profiles of functioning, disability and health of individuals in various fields. Having now seen these concepts, we address this particular case.

Aron Ralston had climbing as preferred sport, and it was this activity that was injured, got his right arm immobilized between two rocks in a landslide and had to amputate it. After this, he started using prosthesis, an assistive technology. Through this technology, Aron was slowly beginning to realize all those activities that he was used to practice throughout life.

Considering this, we can conclude that this technology support had a very positive influence, and which leads Aron's life as normal and functional way as anyone else.

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OVERCOMING THE OBSTACLES

Oliveira, A.M., Silva, M., Gonçalo, P., Martins, R., Martins, A.C.[1]
[1]Theory and Practice of Physiotherapy Course Coordinator
Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

For some people the simplest movement seems impossible. Nowadays, with the aid of new technology, there are unattainable goals.

The amputation of a limb is something beyond all the limitations that originates, to hinder the basic activities of daily life, psychologically affects conveying feelings of frustration and even failure leading to despair.

However, the International Classification of Functioning, Disability and Health (ICF) has demonstrated that functional or structural changes do not necessarily imply participation restrictions and activity limitations, because if the environment surrounding the individual is properly suited to your conditions, this can be fully functional.

The bionic i-Limb hand is a recent technology support that allows an amputee to the level of the upper limbs to perform controlled movements by himself via a mobile phone application. Thus the possibility is given to people with this type of inability to perform increasingly fine and delicate movements, thereby facilitating the life of these people. This prosthesis increases the independence of the individual, allowing them to perform day to day tasks, such as dress without help, eat holding their own fork or even simply grab a toy.

This technology is a really huge innovation, that will make many people happy and with confidence to continue their life normally. But the question is why only few will have a new hand and a smile on their face? What about the others? Who helps them?

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THE TECHNOLOGY WITH SOME IMAGINATION CAN TURN "IMPOSSIBLE" INTO "I´M POSSIBLE"

Alves, I., Fernandes, A., Ferreira, C., Jegundo, M., Vaz, B., Martins, A.C.[1]

[1]Theory and Practice of Physiotherapy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

The 2014 commemoration of International Day of Persons with Disabilities will work to harness the power of technology to promote inclusion and accessibility to help realize the full and equal participation of persons with disabilities in society and shape the future of sustainable development for all!

In the International Classification of Functioning, Disability and Health (ICF), disability and functioning are viewed as outcomes of interactions between health conditions and contextual factors.

If capacity is less than performance, then the person's current environment has enabled the individual to perform better than what data about capacity would predict: the environment has facilitated performance.

Luca suffers from muscular dystrophy and is thus extremely limited in their movements, managed to mobilize only his fingers. He imagined himself integrated in various activities, but this dysfunction precluded such participation. One day, he contacted a photographer and ask him about the possibility of creating pictures that made it look like he was moving. He suggested Luca to lay down on the floor, building the scenes around him to shoot it from the top.

Thanks to Luca's imagination, creativity of the photographer, technology and the rest of environment that involves him, this boy got photos of himself' skating, playing basketball, dancing break dance, and even climb stairs.

Moments like these are just impossible when imagination is "locked".

Even if something is done metaphorically, it is possible to get from that experience the same feeling that is gotten from the real one, without any barrier.

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TERRY FOX: THE MARATHON OF HOPE

Baltazar, A., Carvalho, B., Rojão, D., Spínola, K., Sousa, P., Martins, A.C.[1]
[1]Theory and Practice of Physiotherapy Course Coordinator
Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

Throughout history, technology has had a huge impact in people's life. The constant evolution of science has led to a development of the assistive technologies which aim is to promote the functionality. This relates directly to the theme: "Sustainable Development: The Promise of Technology". An example of a full life coupled with assistive technology is Terry Fox.

At 18, Terry Fox was a university student. At 19, he was diagnosed with osteosarcoma, a kind of cancer that usually appears near the knee. This disease led to the amputation of his right leg which was replaced by a prosthesis.

A biopsychosocial approach, framed in the International Classification of Functioning, Disability and Health (ICF), allowed him to satisfy all his needs, without compromising his functionality. Furthermore, the use of appropriate assistive technologies in cases like this have a great impact on personal performance and outcomes related to the goals of sustainable development.

Three weeks after the amputation, Terry could walk and three years later he started running marathons to raise funds for cancer research.

These accomplishments earned him various tributes, after his death, such as a statue, a foundation with his name and an annual race named "Terry Fox Run".

At 21, Fox became a worldwide hero as well as an icon of hope and determination. It is expected that in the near future, with the development of technology and with the techniques of physiotherapy, it is possible to globalize the concept of functionality, giving way to a full acceptance of the characteristics of human being.

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OVERCOME THE BARRIER OF IMPOSSIBILITY

Mendes, A. , Primo , I. , Preto, M., Sá, R. , Fonseca, J., Martins, A.C.[1]

[1]Theory and Practice of Physiotherapy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

In light of the recommendations of the United Nations, in the International Classification of Functioning, Disability and Health (ICF) model and, in the context of the commemoration of the international day of people with disability (December 3), we produced a project in which we intend to show that it is possible to provide quality of life to a person with disability.

To show that disability is not synonymous with health problems, and based on the biopsychosocial model inserted in the ICF, we resorted to the life experience of Paulo Azevedo, bearer of congenital agenesis of the four members, to whom we carried out an interview. Through assistive technology (prosthetics of four members), he won independence and turn his foreshadowed disability into functioning.

In adapting to the prosthetics, Paulo Azevedo says that "it was not easy because initially caused a lot of pain, and the weight is still not easy to bear", but the simple fact of being able to stand on his feet and have his freedom overcomes everything.

The general welfare of the individual is provided by the balance between three parts: biological, social and psychological. During the interview, Paulo Azevedo said that always dealt with his difference in a very conscious way, but the mood was "the main form" showing that the balance between these parts provides a general welfare, contradicting reductionist ideas, which meets the biopsychosocial model.

Thus, concluding that assistive technologies are essential to obtain quality of life, overcoming barriers of impossibility.

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DISABILITY OR FUNCTIONALITY?

Antunes, I., Fernandes, E., Lobo, M., Pereira, S., Martins, A.C.[1]
[1]Theory and Practice of Physiotherapy Course Coordinator
Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

According to functionality classification highlighted by the International Classification of Functioning, Disability and Health (ICF), functional or structural changes doesn't necessarily imply restrictions on participation or activity limitations, neither a disease. Among others, assistive technologies (AT) are considered essential to promote functionality.
Aimee Mullins is an example. Her prosthesis allowed her to have an active and independent life. Aimee saw her legs amputated when she was just one year old, due to a disease (Fibular Hemimelia). Since then prosthesis provide her a completely functional life, not only in a personal level, but also professionally (as a Paralympic athlete, actress and model).
The AT prevents limitations in activities and restrictions on participation, since the performance has no boundaries within their aspirations and expectations. Nevertheless this is an area in extension where the investment on resources, like a physiotherapist, its necessary to guarantee the accessibility and to achieve an effective AT to answer the user's needs.
Finally, and with Aimee Mullins' example, we conclude that AT are key elements to determine human functionality, mandatory requirement for an active, independent and good quality life.

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SELF-IMPROVEMENT THROUGH SPORTS INCLUSION

Carvalho, J.M., Duarte, J.P., Duarte, P, Rebelo, P.J., Martins, A.C.[1]
[1]Theory and Practice of Physiotherapy Course Coordinator
Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

New technologies have always had impact on the way people live. The International Day of Persons with Disabilities aims to promote an understanding of disability issues and mobilize support for the dignity, rights and well being of persons with disabilities. It also seeks to increase awareness of the advantages of integrating persons with disabilities in every aspect of political, social, economic and cultural life. Disability concept and therefore Health used by the International Classification of Functioning, Disability and Health (ICF) are not attributes of a single person but a complex assortment and conditions generated by the social model. Functioning includes all activities & participation and functional & structural integrity of the body. ICF statement also comprises support technologies in environmental factors as facilitators.

Nowadays, technology is built into every facet of daily living, including sports activities and competitions and can be used as mobility helpers, cultural and recreational activities, too. Sport can change the lives of persons with disabilities, by empowering them to realize their full potential and advocate for change in society. Through sport, persons with disabilities acquire vital social skills, develop independence, and become physically and mentally stronger, empowered to act as agents of change, highlighting the significance of teamwork, cooperation and respect for others. Sport allows persons with and without disabilities to interact in a positive context and thus allows them to reshape assumptions about what they can and cannot do.

Moreover, sport's unique ability to transcend linguistic, cultural and social barriers makes it an excellent platform for strategies of inclusion and adaptation.

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SUSTEINABLE DEVELOPMENT: THE PROMISE OF TECHNOLOGY

Alípio L., Francisco A., Matos C., Rodrigues S., Simões D., Martins, A.C.[1]
[1]Theory and Practice of Physiotherapy Course Coordinator
Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

Allusive to the December 3, International Day of Persons with Disabilities, for the discipline of TPF, we work in a poster. We assign an initial question "What is the price of functioning?"
First, it's important to mention that the concepts "functioning" and "disability" were seen by the model of the International Classification of Functioning, Disability and Health (ICF). This model intends to provide a unified language, considering that the concept of health results of a balance between intrinsic and extrinsic factors, based on an integration of various models, including biomedical, biopsychosocial and social.
Just because a person has a disability, it doesn't mean that he\she has a health problem. Functioning is not only based on structures and functions of the body, environmental factors are of major importance too, particularly assistive technologies. They are fundamental, their complexity has improved, and with that the potentialities of a person that uses them are also improved. In other words, minimize disability and maximize the full functioning.
On the other hand, all of these advances are expensive, making thousands of people incapable of use them. As example of that: the story of Humberto. A man who had an accident and became a lower limb amputated. To get a prosthesis that would allow him to "having both feet on the ground" he needs 7000€, he tried everything, but he ended up begging on the street.
In conclusion, our poster is an alert to the economic difficulties that a person who needs to use assistive technologies has, so we finish our poster with "Everyone has the right, but does everyone have possibilities?"

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"I DIDN'T VIEW MY BODY AS BROKEN."

Duarte, A.R., Duarte, D., Ferreira, C., Ferreira, M.J., Fonseca, D., Martins, A.C.[1]
[1]Theory and Practice of Physiotherapy Course Coordinator
Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Physiotherapy Dept., Coimbra, Portugal

The International Day of Persons with Disabilities, which focuses on the theme ''Sustainable Development: the Promise of Technology'', aims at promoting an understanding of disability, ensuring the well-being, dignity, equality of opportunities and the rights of all persons.
According to the model of the International Classification of Functioning, Disability and Health (ICF), the Functioning is a term encompassing all body functions, activities and participation. This model assumes definitely leads to a model constructed not for the disease by incorporating the concept of functioning. Nowadays there are support technologies that ensure functioning. Hugh Herr is a biophysics engineer from North America, born in 1964. Soon he fell in love with hiking and by the age of 17 was considered the best hiker in the USA. It was also at this age and in this activity that he suffered a severe accident, during a snowstorm, which ended in a partial amputation of the lower limbs. Hugh, after graduating and motivated by his personal experience developed prosthesis and orthosis, in order to eliminate their inability and that of others. Hugh became an example of functioning, since he has overcome his condition.
However, although support technologies are essentials for people such as Hugh, they are not at everyone's reach. Therefore, the lack of resources prevents the individual from becoming the most functional possible, due the fact that not being able to choose for the best technology.
Seeing the support technologies are so essential for the well-being biopsychosocial why aren't they available for everyone?

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TITLE: HOMOCYSTINURIA

AUTHORS: Cristina Correia, Joana Papel, Mafalda Cardoso, Márcia Pinto, Maria Marques, Célia A. Gomes

Homocystinuria is an autosomic recessive condition. It is an enherited metabolic disorder that results in a defectuous elimination of homocysteine, thus leading to its accumulation in the system. There are three types of this pathology: I – cystathionine β synthetase and piridoxin deficiency, II – tetrahydrofolate methyltransferase deficiency and III – tetrahydropholate redutase deficiency. The type I is the most common among the world population.

Each type of Homocystinuria comes from a different gene mutation, located in different chromosomes, that codes the missing enzyme. Homocystinuria type I is caused by mutations in the *CBS* gene which is the most prevalente inborn error of methionine metabolism. Mutations in the *CBS* gene lead to high plasma concentrations of homocysteine leading to accumulation of the amino acid methionine.

The most common clinical symptoms of Homocystinuria are myopia, ectopia lentis, vascular disease and musculoskeletal anomalies.

Nutritonal therapy in this kind of pathologies has a main role once it diminishes the clinical symptoms and consequences.

This study was conducted to enlighten which are the genetic mutations in Homocystinuria type I that cause the Homocystinuria phenotype and the recommended nutritional treatment.

Keywords: Homocystinuria, cystathionine β synthetase, methionin

TITLE: FOLIC ACID METABOLISM AND DOWN SYNDROME

AUTHORS: Andreia B. Costa, Rita A. Melo, Sara P. Matias, Sara R. Silva, Célia A. Gomes

Down Syndrome (DS) is a complex genetic and metabolic disorder caused by the presence of three copies of chromosome 21. In 95% of the cases DS result from an abnormal chromosome segregation during maternal meiosis. Folic acid has an important role for the *de novo* synthesis of nucleotide for DNA synthesis and also for cellular methylation reactions. The advanced age at conception is the only well-established risk factor for meiotic nondisjunction but some studies suggested that abnormal folate metabolism and polymorphism (677C→T and 1298A→C) in the methtylenetetrahydrofolate redutase (*MTHFR*) gene, located on chromosome 1, could be associated with higher risk that mothers may bear a Down's syndrome child.

Methionine synthase reductase (MTRR) is another enzyme essential for normal folate metabolism and has a central role in determining the amount of available methionine for cellular methylation reaction and MTHFR participates in the regulation of cellular methylation reactions, catalyzing the methyl radical which is donated to the remethylation of homocysteine to methionine an important reaction for the synthesis of 5-adenosylmethionine (SAM), the main donor of methyl groups is cellular methylation reactions.

Reduced activity of MTHFR, resulting in an increased consumption of folic acid to maintain normal remethylation. The recommendations of folic acid are 400 µg/day, but in the case of women who are pregnant or planning pregnancy, increased to 600 µg/day.

The aim of the present work is to show the influence of folic acid and polymorphism in genes involved in folate metabolism as a maternal risk for Down Syndrome.

Keywords: Polymorphism, Down Syndrome, Folic Acid, *MTHFR gene, MTRR* gene.

TITLE: THE INFLUENCE OF DIET THERAPY IN THE MANAGEMENT OF PHENYLKETONURIA

Authors: Ana Rebelo; Eduarda Silva; Inês Pedro; Patrícia Leal; Célia A. Gomes

Phenylketonuria (PKU) is an autosomal recessive hereditary disorder in protein metabolism associated to the twelfth pair of chromosomes.
PKU is caused by deficient activity of the hepatic enzyme phenylalanine hydroxylase (PAH) which due to a mutation in the gene is structurally modified.
In those circumstances, conversion of phenylalanine to tyrosine does not occur and its excess is converted by secondary metabolic pathways of phenylpyruvate that accumulates in the blood and other tissues, leading to irreversible damage to the central nervous system.
Early diagnosis of the disease is the most effective way for a rapid implementation of treatment in order to avoid neurological sequelae (severe mental retardation).
The diet therapy consists of a restriction on the consumption of phenylalanine, which should ensure a good cognitive development and a normal growth of the child. Given the severity of the restrictions, it is imperative that the attention paid to the diet is doubled, especially in the younger age group.
The objective of this study is to characterize Phenylketonuria disease at the genetic level, know the appropriate diet therapy and also the consequences of non-implementation and evaluate the quality of life of patients.

Keywords: Phenylketonuria (PKU), phenylalanine hydroxylase (PAH), diet therapy, phenylalanine, quality of life

TITLE: GENETIC DYSLIPIDEMIAS

AUTHORS: Carolina Cardoso, Catarina Ferreira, Patrícia Cunha, Raquel Anastácio e Célia A. Gomes

The word “dyslipidemia” is awry associated merely with high lipid levels in human blood, known as hyperlipidemia. However, this denomination encompasses not only the hyperlipidemias but also the hipolipidemias. By definition, dyslipidemias are characterized as primary and secondary. Primary dyslipidemias are related directly with genetics and heredity. On the other hand, secondary dyslipidemias are associated with wrong habits and unhealthy lifestyles.

This work will correlate genetics and dyslipidemias, basing with definitions of words like heredity, genetic factors, genes, lipid metabolism and lipoproteins. Under the same reasoning, this article’s focal point will be primary dyslipidemias, making a distinction between hipo and hyperlipidemias, depending on whether lipoproteins are being under or overproduced, respectively. Gaucher’s disease is the hyperlipidemia disease that will be mentioned. As regards hypolipidemias, the chosen disease was ApoA’s Family Deficiency, also known as Tangier’s disease. Even though these diseases are genetic, it is known that nutrition behaviour influences this kind of pathologies, either to keep it stagnated or enhancing its evolution so it is important to provide recommendations on what and how to eat to promote health.

The main goal of this work is transmit the real concept of the word “dyslipidemias”, and also identify some genes responsible for influencing lipid metabolism and to mention some nutrition recommendations.

KEY WORDS: dyslipidemias; genetics; nutrition; Gaucher’s disease; Tangier’s disease.

TITLE: FAMILIAL HYPERCHOLESTEROLEMIA AND NUTRIGENOMICS

AUTHORS: Andréa Simões | Cláudia Azoia | Dulce Rodrigues | Tatiana Cunha | Célia A. Gomes

Familial Hypercholesterolemia (FH) is one of the most common genetic disorders, which is considered as autosomal dominant and its genotype may be heterozygous or homozygous (rarer and more severe phenotype than heterozygous). Typically, this disorder is caused by the total or partial absence of functional receptors of low-density lipoproteins (LDLR) caused by a mutation in the *LDLR* gene, may also be caused by changes in apolipoprotein B (*ApoB*) gene and the gene of proprotein convertase subtilisin/kexina type 9 (*PCSK9*).

Nutrigenomics studies how bioactive compounds (components of food such as polyphenols and lycopene) act in gene expression, in other words, all the nutrients and food compounds are viewed as environmental factors that may alter gene expression by modifying metabolic functions. The bioactive compounds may thus provide an additional therapy to pharmacological in certain genetic disorders such as the Familial Hypercholesterolemia.

Pharmacological therapy is almost inevitable, being a therapy that involves the medication with statins, fibrates, nicotinic acid and cholestyramine. Individuals suffering from Familial Hypercholesterolemia should adopt a healthier life style combined with a balanced diet rich in vegetables, fruit, whole cereals (rich in fibre), low in saturated fat and *trans* fat, preferring the unsaturated, in particular the olive oil.

Portugal presents about 20,000 cases of FH which is characterized by elevated levels of total cholesterol and LDL cholesterol which can lead to the development of cardiovascular diseases such as atherosclerosis.

Our goal is to study the influence of bioactive compounds on gene expression of HF.

Keywords: hypercholesterolemia, gene *LDLR*, gene *ApoB*, gene *PCSK9*, feeding

TITLE: GENETIC MECHANISMS AND THEIR INFLUENCE ON CHILDHOOD OBESITY

AUTHORS: Catarina Augusto, Joana Azenha, Joana Breda, Ana I. Santos, Rui Soares, Célia A. Gomes

Obesity is considered, by the World Health Organization, an epidemic characterized as the excessive body fat mass and it has consequences like metabolic disorders and cardiovascular diseases that impair quality of life. Molecular genetic studies have identified mutations in certain genes which have enormous effect on obesity. The analysis of these genes, such as fat mass and obesity-associated gene (*FTO*) and Melanocortin 4 receptor (*MC4R*), has created important paths to unravel and create a deeper understanding of the regulation of the body weight.

Childhood obesity is one of the most serious public health challenges, reaching epidemic levels in many countries around the world. It is evidence that maternal obesity is an important predictor in the descendants, though it is not consensual if that influence is due to genetic interaction or family context. Eating habits also have influence on weight gain; especially fried food or other food rich in fat and salt, which has become so popular. Since children are our future, it is pertinent to study childhood obesity, environmental factors that trigger it, as well as the set of polymorphisms and the way it relates with the distribution of macronutrients in the diet.

The purpose of this article is to review the susceptibility and genetic variability and its influence on the development of obesity level and nutritional treatment in children.

KEYWORDS: Childhood Obesity; Genes; Heredity

TITLE: ALZHEIMER'S DISEASE

AUTHORS: Ana Ferreira | Jéssica Lopes | Sofia Morais | Célia A. Gomes

Alzheimer's disease (AD) is the most frequent neurodegenerative disorder of dementia. AD results from a synaptic loss and neuronal death in the brain regions responsible for cognitive functions. In general, the first clinical aspect is the deficiency of recent memory, and the remotest is preserved until a certain stage of the disease.

About 95% of AD cases are sporadic late-onset, in other words, affects the elderly population, and depends on the interaction between genetic and environmental factors. Early onset Alzheimer`s is a rare form of the disease, that represents the remaining 5%.

The genetic factor is considered as a major factor in the pathogenesis of AD and mutations in genes encoding *APP* (amyloid precursor protein), *ApoE* (apolipoprotein E), *PSEN1* (presenilin1) and *PSEN2* (presenilin 2) are consistently associated with AD. It is also known that about 1/3 of AD cases behave in accordance with an autosomal dominant monogenic heritage, being 50% the probability of transmitting the disease to the progeny.

Aiming to reduce the risk of developing AD, is recommended a high intake of foods rich in vitamins B6, B12, C, E, folic acid and unsaturated fatty acids.

The geriatric population has a higher prevalence of nutritional problems (malnutrition and overweight). Therefore it's necessary a dietary intervention, such as nutritional supplementation and adequacy of volume and fractionation of diet.

The objective of this study is to understand Alzheimer's disease at the genetic level and also the importance of nutritional intervention in their development.

Keywords: Alzheimer's disease, genetic factor, nutritional intervention

THE IMPORTANCE OF WATER TO LIVING BEINGS

Ariana Nunes[1]; Catarina Bordalo[1]; Filipa Ferreira[1]; Tatiana Neves[1]; Cristina Santos[2]

[1] Management of Water Quality I, Environmental Health Course Students

[2] Management of Water Quality I, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Portugal

As we all know, three-quarters of the Earth's surface is covered by water and is of extreme importance to the man. In antiquity, for example, the great civilizations developed on the banks of rivers, and the Egyptians depended on the waters of River Nile for almost everything. In the background, living beings need, since its beginnings, of water to survive. With this work we intend to address the importance of water to living organisms, in particular types of water, how this is distributed on the planet and the impacts of pollution on ecosystems. The work had as objectives, identify and characterize the different water types, hydrological cycle, water pollution and their consequences for ecosystems, water management and conservation of nature and biodiversity: the current models of water management and nature conservation at international level, and some curiosities about the subject. The methodology was based on literature review of studies and scientific articles on the topic. Some consequences of water pollution in the human being is the eutrophication, this fenomenon is caused by excess nutrients in a body of water more or less closed, which occurs in some waters of beaches, making them unsuitable for bathing, contaminating fish and other sea animals that are consumed by people. It is concluded that water is important in various stages for living beings, as well as for the ecosystems to which they belong.

WASTEWATER

Ana Videira[1], Ana Rita Ribeiro[1], Diana Barreira[1], Liliana Loureiro[1], Sandrina Maia[1], Cristina Santos[2]

[1] Management of Water Quality I, Environmental Health Course Students

[2] Management of Water Quality I, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC - Coimbra Health School, Environmental Health, Portugal

Wastewater are designated of sewage and it produced by human activities and it must be collected for undergo an appropriate treatment that is carried out in waste water treatment station (ETAR). After treat are reused and returned to the environment.

There are various types of waste water depending on their origin, which will also determine their type of treatment, that is, for each type of water there is a certain type of treatment.

The main function an ETAR is receive and treats wastewater, so as to be returned to the environment, under conditions environmentally safe. The ETAR can integrate several treatment steps all of which are important and will be fulfilled.

This work, it is intended to make a survey of existing ETAR at national level and their characteristics in terms of the treatment process.

It was found that in Portugal there is an evolution recognized in relation to these treatments, especially in terms of distribution and diversification. While in other countries, particularly developing countries has not integrated these treatments on your system.

The ETAR plays a key role in the hydrological cycle. Through domestic human activities, the water is captured by sewage, which goes after treatment into rivers and oceans, returning to the hydrologic cycle.

DESALINATION: A POSSIBLE SOLUTION?

Ana Azul[1], Carolina Moreira[1], Ivo Roxo[1], Miriam Caldeira[1], Cristina Santos[2]

[1] Management of Water Quality I, Environmental Health Course Students

[2] Management of Water Quality I, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC - Coimbra Health School, Environmental Health, Portugal

Water is a truly abundant substance at our planet, covering much of surface and assuming as the most important constituent of the bodies of living beings. But only a small portion of the water is available for consumption thereof, it is important to use the same sustainable.

One way to resolution this situation is desalination. It is based on physico-chemical process in which dissolved salts are removed from the water, making it very sweet for human consumption. This study is based on alerts how educate the people, for the problems that affect the quality and quantity of the water in our planet.

The methodology was based on systematic review of scientific articles and other sources of information on the topic. Some of the processes used are distillation, reverse or reverse osmosis, etc. This method applies to countries like Israel, Dubai and Florida.

The techniques used to desalinate water tend to be quite expensive and, in many cases, are not feasible for a particular region.

In short, we can see that is a very expensive process, however a solution for the future. Aiming to reduce the negative aspects, it is necessary to implement some measures of prevention and protection: reuse all the water possible, using reducing flow and utilization of rainwater.

WATER FOOTPRINT OF STUDENTS OF COIMBRA HEALTH SCHOOL

Belchior, C.[1]; Pereira, B.[1]; Guerreiro, L.[1]; Pimenta, V.[1]; S.Cristina[2]

[1] Management of Water Quality I, Environmental Health Course Students

[2] Management of Water Quality I, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Coimbra, Portugal

Water is an essential commodity and is an essential for the health and survival of mankind need, is considered one of the basic rights.

Of all the water available only 3 is fresh water, 3 of this only 0.02 is available in rivers and lakes in the form of fresh water consumption. The water footprint is an indicator that expresses the consumption of water involved in the production of goods and services we consume.

This study evaluated the Water Footprint of students of the School of Health Technology of Coimbra, and thus suggest ways to implement best practices in the use of this natural resource.

For this work was used as the implementation methodology of a survey conducted in similar studies and a review of published scientific articles on the subject.

According to the results obtained in other studies, the overall average, the water footprint is 1243 m3 ano/hab, and Portugal is in the sixth position of the countries with the largest footprint (2214 m3 ano/hab). We can also conclude that over time have been taken more awareness about the availability of water and it is necessary to preserve it. Verified the existence of good practices including turning off the water when washing hands teeth, washing the dishes it no longer applies.

So with this work was possible greater awareness among students ESTeSC to the importance of water in our day-to-day, alerting them to the need for measures to management of this essential resource for life.

THERMAL WATERS

Emanuel Lourenço[1], Diogo Cristóvão[1], Gonçalo Oliveira[1], Luísa Santos[1], Ricardo Santos [1]; Cristina Santos [2]

[1] Management of Water Quality I, Environmental Health Course Students

[2] Management of Water Quality I, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Portugal

In Portugal there are about 36 spas. The hot springs are present in several areas of the country and its existence and all its features are not yet common knowledge.

The objectives of this job are de disclosure of geothermic resources, his characteristic and their application and qualification. We also want to make the Good Practices Guide in thermal resorts.

In order to comply the objectives, it is necessary to present Portuguese thermal resorts and all of the benefits of this water, as well as the presentation of the Good Practices Guide present on Decree Law nº 142/2004 of 11 June 2001.

With this study it was possible to prove thermal water effectiveness in the users welfare, due to their specific composition and health and leisure applications. The most prestigious resorts are Thermal Resort of Monção; Thermal Resort of Gerês; Thermal Resort of Chaves; Thermal Resort of Vidago; Thermal Resort of São Pedro do Sul; Thermal Resort of Luso; Thermal Resort of Curia; Thermal Resort of Monte Real; Thermal Resort of Vimeiro and Caldas de Monchique.

By maintaining an appropriate control we should promote and support the Good Practice Guides, the maintenance and conservation, as well as the water control and the assessment of the risk control, associated with a good environmental management.

OVEREXPLOITATION OF DRINKING WATER

Anabela Morgado[1]; Marta Cunha[1]; Vanilce Veiga[1]; Cristina Santos[2]

[1] Management of Water Quality I, Environmental Health Course Students

[2] Management of Water Quality I, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Portugal

Water is an indispensable asset to the survival of man and the development of human activities. In the world there are only 3 of potable water, but only an increasingly small percentage is available to be utilized for consumption. With industrialization and population increase it was necessary to use a larger amount of water for human needs, which made the situation untenable.

With this work it was intended to know the use of water, the errors that lead to overexploitation of water practices to avoid wasting water and sustainable ways of using water.

The methodology was based on literature review of studies and scientific articles written on the subject.

In the world there is water fresh enough to cover all human. The problem is that some countries are overexploitation their reserves of fresh water (ground and surface). By doing so compromise the amount of water available in the future.

Thus, it is necessary to make efforts to implement measures that promote sustainable practices for water use. It is necessary to raise awareness of this issue by presenting the consequences of actions taken, not only directed at the general public, but also to large industries, because these are some of the biggest users of water.

PREVENTION AND CONTROL OF LEGIONELLA

Marcelo Afonso[1], Pedro Pinho[1], Cristina Santos[2]

1 Management and Water Quality I, Environmental Health Course Students
2 Management and Water Quality I, Environmental Health Course Professor
Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Portugal

Legionnaires disease, caused by the bacteria Legionella, derives from an event which occurred in 1976 at a Convention of the American Legion where 221 participants contracted the bacteria taking 34 of them to death. This bacterium is usually in natural aquatic environments and also in artificial systems, such as networks of supply and distribution of water, air conditioning and cooling systems (cooling towers, condensers), existing in buildings, including hotels, spas, shopping malls and hospitals.

The factors that favor the development of the bacteria are, the water temperature, pH, the relative humidity, the reduced water circulation areas, the presence of other organisms in untreated water or with poor treatment; existence of a biofilm on the surfaces in contact with water.

This infection is transmitted by inhaling droplets of contaminated water vapor, aerosols, which leads to bacteria to lungs, where its deposition occurs in the alveoli.

Aim of this study was to assess the degree of knowledge that the students, future health professionals, have about Legionella.

For the accomplishment of this work it was elaborated a bibliographical research on the topic.

We concluded that the preventive measures to ensure proper hydraulic flow, avoiding areas of standing water, or prolonged storage in different systems preventing optimal conditions of growth of Legionella; mechanisms for combating corrosion and fouling phenomena through proper operation and maintenance, adapted to the water quality and characteristics of the premises; control and monitoring of water quality are some of the key measures in the prevention and control of Legionella.

HACCP IN CATERING ESTABLISHMENTS

Pereira. A[1]; Simões. B[1]; Santos. G[1]; Lindo. M[1]; Santos, C[2]

[1] Food Quality and Safety, Environmental Health Course Students

[2] Food Quality and Safety, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Coimbra, Portugal

Catering establishments are often associated with food-borne diseases. Foodborne illnesses are caused by contaminated food by microorganisms and toxins.

The food contamination causes outbreaks that need to be prevented, reduced and or eliminated. The food contamination causes outbreaks that need to be prevented, reduced and or eliminated. There are the need for implementation of best practices for effective food safety, thus applying the HACCP plan, and the owners of the food establishments are responsible for ensuring the safety of the food they sell and it was required by law they had the own plan.

This work served to check all aspects related withe the food quality and safety and are in accordance with the law to provide a production and handling of food in a safe manner.

In implementing the HACCP system in the establishment we saw key steps that may arise, acting so as to avoid potential hazards that could harm consumers by applying a checklist and a literature review of scientific articles.

According to other studies in the establishments surveyed, several unconformities structural and functional were detected, bearing witness to the failure of the legislation regarding the requirement of the existence and implementation of a control system valid, based on the principles of the methodology HACCP.

In short, it is correct to emphasize the development of the HACCP plan as well as its application to prevent any possible contamination and ensure the good quality of the food served at this establishment

APPLICATION OF HACCP SYSTEM IN A BUTCHER

B. Ana[1]; C. Pedro[1]; G. Sara[1]; S. Cristina [2]

[1] Food Quality and Safety, Environmental Health Course Students

[2] Food Quality and Safety, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Coimbra, Portugal

The Hazard Analysis and Critical Control Points (HACCP) is a system that aims a precautionary approach in order to avoid potential hazards that could harm consumers by eliminating or reducing the risks to ensure it isn't made available to consumers how food not safe.

Obviously, there are many dangers for the quality and food safety, which can be generated immediately after the receipt of raw material and thus affect all phases of the process.

This study aimed to assess the food safety system, HACCP establishment of a butcher, and identify risks and propose measures to minimize the risks of the products sold in the establishment.

For the preparation of the work made a checklist and a literature review of articles related to this type of establishment.

The use of watches, bracelets and rings are still very common, and the hygiene of hands and nails is not done correctly. Most handlers do not wear hats regularly.

Therefore, it becomes crucial to apply proactive security in food process, such as the HACCP system in order to restore the confidence of consumers and ensuring high standards of health protection.

HACCP IN RESTAURANT AND DRINKS ESTABLISHMENTS

Ana Inverno[1], Daniela Guimarães[1], Raquel Nossa[1], Valter Durão[1], Cristina Santos[2]

[1] Food Quality and Safety, Environmental Health Course Students

[2] Food Quality and Safety, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Coimbra, Portugal

The HACCP system is an essential tool for control the safety of the Food Quality in all Phases of the Production Process.

The implementation of this methodology consists in identifying the critical control points and dangers in the production process.

This place is a food and beverage establishment where exists different types of food with some risks of microbiological contamination, chemical contamination or physical contamination for the handlers or even to the final consumer.

The aim of this study was to investigate and analyze the chosen restaurant complied with the requirements of the HACCP system.

The chosen methodology has a checklist to assess compliance with the requirements of HACCP and a literature review.

In the restaurant, used in this study, the HACCP system it was implemented in accordance with the EC Regulation N. 852/2004 of 29 April and is revised as needed.

In the process of verify and validate the HACCP system, a detailed study of the products in which microbiological parameters that were not in accordance with the legislation applied were found.

The implementation of the principles of HACCP in whole cycle of handling Products process can easily eliminate or minimize the risks of product contamination. Therefore, products can be sold, ensuring the quality of the product to the consumer. This is all reflected in the protection of product quality and food safety for consumers.

IMPLEMENTATION OF THE HACCP IN A FOOD ESTABLISHMENT

Diogo Pereirinha[1]; Fábio Monteiro[1]; Patrícia Ferreira[1]; Sofia Moura[1]; Cristina Santos[2]

[1] Food Quality and Safety, Environmental Health Course Students

[2] Food Quality and Safety, Environmental Health Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Coimbra, Portugal

Today we are faced with an increasingly demanding society regarding the safety and quality of food. Unlike what happened in the past, today there is great concern about where food comes from, its source, destination of the goods we consume, as well as the processes they are undergo.

Therefore, the objective of this study is to evaluate the implementation of HACCP, from receipt of raw materials for their manufacture, so that any contamination of the product in order to protect consumer health.

The development of a checklist used in the visit to the place where all the hazards have been identified, ensuring that they satisfy all the principles of the implementation of the HACCP system.

There was a literature review on the topic.

With various studies already made can be concluded that in different steps, such as the receipt of raw materials, storage temperature and cooling temperature there are physical, chemical and biological hazards.

An increase in safety and quality of food products is required.

HACCP APLIED TO A BAKERY/ PASTRY SHOP

Adriana Coelho[1], Carolina Teixeira[1], Cátia Estácio[1], Débora Murta[1], Fabrice Capitão[1], Cristina Santos[2]

[1] Food Quality and Safety, Environmental Health Course Students

[2] Food Quality and Safety, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Coimbra, Portugal

Food security is nowadays an important concept. With the evolution of technology and new forms of production, preparation, distribution and supply of food, new dangers have begun to appear. It's indispensable the existence of effective control of food safety and appearance measures that constitute the system of Hazard Analysis and Critical Control points, or HACCP.

Aiming to have a better understanding of the implementation of this system (HACCP), we visited a bakery/pastry shop, where we observed the various constituent parameters of the system, from production to food distribution.

The criteria used for the observation and evaluation of the implementation of the HACCP system in the bakery visited, was the result from intensive research on current legislation and sites of entities.

The results observed in studies, of literature review, are related to damage of pavements, deprivation of a program of hygiene and inappropriate clothing. Although the staff have basic training in food hygiene and safety, the minimum conditions are not fulfilled.

In conclusion, this work help the understanding of the implementation of HACCP system for food security in order to promote public health. It was also important to notice which are the hazards and critical points, in terms of food security, since the food is received until at consumer.

HACCP SYSTEM IN A DRINKING ESTABLISHMENT

Vasco, Inês[1]; Dias, João[1]; Afonso, Marcelo[1]; Marques, Melissa[1]; Custódio, Vítor[1]; Cristina Santos[2]

[1] Food Quality and Safety, Environmental Health Course Students

[2] Food Quality and Safety, Environmental Health Course Professor

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Environmental Health, Coimbra, Portugal

Over the years, the society is increasingly stringent as regards the safety and quality of food products. Nowadays there is great concern regarding the origin, source and destination information of the products we consume, as well as the processes developed by new techniques of production, preparation, distribution and supply of food, along with new consumer habits.

Thus, identification of new hazards and more resistance to existing, it´s necessary creating a preventive system of identification, evaluation and control of hazards associated with food safety, HACCP designated (Hazard Analysis and Critical Control Point).

There was a literature review on the topic.

The place was consists of four distinct zones, a common area, indoor and outdoor, sanitary zone and deliveries zone. We found some disagreement on points such as: degraded pavement, lack of ventilation in toilets; the storage zone product is not regulated according to the standards, since the products are not properly stored; refrigerated and frozen products are at locations where the temperature and equipment is not visible or regulated; cleaning products are not properly identified and stored

These results demonstrate again that procedures such as verification and validation of HACCP plan are important to strengthen the remaining principles of HACCP.

TITLE: DEMYELINATING DISEASES

AUTHORS: Ana Catarina Fernandes; Cristiana Ferreira; Daniela Fonseca; Kathryn Spínola; Sara Rodrigues

A demyelinating disease is any disease of the nervous system (central or peripheral) characterized by the destruction of the myelin sheath of neurons.

The myelin sheath is a layer that surrounds the axons, acting as an electrical insulator, and ensures rapid propagation of nerve impulses in the communication between nerve cells. The cells that produce and maintain myelin are the oligodendrocytes in the central nervous system, and Schwann cells in the peripheral nervous system. The degradation of these cells can lead to the destruction of many segments of the myelin sheath, constituting a demyelinating process. There are several factors that influence this destruction, including genetic predisposition and environmental factors such as smoking and diet. If the myelin is destroyed or altered, nerve impulses lose speed or simply are not transmitted. This destruction can cause sensory impairments, loss of coordination, severe cognitive problems, difficulty in controlling the physiological needs and other functions depending on the nerves or areas involved. Demyelinating diseases may be autoimmune, hereditary, metabolic, induced by infectious agents, among others.

Multiple sclerosis (MS), an autoimmune, chronic, disabling and degenerative disease, is the one that most affects a considerable amount of people. In this disease, the immune system produces antibodies that destroy portions of the myelin sheath of the central nervous system and, thus, the nerve impulse conduction is much slower. Some of the symptoms of MS are impaired vision, poor balance, fatigue and spasms. Although there is no known cure there is treatment, both therapeutic and rehabilitation.

TITLE: CHRONIC PAIN

AUTHORS: Alves, I.; Baltazar, A.; Carvalho, B.; Rojão, D.; Sousa, P.

What is pain? The International Association for the Study of Pain defines it as: An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.

The injury in the affected tissue, such as skin area can cause an increase in the sensitivity of nerve endings in that area (peripheral sensitivity).

The central nervous system (CNS) may also respond to tissue injury decreasing the threshold and increasing its sensitivity to pain (central sensitization). In this situation, CNS neurons release the excitatory amino acids glutamate and aspartate which bind to a specific subset of receivers, used only in repetitive stimulation of neurons, as in the case of severe painful sensations. These receptors opening of Ca2+ channels, which leads to the production of nitric oxide and maintenance of a state of hyperexcitation of CNS cells responsible for chronic and ongoing pain.

Clinical investigators have tested chronic pain patients and found that they often have lower-than-normal levels of endorphins in their spinal fluid. Morphine and other opioid drugs work by locking on to these opioid receptors, switching on pain-inhibiting pathways or circuits, and thereby blocking pain. The body's natural painkillers may yet prove to be the most promising pain relievers, pointing to one of the most important new avenues in drug development. The brain may signal the release of painkillers found in the spinal cord, including serotonin, norepinephrine, and opioid-like chemicals. Many pharmaceutical companies are working to synthesize these substances in laboratories as future medications.

TITLE: MYOKINES - HORMONAL FUNCTION OF THE MUSCLE

AUTHORS: Alípio L, Francisco A, Matos C, Rebelo P, Rocha P, Simões D

Chronic inflammation is involved in different kinds of pathogenesis. There are many examples of that, as insulin resistance, atherosclerosis, neurodegeneration, tumor growth, among others.
It is common knowledge that regular exercise decreases the odds of eventually contracting innumerous diseases; exercise contributes to some extent to the creation of anti-inflammatory responses. According to this theory, the anti-inflammatory effects may be partially mediated by the release of a certain type of muscle fibers derived peptides, designated myokines.
In other words, contracting skeletal muscles release myokines that have endocrine effects, leading to the creation of direct anti-inflammatory responses and/or specific effects on visceral fat. It is presumed therefore that physical activity is an essential component of any diet or lifestyle because it is intended to reduce intra-abdominal fat, inflammation and risk of chronic diseases, derived from a sedentary lifestyle.
Other types of myokines work locally inside the muscle (paracrine mechanism) and exert their effects on signaling pathways that are involved in fat oxidation and glucose uptake.
This discovery that contracting the skeletal muscle tissue secretes proteins defines a paradigm: the skeletal muscle is an endocrine organ that produces and releases myokines, who have a hormonal function, causing specific endocrine effects in other organs. Like this, the myokines induced due to the practice of physical exercise (particularly strength) are involved in local anti-inflammatory effects and systemic mediation.

TITLE: HORMONAL FUNCTION OF BONE – OSTEOCALCIN

AUTHORS: Duarte A., Duarte D., Carvalho J.M., Gonçalo P., Ferreira M.J.

Bone is a multifunctional and metabolically very active tissue that suffers a continuous process of renovation and remodelling.

Non-collagenous proteins (NCP) contribute to a variety of functions in bone, such as stabilization of bone matrix, calcification and other metabolism regulatory activities. Some of them are plasma proteins that were produced by the mineral matrix and others are bone specific proteins which are synthesized by bone cells.

Osteocalcin is one of the most abundant NCP that results from the connection of 49 amino acids. It is synthesized by osteoblasts, odontoblasts and hypertrophied chondrocytes during bone formation. It contains three residues of gamma-carboxyglutamic acid which gives the peculiarity to connect to calcium. This connection is dependent on the presence of vitamin K (cofactor responsible for the functionality of osteocalcin). The protein becomes essential mineralization and on homeostasis of Ca in our organism.

A large part of osteocalcin is found in matrix bone and dentin. However, about 20% of that produced passes into the bloodstream and acts on the pancreatic beta cells and fat tissue, improving the body's ability to regulate sugar and maintain the low amount of fat.

From the analysis of blood levels of osteocalcin pathologies can be identified such as osteoperose, hyper or hypoparathyroidism, acromegaly, and Paget's disease.

In short, osteocalcin and bone metabolism are connected to a series of endocrine functions, such as metabolism of glucose, male fertility, muscle physiological functions and pathological activity.

TITLE: **MUSCLE ADAPTATIONS TO PHYSICAL EXERCISE**

AUTHORS: Andreia Mateus; Isabel Joaquim; Mariana Jegundo; Patrícia Sousa; Renira Rodrigues

Intense physical exercise is the most stressful condition that body encounters, but the human body has adaptations to the increased body metabolism doesn't put their lives at risk. Adaptation of skeletal muscle to physical effort is based on changes in metabolic activity, they tend to revert to baseline after a period of inactivity.

There are two types of muscle contractions: isotonic contraction and isometric contraction. The isotonic contraction refers to a contraction in that muscle shortens while exerting a constant force. The isometric contraction refers to a contraction in that the external length of the muscle remains unchanged. In the body, most contractions are a combination of both contractions.Are considered to be acute muscle adaptation to exercise those which occur during the performance, such as increased heart rate and blood pressure mediated by the sympathetic nervous system. The chronic muscular adaptations has aimed at repairing the body after an physical aggression, chemical and metabolic, occurring at the level of muscles involved in the exercise as systems that sustain them over the long term due to regular training.

Under the exercise, we highlight the aerobic activities, which promote functional improvements of slow twitch muscle fibers; and anaerobic, having increments of strength, power and occurrence of muscular hypertrophy main representatives.

It appears that the type of nutrient used by most of the musculoskeletal (carbohydrates) to obtain the total energy required depends on several factors, especially the intensity and duration of exercise, and the morphological characteristics and muscle fiber composition.

TITLE: ELECTROCARDIOGRAM

AUTHORS: Antunes, I., Fernandes, E., Lobo, M., Pereira, S., Silva M.

The electrocardiogram is a medical examination for the diagnosis of heart disease, where it records the variation of the electrical potential caused by the electrical activity of the heart.
These electrical potentials are recorded by the electrocardiograph, created by Willem Einthoven in 1912.
The P wave is the atrial depolarization, ie it represents the moment at which the contraction of the atrium occurs. The QRS complex represents ventricular depolarization, marking the beginning of the ventricular contraction. The T wave represents ventricular repolarization, which happens at the end of the period of ejection of blood, and the wave of atrial repolarization is not seen in the normal ECG because it occurs during the QRS complex.
The electrocardiogram has twelve derivations grouped into three groups : bipolar derivations of the members (I , II , III) , unipolar derivations members (aVR , aVL , aVF) and also the pre - cordial leads (V1 , V2 , V3 , V4 , V5 , V6).
It is used in the identification of rhythm disturbance, impaired driving and electrolyte imbalance, in obtaining information about heart cavities and the position of the heart, in the diagnosis of Acute Myocardial Infarction, ischemia and pericarditis, atrial and ventricular overload, among others and also in the surveillance of drug effects, forms of QRS, PR interval and ST segment.

TITLE: PULMONARY HYPERTENSION

AUTHORS: ANDREIA MENDES; HELDER BENTA; INÊS PRIMO; JOÃO FONSECA; JOÃO SIMÕES; IVO ALMEIDA;

Pulmonary hypertension is an abnormal elevation of the pulmonary artery pressure caused by fibrosis of the blood vessels, result from its constriction.

The right ventricle responds to an increase in the pulmonary vascular resistance via increased right ventricular systolic pressure to preserve the cardiac output.

In terms of blood pressure, there is a big difference in an individual with the disease compared to a healthy individual.

While in healthy subjects the mean pulmonary artery pressure (MPAP) is 12 to 16 mmHg, in patients with pulmonary hypertension MPAP is higher than 25 mmHg at rest or 30 mmHg in an effort situation

This pathology can be considered primary (idiopathic) when you cannot find a cause for the disorder. It may be due to a mutation in the BMPR2 gene (transformers factors beta receptors), which is involved in the regulation of cell proliferation and apoptosis requiring the aid of an intracellular cofactor.

The decreased expression of the receptor and its cofactor leads to the development of pulmonary hypertension, or secondary when it results from other pathologies.

Extrinsic factors may trigger the development of this pathology such as drug use and medicines.

The symptoms associated with this disease are dyspnea on exertion (which is the most common symptom), fatigue, angina, syncope, peripheral edema and cyanosis.

Several tests are carried out in order to diagnose this disease, such as x-ray, electocardiograma (ECG), echocardiography, among others.

TITLE: MECHANISMS OF ANGIOGENESIS

AUTHORS: Ferreira. C., Martins. R., Oliveira. M., Preto. M., Sá. R.

The growth and differentiation of blood vessels are organic responses that occur by two mechanisms: angiogenesis and vasculogenesis.

Angiogenesis is the development of new blood vessels from pre-existing blood vessels that normally occur during growth and development but also during wound healing, in response to ovulation and, after menstruation, in the endometrium. This physiological process takes place in four stages: breaking through of the basal lamina that envelopes existing blood vessels, migration of endothelial cells towards a source signal, proliferation of endothelial cells and formation of new blood vessels. In order to control this complex system there are some factors that can induce some of the stages. Among the most important factors are angiopoietins and VEGF.

Vasculogenesis happens when new blood vessels are formed where there are no pre-existing blood vessels. This process occurs mainly during embryonic development, from endothelial precursor cells and hematopoietic cells that come from the exact same cell – angioblasts.

Tumor growth is significantly affected by the proliferation of vessels. In this case, there is an uncontrolled multiplication of cells and more oxygen is needed, which can lead to a hypoxia. As a result, segregation of VEGF will occur and consequently the growth of the vessels, which will also contribute to the growth of the tumor.

Due to the importance of this cardiovascular process, when the angiogenesis process goes awry this can result in angiogenic diseases, including, rheumatoid arthritis and cancer when in excess, and cardiac diseases and ulcers with insufficiency.

TITLE: IMPACT OF COMPUTATIONAL METHODOLOGIES ON ERRORS REPORTED IN PEDIATRICS

Pestana, A.; Silva, D.; Pereira, R.; Cruz, R.[1]

[1] Organization, Management and Quality In Pharmacy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal

Introduction: Recent data suggest that the errors in medicine are frequent and result in substantial damage. These errors are three times more common in children than in adults.

Objective: Analyze the impact and reporting medication errors and evaluate the security unit in pediatrics, as well as the implementation of computational methodologies to prevent these errors.

Material and methods: Bibliographic review of online search in the google scholar and pubmed data through the following keywords: medication errors, informatics and pediatric.

Results: Analysis of obtained articles that of the 1010 medication errors reviewed, 298 (30%) were prescribing errors, 245 (24%) were dispensing errors, 410 (41%) were administration errors, and 57 (6%) involved medication administration records (MAR). The most common medications were anti-infectives (17%), pain/sedative agents (15%), nutritional agents (11%), gastrointestinal agents (8%), and cardiovascular agents (7%). In the pre-intervention were reported 13 medication errors of 17 124 and in the post-intervention were reported 42 of 11,801 errors. Thus concluding that medication errors reported increased from 4.6 to 7.6.

Conclusion: The increased use of appropriate technology in health care, resulting in a substantial improvement in patient safety. This system has motivated health workers to report errors, so there is an increase in medication errors reported in the post-intervention period. However, further studies are needed for children, in order to make the distribution and administration of safer drugs.

TITLE: PATIENT SAFETY & MEDICATION ERRORS: WHAT CHANGED?

Almeida, C.; Ferreira, E.; Guerreiro, J.; Loureiro, P.; Cruz, R. [1]

[1]Organization, Management and Quality In Pharmacy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal

Background: Medication errors are the principal cause of ADRs (adverse drug reactions). Due to its high incidence, prevention is crucial for the proper functioning of the health systems and proper medication management. Stand out in a hospital setting, the errors related to prescribing, dispensing and administration.

Objective: The goal is to explore the rules of JCAHO, analyzing their implementation, and checking their impact.

Methods: The methodology was based on a research Google Scholar and PubMed, for articles related to medication errors with the keywords: medication management, medication errors and patient safety.

Discussion: The Institute of Medicine of the United States published in 1999, the study "To Err Is Human" demonstrating that more than 98 000 people in the country die annually as a result of medical errors. . The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has created a series of guidelines to minimize the errors associated to the management of medication in priority areas in a hospital setting like in emergency medication, dispensing in outpatients and review of prescriptions by qualified professionals.

Conclusion: With this review we conclude that there was a decrease in medication errors, after application of the standards set by JCAHO. However it is still a recurring reality that requires proper management of institutions, users and health professionals, to comply with the guidelines implemented.

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TITLE: DRUG CONTROL IN HOSPITAL PHARMACY, WE CAN ASSURE THIS?

Figueiredo, Andreia[1]; Santos, Diana[1]; Coelho, João[1]; Cruz, Rui [2]

[1] Organization, Management and Quality in Pharmacy Course Students

[2] Organization, Management and Quality in Pharmacy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal

Introduction: The drug control is a very important area and with a big impact in all the hospital pharmacy tasks. This impact is more visible in storage and distribution levels on the different hospital sectors.

The hospital pharmacy respect a large law regulation and standard governing guidelines to assure the patient safety when the medication arrives him. This requires a safety human resources with specifically skills and able to realize the drug control, like the pharmacy technician and pharmaceuticals.

Objective: Summarize the drug control in all levels at the hospital environment.

Material and methods: A literature research was conducted in Pubmed database to identify English-language articles reporting the drug distribution and control in hospital well as the importance of the guidelines in preparing drug control procedures for all medication related activities, with keywords: *drug distribution, control, system and hospital pharmacy.*

Results: In this review we observed that the work of pharmacists and pharmacy technician is very important in the drugs distribution system in hospital to guarantee their effectiveness. Descentralized Automated Dispensing Devices (ADDs) have an overall impact in medication errors and drug distribution system.

Conclusion: Pharmacists and pharmacy technician have a fundamental role in the drug control at the hospital. However is also important that all professionals involved in the medication system are conscious of the importance of the rules of procedures for the preparation, control and distribution of medications in hospital.

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TITLE: HOW THE COMMUNICATION GAPS AFFECTS THE SAFETY OF PATIENTS?

Ferreira, A.; Matias, B.; Silvestre, C.; Cruz, R. [1]

[1] Organization, Management and Quality In Pharmacy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal

Background: The European Statements of Hospital Pharmacy of the European Association of Hospital Pharmacists (EAHP) were established to express objectives which every European health system should aim for in the delivery of hospital pharmacy services. All the statements were made to improve the safety of patients.

Communication is the base for the good service of the Hospital Pharmacy. Clinical specific language to patients, illegible prescription by doctors, dispensing errors and adverse drug reactions could lead to the bad adherence by patient. Nonadherence to medication is a leading cause of preventable morbidity and mortality worldwide.

Objectives: In this article we will analyze the statements of hospital pharmacy in handling with these health problems resolving the existing issues referred above.

Methods: Review papers and articles related with the statements of hospital pharmacy, more specific in pubmed online in the last five years, with the keywords: *statements of hospital pharmacy*.

Results: After analyze some prescriptions and also observing clinicians and patients participants who were newly diagnosed with depression and prescribed an antidepressant medication we encountered severe problems. In this area, the prevalence of health problems associated with communication is still high.

Discussion/Conclusion: The formulation of new rules of prescription (computerized prescription) and the establish empathy between the patient and the hospital pharmacy technician and the others health professionals are the essential statements for good adherence to treatment and reduce adverse drug reactions.

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TITLE: USE OF PLACEBOS: THEIR COMPLEXITY AND THE NEED FOR ITS DEBUNKING

Costa, Cátia; Louro, Joana; Diogo, Miguel; Saraiva, Vera; Cruz, Rui [1]

[1] Organization, Management and Quality in Pharmacy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal

Introduction: The use of placebos has been, over time, to generate some conflicts with regard to the dissemination of its composition which leads to the association of several unexpected effects in patient referring to a constant doubt between the benefit of its use rather than the adoption of another therapy. Placebos are used in clinical trials intervention to administer in order to match another intervention that would be, in this case, the therapy under study; these can be chemical or physical agents such as: surgery, exercise, acupuncture, among others.
Objective: This study aims to understand some dimensions of the use of placebo in particular, prior knowledge of the patient on the composition of the same and the possible unexpected effects arising from their constituents.
Methods: It was made a bibliographical research in online databases, including Pubmed and Scholar Google regarding the use of placebos, using the keywords: *placebo effect, clinical trials, composition of placebos.*
Results: With this literature review it was found that the chemical agents used should be physiologically inert, which is not always the case, thus influencing the response of patients and also the result of clinical trials.
Conclusion: It was noted that the knowledge on the part of the patient can influence the results of the study once the psychological issue is very involved. As all substances, placebos have benefits and risks, having arisen lately pros and cons about its use, so there is the need to reflect on its complexity.

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TITLE: THE IMPACT OF ELECTRONIC PRESCRIBING ON MEDICATION ERRORS

A.David[1]; B. Laetitia[1]; C.Mariana[1]; C.Rui[2]

[1] Organization, Management and Quality In Pharmacy Course Students

[2] Organization, Management and Quality In Pharmacy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal

Background: The impact of medication errors, the health of users, causes a lot of problems, bringing not only possible adverse reactions, but also stress, confusion and discontent by the patients. It is therefore essential to avoid such events.

Objective: The aim of our study is to reflect on the most common types of errors, causes and consequences of this type of errors and relates them with electronic prescriptions.

Material and Methods: In this review study, Pubmed database was searched for relevant English publications warning not only for prescription errors associated with this new method, but also the advantages that electronic prescriptions promoted, with keywords: *medication errors; prescription*.

Results: The previous systems to electronic prescription suffered some damage hence the implementation of this system, however this is not free from errors. Our work involves the identification of the causes associated with this system, like omitted information, unclear information, conflicting information and errors in clinical environment.

Conclusion: Systems only certified in electronic prescribing does not guarantee success. It's concluded that the number, type and severity of prescribing errors varied significantly according to the computerized prescription system that was used. Suggesting that systems with more advanced features, or those used by doctors with better training in computer science were better able to avoid error, and the implementation of a computerized prescribing system without comprehensive functionality and processes to ensure meaningful system use does not decrease medication errors.

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TITLE: THE EFFECT OF BARCODE TECHNOLOGY TO DECREASE ADMINISTRATION MEDICATION ERRORS

Carvalho, I.; Dias, J.; Luís, A.; Rodrigues, L.; Cruz, R.[1]

[1]Organization, Management and Quality In Pharmacy Course Coordinator

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Pharmacy, Coimbra, Portugal

BACKGROUND: Medication errors can be defined as any error that is produced during the process of drug administration, "is always an unintentional failure during a planned action".[1] Safe medication administration is necessary to ensure quality healthcare and the patient. Barcode medication administration systems were developed to reduce drug administration errors. [2]

METHODS: In this review study, Pubmed database was searched for relevant English publications on the effect of the barcode in the reduction of medication errors. We search this articles with keywords: *electronic medication-administration*; *bar code medication administration; patient safety.*

RESULTS: In hospital units that had bar-code verification technology, non-timing-related errors were 41.4% lower than in units without the technology. The units with bar-code verification systems also had a 27.3% fewer timing-related errors.[3] In the case of use of BCMA (bar code medication administration) results indicated that medication administration on non-IV drugs dropped from 7.0% to 4.3%, the incidence of patient identification not being checked before medication administration dropped from 82.6% to 18.9%, drug administration turnaround time decreased from 50 to 40 minutes.[3]

CONCLUSION: Use of the bar-code substantially reduced the rate of errors in order transcription and in medication administration as well as potential adverse drug events.[1] Characteristics of the work system were identified as potential precursors of errors and workarounds, such as interruptions, technology issues and patient characteristics. The use of these technologies improve medication and patient safety.[4]

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TITLE: AMBULATORY REGISTER OF THE ELECTROCARDIOGRAM - RESEARCH IN FIREFIGHTERS

Camille Martins, Joaquim Pereira, Jorge Conde

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Coimbra, Portugal

INTRODUCTION: Cardiovascular diseases are a constant presence nowadays, causing more and more mortality and morbidity. There are danger factors that are modifiable or non-modifiable. Anxiety is one of the factors that may increase the danger of cardiovascular diseases, studied, in this case, related to the firefighters activity.

GOAL: Evaluate if individuals exposed to high punctual levels of stress are more susceptible to rhythm alterations that may be danger factor for cardiac diseases.

METHODS: To develop this research, 16 firefighters were monitored during their urgency activities, through a continuous register of the electrocardiogram (holter), in order to collect their cardiac rhythm. Monitoring information was compiled in a database and then analysed.

RESULTS: The sample was composed by 11 firefighters, 9 men and 2 women from Bombeiros Voluntários de Mira, Coimbra and Soure, with an age media of 32,09 ± 15,27 varying between 18 and 61 years old, where only 1 took daily hypertension medication. The medium service time was of 12,18 ± 11,91 years, varying between 1 and 35 years. The medium coffee ingestion during the service period was 2,18 ± 1,47 coffees, varying between 0 and 5 coffees. The statistical significant data is included in the Standard deviation of the RR intervals.

CONCLUSIONS: The variability of the cardiac frequency changes according to the person's age, showing that younger individuals presents more anxiety when compared to older ones, having, however, a better adaptation to that anxiety.

TITLE: AMBULATORY BLOOD PRESSURE MONITORING IN HIGH SCHOOL TEACHERS

Rimoni Souza; Joaquim Pereira; Jorge Conde

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Coimbra, Portugal

Introduction: Hypertension (HT) is an important risk factor for cardiovascular disease, which can suffer alterations resulting of lifestyle and working conditions of individuals.
It has been verified in some workers, variations in blood pressure due to professional features and stress faced at work.
Objectives: Evaluate, in working individuals, the influence of working conditions (stress and risk factors) and mild physical exercise on blood pressure.
Methods: The sample consisted of 19 subjects aged between 28 and 59 years, of which 15 were female (78.9%) and 4 males (21.1%) who practiced their professional activity during the period of data collection. A considerable percentage shows overweight (38.9%), and a small percentage (16.7%), history of hypertension. Some of the individuals were practitioners of physical exercise (31.6%) and a small percentage had smoking habits (26.3%).
Results: During the class period, there was an average increase of 2.44 mmHg in systolic blood pressure (SBP) and an average increase of 4.37 mmHg in diastolic blood pressure (DBP), by considering the sample included in this study, DBP undergoes a greater change when the individual is exposed to the stress of their profession.
Conclusions: There is a slight rise in systolic and diastolic blood pressure (mean) during the work period compared to the previous time.

TITLE: SYNCOPE UNEXPLAINED -STUDY PER TEST TILT

Suse Caeiro; Joaquim Pereira; Jorge Conde

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Coimbra, Portugal

Introduction: Syncope is a common reason to request medical help and going to the emergency which is a symptom that the etiology investigation is associated with variable prognosis and high healthcare costs. The *Tilt* test is a useful test in the diagnostic evaluation of syncope and is currently considered the gold standard for determining the etiology of syncope.
Objectives: Analyze the importance of *Tilt* testing in evaluating of syncope's etiology, watching your positivity index and its most common types of response.
Methods: Between November 2010 and December 2013 were retrospectively evaluated 151 patients with history of syncope or pre -syncope of unknown etiology , aged between 12 and 83 years referenced for performing *Tilt* test in Centro Hospitalar e Universitário de Coimbra – Hospital da Universidade de Coimbra (CHUC-HUC), specifically in Pacing and Electrophysiology department.
Results: Of 151 patients subjected to tilt testing 76.2 % (115 individuals) reported at least one syncopal episode and 23.8 % (36 individuals) mentioned pre -syncope . The median age was 42 (±20,738) years and 60.9 % (92 individuals) were female . Of the total patients 47.7 % (72 patients) had a negative response . There was a predominance of pharmacological protocol, the conclusion is positive or negative . The females showed a higher incidence of positive responses , with predominant vasodepressor response .
Conclusions: Syncope is a communication and symptom varied etiology. The test allows Tilt realize the etiology of syncope. The vasodepressor response is the most common type of syncope, occurring in all age groups.
Key-words: syncope, *Tilt* test

TITLE: CORONARY ARTERY DISEASE IN WOMEN TREADMILL EXERCISE TEST AND CORONARIGRAPHY STUDY

Joana Silva; Joaquim Pereira; Jorge Conde

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Coimbra, Portugal

Introduction: The treadmill exercise test is a reference test for the diagnosis of coronary artery disease, however, the application of this test in women revealed a large false positive number and this may be due to the fact that women have several factors that influence the electric outcome of the test.

Objectives: The aim of this study is to examine the predictive value of exercise stress test in the female population when analysed other variables obtained from the clinical history of the patient.

Methods: The study group consists of 34 women who underwent coronary angiography in the catheterization laboratory of the University Hospital of Coimbra, who had positive exercise treadmill test without other known cardiac disease, this information was gathered through requests for angiography.

Results: Only 14 women in the study had CAD presenting a PPV of 42%. Some variables of the clinical history of the patient to increase this value were included. Age was the variable that showed the best results, with a significant rise in the VPP, with values of 0% for the group with less than 49 years age, rising to 18% and 45% for the groups aged 50-59 and 60 -69, respectively, reached 78% for the group aged over 70 years ($p = 0.033$). The presence of angina and risk factors did not show significant changes in the PPV.

Conclusions: Exercise treadmill test is a non-invasive, low cost and low risk test that should continue to be used for the diagnosis of coronary artery disease in women, since they must be properly laminated to improve the results and make a more reliable diagnosis possible.

TITLE: THE HOLTER EVENTS IN DIAGNOSING SYMPTOMS

Diana Cristo; Joaquim Pereira; Jorge Conde

Polytechnic Institute of Coimbra, ESTeSC-Coimbra Health School, Coimbra, Portugal

Introduction: The Event Monitor is a system developed for long term electrocardiographic monitorization which picks up changes in heart rate whenever symptomatic events occur. It is a fundamental tool in diagnosing non frequent paroxysmal arrhythmias.
Objective: To assess the efficacy of the symptomatic Event Monitor in terms of symptom clarification.
Methods: 44 patients were studied for this purpose, some of them having already used the 24 hour Holter Monitor. Monitorization took place during a 15 day period, and recordings took place 15 minutes before and after event detection or patient activation. Whenever symptoms occurred, the patient would activate the event switch, which, in turn, registered and recorded the subsequent ECG.
Results: The most frequent of symptoms that led to this exam were: heart palpitations (47.7%), syncope (27.3%), lightheadedness (15.9%) and lipothymia (9.1%). 65.9% of patients displayed and registered symptoms, 65.5% of them associated to electrocardiographic changes: supraventricular extrasystoles (10.3%), sinus tachycardia (20.7%), supraventricular tachycardia (13.9%), ventricular extrasystoles (10.3%) and auricular fibrillation (10.3%). The Event Monitor automatically registered events in 25% asymptomatic patients.
Conclusion: The Event Monitor is an effective way to clarify sporadic symptoms.

TITLE: THE PINEAL GLAND AND ITS INFLUENCE IN HUMAN LIFE

Authors: Ana Lírio | Angélico Veiga | Cristina Leal | Ilaria Conti | Joana Inácio | Rita Nogueira

The Pineal Gland, or epiphysis, is a small endocrine gland whose shape resembles a tiny pine cone (hence its name), located at the posterior extremity of the 3rd ventricle of the brain.
In humans, it morphologically consists of a lobular parenchyma of pinealocytes surrounded by connective tissue spaces. There are also four other cell types have been identified: interstitial cells, perivascular phagocyte, pineal neurons and peptidergic neuron-like cells.
In the past, it was considered a vestigial organ and called the "principal seat of the soul" for some philosophers and oriental peoples. They believed it to be the point of connection between the intellect and the body.
Nowadays, it is known that the pineal gland is an interactive gland, whose main function is to produce melatonin, a hormone that regulates daily body rhythms, directly with the day and night cycles. The gland is activated by serotonin that is produced when the brain is asleep.
The circadian rhythm it's deeply connected to the behavior of the endocrine system. The low melatonin secretion is associated to the appearing of diabetes type II, although its suppression may generate a wide variety of cancers, namely the breast cancer and colorectal cancer.
In nutritional terms, there are several studies that show the substantial role of the Pineal Gland to regulate the carbohydrate homeostasis. There are also experiments showing that melatonin enhances immune function because of specific binding sites for melatonin on immune cells.

Keywords: Pineal Gland, Vestigial organ, Melatonin, Circadian System, Cancer, Carbohydrate metabolism, Immune System.

TITLE: ENDOCANNABINOID SYSTEM

AUTHORS: Carolina Reis, Inês Breda, Joana Tomás, Patrícia Eusébio, Sara Pereira

For many years Cannabis sativa has been known to stimulate appetite especially for sweet and palatable food and these effects have prompted research into its mechanisms of action.

The endocannabinoid system is made of two cannabinoid receptors (CB1 and CB2) and its endogenous bindings (anandamide and arachidonoylglycerol 2 AG). The receptors CB1 are the type of receptors liked to the G protein, more abundant in the nervous central system (NCS), and they are implicated in the metabolic and neuroendocrine effects of the endocannabinoid system, while the CB2 receptors are almost exclusively present in the immune system cells.

The endocannabinoids and the proteins engaged in its synthesis and inactivation are also present in the constitution of this system.

The endocannabinoid system is involved in several physiological processes such as the modulation of all the endocrine axes mediated by the hypothalamus, the modulation in the nociception, regulation of the motor activity, the control of cognitive processes, the modulation of the inflammatory and immunological response, the anti-proliferative action in tumoral cells, the control of the cardiovascular system, among others.

Besides this, it is also involved in the modulation of the appetite, food ingestion and energetic balance, mesolimbic circuits and peripheral organs.

In what concerns the hypothalamus, the CB1 receptors release mediators that induce appetite, after periods of food deprivation, whereas in the mesolimbic system it reinforces motivation to consume foods with a high hedonic value.

In conclusion, the endocannabinoid system is an essential component in the regulation of eating behaviors.

TITLE: VITAMIN A

AUTHORS: Francisca Marques; Mariana Afonso; Laura Santos; Joana Pereira; Carlota Santos; Beatriz Sargaço

In general, vitamins are organic compounds essential for the normal functioning of our metabolism. These exist in enormous variety, possessing distinct functions individually.

We will analyse in detail vitamin A. It is a fat soluble vitamin which can be found from two sources: animal foods and vegetable origin.

Thus, in animal foods, such as cheese, butter and eggs, this vitamin can be found in the form of retinoids (oxidized form of vitamin A that regulates its growth development and functions).

In plant foods such as arugula, avocado and mango, the nutrient is in the form of carotenoids (pigments) which includes beta-carotene, a natural antioxidant carotenoid pigment and one of the ways of achieving indirectly vitamin A.

This food constituent plays different roles in the body. We can highlight the intervention in vision (corneal protection), ensuring the functional capacity of the reproductive organs, the proper development of the fetus, the role in cell proliferation and differentiation, but also participating in dermatological procedures.

However, this vitamin can cause problems when ingested in excess (hypervitaminosis), including increased cranial pressure, fatigue, nausea, loss of appetite, peeling skin, hair and atherosclerosis. However, its lack also has repercussions such as sight problems (night blindness), kidney stones, defective development and modeling of bones.

In conclusion, vitamin A is essential for the health of an individual, but requires care when ingested, always taking into account the recommended daily doses, depending on each age group.

TITLE: VITAMIN D AND CALCIUM – CALCITONIN AND PTH

AUTHORS: Ana Carolina Nunes, Diana Petronilho, Jéssica Ramos, Liliana Pereira, Sara Carvalhido

Vitamin D is a general name given to a group of soluble compounds that are essential for maintaining the mineral balance in our bodies.

This vitamin acts as a hormone, stimulating calcium uptake and phosphates in the intestine, promoting its release from the bone and reducing the loss of calcium in the kidneys. Thus, there is an increased level of calcium and phosphate in blood. This vitamin may be obtained by skin exposure to ultraviolet radiation, but can also be swallowed and absorbed in the digestive tract by certain foods.

Calcium is a mineral that is a source of maintenance of the organism cells and is responsible for providing resilience and strength to bones, among other characteristics.

The calcium metabolism is regulated by vitamin D by PTH (parathyroid hormone) and calcitonin (CT).

PTH and calcitonin are important hormones for the regulation of blood calcium levels. PTH is secreted from the parathyroid glands and calcitonin is produced in the thyroid C cells. The latter hormone acts by decreasing the concentration of calcium in the blood, while PTH acts to increase it.

The aim of this study is to identify further the relationship between the concepts mentioned.

TITLE: VITAMIN C – IMPLICATIONS FOR THE PRODUCTION OF COLLAGEN

AUTHORS: Figueiredo, Alexandra; Silva, Diana; Moreira, Márcia; Moreira, Patrícia; Nunes, Rita; Sá, Sara

Vitamin C or ascorbic acid (AA) is a water soluble vitamin and thermolabile. Humans are the only mammals unable to synthesize AA. This vitamin is found in nature in two ways: reduced or oxidized. Both are equally active, but the oxidized form is much less widespread in natural substances.

The role of AA in metabolism of connective tissue is being recognized since a long time, especially when scurvy started to be prevented with citrus juice. Then the acid was seen as essential cofactor in the hydroxylation of proline and lysine, amino acids necessary for structure and function of collagen. This one is essential for the formation of collagen fibers existing in almost all tissues of the human body (dermis, cartilage and bones). In addition to acting as an important cofactor for the enzymes mentioned before, it has also been demonstrated that vitamin C also regulates the synthesis of collagen type I and III, thru human dermal fibroblasts. Although the proliferative capacity and collagen synthesis are age-dependent AA is able to stimulate cell proliferation and also collagen synthesis, regardless of the patient age. Thus, since AA is able to overcome the decreased proliferation of dermal fibroblasts in aged skin and at the same time inducing the synthesis of collagen types I and III, it should demonstrate advantageous and beneficial in the healing process.

Possessing so many qualities and benefits, without any doubt, vitamin C deserves to be investigated in all its implications.

TITLE: PHYSIOLOGY OF OSTEOBLASTS AND OSTEOCLASTS – BONE DEPOSITION AND ABSORPTION

AUTHORS: Carolina Lucas, Cristina Santos, Daniela Couto, Inês Silva e Sara Leal

Bone is a living tissue constantly renewing itself as it is capable to adapt its geometry and internal structure in response to mechanical and physiological demands. Bone adaptation consists of reabsorption of old bone and formation of new one, called bone remodeling. The goal of this process is to prevent the accumulation of micro damage to minimize the possibility of bone fracture and keep mineral homeostasis of bone. This homeostasis depends directly on the dynamic balance between the activities of the osteoblasts, bone forming cells, and osteoclasts, bone resorbing cells. Elongated cell processes from osteoblasts connect to cell processes of other osteoblasts through gap junctions. The osteoblasts then form an extracellular bony matrix that surrounds the cells and their processes. Osteoclasts break down bone best when they are in direct contact with mineralized bone matrix. They assist in the resorption of bone by osteoclasts by producing enzymes that break down the thin layer of unmineralized organic matrix normally covering bone. Removal of this layer by osteoblasts enables the osteoclasts to come into contact with the mineralized bone.

The RANKL/RANK system plays a pivotal role in bone remodeling by regulating osteoclast formation and activity.RANKL (ligand) is secreted by osteoblasts and binds to the RANK receptor on osteoclast precursor and mature osteoclast cells.

Therefore, it´s important to keep a healthy skeletal system in order to have a better life.

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TITLE: ENDOTHELIAL DYSFUNCTION IN AGING AND ATHEROSCLEROSIS

AUTHORS: Ana Silva, Carla Pinheiro, Carolina Dias, Cláudia Mendes, Cláudia Teixeira

Atherosclerosis affects the tunica intima of the artery and it's associated with coronary artery diseases. Endothelial Dysfunction is the imbalance of substances, produced by the Endothelium, which are responsible for dilating and constricting blood vessels.

The causes of Endothelial Dysfunctions appear to be the reduction of nitric oxide synthesis, due to the action of endogenous inhibitors, and its unavailability. This is also responsible for the appearance of Atherosclerosis. And since there isn't enough nitric oxide to oppose the elevated concentrations of endothelin, it wages the constriction of blood vessels and proliferation of vascular smooth muscle cells.

The most known symptoms for Atherosclerosis include pain or discomfort on the chest, fatigue and lack of breath after physical activities. The symptoms also vary depending on the organ affected by the artery obstruction. However, Endothelial Dysfunction is thought to be a key in the development of Atherosclerosis. Ischemic cardiomyopathy also seems to be a reliable marker of Atherosclerosis.

Depending on the symptoms and severity of Atherosclerosis, the doctor may prescribe surgical procedures involving the removal of fat deposits in the arteries' walls, cardiac catheterization, physical activity and certain medication such as angiotensin-converting enzyme inhibitors, aspirin, diuretics, nitrates, and statins channels blockers. When it comes to Endothelial Dysfunction, the treatment is based on the ingestion of Arginine, animal protein, nuts, vitamin K2 and D.

The most important prevention measures, to both Atherosclerosis and Endothelial Dysfunction, include frequent physical activity, a diet based on unsaturated fat and with low cholesterol content and smoke cessation.

TITLE: OXIDATIVE STRESS AND ANTIOXIDANTS

AUTHORS: Ana Carolina Ribeiro | Ana Rita Almeida | Ayline Fortes | Carla Batista | Délfia Lopes

Oxygen free radicals are produced in a natural way and as a consequence of the act of breathing and energy production. These radicals are very reactive molecules that in small quantities are important to the organism but in bigger proportions may have negative consequences for human health.

Antioxidants may be ingested during meals or produced by the organism, and have the function of neutralizing free radicals.

From the relationship between free radical production and the quantity of antioxidants, emerges the concept of oxidative stress. Lots of free radicals, few antioxidants or both, stimulate an increase in oxidative stress. This can be caused by: genetics and age, pollution, smoking, over or lack of exercise and a diet poor in antioxidants.

Uncontrolled oxidative stress leads to oxidation and damage of cellular lipids, proteins and DNA, making it impossible to work in a normal way. Over time, it causes organ damage and leads to several diseases, such as diabetes, cancers, asthma, etc. It is also related to aging in a way that causes loss of skin elasticity (wrinkles).

Oxidative stress also modifies the normal brain function, triggering a decrease in mental activity, earlier than expected. Which can cause conditions such as Alzheimer, depression, schizophrenia, anxiety, among others.

TITLE: PARKINSON'S DISEASE

AUTHORS: Ana Sofia Portásio | Bianca Pessoa | Damiana Chumbinho | Inês Silva | Rita Peixoto | Rui Duarte

The Parkinson´s Disease is a neurological disease that affects the motor system, in other words, people's body movements. It appears when the nerve cells located in a brain region, named *substantia nigra*, begin to degenerate.

Normally, these cells produce dopamine, a neurotransmitter that intervenes in the transmission of messages between the diverse brain areas that control the body movement. So, when the cells of the *substantia nigra* die, the dopamine levels decrease, which leads to less connection with another nerve cells and muscles, causing difficulties in the movements.

The path that commands the movements regulated by our mind comprises the pyramidal way. Alongside the pyramidal system there is an extrapyramidal system. The extrapyramidal structures establish a complex relationship between them and the pyramidal system. In Parkinson's disease the extrapyramidal ways are affected which leads to a decrease of the movements and finally to rigidity, whether during rest, whether during activity.

The more frequent symptoms are: tremors, rigidity in the facial muscles and in the articulations, decrease in the velocity of the body movements, stooped posture, lost of balance, excessive salivation, shuffling gait, bone weakness, depression, anxiety, sleeping changes, lost of memory, abnormal regulation of the body temperature and increased sweating.

Currently, there is no cure. However, the existing therapies control the symptoms and the changes in the board: drugs, as *levodopa* transforms himself into dopamine, reducing tremors and muscle rigidity; physiotherapy preserves muscle activity and articulations flexibility, while Occupation Therapy makes easier the daily life activities.

TITLE: ALZHEIMER'S DISEASE – CHOLINESTERASE INHIBITORS

AUTHORS: Inês Dias, Isa Penas, Marta Tavares e Rita Pereira

Alzheimer's disease is the most common neurodegenerative disorder associated with age. Its cognitive and neuropsychiatric manifestations result in progressive disability with the the main symptoms: loss of memory and reasoning. It affects approximately 10% of individuals older than 65 years and 40% after 80 years.

This disease is characterised by mass synaptic loss and neuronal death observed in brain regions responsible for cognitive functions including cerebral cortex, hippocampus, entorhinal cortex and striatum.

In the first stage, there are changes in memory, personality and spatial and visual abilities, then there is resistance to the execution of daily tasks and inability to plan them and execute them. In the advanced stage, the patient is usually bedridden, not talkative, feels pain when swallowing and is prone to infection.

Currently there is no specific test to identify Alzheimer's disease.

Patients with the disease have reduced levels of acetylcholine (a neurotransmitter important for memory), a way to control the problem is to prevent the degradation of the small amount of acetylcholine produced by using a cholinesterase inhibitor.

Cholinesterase inhibitors increase the concentration of acetylcholine, leading to an increase in communication between nerve cells, which in turn promote a temporary relief of symptoms of Alzheimer's. The effect of these drugs varies among people.

Experts recognize that the afore-mentioned drugs are not a cure. However, it is clear that these drugs improve the quality of life of some individuals with Alzheimer's disease.

TITLE: TYPES OF DRUGS, ITS EFFECTS AND WHERE THEY ACT IN OUR CENTRAL NERVOUS SYSTEM

AUTHORS: Alexandra Morais, Cátia Silva, João Santos, José Marote, Marta Pedro

The poster aims to generally transmit the types of drugs, the organization of our central nervous system and where and how these drugs act in the same system. We will present the classification of drugs according to Chalout, classifying them as addictive and splitting them in three big groups: the depressant, the stimulants and the disturbing of the central nervous system activity. We will still present in the poster very important definitions about drugs, such as drugs, psychoactive drugs, psychotropic drugs and drugs of abuse, and further about our central nervous system for example the concepts of nerve transmission, neuron, neurotransmitters and neuroreceptors. The main goal of this work is to be informative relative to the topics in study and that shows in a general perspective the damage that we can make to our organism by consuming these substances and answer questions and myths that might exist around this matter. To make this poster we resort to several scientific information coming from the book "*Adolescência e Drogas*" of the authors Ilana Pinsky and Marco António Bessa and from the information that was on the scientific paper published on 2001 in the IMESC magazine, publication nº3, entitled "*Drogas psicotrópicas - o que são e como agem*".

TITLE: RETINAL DEGENERATIVE DISEASES – VEGF INHIBITORS

AUTHORS: Bárbara Cruz; Bruna Pais; Catarina Lourenço; Karina Garcia; Mariana Couras; Marlene Silva

Retinal degenerative diseases affect a specific layer of delicate tissue that lines the inside back of de eye. The specific type of retinal degenerative diseases that most affect people is the Age-related Macular Degeneration. Macular degeneration is a disease associated with aging that gradually destroys sharp central vision that is needed for seeing objects clearly and for common daily tasks.

The most common symptoms are blurring of vision with particular difficulty discerning details, both up close and from a distance. People with Macular Degeneration may have blind spots, resulting in a dark or empty area in the centre of their field of vision. They may also notice distortions of lines and shapes and colour vision diminished. It may take some time for an individual to notice vision problems. Others do notice a sudden loss of vision.

In the macula, VEGF is produced in response to inflammation and lack of oxygen. The VEGF binds to the choroidal endothelial cells, which then proliferate and form choroidal neovascularization, the hallmark of wet macular degeneration.

Blocking the VEGF molecule is currently the most effective treatment against choroidal neovascularization. *Macugen*, *Lucentis*, *Eylea* and *Avastin* are the four VEGF-inhibitors currently approved for ocular use, in wide use for macular degeneration. All of these medications are injected into the eye in a painless treatment.

Although not able to reach healing, VEGF inhibitors, allow control the disease in order to improve the lives of the patients in that most of these keeps the vision.

TITLE: I*F* CURRENTS AND THEIR INHIBITORS

AUTHORS: Ana Margarida Silva, Inês Cortês, Mariana Mendes, Paula Martins, Paula Silva

The mechanisms that generate the spontaneous depolarization of the cellular membrane of cardiac cells, become important because is the spontaneous depolarization during stage IV of the action potential that allows cells to have the ability to determine the heart rate. This happens in cells of the sinus node or in cells of Purkinje fibers in the His bundle.

In this process we have a current dependent on ionic channels of sodium and potassium, that due to the fact that be enabled during the hyperpolarization of the cellular membrane acquired the expression of funny. So, it was known as If, I of current and f of funny. The intensity of current If increase due to the stimulation of beta receptors.

This current, unlike the others accelerate from -40mV to -50mV and reaches the maximum between -100mV to -110mV, being an input current of ions into the cell. Their activation happens slowly in membrane hyperpolarization (stage IV) and the speed of ionic flow increases the more negative is the membrane potential difference. The existence of this current implies the presence of passage channels for ions in the cellular membrane. The blockade of If channels changes the speed of spontaneous diastolic depolarization of the cellular membrane. Ivabradine is a specific blocker of channels-f, therefore, a selective inhibitor of pacemaker If, that has the ability to reduce the heart rate.

TITLE: ANGIOTENSIN Vs BRADYKININ

AUTHORS: Cidália Fidalgo, Andreia Acúrcio, Tânia Borges, Maria Lebre, Joana Leal

Bradykinin is a hormone from the kinin group and acts like a chemical mediator in the inflammatory response.

It's produced by the kallikreins enzyme and its degradation is caused by kinase. Acts like a vasodilator and makes the blood vessels to become permeable, in arteries for example.

It can be released by mass cells during asthma attacks or the intestine wall, acting like a gastrointestinal vasodilator.

Bradykinin possesses two receptors B1 and B2.

Angiotensin it's formed in the bloodstream by the action of the renin (enzyme secreted by the kidney) and acts like a vasoconstrictor mainly in the arteries and veins from the blood vessels, kidneys, heart and sympathetic nervous system. Angiotensin acts in the renin-angiotensin system which is a set of peptides, enzymes and receptors involved in the control of the extracellular fluid and arterial blood pressure.

It has several receptors from AT1 to AT4, among others. That way, the bradykinin and the angiotensin act on the blood vessels walls from several blood cells. However, one is a vasodilator and the other is a vasoconstrictor.

TITLE: HYPERTENSION - BETA BLOCKERS

AUTHORS: Cláudia Fernandes, Gonçalo Lima, Maria Brito, Tânia Lourenço, Telma Faria, Valentyna Fita

Blood pressure is the pressure exerted by the blood against the artery walls, which depends on the interaction between the heart and the blood vessels. When it reaches high levels (≥ 140mmHg), we are facing a situation of hypertension. This is a chronic disease in which the heart exerts an increased effort so that the blood can circulate.

At an early stage of the treatment, a diuretic and a beta-blocker, more specifically a beta-adrenergic blocker, should be given. As third generation of beta-blockers (which cause less side effects) for the treatment of hypertension, the use of Carvedilol and Nevivolol is emphasized.

Beta-blockers are a class of drugs that have the ability to block norepinephrine receptor beta (neurotransmitter).

Thus, treatment of hypertension by beta-blocker therapy is closely related to sympathetic autonomic nervous system.

When the neurons innervating the heart (the target organ) are stimulated by the sympathetic nervous system, there is a release of noradrenaline adrenergic receptor in the smooth muscle cells of the blood vessels. As a consequence, there is an excitatory factor of the cardiac muscle, the increase of speed of the conduction of electrical stimulation and contraction of the organ.

Having the effect of increased blood flow in the vessels, culminating in arterial hypertension. With the administration of the drug (beta blockers), it will connect to the existing beta-adrenergic receptor in target cells, thus preventing the binding of the neurotransmitter occurs, inhibiting the stimulatory effect. So, contributing to the stabilization of the heart rate and consequently the pathology.

Key words: Hypertension, Beta blockers, Blood pressure, Nervous system.

TITLE: Water Quality: Microbiological analysis

AUTHORS: Adriana Santos, Ana Sofia Ferreira, Erika Domingues, Joana Sousa, Mónica Casas Novas, Patrícia Costa, Telma Almeida, Vânia Gomes

Introdution: Water has many important functions in the human body and therefore your daily intake is crucial for proper functioning. Thus, it becomes important that the water quality is ensured and it is necessary to make regular evaluations to control that integrate physical, chemical and microbiological parameters.

Aim: In our study we were microbiologically evaluate a mineral water, in order to test their quality for the purpose it was intended.

Material and Methods: According to the Portuguese standards for mineral water, we were study quality indicators: total heterotrophic bacteria, coliforms, *Escherichia* coli, *Enterococcus sp., Pseudomonas sp.* and *Clostrium perfrigens* (spores). We evaluated their presence through the membrane filter technique on selective and differential media; except for heterotrophic *screnning*, the technique used presupposes incorporation into nutrient medium. For help the interpretation, we also made some phisico-chemical parameters using semi-quantitative tests: ammonium, oxygen, nitrates, chlorine, phosphates and nitrites.

Results/Discussion: Semi-quantitative tests presented: ammonium - 0mg/L, oxygen - 12 mg/L, nitrates 0mg/L, chlorine <0.25mg/L, phosphates 3mg/L and nitrite 0mg/L. These values indicate that organic matter exists and this can promote the bacterial development. Relatively to the microbiological parameters we found a greater number of heterotrophic bacteria growing at 22ºC and 37ºC and we obtained coliforms, *Enterococcus sp* and *Clostridium* positives in presumptive tests.

Conclusion: These data show that water doesn't have quality for the purposes for which it is intended. As *Clostridium* parameter was positive, the source of contamination is ancient or intermittent.

Key-words: Water quality and Microbiological parameters

TITLE: Effects of X-Radiation in P53 functions in Lung Cancer Cells Lines

AUTHORS: Jéssica Estrela[1] and Fernando Mendes[1]

1 – Biomedical Sciences Department ESTeSC- Coimbra Health School, Institute Polytechnic of Coimbra, Coimbra, Portugal.

Lung cancer (LC) is one of the most common causes of cancer death in the world and Portugal is considered the leading cause of death. LC can be divided into two histological types: small cell lung cancer and non-small cell lung cancer. The mutation of *TP53* is present in over 50% of existing malignant tumors featuring for interruption of their functions promoting defects in the checkpoints of the cell cycle, cell immortalization, genomic instability and inappropriate survival. Radiotherapy is a major therapeutic modalities for the treatment of cancer, and treatment using ionizing radiation beams with the aim to destroy tumor cells and prevent them from proliferating. The cells are successively irradiated at various doses. The viability and proliferation of cells will be analyzed using the exclusion of the dye trypan blue test which is based on the principle that living cells have intact cell membranes that exclude certain dyes, while dead cells do not. In this test, a cell suspension is mixed with the dye and then examined under a microscope. Also will use the reagent Alamar Blue, which is a non-fluorescent compound that produces a fluorescent product after reduction, e.g., by living cells, without leading to cell death thereof. The P53 protein is subsequently evaluated for phosphorylated and total fraction by Western blot method that is a transfer of proteins by electrophoresis from the support polyacrylamide gel to a nitrocellulose membrane.

TITLE: Qualitative Assessment of the Menu of Nursing Home Rainha Santa Isabel in Santa Casa da Misericórdia at Marco de Canaveses

AUTHORS: Ana Catarina Teixeira [(1)], Helena Loureiro [(2)], Ana Teresa Almeida [(3)]

(1) 4th year student of Bachelor in Dietetics and Nutrition, Coimbra Health School

(2) Guiding, Professor at Coimbra Health School

(3) Internship monitor, Nutritionist Responsible for the Service of Food and Nutrition in Santa Casa da Misericórdia at Marco de Canaveses

Introduction: The proportion of elderly is increasing. Aging causes changes compromising nutritional status, being a good nutrition essential in maintaining quality of life. In the menus of the host institutions for the elderly is prevalent, beyond the quantitative adequacy of nutrients, meeting the sensory aspects. To assess this adaptation it was developed the method of qualitative assessment of menus AQE.

Purpose: To evaluate qualitatively the menu of a Nursing Home.

Materials and methods: We randomly picked a cycle of menus and rated by AQE method. It was analyzed the occurrence of several criteria and calculated their relative frequency.

Results: The fish was present in 50% of the meals, the meat in 47.2% and the egg at 2.8%. From this cycle, 21.4% of the dishes were monochromatic and 15.7% repeated. The method of quilting meat, fish and egg was stewed in 65.7% of the meals. In 44.3% of the times was offered rice, potatoes 25.7% and 22.9% pasta. The vegetables accompanied the dish in 42.9% of the meals. The varied soup was always present. The dessert was seasonal fruit in 68.6% of the meals and sweetmeats at 18.5%.

Conclusions: The menu revealed monotonous accompaniment of cereal products, vegetables, quilting techniques and styles. Regarding the variety of consistencies, soups, desserts and turnover of dishes was satisfactory. There was a good alternation between meat and fish but not egg. The vegetables have proved insufficient and dessert demonstrated a high prevalence of sweets. The menu should be qualitatively improved.

TITLE: IS THE ACTIVE CYCLE OF BREATHING TECHNIQUE MORE EFFECTIVE THAN AUTOGENIC DRAINAGE FOR THE IMPROVEMENT OF FORCED VITAL CAPACITY AND FORCED EXPIRATORY VOLUME IN THE FIRST SECOND IN PEOPLE WHO SUFFER FROM RESPIRATORY DISEASES?

AUTHORS: Nuno Tavares [1], Patrícia Castanheira [2]

BASIS: The active cycle of breathing technique (ACBT) and autogenic drainage (AD) are two airway clearance techniques, developed by physiotherapists. The main aim is the cephalade clearance of secretions. The more air one can expire, the closer one gets of achieving that goal.
GOAL: Analysing the impact of ACBT and AD in the improvement of the forced vital capacity (FVC) and forced expiratory volume in the first second (FEV1) in people who suffer from respiratory diseases. S
OURCES OF INFORMATION: Researches in databases, such as *Pubmed*, *Cochrane*, *PEDro* and *ScienceDirect,* were done in November and December 2013.
QUALIFYING CRITERIA: Research was done based on meta-analysis, systematic reviews and randomized controlled trials, written in English and published in scientific magazines. In order to be validated, the article would have to have people who suffer from respiratory diseases as population; intervention and comparison should use ACBT and AD and the outcomes should be FVC and FEV1. RESULTS: After the application of criteria, three randomized controlled trials were taken into account in this literature review.
CONSTRAINTS: The scarcity of available articles, the existence of several experimental errors in those trials and generalizing the population taken into account in this review to all the individuals with a respiratory condition.
CONCLUSION: Both ACBT and AD improve, with no relevant statistical differences, FVC and FEV1 in people who suffer from respiratory diseases.

KEYWORDS: Active cycle of breathing, autogenic drainage, forced vital capacity, forced expiratory volume in the first second, respiratory physiotherapy.

[1] 4th year student graduating in Physiotherapy in Coimbra Health School

[2] Clinical instructor of Curriculum Unit Educação Clínica IV and physiotherapist in Unidade de Saúde de Coimbra – Fernão Mendes Pinto