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SÃO PAULO - BRAZIL

II International Clinical Engineering and Health Technology Management Congress

APPROVED PAPERS

Code: 57593

Modality: Apresentação Oral

Title: ANALYSIS OF THE CURRICULUM OF POSTGRADUATE COURSES IN CLINICAL ENGINEERING IN BRAZIL

Authors: Anderson;

Presenter: Anderson Alberto Ramos

Abstract: Suggested titles: ANALYSIS OF THE CURRICULUM OF POSTGRADUATE COURSES IN CLINICAL ENGINEERING IN BRAZIL Introduction: Few CEs in Brazil know about the creation of this profession and its beginning in the country. Although there have been more than two decades of ational courses in the area, there is no document with the estimate of EC courses in activity. Therefore, in this work, a summary of the trajectory of EC in the country will be presented, as well as the quantitative of courses and an evaluation of the disciplines that compose the curriculum. Objectives: The objective is to gather information on the opinion of the professionals who attended EC in Brazil and to make a comparison of the disciplines that make up the curricular curricula between the institutions. Methods: The method used was the development of a questionnaire using the Google Platform and dissemination of research in communication channels among CE professionals. A critical research and analysis of the data was also performed to identify the number and regions where clinical engineering courses are offered in Brazil. The study shows each step in details (9 steps) for Information gathering, critical analysis, tabulation and presentation of results. Results: 270 people answered the questionnaire, 18 CE courses were identified in the country, and the results of the comparison of the subjects of 8 curricula between institutions shows the heterogeneity of the disciplines of each program. The results showed that there is a heterogeneity of the disciplines between institutions, as well as a number of suggestions on contents that should be addressed in a deeper way.The maturation of the profession in the country is reflected in courses spread in several states in the national territory. It is worth mentioning that a new generation of EC is being developed. Importantly, as expected, in Brazil, professionals are not aware of how many EC courses are in activities. it is necessary to reflect on the need to increase the workload of disciplines of standards and regulatory affairs. The suggestions captured through the study, the professionals present contents of the practice of clinical engineering and management not addressed in the curricular matrix. Conclusion: The study shows that the effort of researchers and the formation of the first CEs with government support has reached a new generation. This evolution contributes to the society‘s recognition of the importance of EC in the Hospital. One should think about the future of the profession in Brazil, the viability of a national certification that serves as a seal of quality of the EC, there is a need to discuss the curriculum and basic training to be adopted by the institutions. In addition to training, there is a need for advances in relation to clarifications on the legal duties of the engineer in the hospital.

Code: 63599

Modality: Apresentação Oral

Title: CLINICAL ENGINEERING AND IMPACT ON THE FINANCIAL MANAGEMENT OF THE HOSPITAL

Code: 63871

Modality: Apresentação Oral

Title: Clinical Engineering in Ghana

Code: 63881

Modality: Apresentação Oral

Title: Clinical engineering outreach activities of Knowledge Transfer

Authors: Costica Uwitonze;

Presenter: Costica Uwitonze

Abstract: Abstract—In developing countries, the medical device management program is still a huge challenge. In sub-Saharan Africa, medical equipment service and repair due to shortage of skilled biomedical engineers/clinical engineers and technicians. And this has a serious negative impact on healthcare delivery to the population as well as the financial deficits Keywords: Medical equipment management, Clinical Engineering.

Code: 57561

Modality: Apresentação Oral

Title: IMPROVING HEALTHCARE TECHNOLOGY ASSESSMENT IN COLD CHAIN BY APPLYING CLINICAL AND INDUSTRIAL ENGINEERING

Authors: LUCIO FLAVIO DE MAGALHAES BRITO; DJALMA LUIZ; ANDRE ABLA MONTEIRO; RODRIGO; ISMAEL NUNES;

Presenter: LUCIO FLAVIO DE MAGALHAES BRITO LUCIO FLAVIO M BRITO

Abstract: This work presents a comparative study of performance between two vaccine chambers and shows how the manufacturer‘s quantitative engineering specifications can be worked out in conjunction with clinical engineers, making it easier and more objective to compare these products prior to their acquisition. It also contributes to the identification of products with superior technological quality, the costs involved and ways of justifying it technically. Vaccine chamber A uses the traditional refrigerant cycle with R 134 and vaccine chamber B uses inverter technology to control the rotation of the compressor motor using fluid R290. The equipments were submitted separately to a climatic chamber used as a calorimeter with 29.1 m3 internal volume. They were put to operation for 24 hours, with two different water loads and proportional to the number of shelves that each one has and to its internal volume. Thus, vaccine chamber A with four shelves and 0.278 m3 of internal volume used 12 bags of water and chamber B with seven shelves and 0.538 m3 of internal volume used 21 bags of water. Through a data acquisition system, it was possible to carry out the following measurements with 1 second sampling frequency: variation of the air temperatures inside the calorimeter and inside each water bag used as thermal load and of the air inside the vaccine chamber. Measurements were taken of the internal and external volume of the equipment and also of the following electrical characteristics: variation of the active power (W) and the energy consumption in kWh during 24 hours. At the time the central water pouch temperature of each vaccine chamber reached 8°C, we calculated the following values for a comparative evaluation: the amount of heat in joules per unit volume of the vaccine chamber (J/m3) rejected by the equipment for the air inside the calorimeter and the amount of heat in joules/ second per unit mass (W/kg) taken from the body of water inside the vaccine chamber. We also calculate the estimated amount in Reais (R$) that each equipment will impose in operational expenses on the health facility during one month of use. The results showed that the amount of heat rejected into the calorimeter per unit volume by the equipment B is 1.96 times lower than that released by the equipment A. This shows that the inverter technology used in the refrigeration cycle of the equipment B imposes less thermal load on existing HVAC systems in health facilities. In relation to the heat removal velocity of the water load inside each vaccine chamber, it was possible to verify that the B chamber used 1.54 times less watts per unit mass (W / kg) to bring the body of water in the inside it to a temperature of 8°C. Regarding the energy consumption in the 24 hours of the test, it was possible to calculate that the equipment B consumed 1.5 times less electric energy (kWh) than the equipment A and that the amount of energy spent per unit volume of the equipment B was 2.96 times smaller than equipment A.

Code: 57159

Modality: Apresentação Oral

Title: IMPROVING OPERATIONAL RELIABILITY IN MEDICAL WASHER DISINFECTOR WITH THE USE OF FMEA TOOL: A QUALITY IMPROVEMENT REPORT

Authors: Marcelo; Marinilda; Pedro; Karina;

Presenter: Marcelo Espinheira Cravo de Carvalho

Abstract: INTRODUTION: One of the causes of low productivity in health services is the lack of adequate organizational planning for equipment maintenance, which affects high failure rates and emergency repairs at inappropriate and often over-tolerable times. The use of tools and methodologies capable of guaranteeing the availability of systems and equipment, and which, above all, impact on the improvement of operational reliability has become fundamental for the correct maintenance management in the hospital environment. This study aimed to improve the operational reliability of a medical washer disinfector using Failure Mode Effect Analysis (FMEA) as a tool to improve quality. MATERIALS AND METHODS: It was addressed corrective maintenance actions occurring in the two-year period (February 2015 to March 2017), with the preventive maintenance plan implemented based on the recommendation of the equipment manufacturer. The application of the FMEA tool and the calculation of the Risk Priority Number (RPN) of each failure mode allowed the priority actions to guarantee more than 90% reliability for each component analyzed. RESULTS: After the application of the FMEA tool, the authors identified that most preventive maintenance procedures were in agreement with the calculated time in this paper. The study found some disagreements over the inspection period of the hoses and fittings and over the period of inspection and cleaning of the chamber‘s minimum temperature sensor. Currently the outsourced technical team performs these interventions monthly, however, the modification of the periodicity for weekly of these procedures guaranteed reliability greater than 90% for each component. The joint analysis of the failure occurrences of the medical washer disinfector and of the osmosis water supply system is fundamental to guarantee the predicted reliability, considering the number of occurrences observed related to the lack of water and consequent damage to the availability of the equipment. CONCLUSIONS: It is possible to affirm that the hospital maintenance team can use the FMEA tool to increase the reliability and availability of hospital equipment, optimizing the applied preventive maintenance plans.

Code: 57132

Modality: Apresentação Oral

Title: LAUNCH OF A NEW COLLABORATING CENTRE WITH WORLD HEALTH ORGANIZATION: WHO COLLABORATIVE CENTRE FOR RESEARCH AND TRAINING IN CLINICAL ENGINEERING AND HEALTH TECHNOLOGY MANAGEMENT

Authors: Corrado; CARLO; ILARIA; PAOLO;

Presenter: Corrado Gemma

Abstract: Introduction A Collaborating Centre (WHOCC) is a Department/Unit within an institution of excellence designated by World Health Organization Director-General to carry out activities in support of WHO mission and goals. Each WHOCC is specific for a research topic and collaborates with WHO in different activities, for example guidelines preparation, reports development, participation in researches headed by WHO. Worldwide there are more than 700 WHOCC in over 80 Member States working with WHO on areas such as nursing, occupational health, communicable diseases, nutrition, mental health, chronic diseases and health technologies. Objectives and methods One of the aims to create this WHOCC was the recognition of Clinical Engineer s figure and activities. It is the first time a Clinical Engineering Department within a hospital is designated as WHOCC. The pathway for the recognition of the WHOCC was quite long, starting in March 2016 and terminated a year later. This process started filling the Proposal Initiation Form supported by our WHO Responsible Officer, Mrs Adriana Velazquez Berumen. In the meanwhile the Administration Board of the Foundation approved the WHOCC activation request, allowing the Designation Form sending. The pathway continued through several steps inside WHO Headquarter till arriving to Italian Ministry of Health for the consultation to the Italian Government. After WHO Director General s approval, the designation as WHO Collaborative Centre for Research and Training in Clinical Engineering and Health Technology Management arrived on 21 March 2017. The activities carried out by the Centre will follow 3 Terms of Reference: To assess innovative medical technologies To support the dissemination of Clinical Engineer s/ health technology management topics in workshops, activities or documents as needed. To support the harmonization and development of technical specifications of medical devices for procurement purposes Furthermore, the WHOCC would create a network among all those Collaborating Centres involved in the field of Health Technology Management and Clinical Engineering. Conclusion The recognition of Clinical Engineering Dept. of IRCCS San Matteo Hospital Foundation as WHOCC will be a great opportunity for Clinical Engineering in Italy but also in Europe to show how Clinical Engineers activities impact on patients healthcare and safety. This Centre will support WHO for those activities relating medical devices and clinical engineering and will promote Clinical Engineer professional figure worldwide.

Code: 63875

Modality: Apresentação Oral

Title: Opportunities of the Mexican Biomedical Engineering Society to influence and adopt CE in Mexico

Authors: E. Vernet, H. Bravo, F. Aceves ;

Presenter: Elliot Vernet

Abstract: Abstract—The Mexican Biomedical Engineering Society (SOMIB) was founded in 1978 as a nonprofit civil society with professional, academic and scientific interests. Over its 40 years of existence SOMIB has aimed to provide a nurturing field for the Mexican biomedical community to share knowledge, experiences and visions about the profession. As the context changes, the society has to renovate the strategy to deal with the present and future challenges in Mexican health, and as a result, SOMIB has carried out various activities to penetrate into the sectors that mostly influence the national decision-making in health. The organization of the activities was made through the creation of six national technical committees that cover metrology, education, regulatory, innovation, scientific and clinical engineering fields. In this paper an introduction of the society is presented as well as the activities concerning the clinical aspect of each committee are described. It is clear that the clinical engineering has a definitive impact on the biomedical engineer development, this influence represents an opportunity to promote better practices with the highest levels of ethics and professionalism in order to consolidate this field within the health care system. Keywords—BME Society, committees

Code: 57552

Modality: Apresentação Oral

Title: THE ITALIAN CLINICAL ENGINEERS ASSOCIATION: A SUCCESS STORY

Authors: Stefano; Lorenzo; Umberto; Paolo;

Presenter: Stefano Bergamasco

Abstract: The Italian Clinical Engineers Association (Associazione Italiana Ingegneri Clinici, AIIC) was founded in 1993 with two main goals: - To spread and advance scientific, technical and organizational knowledge in Clinical Engineering - To represent the professional interests of Clinical Engineers and promote the establishment of clinical engineering services in health institutions for the governance of medical technologies From its beginning the association distinguished members in two groups: the clinical engineers that work as hospital employees (private or public) and those that work for service companies or as freelance consultants. No members from the manufacturers or other persons not yet working as clinical engineers were admitted. In order to better reflect the changes in the professional environment, in 2005 the association approved its new bylaws, opening the membership to engineers from the manufacturers (labeled as observing members), as well as to students (labeled as candidate members), and even non-engineers that share the purposes and principles of the association. AIIC is now evaluating further changes in its bylaws, to reflect the new challenges and opportunities of the evolving professional landscape in healthcare and health technology management. In addition to its governance bodies, for each italian region one or more delegates are appointed to coordinate the efforts and initiatives locally; moreover, several working groups have been created to address specific topics of interest. The association has grown a lot in the last decade and has now more than 1700 members from hospitals, service companies and universities covering the whole nation. A relevant effort of the association is dedicated to the development of international collaborations. AIIC is affiliated to the International Federation of Medical and Biological Engineering (IFMBE) with an active role in the Clinical Engineering Division (CED), and has regular relationships with other associations (e.g. the American College of Clinical Engineering ACCE, the Sociedad Española de Electromedicina e Ingeniería Clínica SEEIC, the Association Francaise des Ingénieurs Biomédicaux AFIB, and others) and institutions (a Memorandum of Understanding has been signed in 2013 with ECRI Institute and we contribute to several WHO initiatives). Since many important health technology management issues are common for all European countries, AIIC aims at creating a network of European clinical engineering societies, and has recently organized an international session, within the 2017 national congress, dedicated to a view of clinical engineering in the different European countries. AIIC organizes many workshops, training events and meetings during the year, and the main appointment is the national congress, that takes place each year in a different city and involves the whole clinical engineering community (more than 1000 registered participants attended this year in Genova), with a huge participation of the industry (more than 80 exhibitors were present this year), other scientific societies, representatives from local and national institutions (Ministry of health, regional government, etc.). The full presentation will illustrate the main activities carried out by the association, the key elements for its outstanding growth, the results and the challenges that have been faced during the years, as well as our future directions.

Code: 57444

Modality: Apresentação Oral

Title: WIRELESS BODY SENSOR NETWORK AND ECG ANDROID APPLICATION FOR EHEALTH

Authors: Abdelbaset;

Presenter: Abdelbaset Khalaf

Abstract: A wireless Body Sensor Network (WBSN) with ECG android monitor is presented that is capable of monitoring and displaying the ECG waveform and Heart Rate of an individual in real-time. The system uses the Wi-Fi 802.11 standard for wireless transmission of the data to an Android based mobile phone. The developed android smart-phone application displays the ECG information as well as the heart rate and the GPS data. The location is obtained using the GPS available on most smart-phones. The hardware component presented is small and modular to allow the system to fit on a wearable patch.

Code: 63866

Modality: Apresentação Oral

Title: Mutual recognition research of med imaging remote intelligent quality control tech

Authors: Liu Jingxin1, Lou Ziqiang1*, Zhao Guoqing1, Liu Liu1 and Li Ming2, Zhang Conghua3, and Zhang Jian4;

Presenter: Liu Jingxin

Abstract: Abstract: This paper studied the key techniques of the mutual recognition of imaging results in different regions and different levels of hospitals. In order to maintain the consistency of imaging results, the hospitals involved in the mutual recognition should ensure the quality control of imaging equipment, imaging techniques, imaging diagnosis and et al. Key words: Telemedicine, Medical imaging, Mutual recognition, Quality control, Image identification I. OBJECTIVES To solve the problems of the mutual recognition of medical imaging more accurately, efficiently and intelligently using innovative quality control technology and develop relevant standards. II. METHODS By using the phantom of the medical imaging quality control with innovative design, we designed corresponding software to achieve the intelligent identification and analysis of quality control image of imaging equipment. The accuracy of intelligent quality control technology can be verified by comparing the results with the quality control experts judgments. Developing relevant standards and specifications, then we researched on the quality control of remote intelligent and the mutual recognition of medical imaging results. III. RESULTS The recognition of quality controlled imaging were more accurate, objective and efficient by using the remote intelligent quality control technology of medical imaging. The key technical problems of the mutual recognition of medical image results were solved. It could be convenient for patients to get remote medical treatment and reduced radiation damage in patients using the Medical Imaging Cloud Service Platform based on image quality control and the mutual recognition. Medical staff were able to access the required image data and to communicate with the patient to realize the remote diagnosis at any time. This research supports the fact that the mutual recognition of medical images based on remote intelligent quality control technology is feasible. IV. CONCLUSIONS The application of the current can solve the problems of remote quality control of medical image. It reduced the expenditure of hospitals and health management agencies in the aspect of medical image quality control and other aspects. In addition, it not only achieved the computer aided supervision of medical quality, but to provide a great convenience for patients and medical staff as well.

Code: 57527

Modality: Apresentação Oral

Title: AN OBSERVATIONAL STUDY OF THE HIGH INCIDENCE OF FALSE AND NUISANCE ALARMS IN AN INTENSIVE CARE UNIT

Authors: Larissa; Gustavo;

Presenter: Gustavo de Castro Vivas

Abstract: The danger related to hospital alarm management has been on the list of the Top 10 hazards associated with hospital technologies, in the last three years, according to the ECRI Institute, a nonprofit organization that researches approaches for improving patient safety and quality of care. The alarm fatigue is singularized by the lack of response of the clinicians when they are exposed to an excessive number of alarms, by sensory overload, which can compromise the safety of the patient in intensive care. The present study aims to observe the frequency of the alarms of greater triggering in the Intensive Care Unit of a teaching hospital, at ' Hospital Universitário Cassiano Antonio Moraes (HUCAM), as well as to monitoring the time and the answer of the caregivers team during such alerts emitted by medical equipments. The method adopted a quantitative and qualitative analysis, during thirty-one nonconsecutive days, on six beds in the Intensive Care Unit. In the study, it was also analyzed the noise level in the surroundings, in order to observe if the cacophony of noise and competitors alarms could compromise the supply of reliable information to the clinicians. From the data obtained, it was evidenced that about 94% of the alerts were not responded, which exceeded the pre-established ten minutes response threshold time. Furthermore, it was also verified that the noise levels exceeded the acceptable threshold of 45dB, governed by the Brazilian Association of Technical Standards (locally known as ' ABNT), in 100% of the measurements, increasing the problem of alarm fatigue. Possible solutions for reducing the high incidence of false and nuisance alarms have been summarized, which include cultural and organizational changes, as well as training of the stakeholders in the adoption of policies to optimize the setting of alarm limits on the devices for monitoring inpatients.

Code: 57590

Modality: Apresentação Oral

Title: GEOCODING DENGUE CASES FOR SPATIAL ANALYSIS

Authors: Jorge; Delmira Ferreira; Luciana Cássia Araújo de; Lourdes Mattos; Marcos Takashi;

Presenter: Jorge Luis da Silva Lustosa

Abstract: Brazil goes through a phase of great epidemic possibilities, mainly by the Aedes aegypti vector. The necessity to control these disease agents, the absence of antiviral drugs or vaccines for treatment contributes to proliferation. The cases of the disease in Brazil are recorded in Information System on Notifiable Diseases (Sistema de Informação de Agravos de Notificação - SINAN). It was developed in the early 1990's and the main objective is collecting and processing data to about diseases in the country. At SINAN we can find a lot of information like sorology, date of hospitalization, state, address, and others. Analyze spatial data is the main objective and investigate geographical patterns in the determined region of dengue cases. However, analyzing a sample of the data we are faced with a series of address information that is not properly informed. The patient address data is usually abbreviated irregularly in the address field, this study tries to improve the quality of these unstructured data and geocoding this information to obtaining the latitude and longitude coordinates of dengue cases, for posterior analysis in geographical information s system.

Code: 63865

Modality: Apresentação Oral

Title: Survey and analysis of current state of ventilator alarms in ICU

Authors:

Presenter: Zhongkuan Lin

Abstract: Abstract—This article reports about survey and analysis of ventilator alarm state in a children hospital. Based on the evaluation of the alarm effectiveness, we design a survey statistical table for ventilator alarm investigation. We evaluate the alarm situation synthetically through investigation and statistical methods. Result shows that the current ventilator alarms are not sufficiently effective, 26.84% of them are meaningless alarms and the alarms leading to clinician□s intervention make up only 2.26% of all the alarms generated. The reliability of statistical data is also analyzed. According to the survey results, we analyze the causes of the problem, and propose the corresponding alarm management methods as well.
Keywords—ventilator alarm information; alarm effectiveness; alarm management; survey statistics

Code: 63863

Modality: Apresentação Oral

Title: A Hospital-based Dynamic Warning System Medical Consumables Re Adverse Event Management

Authors: J. Sun1, Y.Y. Lv1, and J.Y. Feng1* ;

Presenter: Feng Zingyi

Abstract: Abstract—Management of medical consumables related adverse events is one of the key factors to guarantee patient safety in a hospital. Effective methods are lacking to handle reports of these adverse events for hospitals. Values of abundant historical records of adverse events are also uncovered. This study, thus, aimed to design a dynamic warning system to standardize handling process and take advantage of historical data. A dynamic warning system was designed, integrating relevant populations, adverse events and product information. The system involved five parts: event scale, warning scale, enterprise black/white list, responses to warnings, and upgrading and downgrading mechanism. A pilot study was conducted to verify its manipuility. Results showed that this system was workable. All medical consumables and their suppliers can be monitored via this system. The enterprise black/white list may benefit hospital purchasers with decision making. This system may also promote companies to improve their products. In conclusion, this system standardizes the process of event handling and provides real-time monitoring for use of medical consumables. Continuous optimization, however, is necessary to improve its function. Keywords—quality management, meical consumables, adverse event, warning system.

Code: 63862

Modality: Apresentação Oral

Title: Activities of Clinical Engineering in the University of Valparaiso

Authors: G. Avendaño;

Presenter: Guillermo Avendano

Abstract: Abstract—This article shows the activities in the area of Clinical Engineering CE, which are carried out in the University of Valparaíso, Research in management of technology, in particular maintenance and organization of medical devices, some are framed in the didactics of the Hospital Security, others are consultancies to governmental organisms of Public Health and others in the formation of Professionals and technicians who require training in Clinical Engineering. Show the permanent counseling to the ISP, Institute of Public Health of the Chilean Ministry of Health in the areas of HTA, consultancy in medical equipment, analysis of adverse events and recommendations about the use of certain devices, as well as the development of teaching materials for the training system of technical personnel through the didactic platform of the ISP. Keywords Clinical Engineering, HTA, adverse events. management of technology, Hospital design, Safety training

Code: 57532

Modality: Apresentação Oral

Title: CASE-BASED SELF-LEARNING INTERACTIVE MODEL OF MEDICAL DEVICE TROUBLESHOOTING AND MANAGEMENT

Authors: Mei-Fen; Kang-Ping; Cheng-Lun; Tsiar; Young-Xin;

Presenter: Kang Ping Lin

Abstract: On account of the characteristics of medical devices being diverse and changing, how medical devices quality could be assured to support patient safety has been always a key issue in hospitals. Personal competence is one of a primary factor for quality management. Practical training is the most effective way to enhance personal capability. The paper presented a case-based self-learning interactive model for medical device troubleshooting and management so that biomedical engineers working capability to assure the better quality of medical device could be improved. The model in the paper was implemented by a website using Linux operating system and MS MySQL database technology. The major function of the website was to collect medical device usage problems in practice, which called case in this paper. Several senior clinical engineers and experts were invited to be mentors to upload suggestions and correct actions to the web on the basis of the case. This paper expected to guide the junior clinical engineers and medical equipment technician for self-learning relying on mentor s practical experience and help on medical device troubleshooting and management. This paper provided a training model through a mentor mechanism to share practical experience to enhance junior engineers capability on medical devices. This model is expected to be applied worldwide by web technology to promote personal medical device management training for higher medical device quality in the future.

Code: 63867

Modality: Apresentação Oral

Title: CE - HTM key areas of challenge and progress in Costa Rica

Authors: María Paula Esquivel Asenjo M.P.E ; Gabriela Murillo Jenkins G.M.J. ;

Presenter: Gabriela Murillo Jenkins

Abstract: Abstract—Before the 1990s the management of health technology focused on the maintenance of medical equipment. This has progressed and in recent years the clinical engineering has been expanded thanks to the vision of many people who saw the need to incorporate engineers specialized in medical technology and the university degree of engineers in electromedicine in the country, resulting the Health Technology Management in the acquisition of medical equipment and devices, training, consulting, hospital project management, design, quality control, evaluation, manufacturing, maintenance, and others. The challenge in Costa Rica is to expand the coverage of electromedical engineers in more health centers, improve safety and certification, metrology and establish biomedical master's degree education in the country for both electromedicine engineers and other engineers which require formal education based on health technology. Keywords—health technology management, biomedical engineering, electromedicine, clinical engineering, Costa Rica.

Code: 63860

Modality: Apresentação Oral

Title: Clinical Engineering in Bhutan

Authors: Tashi PENJORE ;

Presenter: Tashi Penjore

Abstract: ABSTRACT Bhutan had embraced the advances in health technologies in the interest of improving the healthcare services to the citizen which is evident from the increasing procurement and supply of medical equipment to health facilities in the country. Until early 1980s, medical supplies were managed by the State Trading Corporation of Bhutan (STCB). During this period, medical equipment after sale services such as preventive as well as corrective maintenance were managed through suppliers and dealers of neighbouring countries. The Health Department took over the medical supplies management in the late 1980s. At the same time, the need for in-house maintenance team was realised. This was compounded by the choice and capabilities of health workers to switch from clinical acumens based healthcare services to technology based services. Accordingly, HERM (Health Equipment Repair and Maintenance) unit was established in June 1985 with 5 technicians to provide after sale services from installation to regular preventive maintenance of medical equipment. The capacity of the unit was enhanced with the recruitment of a United Nations Volunteer engineer in March 1989. In 2007, the Unit was renamed as Biomedical Engineering Services (BES) which was further upgraded into Bio-Medical Engineering Division with mandate to manage medical equipment of the entire country comprising of over 40 health centres. The division currently has 5 biomedical engineers with a few technicians maintaining and managing functionality of medical equipment in the country. This paper will describes the practice of clinical engineering vis-à-vis biomedical engineering in Bhutan over time, current practices and situations, and proposed future plans.

Code: 63861

Modality: Apresentação Oral

Title: Clinical Engineering/HTM in Canada

Authors: Mario R. Ramirez, P.Eng., M.A.Sc., CCE, ;

Presenter: Mario Ramirez

Abstract: The role of Clinical Engineering, Biomedical Engineering Technologists or Health Technology Managers continues to evolve in Canada. The traditional roles in the field continue to be prevalent, however, there is a move towards more value added roles in health care that have resulted in more cost efficient management of medical technology. CE/HTM personnel are more closely involved in the Capital planning for the whole hospital with a more holistic view (hospital wide) rather than a departmental view. Five year capital plans are being developed to assess the capital investment the institutions need to make to replace technology in a more effective manner. CE/HTM personnel have developed closer collaborations with procurement and legal departments to ensure the prompt acquisition of technology, best value for money while at the same time with the right protections for the institutions. Cost reductions in health care funding have prompted the development of Provincial Health Boards. These boards are streamlining processes in the hospitals that have created provincial CE/HTM services in at least five provinces in Canada. The paper will provide an overview of the new roles CE/HTM personnel are playing in the health care area. Improved collaborations with IT/IS are also described. From the educational point of view, Canadian Colleges and Universities continue to see CE/HTM as a field in demand which has prompted the opening of a new college program and a brand new Bachelor degree in Health Care Technology Management.

Code: 63876

Modality: Apresentação Oral

Title: Decodifying HTM in Mexican Private Hospitals

Presenter: Luis Fernandez

Code: 63870

Modality: Apresentação Oral

Title: Development of Biomedical Engineering in the Honorable Junta de Beneficencia of Guayaquil

Authors: Freddy Matamoros Espioza ;

Presenter: Freddy Matamoros

Abstract: Abstract—This paper describes, How the engineering biomedical, has developed in the hospitals of the Junta de Beneficencia of Guayaquil, a non-profit organization, which sought support in organizations such as the (PAHO) Pan American Health Organization, and (WHO) World Health Organization, In order to evaluate technologies that in the last few years began to develop very quickly to improve patient care and which also entail risks that, if not well identified, could bring serious consequences in their lives, as well as regulations and regulations that Help create a safe and reliable environment for physicians and people seeking care and help at these health centers. Keywords Ingeniería Biomédica, Mantenimiento, evaluación de la tecnología.

Code: 63598

Modality: Apresentação Oral

Title: HTM and CE: Improving Quality and Patient Safety in Peruvian Health Sector

Authors: R. Rivas1, 2, 3, T. Clark 4, H. F. Voigt5;

Presenter: Rossana Rivas

Abstract: Abstract—In 2013, Peru initiated a health reform process which would allow systemic and effective responses consistent to the needs of the population. From 2012 to May 2016, 168 health facilities have become operational, 51 establishments are nearing completion, and 265 new projects are currently in process. Additionally, this reform led the understanding of the relevance of health emergencies and strengthened the health authority of the ministry to implement responses in case of risks or service discontinuity at the regions or in Lima the capital. Related to Health Indicators, the poverty rate was 21.8% in 2015, in 2016 it decreased to 20.4%; Neonatal Mortality (per 1,000 Live Births) in 2015 was 10% and in 2016 it increased to 11%; in other side Chronic Undernutrition rates in children across the country, have regressed from 14.4% in 2015 to 13.5% in 2016. Some priorities for improvement stated by MoH in 2017 are: a) achieving an efficient management of the health system services and b) to have a modern and interconnected health infrastructure. The gap in access to health services is due to some of the following factors: (i) human resources, (ii) infrastructural and equipment limitations, (iii) health investment weaknesses, (iv) user s dissatisfaction with the quality of the health service keeps high, among others. According to 2016 MoH Report, two principal goals should be accomplished in the next years: 1. Strengthening the capacity for conduction and response in Public Health: which involves strengthening health authority and implementing mechanisms that constrain the effective access of Interventions in public health; and 2. Improving health care: this requires a structural change of supply to the Primary Health Care (PHC). The document will describe the results and goals of the activities based on Health Technology Management, Clinical Engineering and Health Technology Planning implemented by CENGETS in collaboration with PUCP University, Universidad Peruana Cayetano Heredia, the University of Vermont and Boston University. The sustained and strategic process is developed with the actors of public health sector: MoH, NIH, Essalud, some private organizations, undergraduate, postgraduate students and the Pharmacy Chemical College of Peru. Keywords—Clinical Engineering, Health Technology Management, Strategy, Innovation.

Code: 63879

Modality: Apresentação Oral

Title: Innovative telediagnosis technology for universal coverage in remote locations without access to specialists

Authors: Pedro Galván,1-2 Miguel Velázquez,2 Ronald Rivas,2 Gualberto Benitez,1 Antonio Barrios,1 Enrique Hilario3 ;

Presenter: Pedro Galvin

Abstract: Through technological innovations based on information and communication technologies (ICT), advantageous telediagnostic systems can be developed to improve the health care of remote populations that do not have access to specialist doctors. In the context of universal coverage and the efficient use of available resources in public health which should be directed towards greater equity in the provision of services, greater concern for the effectiveness and usefulness of health technologies, there is a favorable opportunity to develop telemedicine towards an integrated ecosystem to improve health care in remote locations without access to specialists. This study, performed by the Telemedicine Unit of the Ministry of Public Health (MoH) in collaboration with the Dept. of Biomedical Engineering, Research Institute in Health Sciences of the National University of Asunción (IICS-UNA) and the University of the Basque Country (UPV / EHU) have evaluated a telediagnostic system implemented in the year 2014 in public health. However, despite the huge growth of scientific and technological development, the availability and access to appropriate, affordable, and high-quality medical services in low- and middle-income countries are still inadequate. For these purposes, we analyzed the results of a project using innovative health technologies implemented in all remote regional and district hospitals in Paraguay. A total of 182.406 remote diagnoses from 54 hospitals were performed from January 2014 to November 2016; through the system of telemedicine. Of the total, 37.31% (68,085) corresponded to tomography; 62.00% (113,059) to electrocardiography (ECG); 0.68% (1,243) to electroencephalography (EEG) and 0.01% (19) to ultrasound studies. Tomography studies were performed in 12 hospitals, where 54.4% corresponded to skull as a consequence of accidents (motorcycles) and cerebrovascular diseases, 13.8 % chest, 6.2 % dorsal spine, 5.4 % abdominal and the rest from other anatomical regions. The ECG diagnosis performed in the 52 hospitals were: normal (62.1%), unspecified arrhythmias (12.5%), sinus bradycardia (10.4%), left ventricular hypertrophy (4.1%), sinus tachycardia (4.4%), right bundle branch block (3.5%), ischemia (1.4%), atrial fibrillation (1.0%) and left bundle branch block (0.6%). Regarding EEG, antecedents of seizure (54.3%), evolutionary control (14.0%), headache (11.5%), cognitive impairment (2.0%), attention deficit in children (learning) (2.0%), brain death (1.0%), abnormal movements (0.8%), and sleep disturbances (0.3%) were diagnosed. The 19 Ultrasound Studies corresponded to prenatal controls. In summary, our results show that technological innovation in diagnostic services in public hospitals through telemedicine can facilitate the epidemiological surveillance and universal coverage of diagnostic services in rural communities. Moreover, it will also help to substantially improve the local resolving capacity of regional and district hospitals in the interior of the country. However, before recommending its massive use, its implementation and its technical-economic sustainability should be contextualized according to the epidemiological profile of each region. Key words: Telediagnosis, Telemedicine, ICT in health, Technological Innovation, Telematics in health

Code: 57595

Modality: Apresentação Oral

Title: INTERUNIVERSITY MODEL OF COOPERATION FOR THE DEVELOPMENT OF CLINICAL ENGINEERING IN COLOMBIA

Authors: Beatriz Janeth; Javier Hernando; Juan Guillermo; Javier; Nelson Javier;

Presenter: Beatriz Janeth Galeano Upegui

Abstract: The training of Biomedical Engineering is fundamental to ensure the proper development of health technology throughout the life cycle of the same. The impact generated by these professionals is driven by the development, innovation, and impact of medical devices, procedures, and methodologies that directly affect patient safety and the sector‘s economy. In Colombia there are about 16 universities that offer programs associated with bioengineering between undergraduate and graduate programs; In Medellín, Antioquia, approximately 4 higher education institutions currently offer these types of programs and have joined forces to strengthen the development of Clinical and Hospital Engineering in the region and the country; The institutions are: Universidad Pontificia Bolivariana, University of Antioquia, School of Engineering of Antioquia and Instituto Tecnologico Metropolitano. This union generated results that are reflected from the meeting of the representatives of the theme in different work environments since 2013, in which they showed an affinity between them and a passion for the development of the subject, from which the following results: Participation in the Technology Assessment Network promoted by the Medellín Health Cluster. The development of the last two versions of the International Congress of Clinical Engineering, CONIIC. The approach of technology providers to students through training seminars on specific technologies. Participation in the Network of Clinical Engineering promoted by the Ministry of Health of Colombia, through the link to the Antioquia Node. The approach to the Institutions that Provide Health Services, from the development of diverse projects. Manage approaches with the different entities of the Industry, the state, and the academy. Efforts will continue to be generated from the development of activities and the approach to other academic activities, with the state, with the health sector and institutions providing health services.

Code: 57578

Modality: Apresentação Oral

Title: LOGISTICS OF MEDICAL DEVICES FOR INDIGENOUS HEALTH CARE ATTENDING IN REMOTE SITES AT BRAZILIAN AMAZON RAIN FOREST

Authors: Ryan; Fernando; Saide; Rodrigo;

Presenter:

Abstract: There are in Brazil 896.917 indigenous and 48% of them dwell in the Amazon rain forest region. In order to avoid expensive displacement for this population, especially for surgeries such as hernias and cataracts, the Expedicionários da Saúde NGO attends this specific population three times a year since 2003 organized as a workparty regime. This attending is done through a Field Hospital (FH) and is supported by Clinical Engineering (CE). The CE is key to implementation of FHs, being essential in the management of medical technology and in the planning and operation of this type of health structure. This article presents the characteristics of logistics and operation of medical and hospital devices in remote sites of Amazon region.

Code: 57565

Modality: Apresentação Oral

Title: MEDICAL DEVICE MANUALS ANALYSIS USING HEURISTIC EVALUATION

Authors: Julia; Egon; Rodrigo; Ana Paula;

Presenter: Julia C Carneiro

Abstract: Introduction Since most users only use manuals or instructions for use (manual) in few and specific situations, many manufacturers assign a low importance and limited resources for their development[1]. The low quality of manual results in understanding difficulties and could potentially lead to increase use errors[2]. In order to develop a good manual, it is important to include the information required by the government health department (ANVISA), and write all the instructions in an efficiently and doubtless way[3]. Objectives Systematize a methodology for testing and aid in the development of manuals for medical equipment. Evaluate a neonatal intensive care unit manual as a case study. Methods The first step was to analyze the information requirements in medical devices manual from ANVISA[4],the Inmetro[5] and NR12[6]. From these documents a list of 14 topics were selected. The Nielsen heuristics was selected to be used in the heuristic evaluation[7]. Results Regarding the required information, the manual lacks lots of the required information, missing 10 of the 14 selected topics. Although the other topics were presented, some of them were dispersed along all document, requiring the user to keep going forward and backwards to find all data. One potential hazard found was the lack of sensors information. There was no complete explanation describing all sensors and its functions. The little information found was spread along 4 different sections on the manual. There were also found 14 different problems violating 7 heuristics. Some problems were found more than once, totaling 92 errors. The top two heuristics were □aesthetic and minimalist design□ with 49 violations and □recognition rather than recall□, with 15. Conclusion Manuals, aside being the official source of information for the users, some manufactures don□t do a great work on it. Manuals with missing or confused information and grammatical and layout problems can generate a bad impression causing low user interest, leading them to look in other less reliable sources. Our analysis found a list of problems on the analyzed manual. Some are related to safety and basic features of the equipment. The quality could be increased by ensuring that all information is presented and correctly classified on the manual topics. References [1]van Loggem, Brigit. "Nobody reads the documentation‘: true or not." Proceedings of ISIC, the Information Behaviour Conference, Leeds. 2014. [2]Novick, David G., and Karen Ward. "Why don‘t people read the manual?." Proceedings 24th ACM international conference on Design of communication. 2006. [3]Lopinto, Lidia. "Designing and writing operating manual□s." IEEE transactions on professional communication (1984):29-31. [4]ANVISA guideline for medical equipment development. March, 2017, Available http://portal.anvisa.gov.br/documents/33912/264673/IFU+para+regulariza%C3%A7%C3%A3o+de+equipamentos+m%C3%A9dicos+na+Anvisa/ad655639-303e-471d-ac47-a3cf36ef23f9 [5] INMETRO, Portaria n.º 54 Requisitos de avaliação da conformidade para equipamentos sob regime de vigilância sanitária, February 1, 2016, [Online] Available: www.inmetro.gov.br/legislacao/rtac/pdf/RTAC002377.pdf [6]NR12: Segurança no trabalho em máquinas e equipamentos □ May 2, 2016, [Online] Available: http://sislex.previdencia.gov.br/paginas/05/mtb/12.htm [7]J. Nielsen and R. Molich, "Heuristic evaluation of user interfaces." Proceedings ACM CHI90 Human Factors in Computing Systems Conference, Washington, USA, 1990

Code: 57123

Modality: Apresentação Oral

Title: MEDICAL DEVICES PROACTIVE SURVEILLANCE TRENDS AND IMPACT FROM FIELD AND ENFORCEMENT ACTIONS IN BRAZIL

Authors: Maria Gloria Vicente; Evelinda Trindade;

Presenter: Evelinda Trindade

Abstract: Temporal trends are important indicators of the actions effectiveness. International harmonization regarding health products regulation made cross-validation and work collaboration routine achievements. Brazilian Universities Heath Technology Assessment Network, REBRATS, are also working together with National Authorities, the National Agency for Health Surveillance, ANVISA, Task Forces to increase health related surveillance. Brazil has, since 2012, mandatory report, RDC 23/2012, for healthcare related industry field actions regarding registered medical devices, regardless its occurrence in the National or International territory. This study describes medical devices observed trends from the last five years. Methods Observational descriptive study of the industry reported field actions, ascertained from the National Agency for Health Surveillance notifications database, NOTIVISA, from 2012 to 2016, yearly. The data was organized in a matrix format, where each report was indexed with the medical device technical name, registration number, motif described and correlated actions enforced. All database variables were synthesized with quantitative and qualitative analyses softwares (Microsoft Excel® e Access, v. 2013). Linear and multiple regressions across time series were performed aiming to elicit trends that would evidence actions effectiveness and surveillance priorities. Results From 2016 to 2016, there were 1.976 records in the field actions matrix, involving 600 medical dispositive, 857 equipment, 383 in vitro diagnostic products, 01 medical software and 11 where multiple products were involved, overall regarding 1.374 different «Commercial Product Name and Model». Two thirds of those reports (N=953) had a motif for stakeholders further action in the field, were communicated and cross-validated with international regulators, and were publicized in ANVISAs Alerts web site and Bulletins widely distributed. The synthesis resulted in 446 medical device technical names involved. Most (54,4%) Alerts involved High and Higher Risk product classes, III and IV. These analyses elicited average stable or positively increasing trends for the top 10 most involved health products, except the negative downward trend for Linear Accelerators. Also, there were similar trends pattern across the top 10 most involved industries, pointing to continued or increased post-marketing surveillance requirements. Such requirements were appointed to the Brazilian Health Ministry for inclusion in the National Research Priorities Agenda to direct allocation of research incentive funds for REBRATS. Importantly, the negative downward trend for Linear Accelerators rewarded its industry with ANVISAs recognition of the effectiveness of its field actions, a quality example. Conclusion Time series trends helped to ascertain priorities for health surveillance actions and further research. The National and International collaborative work and the publication of the ANVISAs RDC 23/2012 have contributed to proactively increment medical devices post-market surveillance and related knowledge.

Code: 63872

Modality: Apresentação Oral

Title: Medical Devices Repair/Replacement Algorithm Model

Authors: R. Farah ;

Presenter: Riah Farah

Abstract: Abstract - Saint George Hospital is a pioneer University Medical Center in Lebanon, with more than 135 years of services, and more than 25 Million US$ worth of medical devices serving all specialties. The Medical Engineering Department services started over 20 years ago and were based essentially on repairing the devices at the best quality and lower cost possible. But this was not enough to support decisions on ever growing yearly expenditure on technology procurements. Medical devices purchase budget has been rising up to 3 Million US$ a year. In this respect Health Technology Management HTM and Health Technology Assessment HTA offer the tools for the administration to draw a clear roadmap of the needed technologies for the sake of patients. After being HTM certified by ACI, we led a gap analysis project with the commitment of all medical engineers, and came out with list of improvements, changes and projects to be implemented within a 3-year-time plan, to transform services from biomedical to technology management. This paper shall elucidate one of these HTM projects, a concept scheme for engineering a tool to be used by Hospital Administration, to objectively decide whether to repair or replace a medical equipment. This formula was developed to quantify a set of logical rules. Based on the formula result, the decision is planned to be easier, systematic, traceable, evidence-based, reliable, and objective. Previously the decisions were based on studying the total cost of repair versus the purchased cost, taking into consideration depreciated equipment value. The decisions therefore were purely financially subjective, with no technical/technology aspect in it. Most Hospitals in the region commonly use this financial criterion for replacement decision making. This concept paper is therefore instrumental for a wide spectrum of hospitals. The method was validated by using data collected on previously replaced medical equipment. The HTM project outcome started paying off through reduction in budgets and promising savings in replacement of medical equipment. Keywords HTM, medical devices,

Code: 63869

Modality: Apresentação Oral

Title: Medicinal Gases, Medical Surgical Vacuum and Anesthetic Residue Extraction Policy in the Dominican Republic

Authors: Diógenes Hernández;

Presenter: Diogenes Hernandez

Abstract: Abstract —This is the first policy for the regulation of medicinal gases in the Dominican Republic. It is sustained on the study and adaptation of Chapter 5 of the National Fire Protection Association (NFPA) 99 Code, 2015 edition on Gas and Vacuum Systems, complemented With the Compressed Gas Association (CGA) pamphlets and contributions of the "NFPA 55 and 101" codes, in their latest editions. All are US codes with particular applications to the health sector where non-flammable gases are used in patient care and related applications. These codes regulate and standardize the design, construction, maintenance and inspection of centralized systems of medical and vacuum gases, widely used in different clinical, therapeutic and research applications; All these systems or means, combined with the use of medical equipment and devices, facilitate the exercise of activities in the health services. In accordance with acquired knowledge, statistical sources, technical discipline and labor penalties for bad practices, these societies have been able to compile, record in written volumes the experiences and convert into standards and codes such accumulated experiences of technical procedures Applied in different activities with the best results achieved. Continued revisions of standards and codes to align with practices of technical excellence have advanced the systems created. It establishes the requirements for the design, installation, supply, testing, technical documentation, operation, inspection, repair and maintenance of centralized systems of gases for use in medical, vacuum and residual anesthetic gases in specific hospital room locations. The code deals with the selection of sources of supply, controls, distribution networks and endpoints for use in patients, systems of cryogenic liquids and non-flammable compressed gases, suction or emptying and extraction of residual anesthetic gases, for the purpose to ensure the continued and safe operation of the mentioned systems in health facilities of a certain level of complexity. There are three situations to consider in the technical and architectural design for the application of most of the postulates of the standard. These considerations define the generic aspects to be considered when designing a medical gas system: 1) In deciding to build a new hospital. In this case, the expert engineer in medical gases does the inquiries of place to know which are the systems of gases to install and focuses on each design; 2) The hospital is built and functioning, but there is no centralized supply of medical gases. When this situation arises, the design and construction processes become complex, since a building already exists and the gas network will have to be installed; 3) The hospital is built and functioning, but medical gas systems will be expanded. In the Dominican Republic, a new entity called DIGEMAPS (General Directorate of Medicines, Foods and Health Products) has been created as a unit of the Ministry of Public Health. This entity is responsible for applying the standard.

Code: 63877

Modality: Apresentação Oral

Title: National inventory of high-tech medical equipment as HTM tool for strategy planning

Authors: R. Ayala;

Presenter: Roberto Ayala

Abstract: Abstract—By obtaining reliable data about the installed capacity in Mexico for twelve defined groups of high technology medical equipment (HTME), the authorities at the Ministry of Health can have necessary evidence for strategy planning when there's a need to incorporate one of those technologies, especially for the public/social health sectors that receive federal funding. The National Center for Health Technology Excellence (CENETEC), a MoH agency in charge of HTA and HTM needs for the health system, conducted the integration of a national inventory of those 12 HTME categories over an 18 month span, obtaining more than 2,000 registries that have been used to define some policies regarding the use of technology for priority health issues, such as cancer and cardiovascular diseases. This information, that is publicly available, has been used to work on offer/demand studies and technology guidelines, also made by CENETEC, as planning tools for decisions makers in order to assure the rational use of available financial resources. Keywords—Inventory, Medical Equipment, Planning, HTM.

Code: 63859

Modality: Apresentação Oral

Title: Necessity of Clinical Engineering to Regulate the Medical Devices in Middle Income Countries

Authors: M. A. Hossain1, M. Saiful Islam2, M. Ahmad3, M. Ashrafuzzaman4, Yadin David5;

Presenter: M. Ashrafuzzaman

Abstract: Abstract- In last few decades, it has been perceived that middle income countries like Bangladesh, Bhutan, Nepal, and Indonesia etc. have been imported costly and sophisticated medical devices to enhance the quality of healthcare like developed and other developing countries like Malaysia, India and Sri Lanka etc. But without proper utilization, all these efforts to import medical devices for the healthcare delivery system become insignificant. Moreover, developmentof clinical engineering professionals is yet in exaltation by the developed world for the enhancement of medical device regulation, middle income countries like Bangladesh could realize the necessity of clinical engineering professional for regulation of medical devices in last decade. As the result, medical devices operation dominated by the conventional engineers and medical doctors become antagonistic and its straight consequence is hindering patient care extremely and continually. Many articles were published by the healthcare delivery system of Bangladesh but we do not find any notable source describing clinical engineering and medical devices regulation to enhance the safe and cost effective use of the medical devices since past years. Clinical / biomedical engineering professional is the best resources to ensure medical device regulation among other healthcare providers and allied healthcare professionals in the healthcare delivery system. This statement was established in developed and developing countries. The staple aim of this study is to enhance the present apathetic medical devices regulation in middle income countries like Bangladesh by introducing clinical engineering professional. Our proposal briefly describes the roles of clinical engineering professional, medical devices regulation relates with clinical engineering professional as well as impotence of in-hierarchy of clinical engineering and patient safety aspects from the medical devices. We represent some case studies to find out the performance of medical devices as well as patient safety with and without Clinical Engineer. Our study shows the benefits of introduced CEP for medical equipment regulation which will provide adequate indication to our high authority of healthcare sector and healthcare stakeholders for the necessity of CEP in an immediate. We firmly believe that an excellent result is to be obtained from our novel proposal such as understanding the necessity of clinical engineering, introducing of clinical engineers in the healthcare system, necessity to produce skill clinical engineers for establishing a safer and cost effective patient care for underprivileged patients in this country and which is in unsavory state at present. The bridge between medical device regulation and clinical engineers were established in many countries over the past years. It is concluded that medical equipment regulation practice was necessary to practice since 2000 in our country like some developing countries. We firmly believe that with increased number of BME/CE/CET/BMET, Bangladesh will be able to reduce the hospital operational cost; and consequently, health care services will be safe and cost effective in near future. Keywords—Medical devices, medical device regulation, biomedical engineering, clinical engineering, health care technology management.

Code: 63864

Modality: Apresentação Oral

Title: PM of Fetal Monitors

Authors: Lu He-qing, Wang Wen-gang1, Li Bin2, Qian Jian *, Qian Jian3,Su Qi1 and Yan Hao;

Presenter: Lu He-qing

Code: 63858

Modality: Apresentação Oral

Title: PRESENT AND FUTURE OF CLINICAL ENGINEERING IN ARGENTINA

Authors: Marcelo Horacio Lencina ; Germán José Giles;

Presenter: German Gilles

Abstract: Abstract - Argentinian Health System is experiencing big challenges to improve patients´ diagnostics and treatments. In that order, medical technology is a key factor that must be projected, purchased, implemented and maintained to achieve those goals. Biomedical and Clinical Engineers play those roles, along with others. During the years, they just made service support of those technologies; but introduction of Laws & Standards, patient security initiatives and fast evolving market, made their work more complex, and required other tools to manage them. Government and Universities identified those needs, and joined to develop programs across the Country with the idea of a Healthcare Technologies Management (HTM) system, in a Public/Private alliance. Argentinian Ministry of Health promotes a National Health Quality Program, in line with international resolutions and experiences, and HTM became very important to assure safety, efficiency and sustainability in different processes of the Program. We explain here, most of changes Argentinean Clinical and Biomedical Engineers are facing today, and a roadmap for next years. Keywords □ Healthcare technologies, traceability, patient safety, internships, education.

Code: 57559

Modality: Apresentação Oral

Title: PROPOSED CALIBRATION OF APHERESIS EQUIPMENT

Authors: Anderson; Marcelo; Rodrigo;

Presenter: Marcelo Antunes Marciano

Abstract: It is under development in health establishment, a quality control through the calibration of biomedical equipment, in a systematic and comprehensive way of the wide range of available hospital technology. Thus, this work aims to propose and demonstrate a method of qualification of the apheresis equipment through of the equipment calibration, before to release it for the first time use. As results are shown the values obtained in a calibration of an apheresis equipment, relating to the MNC protocol (removal of mononuclear cells), the pressure of access and return pressure.

Code: 57591

Modality: Apresentação Oral

Title: REGIONAL NODES OF COLOMBIAN CLINICAL ENGINEERS.

Authors: Andrea; Paula Andrea; Leonardo Fabio; Maximiliano; Francia Elena;

Presenter: Andrea Garcia-Ibarra

Abstract: The HTM staff in small or remote hospitals have difficult accessing good practice information at HTM, so we have created a simple, convenient and accessible networking model for clinical engineers in Colombia, called "regionals nodes". The Nodes break radically with tradition, because they do not have static structure that limits access to meetings or information, other way, the nodes are dynamic to reach more people in less time and lower cost; It use social media to be in contact, to coordinate regular meetings with leaders and topics of interest, and disseminates information in a massive way. Thus, new open spaces are created, adaptable to each region and tending to evolve over time. Currently the nodes are led by the MoHSP with regional support of engineers from hospitals with national accreditation or joint commission accreditation. Today , there are 200 engineers from 120 hospitals, 10 universities, and territorial health entities. The regulatory agency was added in the last months to the dynamics. Thus, we covered 40% of the territory since 2015, the date on which the nodes began. In order to prepare projects on Medical Equipment Management (MEM) and share information and experiences, the members of the Nodes meet every two months. Some of the accomplishments and outcomes of the meetings are: Continuous training in Colombian regulations. Positioning the Biomedical Engineers as the key stakeholders in MEM. Institutional strengthening of the Ministry of Health in the Health Technology field. HTM regional benchmarking The interaction among the members of the participant institutions has facilitated a successful knowledge and best practices transfers in MEM from the eight high-complexity university hospitals to almost 120 regional and local hospitals. These regional and local hospitals have limited access to resources and the operation of the Nodes has contributed to improve the efficiency in the equipment managing process. The outcome is a better service to the population. One of the priority projects of the Nodes is the collaboration with the MoH in the validation of the Equipment Maintenance and Obsolescence Assessment Manual. The document should be ready by the end of 2017. The next steps are: Strengthening of the Nodes Increasing the membership and the motivation of members and institutions. Interacting with professional engineering societies and health technology organizations worldwide. Seeking support and improving communication with health authorities, hospital directors, and administrators for the expansion of the Nodes.

Code: 63597

Modality: Apresentação Oral

Title: Regulation, standards and market surveillance of medical devices and systems in Albania

Authors: Ledina Picari ;

Presenter: LEDINA PICARI

Abstract: Abstract: This work presents the progress of Ministry of Health of Albania to develop a regulatory framework for medical devices and systems in line with current European Union (EU) directives for medical devices. Market surveillance process has started just recently and aims to control the chaotic Albanian market. The regulation framework aim to ensure safety of the patients and users. Legal intervention for fiscal alleviation for implantable medical devices and for the reimbursement of medical devices. These two legal interventions aim to start this process for the first time in country in order to increase access and improve health care for the patients. Keyword: Regulation, standards, market, surveillance, reimbursement.

Code: 56572

Modality: Apresentação de Pôster

Title: A COMPARISON OF THE JOINT COMMISSION AND JOINT COMMISSION INTERNATIONAL STANDARDS FOR MEDICAL EQUIPMENT MANAGEMENT AND MAINTENANCE

Authors: Binseng; Bassam;

Presenter: Binseng Wang

Abstract: Healthcare organizations around the world seek accreditation as a means to prove that their services meet established standards of practice and quality. In some countries, accreditation is a pre-requisite for participation in public or private health insurance programs, while in others it helps to earn higher reimbursement rates. Its importance is obvious for the financial survival of most hospitals. Among the healthcare accreditation organizations, The Joint Commission (TJC) and Joint Commission International (JCI) are known for their longevity, wide scope and prestige, with the former being the dominant player in the United States while the latter highly recognized elsewhere. Although both have a common origin, their standards have evolved separately. This article compares TJC and JCI standards and specific requirements for medical equipment management and maintenance. While most of the standards are similar, some clear differences have been uncovered. Some of these differences are traceable to national laws, regulations and standards, while others are caused by lessons learned by prior surveys in respective geographies or simply tradition. In depth discussion of these differences not only helps to understand the strengths and weaknesses of each set of standards, but also uncovers the rationale—or the lack of—behind those requirements. Similarly, differences in the survey focus and questions can help clinical engineering (CE) professional better understand these standards and, thus, prepare themselves for future surveys.

Code: 57157

Modality: Apresentação de Pôster

Title: A METHODOLOGY TO IMPLEMENT AN EFFECTIVE INTEROPERABLE PLATFORM FOR AN ICU (ICU4.0)

Authors: Luca; Maria; Marco; Alexandra; Elcio; Antonio; Giovanni; Eduardo;

Presenter: Luca Gabrielli

Abstract: The lack of interoperability between systems and equipment used in the current hospital environment is one of the main reasons of inefficiencies and high costs. Applied to the intensive care environment and its inherent complexity, it impedes an effective 360 degree monitoring of patients forcing manual intervention to gather an analyze data from multiple devices introducing unnecessary and potentially dangerous delays in responding to patience changing conditions. An effective machine to machine integration would allow complete remote monitoring and the implementation of real time responses to critical or changing patience condition guarantee the best medical procedure and avoiding unnecessary manual interventions. An ICU environment can contain between 50 to 100 different devices for the most part provided by different manufacturers and often time not even integrated when provide by the same. Where multiple standards of integrations exists, HL7, IEEE 11073-10101, 10xxx, IEEE 11073-20601, 40xxx, ASTM F2761 (ICE), DICOM, ISO TC215, CEN TC251, IEC, most are focused on device to device integration lacking a comprehensive approach of optimizing the processes involved on an ICU environment aims to guarantee the best patience outcomes. The paper objective is to proposes a methodology to implement an effective interoperable platform for an ICU. The methodology takes in consideration the current efforts on building interoperable environments, usually defined as 4.0 models, integration standards, ICU best practices and defines a step to step process to help select systems, standards, define procedures and implement a comprehensive IT governance model to implement a fully interoperable ICU.

Code: 63892

Modality: Apresentação de Pôster

Title: A novel automatic method of renal segmentation in GRF estimation

Authors: XuLei,MengQingle and YangRui ;

Presenter: Xu Lei

Abstract: Abstract:This paper proposed a novel method of ROI extraction which is used in GRF estimation.The renal imageis initially performedby contrast stretching followed by morphological reconstruction. Then, Otsuthreshold methodwas applied to segmentthe rough renal area. Finally, themorphological operation and boundary tracking are adopted to remove the irrelevantparts and extract the contourof renal. The subjective evaluation showed that the proposed methodcan obtain clean and high quality images; the objective evaluation clearly demonstrated that our approach can acquire larger Kappa index and lower computing time than other methods. The proposed method is a feasible approach for ROI extraction in GFR estimation which can obtain more efficient, accurate and robust results.

Code: 57453

Modality: Apresentação de Pôster

Title: ACTIONS TRAVELLING ECG FOR TELEMEDICINE - A PARTNERSHIP OF ACADEMIC AND PUBLIC SERVICE.

Authors: Kleber; Nayra; Laura; Tatiane; Débora; Marcos; Rosimara;

Presenter: Kleber Teixeira de Souza

Abstract: This work has the purpose to describe the actions roaming electrocardiogram (ECG) telemedicine carried out in Primary care in the Municipality of Montes Claros MG, in partnership with the voluntary work of academics of the Faculdades Integradas do Norte de Minas (FUNORTE) and Faculdades Santo Agostinho (FASA). The methodology used is the experience report. The goal of the actions was to offer ECG exams report with the assistance of the Network of Telecare of Minas Gerais (RTMG), to the users of the SUS attended in primary care in the urban area and rural Municipality of Montes Claros that represented a pent-up demand from examination of the ECG, between the years of 2013, 2015, 2016 and 2017. The Actions Itinerants have the support of the Municipal Health Montes Claros, responsible for providing logistics for transport of the equipment ECG (ECGPC TEB), as well as the service professionals of the Family Health Strategy - ESF. The Network Telecare of Minas Gerais (RTMG) carries the reports of ECG for telemedicine and academics of the Faculties FUNORTE and FASA contribute by providing your personal computers and your volunteer work on Saturday morning. These volunteers are academics of Biomedical Engineering (FUNORTE) and Nursing (FASA). The idea for the project came from a visiting academic to emergency services Municipal Dr. Alpheu de Quadros, where it was verified that the equipment was not used. As the authorization of the Secretary of Health equipment began to be used in the unit of the ESF, the site of a large pent-up demand for tests of ECG. All disassembly, assembly equipment, as well as the conduct of the examinations in the units elected in each action was carried out by academics under the supervision of a Course professor of Biomedical Engineering of FUNORTE. In 2016, the RTMG found the volume of pent-up demand for tests of this nature in the municipality and has released three more equipment. Thus, the actions itinerants began to perform 80 tests ECG by Saturday. Considering the impact of cardiovascular disease, the difficulties for the access to the examination and electrocardiogram and the resource implementation of Telemedicine in primary care, aimed with this study to benefit the population with the examinations of ECG and the quick delivery of the report, in locations close to their residences, which has caused a direct impact on the reduction of the pent-up demand for the realization of these examinations, as well as contributing to the early diagnosis and treatment of pathologies of the heart. Kleber Teixeira de Souza Secretaria Municipal de Saúde e Faculdades Funorte. Nayra de Oliveira Duarte - Secretaria Estadual de Saúde de Minas Gerais. Laura Adriana Ribeiro Lopes Faculdades Funorte. Tatiane Marques Dantas Silva - Faculdades Funorte. Débora Kelly Laurenço Fernandes - Hospital Prontosocor e Faculdades Funorte. Marcos Gabriel de Jesus Rodrigues - Faculdades Santo Agostinho. Rosimara Viana dos Santos - Faculdades Santo Agostinho.

Code: 57584

Modality: Apresentação de Pôster

Title: ANALYSIS OF THE INCIDENCE OF OVERWEIGHT AND CHILDHOOD OBESITY IN NURSERIES/SCHOOLS IN BRAZIL

Authors: Paula; Lourdes; Bruna; Osmam;

Presenter: Paula Uessugue

Abstract: Abstract-Childhood obesity isconsidered a public health problem. In this sense, the purpose of this article is to analyze the prevalence of overweight and obesity. A systematic review and literature search in Medline, Scielo and Proquest using keywords in Biomedical Engineering area related to the topic under study was performed. Thus, they surveyed 39 articles published in the period 2010 to 2016, and only 10 were selected due to the inclusion and exclusion criteria. It follows then that there incidence of overweight and childhood obesity in Brazil, increased risk of associated diseases.

Code: 63891

Modality: Apresentação de Pôster

Title: Analysis of the selection criteria offers of maintenance management services for medical equipment used by public hospitals in Chile during the years 2014 and 2017

Authors:

Presenter: Cristian Diaz

Abstract: La ingeniería clínica, tiene como uno de sus principales propósitos el de servir y apoyar a los hospitales y los sistemas sanitarios en habilitar y potenciar el uso de la tecnología biomédica y equipos médicos en particular. Esta disciplina nace en los países desarrollados, por la necesidad de apoyar al sistema médico asistencial en procesos asociados a la adquisición, mantenimiento y control de las mediciones de la tecnología biomédica, así como por la necesidad de lograr incorporar tecnología segura. Chile es un país que a partir del año 2000 ha ido incorporando gradualmente la ingeniería clínica en los distintos estamentos de su sociedad, partiendo por el área universitaria, para luego comenzar a insertarse en el sistema sanitario nacional. Desde entonces a la fecha la disciplina se ha ido posicionando, robusteciendo y adoptando el rol que la define. Lo anterior, es un proceso que aún está en etapas iniciales y por tanto es importante analizarlo e identificar brechas o posibles mejoras. En plan de modernización de las instituciones públicas de Chile, se han implementado diversos sistemas, dentro de estos se destaca el sistema de compras públicas, el cual permiten tecnificar la decisiones y procesos de compras de las instituciones y a la vez transparentarlas ante la opinión pública de los ciudadanos. Este sistema, habilita el levantamiento de información de los procesos de compras públicas, de entre estos el de compra de servicios de gestión de mantenimiento de equipos médicos, utilizados por hospitales públicos. El objetivo de este trabajo es hacer una caracterización de los criterios de selección ofertas de servicios de gestión de mantenimiento de equipos médicos utilizados por hospitales públicos en Chile durante los años 2014 y 2017, en base a registros del sistema de compras públicas de Chile. Para lo anterior, en primer lugar, se identifican los factores de selección más significativos o estructurales encontrados en las licitaciones del sistema de compras públicas, se establecen equivalencias y estandarizaciones que permitan clasificarlos, compararlos y analizarlos, luego se correlacionan factores identificados con factores recomendados en la literatura de la Ingeniería Clínica y finalmente se realizan análisis estadísticos de los resultados. En resumen, el propósito de este estudio es levantar los criterios los de selección utilizados, establecer equivalencias conceptuales y realizar análisis estadísticos de la lógica empleada por hospitales públicos en la evaluación de ofertas de servicios de gestión de mantenimiento de equipos médicos, realizadas por hospitales públicos en Chile durante los años 2014 y 2017, todo lo anterior, según registros del sistema de compras públicas de Chile. Finalmente, se exponen, a criterio del autor, los retos para los hospitales públicos en Chile respecto áreas de mejora en la evaluación de ofertas de servicios de gestión de mantenimiento de equipos médicos.

Code: 57586

Modality: Apresentação de Pôster

Title: APP HEALTH & COMMUNITY: AN APPLICATION FOR THE BASIC ATTENTION USING GEOREFERENCING AND THE INTERNATIONAL CODE OF DISEASES FOR DATA ANALYSIS

Authors: Weberson Santos Ferreira; João Evangelista Neto; Geferson Oliveira da Silva;

Presenter: Weberson Santos Ferreira

Abstract: This paper presents an application intended to assist in gathering information on basic health care with the use of geocoding (latitude and longitude) including of households that do not have formal address, enabling the tracking of epidemics. Another main character of the application is the use of the International Code of diseases for the analysis and distribution of diseases in a defined population providing a more detailed study of pathologies, symptoms, signs and reasons for doctor´s appointments. Keywords

Code: 63902

Modality: Apresentação de Pôster

Title: Application of integrality in the hospital management of biomedical technology: Maintenance model applied in the entities of San Vicente Foundation.

Authors:

Presenter: Maximiliano Trujillo

Code: 57551

Modality: Apresentação de Pôster

Title: APPLICATION OF MULTIPARAMETER METHOD AS AN ASSISTANCE TO THE EVALUATION OF THE NEED FOR REPLACEMENT OF MEDICAL EQUIPMENTS

Authors: Eliezer; Marcelo;

Presenter: Marcelo Marciano

Abstract: The medical equipments (EM) are increasingly decisive and essential in modern medicine and medical and hospital care. For the EM contribute effectively and to the health organizations to use them more productively, it is necessary to carry out the management of the life cycle of the same. A decisive factor in this cycle of life is to know when a piece of equipment must be replaced. It is observed the absence of defined and clear methods to assist in the clinical engineering and hospital management, in deciding and prioritizing which EM need to be replaced. This work demonstrates a practical application in an equipment park. As a result, the classification of EM as the prioritization of substitution was obtained with respect to diversity, quantity and cost of the equipment shown to be replaced. The application of this method may contribute to increased quality of installed equipment and budget planning of hospital investments.

Code: 57567

Modality: Apresentação de Pôster

Title: APPLYING GAMING TOOLS AND VIRTUAL REALITY DEVICE‘ S TO HEALTH CARE: GOOGLE CARDBOARD & UNITY

Authors: Lucas Gabriel Guilherme dos Santos; Augusto; Gilberto; Francisco; Mateus; Francisco; William;

Presenter: Lucas Gabriel Guilherme Dos Santos

Abstract: Despite the new technologies have overcome the humankind lifestyle on the last few years being more and more present every day, pervasive systems like it was predicted on the late 80‘ s are a reality in this decade. This includes every aspect of human activity, passing by the educational or commercial proposal to the health care, just like it‘ s proposed on this paper. Virtual Reality Devices are becoming more common even on activities that do not have entertainment destination, like educational or professional areas as it is been displayed on social media - Facebook & Oculus association for example. As a support to strabismus surgery treatment, ocular physioterapy was developed to light-type patients, and it is being explored by other areas in medical care, precisely by the orthopedic field. On the other hand, new metrics must be created or the oldest ones have to be re-evaluated to fit on a new standard provided by these advances, so we are able to evaluate the patient evolution. This paper suggests the usage of a newborn technology application and will provide metrics for this evaluation.

Code: 57557

Modality: Apresentação de Pôster

Title: ASSISTANT MULTI-PARAMETRIC METHOD TO THE SELECTION IN THE PROCESS OF INCORPORATION OF HOSPITAL EQUIPMENT

Authors: Marcelo;

Presenter: Marcelo Antunes Marciano

Abstract: This project aims to demonstrate a multi-parametric method of hospital technology comparison. The main goal was to develop a method to assist the clinical and hospital engineering team, in the process of acquisition and incorporation of medical-hospital equipment, to be used as a tool in the comparison stage of brand options and models of available equipment in the market. The method is composed by groups of criteria or characteristics that can be evaluate referring to the technologies to be compared. This method was applied to compare autoclaves and disinfecting machines that would be purchased to install in a Material Central and Sterilization (CME) in a hospital in the south of Brazil. As a result, it was obtained the classifications with the final scoring referring to each brand and model of technology. It also contributed significantly to assist the choice definition of the equipment, considering the hospital and technology profile, as well as the requirements and expectations of the multi-professional technical group of evaluators and users. Keywords Multi-parametric Method, Hospital Equipment Comparison, Selection Assistance, Incorporation Process

Code: 63890

Modality: Apresentação de Pôster

Title: BIOMEDICAL EQUIPMENT□S DONATION TO PARAKOU HOSPITAL

Authors:

Presenter: A MALIKI SEIDOU

Code: 57587

Modality: Apresentação de Pôster

Title: BUSINESS INTELLIGENCE APPLICATION IN HEALTH MANAGEMENT

Authors: Osmam Brás de Souto; Lourdes Mattos Brasil; Ronni Geraldo Gomes Amorim; Bruna da Silva Sousa; Paula Uessugue;

Presenter: Osmam Brás de Souto

Abstract: Business Intelligence (BI) is a management support tool that can be used in the systematization of processes and generation of indicators which will support the process of drug distribution monitoring made available by the Popular Pharmacy Program Brazil (PFPB). Thus, the main objective is to map the profile of users of PFPB. In this sense, there was the study based on the draft Law No. 219/0726, which was identified problems in access to drug users of the Unified Health System (SUS). This problem makes this public refer to PFPB.However, the measurement of drug distribution process demonstrates how the importance of using the correct tool. With this, there is the need to draw up rules that analyze the profile PFPB the users according to the criticality of the disease, family income, address and place of availability of stock in PFPB pharmacies. Therefore, the appropriate use of technology in health care, provides the realization of a more efficient management.

Code: 57162

Modality: Apresentação de Pôster

Title: CASE STUDY ABOUT IMPLEMENTATION OF THE CLINICAL ENGINEERING SERVICE FOCUSING THE DEPARTMENT OF NUCLEAR MEDICINE IN A PHILANTHROPIC INSTITUTION

Authors: Tallita; Jaime Luiz; Arthur; Jafet;

Presenter: Tallita de Souza Zimmermann

Abstract: Introduction: The quality and velocity of diagnosis is one of the most important factor of patients treatment and healing. Because of that, make a control quality management of the equipments and process is an issue inside the institutions. That study describes a methodology applied on the implementation of a quality control program in a cancer treatment and diagnosis institute, specially inside the Nuclear Medicine department. Moreover, describes the primary steps followed to implement a department of clinical engineering. Targets:1) Identify the needs, equipments and services offered. 2) Protocols record: Digitalization of the machine configuration and operators recommendation protocols. 3) Creation of the Calibration Guide about daily and periodic quality tests. 4) Creation of a Maintenance Schedule (preventive and corrective) and Schedule of quality controls tests according to CNEN(National Commission of Nuclear Energy). 5) Implementation of a digital repository to save and analyze information results from the control quality tests, creating reports. 6) Creation of the Technological Park of Equipment inventory‘ s, which includes a digital occurrences book. Methodology: Were applied concepts of Clinical Engineering and principles of medical devices management to implement the targets above, following recommendation from ANVISA and CNEN NN 3.05. The inventory include three Gama Camera from GE Medical Systems: Brivo 615, Discovery 630 and Millennium. One hybrid Positrons Emission Tomography (PET-CT) BrightSpeed from Siemens Health Care, and one Curiometer The control quality tests and protocols record were made just for the Gamas Camera and for the Curiometer, because of the availability of the information and access to the equipment. The POPs about daily and periodic quality controls were made for all equipments of the inventory. The used tools to do the management were from Microsoft office: Excel, Word. The software choice was made because of the malleability and accessibility to his information and training. Results: The approach described had a positive impact inside the department. The reliability and quality of the exams and of the equipments was ensured. The protocols record was crucial to start their updates. Conclusion: The present study shows that the implementation of a quality control management of the equipments give to doctors the security to make diagnosis. Also, the practice experience shows that the partnership among physicists, engineer and operators make this work more efficient. The next step is extended this work to all institution, make the quality, velocity and security of the whole process standard of efficience.

Code: 63889

Modality: Apresentação de Pôster

Title: Clinical Engineering Approach to Improve Healthcare Technology Management for Enhancing Healthcare Delivery System in Middle Income Countries

Authors:

Presenter: M. A. Hossain

Code: 63906

Modality: Apresentação de Pôster

Title: Clinical Engineering in Mozambique

Authors:

Presenter: Mario SECCA

Code: 57514

Modality: Apresentação de Pôster

Title: COMPARATIVE ANALYSIS BETWEEN THE ENGINEERING LITERATURE CONCEPTS OF PRESSURE, TEMPERATURE AND AIR FLOW AND ITS APPLICATION IN THE DRC 15 OF 15 OF MARCH OF 2012

Authors: Felipe;

Presenter: Felipe Boeing Pinheiro

Abstract: By the present study, the article shows an approach to analysis and interpretation about the 15º Resolution, from the Collegiate Directors that, "provides on the requirements of good practices for the processing of health products and other measures". For this, in addition to the 15º RDC from 2012, the study compares the engineering requirements of this standard, with concepts of heat transfer and dynamics fluid, more specifically in pressure gradient, air flow and temperature, to show the applicability of these in healthy infrastructures, in a functional unit destined to the processing of products for the health, of the health services. They will be separated in their work areas as well as contaminant control needs, technical concepts for a work team, and how to meet normative requirements. Through the exploratory research and deduction to compare the results, it has been possible to understood the normative requirements and applicability of the engineering literature in these environments.

Code: 57461

Modality: Apresentação de Pôster

Title: COMPUTED TOMOGRAPHY SCANNERS PRODUCTIVITY AND EXAMINATIONS TIMES

Authors: Rogério; Renan; Andrei; Wagner;

Presenter: Andrei Lenine de Almeida Pires

Abstract: Objective: The aim of this paper was to study the productivity from exams execution times, using single-slice, dual-slice, 4-slices, 16-slices and 128-slices CT scanners. Methods: The productivity of 1, 2, 4, 16 and 128 slices TCs was analyzed by the exam times. To this end, 107 exams and nine TCs were analyzed. Examinations were divided into six stages: patient‘ s arrival, movement in the examination room, positioning, CT data entry, examination time and the patient‘ s exit. Results: The average times for 1, 2, 4, 16 and 128 slices exams were respectively 9‘ 39", 11‘ 53", 10‘ 12", 9‘ 09" and 5‘ 33"; and maximum theoretical productivities were 410, 333, 388, 432 and 713 exams/week. Excluding time needed for examination, times in all other stages were similar, drawing attention to the similarity among health unit procedures. Conclusion: It was observed that even simple devices can be productive, and that productivity gains by the use of sophisticated devices may not be essential for units with low demand and / or purchasing power. It was clear that increased productivity is not a linear function of the number of slices, and that without organizational changes this increase may not be as large as expected.

Code: 57558

Modality: Apresentação de Pôster

Title: CRITERIA FOR SELECTING SERVICES FOR CALIBRATING MEDICAL EQUIPMENT

Authors: Marcelo; Anderson;

Presenter: Marcelo Antunes Marciano

Abstract: Because of the importance of calibration biomedical equipment and the difficulty of access protocols with propositions of the calibration service selection criteria regarding the quality of biomedical equipment calibration process, this paper aims to propose basic and minimum criteria for evaluation preview hiring for selecting a calibration service for biomedical equipment.

Code: 57163

Modality: Apresentação de Pôster

Title: DEFIBRILLATORS IN LOCATIONS WITH A HIGH CONCENTRATION/MOVEMENT OF PEOPLE IN BAURU/BRAZIL

Authors: Aline; Luiz Roberto;

Presenter: Aline Souza de Melo

Abstract: Defibrillators are equipments used in emergency care for the patient in cardiorespiratory arrest, especially in cases of ventricular fibrillation. Each minute of the onset of ventricular fibrillation, the probability of survival falls by 10%, and a pulse of electric current that pass through the heart in a few minutes (3 minutes is ideal) is effective. With the need for a fast defibrillation care, laws have emerged that require these equipments in places with high concentration/movement of people, such as Law nº 12,736/2007 of the state of São Paulo. The objective of this research is to verify if these institutions/places, located in the city of Bauru/Brazil, have the automated external defibrillator (AED) for emergency situations. As well as, analyze their operating conditions and how maintenance of this equipment in these institutions is performed. A bibliographical research was done on the physiology of the heart, arrhythmias and the importance of the defibrillators to combat these arrhythmias. Also a questionnaire was carried out involving questions such as the existence, operational condition and maintenance of the AED, number of people who circulate or are concentrated in these places, among others; followed by the application of this questionnaire in the institutions that agreed to the research. Among the 33 locations where the first contacts were made (telephone, e-mail or personally), 22 granted their participation. Among them, 6 of them have the defibrillator, and in one place the equipment is not in use, because it does not have a trained professional yet. It is concluded that the knowledge of having the availability of defibrillator in these locations should be further expanded, therefore it is possible to apply defibrillation between the initial minutes of ventricular fibrillation or pulseless ventricular tachycardia, increasing the chances of survival.

Code: 57579

Modality: Apresentação de Pôster

Title: DEVELOPMENT OF AN UBIQUOTOUS MANAGEMENT PLATFORM IN AIR COMPRESSORS USED IN PRIMARY HEALTHCARE

Authors: Ion; Felipe; Renato;

Presenter: Ion Leandro dos Santos

Abstract: On this article is presented a HFMEA study applied in search for a monitoring system implementation for air compressor (CPR) and a prototype development for ubiquous management of this technology. The aplication of the tool Healthcare Failure Mode and Effect Analysis (HFMEA) enable select which information are possible to be use in the CPR monitoring system. The information analysis results contained in the HFMEA identified the relevant physical quantitys in the CPR to be monitoreted with theorical basis of the necessity of its monitoring, for a more efficient and trustworthy management of this technology. As results, the development of sensing module that will be applied in a Ubiquotous Management System for Clinical Engineering HTM (Health Technology Mangement) is presented, that allow an enhacement in the ubiquotous management of the technological process in compressors aplied to primary healthcare.

Code: 57549

Modality: Apresentação de Pôster

Title: DIGITAL STORAGE AND SYSTEM MANAGEMENT FOR VIDEO SURGERY RECORDS IN A NETWORK PLATFORM

Authors: Benedito; Daniel; Berthone; Guilherme; Filipe; Antonio;

Presenter: Guilherme Tenorio Santos

Abstract: This Project aims to replace the actual manual operation, management and storage method regarding to video surgeries by a digital method on local network servers, providing a high level of security and favoring the management and easy access for all information by all those responsible, by legal right. The system will also contribute to the surgical staff routine, making the employees labor involved in the process more efficient. It will include a reducing of the storage costs and physical waste (medias and cases) besides to reduce loses with physical media data inherent to the actual process. In addition, the project will increase the shelf life of the surgical data archived. The videos will be stored in an available system used for another purpose in the institution. There is no need to purchase a new equipment (only adding storage discs) to implement the solution which makes the project financially attractive with an excellent cost benefit.

Code: 63895

Modality: Apresentação de Pôster

Title: Digital System of Operation Room in Private Hospital

Authors: Chen Chen ;

Presenter: Chen Chen

Abstract: Abstract— The integrated operating room is changing the way how surgery is performed and how medicine is practiced in hospitals and medical facilities across the country. This paper discusses how technological developments in the operating room have improved efficiency and changed the ways surgeons and other OR staff approach their jobs. The integrated operating room will undoubtedly have a significant impact on how medicine is performed in the future.

Code: 57588

Modality: Apresentação de Pôster

Title: DISCARDING FLOW PROPOSITION OF HOSPITAL ELECTRO-ELECTRONIC EQUIPMENT

Authors: Marcelo;

Presenter: Marcelo Antunes Marciano

Abstract: This work has as its proposition, to present a project whose main goal is to suggest the establishment of a flow with detailed stages, from the moment that it is defined the discarding of an electro- electronic equipment used in hospital environment until the reuse of possible material to the manufacturing of new equipment. The suggestion is applying to all the equipment electro-electronic used in the hospital (be the biomedical, electro-mechanic in general, computer, refrigerator, air conditioner etc.). And thus contributing to issues socio-environmental, as well as economic financial, through an appropriated discarding process.

Code: 57554

Modality: Apresentação de Pôster

Title: DISTRIBUTION OF MAMOGRAPHS BY MACROREGION OF BRAZIL

Authors: Sarah; Ana Claudia;

Presenter: Ana Claudia Patrocinio

Abstract: Cancer in general, is one of the biggest public health problems in the world. Breast cancer represents the second most frequent type of cancer in the world population and the most common among women, being in Brazil, the first cause of cancer death among ladies. The main method to breast cancer screening is the mammogram. At the national level, as far as the north, north-east, center-west, southeast and south macroregions are concerned, it can be said that the number of existing mammographs and fully functioning is more than sufficient for the total care of the population. However, several studies show that these equipments are poorly distributed, with the majority concentrated in the metropolitan regions and with a higher socioeconomic standard, in the lag of peripheral and lower income regions. The quantity and qualification of health professionals, and the mechanisms capable of guaranteeing the use of these services (financial resources, maintenance, calibration, etc.), also affect the population‘s access to mammography.

Code: 57371

Modality: Apresentação de Pôster

Title: EARLY STAGE STRATEGIC EFFECTIVENESS EVALUATION OF HIGH FLOW NASAL THERAPY (OPTIFLOW®) IN THE TREATMEN T OF ACUTE PEDIATRIC RESPIRATORY FAILURE

Authors: Graziela; Ana Lucia; Artur; Werther; Vicente; Regina; Maria Thereza; Evelinda;

Presenter: Graziela de Araujo Costa

Abstract: Introduction: Heated humidified high-flow nasal cannula (HFNC) therapy is used in the pediatric intensive care unit (PICU) and may be effective in the treatment of acute respiratory failure as an alternative to prevent orotracheal intubation and its complications or to remove the child of the invasive or non-invasive mechanical ventilation (NIV). Brazil has restricted PICU installations imposing requirements for optimization. Adoption of early stage strategic effectiveness evaluations may help to justify incorporation of beneficial new medical devices into the public Brazilian healthcare system, SUS. Objectives: To assess the clinical impact of HFNC use in pediatric patients and to describe their evolution during the hospitalization. Methods: Prospective observational study of consecutive series of patients, between one month and 19 years, who were hospitalized at the Children´s Institute oncology and pediatric wards of the São Paulo University Medical School´s Hospital das Clínicas, from September 2016 to March 2017, with acute respiratory insufficiency requiring respiratory support after prophylactic extubation or post-extubation insufficiency, respiratory support for patients in exclusive or terminal palliative care, and having hypoxemia refractory to conventional oxygen therapy (O2Sat <90% with FiO2> 60%). Patients with choanal atresia, mouth breathing, trauma or nasopharyngeal surgery, postoperative neurosurgery with skull base approach, active epistaxis and tracheoesophageal fistula were excluded. All used the Fisher & Paykel® CAF system with Optiflow Jr® or Optiflow® nasal cannula chosen according to the patient‘ s weight which did not exceed 2/3 of the nostril diameter, with a MR850 humidification base of the same brand. Respiratory insufficiency was classified as mild, moderate or severe according to the modified Wood Downes scale. Admission demographics, population characteristics, clinical variables, treatments given, the PICU outcome and the patients´ discharge or death were analyzed. Variables relative distribution are described. Results: 40 patients used HFNC, with median age of 29 months, males predominated (55%). Of them, 62.5% were admitted with acute respiratory failure, amid whom 67.5% had moderate respiratory insufficiency as the major HFNC indication, 17.5% required HFNC for respiratory support after extubation, 7.5% due to severe respiratory failure. The HFNC median use extent was 5 days and 50% of the children could be fed orally, 19.5% used continuous sedation, and 9 (25%) used intermittent NIV for a median of 0.3 days. Six patients (15%) were intubated due to respiratory worsening, 5 patients (17.5%) died (2 were in terminal palliative care, 2 died within 48 hours of hospitalization and the last patient was intubated after the 2nd HFNC day and died at the 30th hospitalization day). There were only 2 patients (5.5%) with complications (epistaxis), whom both had platelets <20,000 / mm3. Conclusion: HFNC seems to be effective in the treatment of pediatric acute respiratory failure and is an alternative to avoid the intubation of these patients with few complications. PICU earlier discharge, ward admission and oral feeding benefited over half of these patients favoring patient´s safety, health recovery, resource economy and services´ solvability. Further HFNC studies are encouraged by the results obtained, aiming for its adoption into the public Brazilian healthcare system, SUS.

Code: 57510

Modality: Apresentação de Pôster

Title: ENTRY INTO THE EUROPEAN MARKET OF MEDICAL DEVICES. TWO VISIONS: SPAIN AND CUBA.

Authors: Chaveco; Juan Carlos; Rosa Mayelín;

Presenter: Yariza Chaveco Salabarria

Abstract: The work presented is part of an ongoing research project that looks at the same issue from two different perspectives: developed and developing countries. The objective is identify the existence and impact of barriers to entry into the european market for medical devices. An exploratory case study was conducted with spanish companies. At present a descriptive case study is carried out with cuban companies in the sector. The preliminary results show a consensus in the criteria of the spanish participants about the absence of tariff barriers and some discrepancies with respect to non-tariffs barriers, highlighting influence of technical barriers. However, the definitive findings are not yet available.

Code: 57573

Modality: Apresentação de Pôster

Title: EVALUATION OF PRODUCTION CAPACITY, THE HEALTHCARE COVERAGE AND THE ACCESS OF COMPUTERIZED TOMOGRAPHY IMAGING IN THE BRAZILIAN PUBLIC HEALTH SYSTEM (SUS)

Authors: Diana Lima dos Santos; Handerson Jorge Dourado Leite; Luis Eugenio Portela Fernandes de Souza; Ricardo de Araujo Kalid;

Presenter: Diana Lima

Abstract: Background: High-cost health-care technologies have become more widely available in Brazil in the public health system (SUS) in last years. Considering the importance of computerized tomography (CT) in the diagnosis of many people's health problems and for the fundamental principles of SUS, this study aims to analyze the coverage and the access of CT in the municipalities of the state of Bahia referring to the year 2013, considering the performance indicators and parameters of Decree 1,631/2015. Methods: We estimate indicators of Nominal Potential Production Capacity (CP) and rate of use (RU) of CT equipment for the year 2013, using data the municipalities of Bahia extracted from DATASUS. The operating time of the establishments that provide this service was considered and an average time of 30 min was defined for the accomplishment of each CT examination. The flow of patients in each Brazilian municipality who underwent CT examination was mapped and the distances travelled by patients from their hometown to places to have these examinations was compared to the recommendations of Ministry of Health Decree 1,631/2015. Furthermore, we categorize the municipal variables by HDI-M tertiles to evaluate the relationship between the analyzed variables and this socioeconomic indicator. Results: For municipalities of the state of Bahia in year 2013, we observed that the RU of CT equipment of the public CT equipment was on average 12.5%. In the private sector, on average, the RU was 17.54% for SUS. We observed that of the total of 1,550,391 CT examinations performed in 2013, 83% of the population of Bahia carried out examinations in its municipality or in the nearer, when none existed offer by SUS in the same municipality. However, the municipality of attendance close to the patient is not always located within the minimum distance recommended of Decree 1,631/2015, due to the concentration of equipment in some municipalities. Due this, 37% of the population of the municipalities served traveled a minimum distance that was greater than 75km. For municipalities located up to 75km from the city of care, the number of tests performed per 1,000 inhabitants was on average 9.81, while for municipalities located more than 75km from the city of care, we observed, 2.54 examinations per 1,000 inhabitants. We observed that the average of exams per 1000 was 1.23 and 12.65 for the municipalities in 1st tercil (more poor) and 3rd tercil (more rich), respectively. Conclusion: Despite the possible underutilization of the productive capacity of the equipment, considering the coverage parameters of Decree 1,631/2015, it was observed geospatial and socioeconomic inequalities in the access to CT scans. Populations living in richer municipalities had greater coverage of exams compared to populations living in poorer municipalities. The results converges to the results of several Brazilian studies; whose results prove that the distance, as well as the socioeconomic conditions are barriers to access to health care (ANDRADE ET AL 2013, SANTOS ET AL 2014; BARRETO ET AL, 2014).

Code: 57592

Modality: Apresentação de Pôster

Title: EVALUATION OF SPHYGMOMANOMETERS: COMPARISON BETWEEN MANUAL AND DIGITAL MEASUREMENT

Authors: Bruna da Silva Sousa; Vera Regina Fernandes da Silva Marães; Lourdes Mattos Brasil; Jorge luiz Ferreira da Silva Junior; Hugo Hilário dos Santos Júnior; Paula Uessugue; Osmam Brás de Souto;

Presenter: Bruna da Silva Sousa

Abstract: Abstract—Blood pressure is one of the most important hemodynamic variables for early verification of cardiovascular diseases and autonomic changes in the heart. At the population level, its measurement may indicate risks or not of cardiac events during moderate or high intensity physical activities. Thus, the purpose of this paper is to compare the blood pressure measurement using manual and digital sphygmomanometer in pre-training athletes. To obtain the data, the blood pressure was verified twice in football players of Brasilia - Federal District, Brazil. The players were divided into two observation groups denominated A and B, both composed of 10 athletes, and chosen randomly. In group A blood pressure was verified following manual and digital order. In relation to group B, the order of the verification was inverse, it means, first digitally and later manually. It should be noted that all checks were performed on the same arm. Subsequently, the two measurements were evaluated for descriptive statistics and significant. Thus, in terms of the result, it was observed that the blood pressure presented a descriptive average (systolic 148.50 ± 21.58 - diastolic 93 ± 10.80) when measured in a manual sphygmomanometer, while for the measured in a digital sphygmomanometer was obtained (systolic 150, 25 ± 21.67 - diastolic 90.50 ± 15.38), verifying that that the mean arterial pressure of the athletes was elevated as acute adjustments to the predicted physical exercise. It can be said, thus, that the digital sphygmomanometer presented a greater change in the diastolic pressure values. However, there was no significant difference between the digital and manual sphygmomanometer, suggesting that both can be used for measuring blood pressure, since it is well positioned.

Code: 57528

Modality: Apresentação de Pôster

Title: EVALUATION OF WASTE DISPOSAL INADEQUATE MANAGEMENT FROM HEALTH SERVICES

Authors: Larissa; Ana; Ana Claudia;

Presenter: Larissa Teixeira de Oliveira

Abstract: This paper presents the solid waste generation from a large private hospital in the Triângulo Mineiro region, how the hospital s waste is segregated and handled, and how health professionals behave on this matter. During approximately two months, the hospital's waste generation processes were monitored and therefore, inadequate procedures related to waste management from generation to collection were observed. Was founded a lot of failures about waste disposal from health because of the lack of attention, and knowledge of nursing team, and almost people in the hospital.

Code: 57570

Modality: Apresentação de Pôster

Title: FDA INTERNATIONALIZATION UNDER THE ASPECT OF MEDICAL DEVICE STANDARDS

Authors: Rafael; Saide;

Presenter: Rafael Gomes Fernandes

Abstract: INTRODUCTION: Food and Drug Administration (FDA) follows the practice of evaluating the safety and efficacy of medical devices using internationally recognized standards and their guidelines. Although there are recommendations from intergovernmental organizations [1,2,3], not all international standards are recognized [4]. OBJECTIVES: Determine the FDA internalization level in using international standards for the evaluation of medical devices. METHODS: The study uses FDA public database and data collection from International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC). A preliminary list of International Classification for Standards (ICS) codes was built from ISO and IEC medical device groups [5, 6]. This list was cross-checked with IMDRF report [7]. Using this final list, we searched for all standards on medical devices in the ISO and IEC database [8,9]. Only the Standard Number was considered to avoid duplicity between the versions (commented, consolidated, extended, etc.), since the addressed risk and the scope in the versions are similar. Subsequently, we crosschecked the information from the FDA database for products [10] and standards [11], adjusting the information. RESULTS: The IMDRF report [7] does not take into consideration the ICS groups 35.240.80, 37.040.25, 13.040.35, 11.200, 11.180.10, 11.100.10 and 11.100.20. Our final list for ISO and IEC complies with 1087 standards, against 1102 from the IMDRF report [7]. The cross-checking between FDA recognized standard list and the IEC/ISO-standards final list, showed that out of 569 Standards, 388 are in the ISO-IEC final, 106 are duplicates (other versions), and 75 are not part of the ISO-IEC final list. Out of the 75 existing standards, 3 were withdrawn, 3 were revised by another standard, and with classifications not directly related to medical devices there were 69 i.e., 71.100.40 - surface active agents. Only 36% (or 388) of International Standards are recognized by FDA. In addition, our analysis showed that 86% of FDA products are not covered by international standards, but their coverage can be extended by other standards or guidelines. The coverage for risk class 3 products reaches to 12% (7% by vertical standards), for implants reaches 33% (11% by vertical) and for life-suport reaches 26% (25% by vertical). The coverage of vertical standards is important because it addresses specific risks and performance [12]. CONCLUSION: Whereas the ISO/IEC list has fewer items than the IMDRF list, more ICS codes were considered in our list. The number of international standards recognized by FDA is very low (36%), as a consequence of 14% medical devices are covered, with 8% by vertical standards. Our analysis showed great opportunities for improvement in the ICS 35.240.80 (IT applications in health care technology), 11.040.40 (implants for surgery, prosthetics and orthotics - including pacemakers), and 11.060.20 (dental equipment). This study was limited by the available information. Moreover, we cannot find the complete standard list from the IMRF report [7]. As a suggestion for further studies, it is recommend to compare this study with other IMDRF data from other countries, and include other recognized standards (e.g., national).

Code: 57560

Modality: Apresentação de Pôster

Title: FLOW ANALYZER FOR BLOOD PUMP

Authors: Rodrigo; Anderson; Marcelo;

Presenter: Marcelo Antunes Marciano

Abstract: This study presents the development of a low- cost, open source prototype, with the objective of automating the flow analysis process (measurement and recording) of the blood pumps of hemodialysis machines, enabling support in the process of inspecting the operation of the device and, as a consequence, raising the quality and safety of use. Through this technology (process automation) it is believed that the equipment downtime and the total cost of the test can also be reduced. This device will have a system that will collect data in real time, generated by the blood pump. Mathematical calculations will be used to present flow information including the standard deviation of the measurement, which will be presented at the end of the test in an objective and simple way. Through a software and a Human Machine Interface (HMI) the test can be monitored, as well as generate a report that will contain additional information with the name and model of the equipment, as well as the quantitative results of the flows and the standard deviatons of the measurements. The automated flow analyzer can be used by clinical engineering teams in preventive maintenance and after corrective maintenance, as a control practice, making the process more practical and safe.

Code: 63911

Modality: Apresentação de Pôster

Title: Hemodialysis in Syria: a BME Approach

Authors: Lama Almohamad;

Presenter: Lama Almonhamad

Abstract: Before the conflict erupted in Syria, the haemodialysis services were supported mainly by the Ministry of Health and Ministry of Higher Education in their respective health facilities. Additionally, some local charities and the Syrian Arab Red Crescent (SARC) supported haemodialysis either in their own centres or by covering the cost of the service in private hospitals. As the conflict evolved, local authorities limited the support to the health services. Dialysis was one of the many affected services. In 2014, Evidence of deaths of patients from renal failure were reported in some areas in Syria such as Raqqa (IS) in early 2014. As a result, the ICRC responded by piloting a haemodialysis project in mid-2015. The aim was to support the haemodialysis department in Raqqa National Hospital by provision of a new reverse osmosis system, two haemodialysis machines and consumables. Similarly, ICRC began the supporting six haemodialysis centres in three governorates, Damascus, Homs and Aleppo; one on each side to ensure a neutral and balanced approach. Unfortunately, access to Raqqa National Hospital was not managed. The support included consumables, provision of machines if needed, and with the support of WatHab reverse osmosis systems including provision and maintenance. Achievements: In 2014 More than 1500 sessions were distributed to both SARC HQ (Government controlled area) to support their haemodialysis facilities and to AlBir Hospital, Al-Waer, Homs (Armed Opposition controlled area), benefiting more than 200 patients. In 2015 About 7450 sessions were distributed to 10 facilities across the country including across front lines, benefiting more than 800 patients. In 2016 About 29250 sessions distributed in 22 facilities reaching government controlled areas and across front lines, benefiting more than 1200 patients. Three haemodialysis machines were donated. Up till May 2017 17500 complete sessions, 2 machines and enough consumables for a maximum of 11000 sessions were distributed to 14 facilities benefiting about 1140 patients. Efforts to rehabilitate out of service machines are ongoing in different areas across Syria. II ECEHTMC, 2017 Abstract: Dialysis Programme in Syria Lama Almohamad ICRC Syria Eng. Lama Almohamad Biomedical Engineer Officer ICRC Syria Lessons Learned: The main challenge remains access. Mainly for hard-to-reach areas where such interventions are life-saving. Due to the sporadic/non-regular access to such areas, delivering assistance in larger quantities and long expiry dates proved to be beneficial. Splitting the annual order to avoid having to distribute massive quantities of consumables with short expiry dates and ending up with critical stock later on. Partial support to the facilities is crucial in order not to create complete dependency in case of breakage in the supply chain. The programme strategy for 2018-2020 is ongoing.

Code: 63903

Modality: Apresentação de Pôster

Title: Hi Focused Ultrasound

Authors: C. Gemma1, C. Martinoli1, I. Vallone1, L. Sammarchi2, G. Broich2, A. Leo3, P. Lago1;

Presenter: Corrado Gemma

Abstract: High Focused Ultrasound (HIFU) is an innovative technology using the combination of two diverse technologies: focused ultrasound, which ablates tissue precisely and noninvasively to treat many medical diseases; magnetic resonance (MR) or ultrasound (US) imaging, which allows to target tissue to be treated, direct and control the treatment in real-time and verify the effectiveness of the treatment. HIFU is indicated to treat many types of cancer, such as bone metastases, liver tumors, prostate and breast cancer. Moreover this technology has been indicated to treat neurological disorders, as essential tremor, depression and Parkinson's disease. The analysis focuses on MR-guided focused ultrasound (MRgFUS). This technology is quite new comparing to the US guidance one, starting to be developed around 2000, but it is used both for clinical treatments and for research purposes. Nowadays there are several MRgFUS manufacturers but only two of them received CE mark and/or FDA approval: Philips Healthcare (Eindhoven, The Netherlands) and InSightec LTD (Tirat Carmel, Israel). Philips Sonalleve MR-HIFU system is compatible with Phillips's Achieva 1.5 T/3.0 T, Ingenia 1.5 T/3.0 T, and Intera 1.5 T/3.0 T MR scanners. InSightec ExAblate 2100 system (second-generation ExAblate 2000 system) is compatible with GE Healthcare's Signa 1.5 or 3.0 T MRI and DV450 and 750 models. There is no such evidence 1.5 T MRgFUS system are better than 3.0 T ones in temperature control. Although this technology is currently in the early stages of adoption, it could be a real solution to the treatment of severe medical diseases, including neurological disorders, various types of cancer, cardiovascular diseases and endocrine disorders. Clinical Engineers should be fundamental in this stage both for manufacturers and physicians. They could give a great support in development stage and in research projects, as they are experts on health technologies.

Code: 57582

Modality: Apresentação de Pôster

Title: HOSPITAL MAINTENANCE MANAGEMENTE

Authors: Aby Akel; João;

Presenter: Aby Akel dos Santos Forte

Abstract: The article deals with a plan of improvements developed in the Foundation of Tropical Medicine Doctor Heitor Vieira Dourado - FMT - HVD for maintenance area, a maintenance management software was used and this one has the purpose to form a database with all operations carried out by that sector, the software will provide more detailed reports of the actions of the sector, as well as the monitoring of the useful life of the hospital equipment

Code: 57142

Modality: Apresentação de Pôster

Title: IMPACT OF A CLINICAL ENGINEERING INTEGRATED MANAGEMENT SYSTEM IMPLANTATION - CASE STUDY EXAMPLE IN A TERTIARY HOSPITAL COMPLEX WITH MULTIPLE DIVERSE INSTITUTES BUILDINGS AND 2400 BEDS

Authors: Ferdinando; Fábio; Francisco; Alessandro; Dennis; Diego; Cleiton; Ilan; Antonio;

Presenter: Ferdinando Silvestre de Melo

Abstract: Due to the absence of an integrated management system for the medical and hospital equipment of the Institutes: Central (ICHC), Orthopedics and Traumatology (IOT), Psychiatry (IPQ), Radiology (INRAD) and Children□s (ICR) of the University of São Paulo Medical School□ Hospital das Clínicas Autarchy (HCFMUSP), it was impossible to manage appropriate clinical engineering, CE, techniques. With the implementation of the CE integrated management system, it was possible to carry out a global inventory of the equipment and, from that start, to implement management actions that brought as a benefit: maintenance planning, equipment□s historical data, direct communication connection between the Healthcare Team and Clinical Engineering for opening and follow-up Service requests, indicators extraction and cost saving with Unified Contract Management strategies.

Code: 57153

Modality: Apresentação de Pôster

Title: IMPLEMENTATION OF MONITORING CENTRAL IN NEONATAL INCUBATORS

Authors: Ana; Aline; Mariana; José; Ana;

Presenter: ANA BEATRIZ FRENHE

Abstract: The premature baby is the one born before completing 36 weeks of gestation. When this happens the newborn (NB) is placed in the neonatal incubator to complete their development and have more chances of surviving than when it is not placed on such equipment. The constant monitoring of the local by the nursing staff is also of great help, as well newborns can stay in incubators prevented from future permanent damage to the little ones. Thinking of a way to increase and even facilitate such monitoring, it was reproduced in this work the project to develop a central monitoring through software installed on the computer of the Neonatal Intensive Care Units (NICU). The control unit is a technological innovation that aims to perform the functions to monitor, display and record the data obtained in the neonatal incubator, and if there is any abnormality can be quickly corrected by the nurses on duty. The study methodology used in this work was to collect bibliographical data about the newborn, incubators and monitoring centers used in hospital equipment and functional verification of monitoring centers. The development of this project can improve the quality of care in NICU, as well as ensure that all parameters are working according to current norms.

Code: 57556

Modality: Apresentação de Pôster

Title: INTEGRATION OF THE TRANS-OPERATIVE INFORMATION WITH THE PATIENT‘ S ELECTRONIC RECORD

Authors: Marcelo; Eliezer;

Presenter: Marcelo Antunes Marciano

Abstract: This article presents an integration project between the anesthetic station used in the step of trans-operative (life signals multiparameter monitor, anesthesia device and controlled target infusion pump) and the system of hospital information. The main goal of this project is to capture in an automatic way the vital signals from the medical equipment and the records trans-operatives and provide an anesthesia record to be storage in the patient□s electronic medical record (PEMR). The integration mode is through a gateway that execute the conversion of the machine - specific language into data/information of the HL7 standard. This interaction will allow to integrate data and information from multiparametric monitors, anesthesia devices, Controlled target Infusion pumps and the intra-operative anesthesiologist inputs. Keywords - Medical Equipment, Anesthesia Station, Step of the trans-operative, Pacient Data Integration, Electronic Records.

Code: 57589

Modality: Apresentação de Pôster

Title: INTELLIGENT SYSTEM FOR CAPTURE OF HUMAN MARCH MOVEMENT THROUGH AN INERTIAL MEASUREMENT UNIT

Authors: Gilmar Severino Lucena de Souza; Lourdes Mattos Brasil; Vera Regina Fernandes da Silva Marães; Gabriela Ataides de Oliveira;

Presenter: Gilmar Severino Lucena de Souza

Abstract: For a long time, a way has been sought to analyze the human body in motion with the least possible discomfort. In this sense, several mechanisms are used to make a complete analysis of the movements, striving to be as precise as possible in these measurements. In this case, in the field of Biomedical Engineering[1], for example, there are electromagnetic detectors, accelerometry, mechanical and electrostatic orientation and position, as well as electro-optical and video tracking systems[2]. The general objective of this article is to develop an intelligent system for capturing human gait movement using an Inertial Measurement Unit (IMU), which consists of the union between accelerometer, gyroscope and magnetometer[1], as well as to explore biomechanical processes of the To evaluate the sensors present in the IMU, developing an IMU for data collection, using fuzzy logic to treat human gait data. The methodology used to develop the IMU will be based on fuzzy logic. In this project will be inserted a set of rules based on fuzzy logic in order to minimize the errors found in the results. The IMU model to be researched should be evaluated according to its main characteristics, such as data transmission protocol, types of embedded sensors, cost and other pertinent functionalities of each device. Initially, three walking patterns will be analyzed and identified, including the normal walking cycle, climbing and descending ladder. The result will be the possibility of evaluating the performance of each gait pattern (normal gait, stair climbing and ladder descent) with the Artificial Neural Networks - RNA: Cerebellar Model Articulation Control CMAC[3] and Multilayer Perceptron - MLP4 algorithms, respectively. In (3), it is possible to verify that the CMAC training developed can be used to test a true prototype of a transfemoral active prosthesis, as it showed great performance in the results. In the work developed in (4), it demonstrated the use of the ANN MLP in order to predict the angular velocities of a human knee. The results obtained from RNA are similar to real ones. However, it can be enhanced with more data (capture by IMU).

Code: 57583

Modality: Apresentação de Pôster

Title: INTERNATIONAL STANDARDS FOR MEDICAL DEVICE AND THE U.S. FOOD AND DRUG ADMINISTRATION

Authors: Rafael;

Presenter: Rafael Gomes Fernandes

Abstract: Health agencies around the world follow the practice of evaluating the safety and efficacy of medical devices using internationally recognized standards and their guidelines. Although there are recommendations from many intergovernmental organizations, not all international standards are recognized. Therefore, we aim to determine the Food and Drug Administration (FDA) level in using international standards for the evaluation of medical devices. The study uses FDA public database and data collection from International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) databases. The conclusion points to a low level of adherence to international standards (only 36% of IEC/ISO Standards) and the need to increase their utilization (14% of medical devices covered). This research contributes to understanding global harmonization of these medical devices and proposes opportunities for improvement.

Code: 63908

Modality: Apresentação de Pôster

Title: KEY AREAS OF CHALLENGE AND PROGRESS OF CE-HTM IN NIGERIA

Authors: Esan, Bukola Emmanuel;

Presenter: Bukola Esan

Abstract: 1.0 Background: Since the adoption of resolution WHA60.29, WHO had embarked on a number of projects focusing on medical devices; specifically in Nigeria, which had been helping to promote awareness, and advocacy in terms of access to safe and quality medical devices. To date, the World Health Organisation (WHO) had organised 2 events in Nigeria including a Stakeholders Workshop tagged ' Local Production and Technology Transfer for Medical Devices- LPTT; with a view to understanding barriers and challenges to access of medical devices, particularly in a low-income setting amongst others. 2.0 Some of the key challenges include: Some of the key challenges that we are facing in Nigeria include: i. Poor infrastructure such as space availability etc. ii. Lack of planned preventative maintenance (PPM) programme iii. Poor maintenance policy, wrong selection of equipment manufacturers having inadequate after-sale service iv. Fluctuations in the mains voltage (a common problem in developing countries) v. Lack of comprehensive service manual with detailed circuit and component layout diagrams, parts list, dismantling procedure, test points along with voltage and waveform information, fault location trees, etc. vi. Inadequate suitable test and measuring equipment and relevant tools. vii. Poor operability of equipment with possibility of high degree of operator error viii. Poor motivation, lack of skill and sense of involvement of staff. ix. Absence of training programmes for workers for employing correct and most effective production techniques. x. Hostile working environmental conditions like lack of air-conditioned room, dust free areas. 3.0 Progress of Activities: At present, a lot of activities are currently on-going to address above challenges which include: i. Efforts of government of the Federal Republic of Nigeria in ensuring local capacity of Human Resource for Health ii. Growing number of Training Institutions in Clinical Engineering and Health Technology Management; particularly Biomedical Engineering Education in Nigeria iii. On-going efforts to establish a scheme of service and career progression for CE-HTM personnel in the Federal Public Service; and by extension the States and Private Sector iv. Harmonised Training Curricula for Biomedical Engineers (BMEs) and Biomedical Equipment Maintenance Technicians have been developed for the 15 ECOWAS Member States v. Advocacy for establishing a medical equipment inventory programme is also on-going. 4.0 ACHIEVEMENTS: i. In Year 2014, we had written proposal and won a grant from GE Healthcare Foundation for the proficiency training of Biomedical Equipment Maintenance Technician (BMETs) in Nigeria for a 3 Year period (2014- 2017). ii. Presently, we have approval from the West African Health Organisation (WAHO) for technical support to train fifteen (15) Biomedical Equipment Maintenance Technicians (BMETs) in five Training Institutions in Nigeria. I wish I will be able to be more detailed in my paper presentation, in explaining more on activities, challenges and achievements both in Nigeria and West African region.

Code: 63896

Modality: Apresentação de Pôster

Title: Lean and Computerized Mgmt System for Non-hospital owned Medical Equipment

Authors:

Presenter: Yun Yun Wu

Abstract: Abstract—There are many challenges existed in management of non-hospital owned medical equipment. In this paper, a novel kind of lean and computerized management method is proposed and implemented, in which the management policy, procedures, agreement signing, equipment installation, acceptance and maintenance, exit procedure are included. The result shows that the lean and computerized management system is able to improve oversight and assure the safe integration of non-hospital owned equipment; to reduce liability exposure and increase compliance with regulations. Keywords—Non-Hospital Owned Medical Equipment, Lean Management, computerized management system, Trial Protocol, Medical Safety, assets control

Code: 57534

Modality: Apresentação de Pôster

Title: LOCATION OF ELECTROMEDICAL EQUIPMENT IN CLOSED ENVIRONMENT USING WI-FI TECHNOLOGY

Authors: William;

Presenter: William Knob de Souza

Abstract: This article seeks to show a method of location of electromedical equipment in a wireless network based on the IEEE 802.11 standard. The work makes use of an existing system to demonstrate the ways to locate a device in a building. Over the course of the article seeks to show the location system in operation. Sequentially, from an exploratory research, makes the introduction of a micro controller with wireless module, with the purpose of presenting a solution for location of medical equipment.

Code: 57547

Modality: Apresentação de Pôster

Title: MACHINE PERFUSION: GLOBAL IMPACT PERSPECTIVES IN TRANSPLANTS

Authors: Carlo; Corrado; Ilaria; Marinella; Paolo;

Presenter: Carlo Martinoli

Abstract: Introduction: The demand for organ transplantation is continuously increasing due to the great success of modern transplant protocols and techniques. Nevertheless, several people on waiting list for organ transplantation die because the demand is much higher than the supply. There are various strategies for increasing organ pool: extended-criteria donors (ECD) and donors after circulatory death (DCD) are two of the most known. Both strategies imply organ perfusion and we focus on ex situ perfusion where grafts are treated with medical devices called Machine Perfusion (MP). Methods: MP are integrated and stand-alone systems that allow preservation, perfusion, assessment and reconditioning of organs. MP are also characterized by an high level of automation and integration so that they are easy to use and plug and play-like. MP are able to restore a good functionality even in those organs that would be otherwise rejected for this operation, therefore it is possible to increase the number of transplants. Kidney, liver and lung are the most diffuse and developed MP nowadays, while those for pancreas and hearth are less spread. MP perfusion could have a great impact on national health systems worldwide in the near future, as the management of transplants process will change completely. Firstly, it could be possible managing the organ transplant operation as a normal surgical operation characterized by more manageable election criteria and by activities planning. Therefore, it could be possible releasing transplants from time and urgency bounds. Further development could be the creation of perfusion centers where organs are kept alive and ready to use. There are also side effects in the spreading of MP: one of the biggest one is that MP could increase organ trafficking. There is lack of information about organ trade, but it is considered a very important issue in the WHO. Especially the use of MP could increase the trade of kidneys and liver as for those organs there are in commerce some portable MP. A World Health Assembly resolution adopted in 2004 (WHA57.18) urges Member States to take measures to protect the poorest and vulnerable groups from ‘ transplant tourism and the sale of tissues and organs. Conclusions: MP could really increase organ pool and help in reducing organ waiting list. MP could also give big improvements in developing the transplant process into a process more similar to an elective surgery.

Code: 57568

Modality: Apresentação de Pôster

Title: MAINTENANCE OF THE ELECTROMAGNETIC COMPATIBILITY LEVEL ON MEDICAL ELECTRICAL EQUIPMENT USED OUTSIDE OF HEALTHCARE FACILITIES

Authors: Jamilson Ramos; Sérgio Santos;

Presenter: Jamilson Ramos Evangelista

Abstract: The healthcare area has experienced technological advancements that have significantly changed the practice of medicine. Medical Electrical Equipment (MEE) is designed to be tools used on health care and therefore must comply with regulatory requirements to show their safety, mainly the Functional Safety. Considering the evolution of hardware and software, MEE have become portable, allowing them to be used in a variety of environments, from the Intensive Care Unit (ICU), Operating Rooms (OR), patient residences and ambulances. Home care and pre-hospital care are health services performed outside the hospital, where the functional risk can be more higher than the healthcare facilities. The basic safety and the essential performance of the MEE can be compromised by electromagnetic disturbances present in the various environments where the equipment is used. At the same time, it is difficult to update the regulatory requirements due to the dynamism of health services. In addition, the risk management process should be applied by the manufacturer during the pre-marketing phase and the clinical engineering knowledge base for healthcare technology management needs continuous updating for the maintenance of risk acceptable level. The purpose of this work is to share information on regulatory tools, including the specification of standards used by the manufacturer, with a view to optimization of clinical engineering activities during the MEE utilization. The methodology is based on the review of some details of the 4th edition of the EMC standard for MEE (IEC 60601-1-2: 2014 Collateral Standard), which defines three electromagnetic environ-ments: Professional, Home and Special for MEE use. The disturbance of RF electromagnetic field radiated from broadcasting station and wireless communication is discussed in details considering the electromagnetic behavior for each one of the environment. In addition, this study provides some details on the standard applied to the area of transport, especially ground and air ambulances. Finally, some actions to EMC maintenance of the MEE during their use is discussed. A flowchart shows the step sequence, describing the manufacturer□s activities on pre-market phase and the clinical engineering actions on monitoring the risk of electromagnetic interference during the utilization. The same actions can be applied for equipment already in use, especially those used outside Health Services.

Code: 57158

Modality: Apresentação de Pôster

Title: MANAGEMENT OF THE MAINTENANCE AND MANAGEMENT OF ASSETS BASED ON THE QUALITY OF THE CADASTRE (INSTALLED BASE).

Authors: Manuela; Diego Marcelo; Antonio;

Presenter: Manuela Petagna

Abstract: The registration of items in a database is necessary in order to have control over them, however the non-predefined register can cause a wrong impression of a complete cadastre, but without the essential information for future decision making . Having as a study parameter the entrance of equipment in a hospital, which will become part of the installed base (ie, excluding consigned), it is important to list which data must to record in the registry with focus on asset management and maintenance management. For asset management, the following items were identified: standard name, brand name, model number, serial number, invoice for equipment entry or purchase order number, useful life, asset number and place of installation within the institution . The default name is to avoid registering items with the same purpose, but with different names. The brand and model serve to identify where it was purchased. The serial number identifies an item in a unique way among others of the same brand and model. The invoice and the purchase order identify how the item entered the institution, the first for loans, rents, and donations, and the second for items purchased. The useful life must be used within a program of substitution of the institution, since, after the useful life, it tends to arise problems with the operation of the same. The number of patrimony, to identify the equipment as an asset of the company and the place of installation so that it is located within the institution. For the management of the maintenance were listed the items to know: purchase value, cost center, warranty period, authorized representative for sale of parts and services and criticality. The purchase value is used as a means of comparison for the purchase of services and parts, that is, once the institution determines a value to be used with maintenance of equipment, the value destined to each can be determined from of the purchase value. The correct cost center so that the maintenance value is charged correctly from the sectors, when there is this division within the institution. The warranty period so that no undue amounts are charged. The representative, when the equipment has been imported, avoiding the loss of quality assurance and the criticality that must guide the plan of maintenance of that equipment classifying those that need periodic maintenance and calibrations. The implementation of the described pattern resulted in a safer database assisting managers in decision making, since the base initially had only 40% of the information defined as necessary. In parallel with the standardized register, there is also a need to update the pre-existing basis for complete standardization.

Code: 57563

Modality: Apresentação de Pôster

Title: MATERNAL FETAL SIMULATOR

Authors: Rodrigo; Anderson; Marcelo;

Presenter: Rodrigo Lopes Rezer

Abstract: In this study it is presented the implementation of a low-cost automated prototype, in an open code platform, that simulates maternal fetal signals, allowing test executions and fetal detectors. The goal is guaranteeing the use of these equipments in a safe, effective way in the monitoring of maternal fetal signals in hospital environments, since the simulator is used to evaluate the correct use of the equipment. Another possible application of the simulator is as a teaching tool. The results are demonstrated in a man-machine interface, the views of the measurements of fetal movement, uterine activity and fetal heart rate, generated by the simulator. The values demonstrated in the man-machine interface can be compared with the ones presented by the fetal monitor. With this comparison it is possible to check the correct functioning of the equipment tested.

Code: 57542

Modality: Apresentação de Pôster

Title: ME ACQUISITION METHODOLOGY IN PUBLIC PROCUREMENT PROCESS IN BRAZIL

Authors: RENATO; RENATO; JULIANO;

Presenter: RENATO ZANIBONI

Abstract: This paper presents a methodology for the acquisition of Medical Equipment (ME) in a procurement process for public Health Care Facilities (HCF), seeking to improve the quality of the technology acquired through the adaptation to use and improvement in cost benefit, complying with the clinical demand. Such methodology is necessary in Brazil due to the requirements of Law No. 8666 that reformulated the public procurement process, coming up with the need to meet their technical and financial demands. The procedure begins with the Dimensioning of the Health Environment, followed by the Dimensioning of the Technology and the Technical Specification, followed by the Technical Analysis of the proposals and Samples evaluation, ending with the Receiving and Incorporation of the ME. To validate this methodology will be presented the results of a comparative study of the purchase process effectiveness and cost benefit of similar ME for two HCF of SC, Brazil. It was concluded that this methodology is a fundamental tool for the GTMH of EC structures in Brazil.

Code: 57445

Modality: Apresentação de Pôster

Title: MEDICAL INTERNET OF THINGS, THE ROLE OF CLINICAL ENGINEERING

Authors: Abdelbaset;

Presenter: Abdelbaset Khalaf

Abstract: eHealth and Artificial intelligence (AI) hold great promise in computational medicine and considered as an ultimate goal to prevent and treat diseases. Although (AI) has been developed for screening and assisted decision-making in diseases prevention and management as part of Clinical Decision Support System (CDSS), it has a greater potential if integrated with medical internet of things (MIOT) and embedded intelligence in medical systems and equipment. This may reshape the future of healthcare, which lies in building cognitive action derived from the intelligent medical devices that provide sensing, data integration, analysis of things and cognitive action. This presentation will focus on the embedded intelligence in healthcare and the application of medical internet of things coupled with Fog and Cloud computing infrastructures. The future of Clinical Engineering as a core discipline requires careful study of current practices and curriculums. This may be seen as an opportunity rather than a threat to Clinical Engineering Professionals

Code: 57576

Modality: Apresentação de Pôster

Title: METHODOLOGY DESIGN FOR BIOMEDICAL TECHNOLOGY REPLACEMENT PLANNING

Authors: Daniela María; Javier Enrique; Stiven Aleison;

Presenter: Javier Enrique Camacho Cogollo

Abstract: It s fundamental to plan within the medical equipment life cycle. This process includes different activities such as planning, maintenance, training and replacement among others. This research aims to design a methodology that allows to adequately and efficiently plan the biomedical technology replacement. In order to design the methodology proposed in this manuscript various activities were performed, such as: a bibliographic review, benchmarking taking into account what is done in other industries and the application of an Analytic Hierarchy Process (AHP) for the criteria weight of the methodology. The structure of the presented methodology is based on a less subjective process, which is normally used for decision-making to replace a technology. A comparison is made with other methodologies found in the literature and it s concluded that a recommended and objective methodology for health institutions has not been established in the country, so there is not a solid basis at the time of making a replacement decision and the research gives a new methodology, with this clinical engineers have to take better decisions, quantitative and qualitative criteria.

Code: 57548

Modality: Apresentação de Pôster

Title: NEED TO CREATE A NETWORK AMONG EUROPEAN CLINICAL ENGINEERING SOCIETIES

Authors: Corrado; Carlo; Ilaria; Stefano; Paolo;

Presenter: Paolo Lago

Abstract: European Union is reviewing its regulatory framework on health technologies, approving two main Regulations on this field: Regulation (EU) 2017/745 on Medical Devices and Regulation (EU) 2017/746 on In Vitro Diagnostic (IVD) medical devices. This renovation on health technologies regulations is framed in the European Union strategy to be part of a European Single Market. The Single Market is at the heart of the European project and it involves not only health technologies, but also goods, services, people and of course the common monetary system. However European Union efforts to unify Member States in different fields, nowadays there is no coordination among European Clinical Engineering Societies. According to the WHO publication Human Resources for Medical Devices there are about 50 Biomedical engineering professional associations in the European Region (comprehending also other States out of EU). That means in each European Union Member State there is at least a professional society. Moreover, there is no common certification program establishing certification standards for Clinical Engineers in all European Union Member States. In 2007 there was an attempt to create a network between Clinical Engineers in Europe. This beginning of European partnership was the so-called BAC-Biomedical Advisory Board. During BAC meetings Clinical Engineers exchanged best practices. This initiative laid the groundwork for AIIC (Italian Clinical Engineering Association) proposal, announced during its annual national meeting, to create a European Clinical Engineers Associations Network among all European CE Societies. WHO Collaborating Centre for Research and Training in Clinical Engineering and Health Technology Management will actively help AIIC to organize a meeting in 2018 to gather all Clinical Engineers from all around Europe. The first aim of this new network will be the developing of a strategy for official acknowledgement and certification for Biomedical and Clinical Engineers in the European Union. Furthermore it could be a great opportunity to collaborate with manufacturers, institutions, academia and other stakeholders in European research projects.

Code: 63897

Modality: Apresentação de Pôster

Title: Outsource Service Management in Private Hospital

Authors: Chen Chen ;

Presenter: Chen Chen

Abstract: Abstract—There are generally two categories of external service provides, equipment manufacturers and independent service organizations. The independent service organization, as third party service, is more and more popular in China now, which offer the clinical engineering department a wide variety of options. The independent service companies range in size, some specialize in a particular type of medical device and others offer maintenance services for a wide variety of equipment types. The vendors could help private hospital establish PM strategy for equipment failure, improve clinical users satisfaction, and it also could improve the cost-effectiveness of the whole maintenance programme, implement and maintain energy conservation, tracking program to minimum utility expenses. There are several types of service agreements, such as full service, time and material service, initial response and repair. The flexibility in the terms of service agreements is valuable to the clinical engineering department. It is essential to monitor the performance of the service provider in private hospital. Clinical engineer in hospital must monitor service vendors when the equipment belong to outsource service. And it is also very important to monitor the productivity of internal and outsourced technical personnel on a regular basis.

Code: 63909

Modality: Apresentação de Pôster

Title: Perspectives of an innovative Telemedicine System in Public Health for diagnosis in remote populations

Authors: Pedro Galván,1-2 Miguel Velázquez,2 Ronald Rivas,2 Gualberto Benitez,1 Antonio Barrios,1 Enrique Hilario3 ;

Presenter: Pedro Galvan

Abstract: Abstract The wide territorial spreading and potential benefits in the country of the information and communication technologies (ICTs) have made easier the implementation of telemedicine systems to improve health services from scattered and remote populations. In the context of the universal coverage and the efficient use of available resources in public health which should be directed towards greater equity in the provision of services, greater concern for the effectiveness and usefulness of health technologies, there is a favorable opportunity to develop telemedicine in both developing and industrialized countries as a tool to improve health care in remote locations without access to specialists. This observational and descriptive study, performed by the Telemedicine Unit of the Ministry of Public Health (MoH) in collaboration with the Dept. of Biomedical Engineering of the Research Institute in Health Sciences of the National University of Asunción (IICS-UNA) and the University of the Basque Country (UPV / EHU) served as a pilot project to evaluate the potential of a telemedicine system in public health. For these purposes, we analyzed preliminary results of a pilot project using telemedicine for diagnosis implemented in some remote regional and district hospitals of the MoH. However, before recommending its massive implementation, its technical-economic sustainability should be contextualized according to the epidemiological profile of each region.

Code: 57538

Modality: Apresentação de Pôster

Title: PRINCIPAL COMPONENT ANALYSIS USAGE IN BIOMEDICAL ENGINEERING TO AID AT DIAGNOSING PATHOLOGIES

Authors: Eduardo; Wagner; Leandra;

Presenter: Eduardo Farias Esmanhoto

Abstract: This paper aims to present a review of the many uses of the statistical method of Principal Component Analysis (PCA) in the Engineering Biomedical field, aimed specially in those where PCA was used as a tool to diagnose pathologies in the last 5 years. An exploratory study was made through the use of bibliometrics, narrowing down the initial search to a final portfolio of 26 papers, providing the latest and state-of-the-art researches on the desired field of study. It was found that PCA has been used in a wide spectrum of areas with significant results, and all around the world. The main use is to reduce the dimensionality of the data to a few principal variables which can explain most of the variance present in the original data. There were studies which reduced from 14 to 50 variables into 1 to 6 principal components, while retaining in average 80% of the variance, and others reduced from 51 to 140 variables into as low as 2 components, keeping 68% to 99% of the variance.

Code: 57541

Modality: Apresentação de Pôster

Title: PRODUCT CERTIFICATION BODY VERSUS ELECTRO-MEDICAL DEVICES DEMAND: THE BRAZIL S SCENARIO, LIMITATIONS AND DISPARITY

Authors: João; Paula;

Presenter: Paula Micheski

Abstract: Introduction: Electro-medical devices (EMD) are widely used to monitor physiological signals, to diagnose and to treat patient' s diseases. The Brazil' s bureaucracy process of EMD conformity certification may limit the market growth, especially in micro and small companies, affecting competition with imported EMD. On the other hand, good manufacturing practice and strict legislation contribute to the EMD quality. Objectives: The study aims to identify the current scenario of the Product Certification Body (OCP) in Brazil for its strategic design according the Brazil' s EMD companies demand. Methods: Firstly, it was investigated the number of Brazilian manufacturing EMD companies and their geographical distribution (ABIMO, BNDES and The Ministry of Health). After mapping the EMD companies, the number of OCPs was gathered, and their conformity certification scope and their accreditation by the National Institute of Metrology, Quality and Technology (Inmetro, based on the ABNT NBR ISO/IEC 17065) were reviewed. Three main resources levels based in human, financial and technical aspects have been strategic considered for implementation of news OCPs. Results: Brazil has nearly 450 EMD manufacturing companies, being 45% in São Paulo capital and 22% in São Paulo countryside, totalizing 67% out of 78.7% from the Brazil Southeast region. The remaining regions share are respectively 16.7% (South), 2.90% (Northeast), 1.30% (Midwest) and 0.50% (North). The majority are micro and small EMD companies, 42.7% (23.10% micro and 19.60% small) when compared with medium (32.80%) and large (24.50%), highlighting the importance of these companies to the Brazil EMD scenario. For EMD Brazilian companies that voluntary and compulsory certifications are desired, there are a total of 16 OCPs specialized in EMD, being all based in the state of Sao Paulo (7 in the capital of the state, 5 in the metropolitan area, 3 in Campinas and 1 in Itu), highlighting a distribution discrepancy in Brazil. The bureaucracy process of new OCPs accreditation has been reviewed and divided into six key steps: 1) attending the good manufacturing practice and legislation, 2) documents analysis, 3) initial audit with sample collection, 4) certification test, 5) analysis of test report and, 6) certification. Conclusion: The state of São Paulo has an important role in both number of EMD companies and EMD' s accreditation. Micro and small companies has a fundamental importance on the Brazilian EMD national sector. OCPs could be strategically spread across the country minimizing costs and helping in the certification access, particularly to micro and small EMD companies. This may create a competitive market affecting directly the country s economy.

Code: 57585

Modality: Apresentação de Pôster

Title: RAIO X : SUA FINALIDADE X RISCOS AO PROFISSIONAL DE SAÚDE EM SETOR FECHADO DE UM AMBIENTE HOSPITALAR

Authors: Silmara;

Presenter: SILMARA FERREIRA RODRIGUES

Abstract: Dentre os diversos setores hospitalares, é especialmente no Centro Cirúrgico (CC) onde se localiza os equipamentos que emitem radiação e expõem seus funcionários, principalmente as equipes médica e de Enfermagem, aos riscos a ela associados. Diante disso o presente estudo buscou responder: Qual a importância e o risco de realizar o raio-X no centro cirúrgico para o paciente e o cirurgião? Através de uma pesquisa bibliográfica que teve como objetivo geral analisar a importância de ser realizado o raio-X no centro cirúrgico, para o paciente e cirurgião, bem como avaliar o risco a saúde dos profissionais que atuam neste setor. Conclui-se que as normas de proteção radiológica não são rigorosamente cumpridas pelas instituições incluídas nesse estudo, bem como se observou que as medidas de segurança estão voltadas para os profissionais técnicos em radiologia, que são providos do uso de equipamentos de proteção individual EPIs e dosímetros. Mas os demais profissionais expostos não possuem conhecimento diante da proteção necessária.

Code: 57537

Modality: Apresentação de Pôster

Title: STRUCTURING THE RADIOLOGICAL REPORT

Authors: Douglas; Lourdes; Janice; Jorge;

Presenter: Jorge Luis da Silva Lustosa

Abstract: Currently, although all advances in computing, information storage and processing facilities, most radiology reports are still stored in free text. This methodology hinders systemic searches and clinical research for future assistance in the early diagnosis of pathologies. This context points that information obtained through radiological examinations should be stored in a structured way so that they can be retrieved and searched with easy and agility, possibility clinical and scientific research. And enabling a better compression of the report and reducing the margin of mistakes, because the entire report will be transposed in structured fields and all the data will be arranged in a standardized visual form, helping a more accurate and reliable diagnosis.

Code: 57550

Modality: Apresentação de Pôster

Title: STUDY INVOLVING X-RAY TUBE LIFE SPAM IN COMPUTED TOMOGRAPHY EQUIPMENT

Authors: Petrick Marcellus de Victorio; Kleber; Berthone; Antonio;

Presenter: Petrick Davoglio

Abstract: The Project aims to study the life cycle of Computed Tomography (CT) X-ray Tube seeking out improve the management involving this vital part of CT equipment besides understand the better condition to optimize your life spam, improve the department budget planning and optmize equipment Uptime. The study compares the replacement of X-ray tubes in a huge hospital in Brazil considering 7 CT of the same manufacturer and with data collected between 2006 to 2017.

Code: 63880

Modality: Apresentação de Pôster

Title: Success Case: Implementation of the First Department of Clinical Engineering in the Private Healthcare Sector of Peru - AUNA

Authors: Mery Isabel Vidal;

Presenter: Mery Isabel Vidal

Abstract: We will present the successful case of AUNA (holding of private hospitals) in the implementation of the First Clinical Engineering Department in the Private Healthcare Sector, which to date is the Referent in Peru. Achievements will be presented in the following areas: Design, construction and implementation of 06 Private Hospitals and Medical Centers, of which Clinica Delgado stands out (Peru‘s most important private hospital and referent hospital). Purchase of Medical Equipment from AUNA. Active participation in the process of obtaining the Canadian Accreditation (ACI) in 2 private hospitals. Resources: we develop an ISO methodology and work as a Network. Social Responsibility: organization of 2 International Congresses in Perú totally free, which allowed hundreds of professionals in the area to be in contact with the best practices of Clinical Engineering and Technology Management of Medical Equipment worldwide. Maintenance: actions, strategies and contribution in the development of 2 main suppliers. Likewise, the Future Plans and Challenges will be commented as: Non standardization in medical equipment regulations, maintenance, etc. Non working as a team with the public healthcare sector (ESSALUD, MINSA). INFORMATION TECHNOLOGY (IT) / TELECOMMUNICATIONS. RISK MANAGEMENT / SAFETY. Continuing academic and professional training with the creation of diploma programs and master‘s degrees in the area according to international standards (ACCE, UCONN, etc.). Develop a program according to AAMI and ACCE Body of Knowledge (BOK) Survey. And finally, we will present how Peru is positioned with respect to other countries in Latin America and the United States (Benchmarking).

Code: 57571

Modality: Apresentação de Pôster

Title: TANNING BED AND MELANOMA: PROJECTIONS FROM BRAZIL

Authors: Rafael;

Presenter: Rafael Gomes Fernandes

Abstract: INTRODUCTION: Brazil was already facing a series of adversities with tanning bed when International Agency for Research on Cancer (IARC), the World Health Organization' s arm for cancer studies, published a study reclassifying UV radiation as certainly carcinogenic [1]. Given this conclusion, no studies found safe limits for the use of tanning bed [2] and no benefits that could counterbalancing their risks, Brazilian National Health Surveillance Agency (ANVISA) decided to prohibit this practice [3]. Among the expectancies was the reduction in the incidence of melanoma. It should be noted that the benefits may be related to the reduction of all types of skin cancer incidence, burns, premature aging, among others [2]. However, the concern is in melanoma, due to its aggressiveness with great possibility of metastasis, with a very high mortality rate [2]. OBJECTIVES: To calculate the prediction of melanoma reduction based on the prohibition of the tanning bed use and to crosscheck with real data from Brazil. METHODS: Using the biannual melanoma data from Brazilian population [4,5,6,7] is possible to calculate the incidence per 100,000 population of new cases. With the growth from 2006 to 2008, one can project what the incidence rate would be without the tanning prohibition rule for 2016 (3.22 per 100,000 population). Using the percentage of melanomas by sun exposure (80%) [8], users of artificial tanning (4.3%) and intense sun exposure (59%) [9], one can calculate the incidence of melanomas by artificial tanning and its contribution. RESULTS: In 2006, the incidence of melanoma was 3.07 per 100,000 population, in 2008 it was 3.09 per 100,000 population, and in 2016 it was 2.75 per 100,000 population. Thus, there was a difference of -11% between 2008 and 2016. However, if the projection continued with the growth of 2006-2008, in 2016 the fall would be even higher off -17%. The contribution of the incidence of melanoma cancer by tanning bed, however, is only 5.8% in 2016. CONCLUSION: Considering that the low adherence to this type of practice, the prohibition may have contributed to the reduction of sun exposure by the great publicity that the prohibition rule had, encouraging the reduction (-17%) more than only the contribution of the rule (5.8%). This is an important achievement because other countries had increases in melanoma cases per 100,000 population in the period 2008-2016, for example, in England (+ 21.4%) [10] and Australia (+10%) [11]. The work was limited by the use of a single regional survey on the use of tanning in the absence of a national survey, which may range from 3.5% [8] to 7% [9]. Thus, it is suggested that future studies should seek a national survey for the use of artificial tanning and intense sun exposure, as well as a way of calculating the possible contribution of conventional sun protection alerts.

Code: 63905

Modality: Apresentação de Pôster

Title: Technical Healthcare Human Resource vis-a-vis Training Institutions in Kenya "The Paradox"

Authors: Salome Wangari Mwaura;

Presenter: Salome Mwaura

Abstract: This paper attempts to unravel the paradoxes surrounding the technical human resources situation in our healthcare industry. It tries to compare what is taught in training institutions vis-a-vis the job market. An analytical approach is adopted to try and figure out and isolate the gaps and shortcomings among Medical/Hospital engineering training institutions, Industry requirements, healthcare facilities, curricula quantity and quality against graduate output - overall quality, capability, suitability, relevance and preparedness status. The role of a Bio-med is to troubleshoot, repair and maintain healthcare technical aides, infrastructure; play a role in healthcare teams and be an effective team player in technical teams. Also to manage technical, human and material resources, as well as plan, organize and execute preventive maintenance programs, formulate and oversee implementation of maintenance budgets. This therefore calls for a comprehensive training of the graduate in readiness for the tasks ahead of him or her. There is a lot of disconnect between the training institutions and the job market since the institutions are not up to date with emerging technologies. The teaching approach remains the same without considering what the market out there is offering. Many a times, students graduate from college half-baked due to the use of the same old curriculum by training institutions over the years. Even when they review it, they always have a set mind which does not accommodate other stakeholders views. This has brought down the quality of graduates coming from these institutions and makes work very hard for all since the new employee has to be taken through another set of training by the other Bio-meds. With emerging technologies, these institutions ought to change with time to offer students training and skills which will help them in the job market. They need to be more vigilant and keep pace with the job market for better results and make work easier for everybody. Most institutions have made education too commercial forgetting that in engineering, it is not about the numbers but the quality of the product. Conclusion In conclusion, all the components are interlinked such that a deficiency in one, weakens the operation of others. There is need for professional guidance and development due to emerging technologies to all. There should be a means of enforcing participation in development, previewing, analyzing and monitoring all biomedical engineering curricula. We should push hard for harmonization and standardization of all curricula at all biomedical engineering qualification levels. We should survey all ways and means of enforcing participation in development, previewing, analyzing and monitoring all biomedical engineering curricular and execution.

Code: 57575

Modality: Apresentação de Pôster

Title: THE CLINICAL ENGINEERING IN HOSPITAL ACCREDITATION CASE STUDY: RADIOLOGY CLINIC

Authors: Ricardo; Camille; Hugo; Rodrigo;

Presenter: Ricardo de Sá

Abstract: This article provides the case study of Clinical Engineering (CE) actuation in Hospital Accreditation at a radiology clinic. The clinic is situated in Goiânia-GO. The certification of Hospital Accreditation process is given by Organização Nacional de Acreditação Hospitalar (ONA). The step-by-step of main tasks realized by the clinical engineering team is presented, directed to succed the Acreditado Pleno Nível 2 ONA certification.

Code: 57564

Modality: Apresentação de Pôster

Title: THE CLINICAL QUALITY ASSURANCE OF MEDICAL INSTRUMENT AND EQUIPMENT SERVICE STARTS FROM PURCHASING

Authors: WANG;

Presenter:

Abstract: This paper mainly expounds the quality assurance factors and measures that the hospital needs to fully consider in the purchase of medical equipment. Discussion: how to improve the bidding documents and contracts, guarantee the medical instruments and equipment in the process of clinical medical equipment service function and reduce the cost. Methods: to provide a perfect example of tendering and implement it widely. Conclusion: the quality assurance of medical instrument and equipment service is greatly improved.

Code: 57553

Modality: Apresentação de Pôster

Title: THE DIVERSITY INDEX: A METHODOLOGY TO EVALUATE THE UNIFORMITY OF MEDICAL EQUIPMENT INVENTORY FOR EASIER MANAGEMENT, COST REDUCTION AND IMPROVED PATIENT SAFETY

Authors: Stefano;

Presenter: Stefano Bergamasco

Abstract: Standardization in terms of different models of medical equipment in a hospital's inventory can bring savings and improvements in different areas: procurement of equipment, consumables expenditure, maintenance, user training and patient safety, etc. Since there's no established methodology to make an analysis of an existing inventory to highlight the areas where standardization could be improved (and the amount of this possible improvement, or a benchmark to compare with other facilities), we have introduced the concept of a Diversity Index that can be calculated for each class of equipment, to focus the analysis and highlight areas of possible improvement. There are many possible diversity indexes in literature, however one that is particularly simple and effective is the so called «Laakso and Taagepera formula» which was initially concieved to provide for an adjusted number of political parties in a country's party system. The index is calculated with a simple formula: N=1/(p1^2+p2^2+ +pn^2) where n is the number of parties with at least one vote/seat and pi^2 the square of each party's proportion of all votes or seats. The idea behind our proposed Diversity Index is to use this formula where n is the number of models of a certain typology of equipment in a hospital or department and pi is the proportion in number of units of each different model. The Diversity Index is a number between 1 (if only one model of equipment is represented, therefore total uniformity) and n (if each model of equipment is present with the same number of units, therefore total lack of uniformity). The lower the Diversity Index, the better. With this model we are able to quickly make a full analysis of an hospital inventory where for each typology of equipment we easily calculate the Diversity Index and based on the results we can benchmark the hospital inventory to other hospitals, or highlight the technology areas where improvements can be made. Of course, after this preliminary analysis further considerations must be made (clinical necessity of having different models, costs, etc.), but this will give us a baseline (numerical, objective) to start from. We will present several examples of application of this concept in hospitals of different European countries. Our analysis highlights a general situation with significant areas of possible improvement in terms of equipment inventory uniformity. This would bring big advantages in terms of easier and more effective staff training, increased patient safety and quality of care, reduced stockholding and cost reduction for consumables, reduced stockholding of associated spare parts, cost reduction for maintenance. Other proposed formulas and modifications to the Diversity Index will be discussed as well as future developments.

Code: 57161

Modality: Apresentação de Pôster

Title: THE IMPORTANCE OF THE MANAGEMENT OF MEDICAL EQUIPMENT FOR THE EVALUATION OF THE INCORPORATION OF TECHNOLOGIES IN THE HEALTHCARE SYSTEM.

Authors: Cleiton Alessandro Vieira; Antonio Jose Rodrigues; Evelinda Marramon;

Presenter: Cleiton Alessandro Vieira Caldeira

Abstract: Introduction: The Health Technology Assessment, HTA, aiming the adoption of technologies in the Brazilian Public Healthcare System, SUS, is a recent topic and is of fundamental importance for the safety, management, expenses and in the dissemination and use of health technologies. For technology classified as Medical Assistance Equipment (MAEs) there are specific Clinical Engineering (CE) important aspects that must be systematically analyzed. Therefore, MAEs management in Health Care Facilities (HCF) is a strategic activity where the basic information is generated for equipment s performance evaluation studies in order to subsidize various levels of decisions, including its incorporation and consequent planning/reimbursement. However, Brazil has CE professionals paucity and therefore HCF structure surveys are important, educative and promote CE standards. Objective: To review HTA methodologies aiming for MAEs incorporation optimization, ascertain standards and local structure further development requirements in order to increment the MAEs performance evaluations in a HCF. Method: —Integrative literature review regarding HTA methods and of the evaluations for adoption, technology performance evaluation and MAEs management. —Survey study regarding MAEs management practice in the public São Paulo University Medical School Hospital das Clínicas, HCFMUSP, and its correlation with the guidelines and standards available. —Descriptive study of MAEs management structure and of its main indicators. —MAEs management and MAEs performance evaluation workforce qualification survey in 2016. Results: The Health Ministry published National HTA Guidelines [REBRATS] and the Brazilian Health Services Mandatory Surveillance Directive, RESOLUÇÃO-RDC Nº 2:2010 are ineludible and have included MAEs adoption and management major scientific literature. HCFMUSP adopted the Dynamus management software, parameterized it according to the above standards, where preventive maintenance plans, corrective maintenance records, calibration and quality control test records, as well as all maintenance costs are recorded for any MAE intervention. A Central Clinical Engineering Coordination (CCE) and 06 individual Institutes CE are ultimately responsible for 33 thousand HCFMUSP registered equipments, from acquisition to disposal, supported by the Engineering and Hospital Architecture Nucleus (NEAH) and the Infrastructure and Logistics Center (NILO). In June 2016, only 35% (14/40) of the professionals have ever participated in HTA trainings, resulting, however, in at least one HTA proficient professional in 75% (6/8) of the Institutes CE, including the CCE. Considering that the Psychiatry Institute and the Institute of Orthopedics and Traumatology set up their CE teams in the previous year, 2015, they were still receiving direct support from the CCE team. Conclusion: The observation of the RDC 02:2010 mandatory surveillance requirements, and of the Ministry of Health Methodological Guidelines associated with good practices in MAEs management, form the basis for information production enabling to perform good HTA studies for MAEs incorporation and for MAEs continued performance evaluation. The HCFMUSP CE structure is lean, but organized according to these standards. The responsible CE HCFMUSP MAEs managers qualification to perform HTA and MAEs evaluation at each stage, however, requires periodical and further investments to guarantee continuous HTA throughout MAEs useful life. HCFs may also benefit

of such periodic conduction of these transversal surveys aiming to identify opportunities for improvements.

Code: 57160

Modality: Apresentação de Pôster

Title: THE ODYSSEY OF AN HTM EXPERT IN AFRICA

Authors: Andre;

Presenter: Andre MBOULE

Abstract: My career, as a healthcare technology management (HTM) expert in Africa, is considered as a journey. Like an odyssey, this journey is full of events. It is a long journey, a journey of many years during which I meet people of many kinds. The diverse occasions are considered as opportune adventures. This journey is also a quest during which the following questions find answers: (i) Where does an HTM expert operate in a clinical environment? (ii) How to get fundings to sustain HTM activities? (iii) What is the policy or strategy that is suitable to HTM activities? (iv) Who are the people with the capacities to conduct HTM activities? (v) Why is an HTM expert involved in the lifecycle of medical devices? (vi) When does the procurement process start for a healthcare facility? During my odyssey in Africa, in my 34 year-experience, I have been working on finding answers to the above questions among others. My international assignments in some 25 African countries with international donors (African Development Bank, European Union, French Cooperation Agency, etc.), international consulting firms and World Health Organization (WHO) have been events in which my story finds its different places and characters. They have eventually led to get answers like the following: 1. Setting up an HTM organizational structure for three States in Nigeria (1999) and a Quality Manual for clinical engineering (CE) departments in Cameroon (2013); 2. Designing funding mechanisms for HTM in Guinea (2002); 3. Elaborating an HTM policy/strategy in Rwanda (2005); 4. Designing schemes of services for HTM human resources in Sierra Leone (2006); 5. Identifying the maintenance concept in Rwanda (2008); 6. Conducting a needs assessment for a tender process in Benin (2014) and Guinea (2016). As an odyssey, my long career in Africa have got diverse opportunities to expose the competencies of an HTM expert. The experiences in this story are just a portion of many others in my professional life. They all have contributed in developing solutions to many issues that arise in the HTM sector in the African context. As a way forward, more initiatives are needed to facilitate appropriateness of HTM competencies and approaches in Africa s health sector.

Code: 57581

Modality: Apresentação de Pôster

Title: THE OFFER OF ENTRY LEVEL MODELS COMPUTERIZED TOMOGRAPHIC EQUIPMENT IN THE GLOBAL MARKET

Authors: Fernando Cesar Coelli; Rogério Pires dos Santos; Andrei Lenine de Almeida Pires; Mateus Afonso Souza; Tiago Afonso Souza;

Presenter: Andrei Lenine de Almeida Pires

Abstract: The market for medical devices (MD) worldwide has experienced profound changes, accumulating new tech-nologies. Seven companies, such as the American General Eletric (GE), the German Siemens, the Dutch Philips, the Asians Hitachi, Neusoft, Shimadzu and Toshiba, dispute the Computed Tomography (CT) market. This study aimed to search the CT simplest versions from leading manufacturers worldwide. This work was based on search on the Internet using the terms "Tomography" and "Manufacturer". In the study was identified that in developed countries the main manufacturers offers CT models with 16 slices or more. In developing countries, simpler devices such 2 or 4 slices can also be find and, more rarely, single slices. This distribution showed the approach taken by manufacturers to more sophisticated models. The apparent preference of CTs manufacturers for more complex models is removing the simplest market models. The offer of cheaper/simpler models can reflect a greater democratization of this technology. An interesting solution to this could be the creation of basic "upgradea-ble" models. Currently, many CTs can receive new fea-tures by upgrades, but these are sophisticated models and don´t comply with the technology health universalization proclaimed by the World Health Organization.

Code: 57546

Modality: Apresentação de Pôster

Title: TOTAL LABORATORY AUTOMATION: OPTIMIZATION OF HOSPITAL WORKFLOW

Authors: Carlo; Corrado; Ilaria; Riccardo; Umberto; Paolo;

Presenter: Carlo Martinoli

Abstract: Introduction: Total Laboratory Automation (TLA) are systems used to manage specimen tubes from pre-analytical to post-analytical tasks. The main goal of those systems is to carry out analysis of Clinical Chemistry and Immunochemistry using a completely automatic equipment. Methods: As the implementation of TLA is a great investment for a hospital, the first thing to do is an applicability analysis. This analysis is based principally on an estimate of the whole workload of the laboratory. In general, those structures that perform more than one million of samples per year should fit for the application of TLA. A second element to consider in order to achieve an efficient design is the distribution and the peak of the samples during workdays. Usually this peak is reached in the second part of the morning after blood collection. There are plenty of advantages in the introduction of automation, the first is a reduction of wait moments and delays in the whole process. A second big improvement by automating routine processing steps is that laboratories can free up technician time to perform work that requires manual process and critical analytical interpretation. Furthermore, automation systems are interfaced with existing laboratory or hospital information system (LIS or HIS) which enables sample tracking throughout the testing process, from collection to results reporting. This can further decrease the level of risk of errors caused by misreading orders or sample identification. The implementation of automation systems can also lead to an improvement on budget control and efficiency. In fact the definition of a full service acquire based on price for only actually carried out tests guarantees a more efficient system and an easier control of costs. Conclusion: Automation systems are feasible solutions for hospitals that perform high volume of tests. Reduction of processing times and the increase of levels of security, traceability and efficiency are the most important improvements given by the implementation of laboratory automation.

Code: 57566

Modality: Apresentação de Pôster

Title: UBIQUITOUS MANAGEMENT MODULE FOR DENTAL CHAIR UNIT IN CLINICAL ENGINNEERING STRUCTURE FOR PRIMARY HEALTH CARE

Authors: Guilherme; Felipe; Renato; ION LEANDRO DOS SANTOS;

Presenter: ION LEANDRO DOS SANTOS

Abstract: This paper presents a health technology ubiquitous management suggestion, in the Primary Health Care network, through a Dental Chair Unit remote monitoring system, divided physically in two modules, a sensing one and a storage one, interconnected wirelessly. The system was implemented based in the main controllable parameters, acquired from the technology management softwares information system, developed by Clinical Engineering structure of the Biomedical Engineering Institute of the Federal University of Santa Catarina (UFSC) and executed in the Primary Health Care in Florianópolis, Brazil. The presented results was obtained from laboratory and field tests, through a smart socket format prototype. That data was collected, processed and analysed, allowing the adjustment for a prototype new version and upgrade.

Code: 57580

Modality: Apresentação de Pôster

Title: USABILITY HEURISTICS FOR TOUCHSCREEN-BASED MEDICAL DEVICES

Authors: Saide Jorge; Carlos Alessandro Bassi;

Presenter: Carlos Alessandro Bassi Viviani

Abstract: A great proportion of adverse events daily happening in different technological areas, are due to human errors. Many of these human errors reported by the FDA,. occur due to problems in the software interface of the equipment, which often leads the user to error. To minimize such usability problems, it is necessary a careful evaluation of the interface device. Touchscreen technology is increasingly being used as user interface in a great number of medical devices. This study proposes a set of heuristics to ensure adequate evaluation of touchscreens used by medical devices. The new heuristics proposed includes important aspects, which were to be found. The new heuristics are: interaction human device, physical and ergonomic interaction; and readability and layout. This essay is an initial study yet is extremely important to guide an evaluation process that be develop in a medical device that use touchscreen technology.

Code: 57199

Modality: Apresentação de Pôster

Title: WHICH CAPABILITIES CAN BE IDENTIFIED ON THE PRIMARY ACTIVITIES OF A HEALTHCARE TECHNOLOGY PROJECT VALUE CHAIN?

Authors: ignacio;

Presenter: ignacio andrade bravo

Abstract: In this paper, we are going to explore different approaches of skills needed to identify the key issues on the value chain of a product, therefore, a firm can be sensible and perceptive of where they not only have been doing things right, where they have been developing better strategies, where they are experts, where they can manage trouble but also where they need to pay attention, where they do not have idea what to do or where they need to bring experts, etc. However, the methods and evidence are sustained on a proved theory, the arguments exposed here help us identify how capabilities inhibit or help a Research and development project by analyzing different aspects of innovation and understanding which have been the right paths on a success project by exanimating a project proved as successful by a Mexican Firm.

Code: 57154

Modality: Apresentação de Pôster

Title: A NEW DIGITAL ERA OF CLINICAL AND BIOMEDICAL PROCESS

Authors: Giulia; Stefano;

Presenter: Giulia and Stefano Marchesi

Abstract: INTRODUCTION: HealthCare digitalization is closely linked to technological progress, which in recent years has grown exponentially. Health Informatics (eHealth) is now not only a necessity but a new era that can change the way we work. The appropriate use of technology can support entire hospital processes in order to optimize the context. MATERIALS and METHODS: Usually all Healthcare processes are supported by standard architecture and by a regulated way of working depend on what medical/process software usually allows. This circumstance limits the users possibilities. Our goal is to provide a new working approach based on a careful process analysis, supported by engineering modelling instruments(UML language, diagrams, others) in order to provide the most suitable solution. Across multiple potential solution we evaluated that a WEB APP is fitting most of users critical needs. WEB APP tool is innovative and enables different way of work.The advantages are multiples, first of all is a free programming technique, the script language is open source. Economic benefits are essential in most of public Healthcare structures, but also saving clinical/department operative time is nowadays a keypoint. WEB APP can optimize Clinical and Biomedical process and boost productivity. Using WEB APP we enabled some new medical process, for example: o Radiology o Drugs Prescription o DoctorFB o High Emergency o OrhtoArchive Fundamentally we identify some Clinical and Biomedical complex processes and we worked to make it easier, to get this we use many engineering model instruments and translate features and necessity in code using WEB APP. RESULTS Many of the clinical optimization reduce workflow cycle time, department complexity and provide a new way of thinking. We collected some evidences that demonstrate how changes in some clinical process may facilitate doctors, department stakeholder, patients. CONCLUSIONS Change is never easy, and the idea to change dramatically an entire working system based on hardware and software, in use for decades is hard to materialize quickly. However, our aim is to highlight what technology possibilities can improve and which are the preferred ways for a smooth and integrated transition within the medical context.

Code: 63893

Modality: Apresentação de Pôster

Title: Case Study and Management Improvement of Medical Device

Authors:

Presenter: Jing-ying Gao

Code: 63894

Modality: Apresentação de Pôster

Title: Development Strategy of Biomedical Engineer in Hospital Service

Authors: Chen Chen, Mary Wan ;

Presenter: Chen Chen

Abstract: Abstract—In China mainland, engineers have promising career opportunities in manufacturing business, marketing and sales, construction and design, education and research, and life science and technology. In healthcare services, engineers come from different backgrounds and equipped with different specialty. Many chances are being given to engineers to work in technical, research and managerial roles to enrich their experience and knowledge in medical engineering field. The key challenge to them is to achieve zero defects in maintaining healthcare devices and equipment for the safety of patients and staff. Many people may have a wrong conception that engineers focus only on repair work. In fact, the clinical engineers have an important role in the entire life cycle of equipment management ranging from service planning to equipment selection, operation, maintenance, disposal and replacement. Technology is the driving force to sustain the growth and development of our society. We see the changing era from Information technology to Data Technology to Information Communication Technology. So as engineers how do we sharpen our skills and create value added contribution in the technology development world is very important. The professional biomedical engineers play an important role in enhancing the quality of domestic medical devices and products- through learning and sharing clinical evidence base knowledge with domestic business industry. The professional biomedical engineers have the breadth and depth to accept criticisms, be it positive or negative, in our continuous improvement journey. The professional biomedical engineers integrate seamlessly into the clinical workplace and work harmoniously with the doctors and nurses for the betterment of our patients and community.

Code: 63899

Modality: Apresentação de Pôster

Title: The exploration of Clinical Engineering talent cultivation in China

Authors: Liu Gang ;

Presenter: Liu Gang

Abstract: Abstract: In China, there are some problems of personnel situation in the field of Clinical Engineering, such as the uneven of personnel quality, lack of the standard of professional qualifications and the relatively lower salary. These problems cause the talent outflow which restricts the progress of Clinical Engineering. In order to improve the integral level of the discipline, the Clinical Engineering Association helped to compile the first series of teaching materials of Clinical Engineering to establish the basic theories and basic knowledge of this discipline. The Association has also made great efforts in continuing education and technical training to improve the capability of the Chinese clinical engineers. Furthermore, the Association has set up a certification system by evaluating the clinical engineers on account of their professional knowledge and skill. By doing so, the Clinical Engineering Association intends to contribute to the official certification of professional qualification and professional title evaluation pattern established by the government. Once a Clinical Engineering post needs a professional certification ruled by the government, the talent team construction of Clinical Engineering will go into a benign development track. Key words: talent cultivation, Clinical Engineering, certification system, continuing education, technical training

Code: 63901

Modality: Apresentação de Pôster

Title: The Survey on thece Departments in Guangdong Province Under New Regulations

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Presenter: Yang Shaozhou

Abstract: Abstract Objective To investigate the status quo of clinical engineering departments(CED) in Guangdong province, to find out the main problems and challenges, and to give some suggestions on promoting the development of clinical engineering. Methods Questionnaires were issued to directors or engineers in hospitals, in the aspect of core duties and responsibilities, age, staff structure, the practice of QC and the main factors that resist the development of CE. Results Only 53.19% of the CED operate independently. The daily CE practice in Guangdong hospitals includes budget preparation and procurement, strategic technology Planning, technology management, management of installation, mounting, operation, repair or maintenance team, IT management, training and research and development, and archiving. Only 28.0% of the hospitals have QC instruments.14.1% of clinical engineers are younger than 25 years old,39.0% of them are between 26-35,27.3% of them are between 36-45, 15.8% of them are between 46-55, and 3.8% of them are older than 55. The education background of the clinical engineers is mainly undergraduate degree and junior college degree, accounted for 80.0%, and only 6.7% of the them received master or doctor degree. Professional titles are mainly primary, accounted for 61.96%. There is 0.68 engineer per 100 beds or 0.23 engineer per ten million Yuan medical equipment. The top 3 factors that hinder the development of CE are inadequate of professional staff, low education level and lack of laws and regulations. Conclusion The current status of CED of Guangdong lags much behind the benchmark CED in China. Risk management, testing and quality assurance, technology assessment should be paid much more attention to ensure the quality of medical equipment. The roles of CED are underestimated. Collective efforts should be taken to lay out the core duties and responsibilities of CED, and to set up clinical engineering standards of practice, to construct continuing education and training system for clinical engineers to promote the service technique of CED.