PAPER ABSTRACTS

Paper ID: 1908202301

Development of RP-UHPLC Method for Peptide Mapping for the Identification of Semaglutide: A Specificity-Based Approach in Accordance with ICH Guidelines

Arsalan Ahmed, Syeda Bushra Zafar, Saad Jawaid Khan

In this study, we present the development of a specific and sensitive reversed-phase ultra-high-performance liquid chromatography (RP-UHPLC) method for comprehensive peptide mapping of Semaglutide, a glucagon-like peptide-1 receptor agonist widely used in the treatment of type 2 diabetes. The method development phase involved systematic optimization of key parameters, including incubation time, column temperature, and enzyme volume, to achieve reliable and precise peptide separation. After multiple iterations, the optimal conditions were established, comprising a 6-hour incubation at 37°C with 20µL of Glu-C endopeptidase. The RP-UHPLC analysis was performed using a Waters XBridge C18 ODS column (250x4.6 mm, 3.5 µm) with a column temperature of 37°C. The gradient elution profile provided efficient peptide separation within a running time of 102 minutes. The final developed RP-UHPLC method exhibited excellent peak separation and retention time accuracy for six specific Semaglutide peptides. The peptide mapping results were obtained using a 1 mg/mL stock solution of Semaglutide, and the identified peptides were compared to a Semaglutide reference standard. This robust analytical approach can provide valuable insights into Semaglutide characterization and ensure quality control in pharmaceutical formulations. Moreover, the method's potential applicability for analyzing other therapeutic proteins highlights its relevance in advancing pharmaceutical research and development. The optimized RP-UHPLC method, with its efficient chromatographic conditions and precise identification capabilities, is a valuable tool for the biopharmaceutical industry in evaluating the quality and consistency of Semaglutide-based therapeutics and other related compounds.

Paper ID: 1908202302

"Development of Facile Layer on Magnesium Alloy to Enhance Corrosion Resistance for Hard Tissue Application"

Rabiya Asad, Eraj Humayun Mirza, Muhammad Rizwan

ABSTRACT:

The utilization of permanently inserted biomaterials could potentially lead to complications within the recipient's body, linked to persistent and extended inflammation, eventually prompting the need for corrective surgical intervention. This has prompt interest in creating biodegradable substances that can be assimilated, digested, and expelled by the patient. Magnesium alloys have been understudying for a considerable duration as potential biomaterials for bearing loads, owing to their exceptional biological attributes, which encompass superior biochemical and biomechanical harmony when contrast with other choices like biodegradable polymers and bioceramics. Nonetheless, the utilization of magnesium material in biological contexts, specifically its integration into the human body, remains constrained due to its inherent liability to corrosion within biological settings. As a result, multiple approaches have been investigated to regulate the pace of magnesium degradation within bodily fluids. Among these methods, plasma electrolytic oxidation (PEO) stands out as the most favorable technique. Plasma Electrolytic Oxidation involves a plasma-assisted anodization process that creates a protective layer on the magnesium's surface, thereby enhancing its resistance to corrosion and effectively reducing the rate of degradation. Moreover, the utilization of suitable electrolytes during the PEO procedure can yield coatings that possess exceptional biocompatibility A lot of work will be put into developing magnesium implants with PEO assurance because of the beneficial properties of magnesium, which are required for muscles and nerves to function properly, for blood sugar and blood pressure to stay at the proper levels, and for making protein, bone, DNA, and corrosion protection. The current investigation studies into the monarchy of PEO treatments applied to magnesium alloys and the subsequent attributes of the coatings produced. This comprehensive exploration has led to the development of an electrolyte conducive to biological compatibility. Within this research, the enhancement of layer development is managed through adjustments to voltage and current, seeking optimal outcomes. Deposited coating has been characterized by various characterization techniques including stereotype microscopy, scanning electron

microscopy (SEM), X-ray diffraction (XRD), hardness, contact angle and scratch test has been applied to evaluate the morphology of layer, their bond strength and there mechanical properties respectively.

Paper ID: 1908202303

Investigating the Effects of Full Restriction and Stenosis on Blood Flow in the Coronary Artery using ANYSYS Fluent

Muhammad Taha, Dua Amna, Syed Faraz Jawed

ANSYS provided a potential platform for simulating intricate and accurate models of the coronary artery. By solving the Navier-Stokes equations, ANSYS provides an accurate representation of fluid flow and can handle large datasets and multiple physics. The software has been essential for investigating different flow conditions, from steady to pulsatile, shedding light on both healthy and diseased states of the coronary artery. ANSYS's capability to mimic stenosis and obstruction has provided valuable insights and identified critical areas of concern. In this work we found that for a stenotic coronary artery, simulating the flow can help to identify areas of increased velocity and turbulence, which can increase the risk of thrombosis or embolism. Evaluation of the efficiency of procedures like angioplasty or stenting in lowering the risk of thrombosis or embolism can also be helpful. For a fully restricted coronary artery, simulating the flow can help to identify areas of decreased velocity and stagnant flow, which can increase the risk of ischemia or infarction.

Paper ID: 1908202304

Characterization and Modeling of Human Trunk Movement in Seated Postures Using Anthropometric Data

Tazeen Zohra, Ahmad Zahid Rao, Muhammad Abul Hasan

The present study focuses on the comprehensive characterization and modeling of human trunk movement in various seated postures. The objective of the research was to develop precise mathematical equations that quantify the movement of each shoulder during seated trunk flexion, trunk lateral flexion, and trunk rotation movements. Anthropometric data was used for the length of the trunk and shoulders. We successfully derived mathematical equations that establish a relationship between shoulder movement and the angle of trunk movement. These equations provide valuable insights into the biomechanics of the human trunk in seated postures and serve as fundamental tools for understanding and predicting human body movements. Our findings indicate that the length of the trunk and shoulders significantly influences the extent of shoulder displacement during seated postures. The equations developed in this study can be utilized in ergonomic design, physical therapy, and rehabilitation practices, contributing to the development of more comfortable and supportive seating solutions, as well as improving rehabilitation strategies for individuals with mobility impairments. In conclusion, this research advances our understanding of human trunk movement in seated positions, offering novel equations to quantify shoulder movement with respect to trunk flexion, lateral flexion, and rotation. The knowledge gained from this study has practical implications in fields related to human movement, ergonomics, and rehabilitation, potentially enhancing the overall quality of life for diverse populations.

Paper ID: 1908202305

The Role of Erector Spinae Muscles in Dynamic Seated Movement

Mehak Rashid, Ahmad Zahid Rao, Muhammad Abul Hasan

The erector spinae (ES) muscles run along the length of the spine on either side. They play a crucial role in maintaining posture, supporting the spine, and facilitating various movements of the trunk. The ES muscles are actively engaged in spine stabilization and postural control during standing postures, however, due to additional support of the seat, this is not the case during seated postures. The purpose of the current study is to investigate the pattern of ES muscle activation during seated movements. We recruited forty healthy volunteers who performed three trials of dynamic seated reaching (Rh) and returning (Rt) tasks. These Rh and Rt tasks were executed along five horizontal orientations of 0°, 45°, 90°, 135°, and 180° using each upper limb separately. The electromyography of bilateral ES muscles at thoracic and lumbar regions was measured at 2048 Hz. To evaluate the dynamic movement patterns of ES muscles we analyzed 1.5 second epochs from each activity. The bar graphs display the averaged (n=120) amplitude of muscle activity in each task for each ES muscle. We find that the thoracic ES are the most active muscles in dynamic movements. Moreover, the movements along 45°, 90°, and 135° orientations produced higher muscle activity than the movements along 0° and 180° orientations. This study deepens our understanding of biomechanics, motor control, and spinal stability during dynamic seated movements. The findings may guide treatment plans for people who have seated movement control problems.

Paper ID: 1908202306

Investigating the Effects of Work Tasks on the Posture of Laborers: A Comparative Study of Normal and Abnormal Postures

Adnan Javed, Sheikh Muzammil Anwar, Sana Rehan, Myra Aslam Qureshi, Moazzam Ali Khan

The objective of this research was to investigate the impact of work-related factors on physical abnormalities in the backbone and shoulders of laborers and how it affects their posture. The researchers analyzed the postural deviations and angles of 20 laborers in their regular work positions using a goniometer and mathematical equations. The results demonstrated that more than 80% of the laborers had posture deformities, including kyphosis and mom posture. These findings indicate that laborers are at significant risk of developing postural abnormalities due to their work tasks, which can negatively affect their health and well-being. Furthermore, the study revealed that longer work experience was linked to more significant abnormalities. The study also highlighted the importance of recognizing and addressing physical abnormalities in the work environment of laborers, comparing normal and affected postures. Future studies can use this research to prevent these deformities and promote the overall health and well-being of laborers. Further research could also explore the potential economic benefits of implementing such interventions, including reductions in healthcare costs and improvements in productivity and worker retention.

Paper ID: 1908202307

Fabrication of Sodium Alginate Microparticles Embedded in PVA hydrogel for Tissue Regeneration

Iqra Mohammad Hanif, Savaira Noman Hashmi, Amna Feroze Hadiawala, Abdul Moiz, Wasim Munir, Tooba Khan

Tissue regeneration is a decisive area of medical research with the purpose of repairing or substituting impaired or ailment tissues with suitable ones. One promising approach to tissue regeneration is the use of biodegradable hydrogels as scaffolds for cell extension. In this proposed study, we intend to investigate the prospects of fabricating sodium alginate microparticles embedded in polyvinyl alcohol (PVA) hydrogel for tissue regeneration. Sodium alginate is a natural polymer derived from brown seaweed that has shown potential as a tissue engineering material due to its biocompatibility and biodegradability. PVA is a synthetic polymer that is widely used in the biomedical field due to its biocompatibility and stability. The amalgamation of sodium alginate and PVA has been shown to produce hydrogels with improved mechanical properties and adjustable degradation rates. The proposed study evaluates the optimal conditions for creating sodium alginate microparticles and investigates their properties such as size, shape, and mechanical properties. The specimens are prepared using freeze-thaw method. We conducted an extensive analysis, including contact angle analysis, moisture content analysis, and gel fraction, to assess the properties of the hydrogel scaffolds. The end results of this study provide significant information about the potential of sodium alginate microparticles embedded in PVA hydrogel as a tissue engineering material as PVA/SA hydrogel exhibits significantly higher hydrophilicity, water retention capacity, and cross-linking density as compared to PVA hydrogel. In a range of medical applications, this material might proffer a modernistic option for tissue regeneration if it is successful.

Paper ID: 1908202308

Fabrication of Eco-Friendly Plastic for Biomedical Applications

Maryam Furqan, Qandeel Zahra, Zaiba Muhammad, Hassan Ali, Tooba Khan

This study focuses on the fabrication of Eco-Friendly Plastic for Biomedical Applications. Plastic is a synthetic material made from polymers and has been utilized in various industries because of its low cost and versatility. However, due to its non-degradable nature, plastic waste has created a profound influence on the environment, such as pollution, habitat destruction, and health hazards. To mitigate these concerns, we fabricated a Bioplastic incorporation of PVA, Aloe vera, Glycerin, and Corn Starch. All these materials are derived from natural resources and have been used for various biomedical applications. The specimens are fabricated by first boiling aloe vera, glycerin, corn starch, and acetic acid together at 150°C for 20 minutes. The PVA polymer is dissolved in distilled water separately at 80°C C for 1.5 hours. Both the solutions were then combined and poured into Petri dishes and oven dried at 60°C for 180 minutes, resulting in a plastic film with enhanced properties. To assess the material's properties, various tests were conducted including pH analysis, moisture content determination, swelling tests, and wettability analysis through contact angle measurements, and the obtained results are compared with the pure samples to find out if the fabricated material possesses statistically significant results. The conducted tests provided valuable insights into the properties and behavior of the fabricated materials, indicating their suitability for various biomedical applications. The successful development of eco-friendly plastic films incorporating aloe vera, glycerin, cornstarch, and, PVA for biomedical applications will have a significant impact on the reduction of plastic waste and the improvement of human health. It could also open new opportunities for sustainable and innovative material design.

Paper ID: 1908202309

Modeling and Analysing the Effects of Different Material on the Cradle Kit of a Patient Lifter using ANSYS

Rafia Jabbar

This study presents an analysis of the effects of different materials on the cradle kit of a patient lifter, utilizing ANSYS, finite element analysis software. Patient lifters are essential medical devices used to transfer patients with limited mobility. As a crucial component of the patient lifter, the cradle kit requires optimal design and material selection to ensure its structural integrity, safety, and functionality. In this research, various materials commonly used in the manufacturing of cradle kits are investigated, including structural steel, 316 stainless steel, aluminium, iron, and neoprene rubber. The finite element method is employed to model the cradle kit and simulate its performance under various forces. Parameters such as stress distribution and deformation are analyzed to assess the structural performance of the cradle kit for each material. The results of this analysis will provide valuable insights into the suitability of different materials for the cradle kit; hence it has been seen that structural steel and 316 stainless steels are reliable materials for the manufacturing of the cradle kit. Ultimately, the findings of this study aim to contribute to the enhancement of patient lifter design, ensuring safer and more efficient patient transfer processes within healthcare facilities.

POSTER ABSTRACTS

Poster ID: 1808202301

"Enhancing Cognitive and Emotional Well-being in Alzheimer's Disease through Binaural Beat Stimulation: A Promising Avenue for Non-Invasive Intervention"

Syeda Sehar Hussain, Shaheera Shoaib, Faryal Siddiq, Sarah Syeda Vasty,
Muhammad Danish Mujib, Muhammad Abul Hassan

ABSTRACT:

Alzheimer's disease (AD) and other dementias affect 50 million individuals worldwide, a number projected to triple by 2050, with a significant impact in Pakistan (150,000 to 200,000 sufferers). Medications remain the primary treatment approach. This study explored the potential of binaural beat stimulation for enhancing cognitive and emotional aspects in AD patients. Twenty-five participants were divided into Experimental (n=15) and Control (n=10) groups, with assessments before and after a 15-day intervention. Experimental Group participants showed reduced depression and stress scores (DASS-21) and improved cognitive functions (MMSE). Enhanced daily performance trends were observed, distinguishing from the Control Group. EEG recordings revealed increased theta band power and decreased alpha band power in the Experimental Group. This study underscores binaural beat stimulation's promise as a non-invasive intervention for enhancing emotional and cognitive well-being in AD patients, urging further research given the escalating dementia prevalence.

Poster ID: 1808202302

"The Impact of Base of Support on the Stability of a Patient Lifter"

Muhammad Obaidullah Hassan, Syed Muhammad Ateeb Hussain, Ahmad Zahid Rao

ABSTRACT:

Alzheimer's disease (AD) and other dementias affect 50 million individuals worldwide, a number projected to triple by 2050, with a significant impact in Pakistan (150,000 to 200,000 sufferers). Medications remain the primary treatment approach. This study explored the potential of binaural beat stimulation for enhancing cognitive and emotional aspects in AD patients. Twenty-five participants were divided into Experimental (n=15) and Control (n=10) groups, with assessments before and after a 15-day intervention. Experimental Group participants showed reduced depression and stress scores (DASS-21) and improved cognitive functions (MMSE). Enhanced daily performance trends were observed, distinguishing from the Control Group. EEG recordings revealed increased theta band power and decreased alpha band power in the Experimental Group. This study underscores binaural beat stimulation's promise as a non-invasive intervention for enhancing emotional and cognitive well-being in AD patients, urging further research given the escalating dementia prevalence.

Poster ID: 1808202303

"The Effect of Angle of Lift on the Load Bearing Capacity of Patient Lifter"

Muhammad Taha, Dua Amna, Muhammad Obaidullah Hasan, Ahmad Zahid Rao.

ABSTRACT:

Patients with mobility challenges can use assistive patient lifters for safe transfers. The lifter typically consists of a stable base with wheels for mobility, a vertical shaft, and a boom extending horizontally from the shaft. The patient is secured in a sling or harness attached to the end of the boom. The lift angle in a patient lifter refers to the angle formed between the boom (the lifting arm) and the base of the lifter. The lift angle plays a critical role in how the lifter operates and how the patient is lifted and transferred. Different lift angles can affect the lifter's stability, load-bearing capacity, stress distribution, and patient comfort during the transfer process. In this study, we investigate the critical impact of three different lift angles (i.e., 125, 135, and 145 degrees) on the load-bearing capacity of patient lifters. We developed models of the patient lifter using computer-aided design and conducted the finite element analysis using ANSYS software. We analyzed the force reactions, stress distributions, and total deformations at fixed points on the hanger, shaft, boom, and base. A consistent force of 1000 Newtons was used to represent the patient's weight. The material of the device was chosen to be structural steel (Young's modulus: 200 GPa, Poisson's ratio: 0.3, Yield strength: 250 MPa). Our results reveal intricate relationships between lift angle and the load-bearing capacity of patient lifters. At 125 degrees, force reactions demonstrate stability, with uniform stress distribution and minimal total deformation. As the lift angle increases to 135 and 145 degrees, we observe a substantial increase in reaction forces and strain accompanied by localized stress concentrations at critical areas that may affect the lifter's structural integrity. This study shows that altering the lift angle directly influences load distribution and recommends optimal lift angles within 125 to 135 degrees.

Poster ID: 1808202304

"Development of a Portable Joint Mobility Measurement System"

Syeda Fakhra Jalal, Amna Ayaz, Abdul Moiz, Tooba Khan

ABSTRACT:

The conventional approaches for measuring joint angles suffer from issues of non-repeatability and inaccuracy, and they lack real-time data display and recording capabilities. To address these limitations and enhance the evaluation of rehabilitation exercises, this research paper aims to develop a portable device capable of measuring joint angles. 3-axis accelerometers are used for measuring joint angles and are specifically designed to aid stroke patients in their limb and joint rehabilitation exercise programs. Leveraging Bluetooth communication technology, we have successfully crafted a portable electro-goniometer to capture the free range of motion in both upper and lower limb joints, with the data seamlessly presented on compatible smartphone applications. To validate the reliability of our proposed device, we conducted a comparative analysis against a well-established commercial PASCO goniometer. The evaluation involved twenty healthy youth subjects, comprising an equal distribution of ten males and ten females. Statistical analyses were employed to assess the accuracy and repeatability of our proposed device, drawing comparisons to the PASCO goniometer. The results demonstrated that measurements obtained from our proposed device and the commercial electro-goniometer were comparable and repeatable, as confirmed by the remarkable degree of accuracy and precision of about 98% between the two devices. Consequently, this portable and highly precise device holds immense potential for clinical assessment and rehabilitation applications. This innovation serves to provide users with enhanced motivation to engage in their rehabilitation process, thereby facilitating better outcomes and representing a promising advancement in the field of joint angle measurement and rehabilitation practices.

Poster ID: 1808202305

"A Finite Element Analysis Based Comparison of Two-point Versus Four-point Spreader Bar of Patient Lifter"

Dua Amna, Muhammad Taha, Ahmad Zahid Rao

ABSTRACT:

In the realm of healthcare, the safe and efficient transfer of patients holds paramount importance, particularly for those affected by conditions such as stroke, hemiplegia, and paraplegia. Precise handling during transfers not only ensures patient safety but also upholds the well-being of healthcare providers. The essential components of patient lifters include a spreader, boom, shaft, and base. Among those, the spreader bar stands out as a vital element, serving as a crucial link between the lifting device and the patient's sling. These come in various configurations including two- and four-point spreader bars. In this study, we conducted a meticulous comparison of these two designs of spreader bars through finite element analysis (FEA). The critical material properties parameters are considered in the FEA model employed for the patient lifter's structural steel components such as Poisson's ratio of 0.3, Young's modulus between 200 GPa and 210 GPa, Ultimate tensile strength between 400 MPa to 700 MPa, the Yield strength between 250 MPa and 460 MPa, and the material's density is 7850 kg/m3. Equal force vectors, totaling 1000 Newtons, were applied at the corners of spreader bars and the force reaction, stress distributions as well as total deformation were simulated. The findings demonstrated that both two- and four-point spreader bars effectively achieved force equilibrium during patient lifting. The two-point spreader bar demonstrated consistent stress values, while the four-point spreader bar showed a slight difference in the boom's stress response, highlighting the importance of precise dimensions in design. The variations in total deformation underscore the need for considering specific application requirements when choosing the appropriate spreader bar configuration. To enhance accuracy, future improvements may involve incorporating more material properties and analysis parameters in the FEA model under varying loads. This will aid to optimize patient lifter design and performance.

Poster ID: 1808202306

"Smart Hand Glove with Obstacle Detection"

Zahid Siddique, Sami Ullah Khan, Yousaf Masih, Gul Munir, Wasim Munir

ABSTRACT:

Humans are born with the ability to see, hear, and interact with their surroundings. Unfortunately, some people are differently abled and do not have the ability to use their senses. Such people rely on alternative modes of communication, such as sign language. This creates a significant barrier for people with hearing and speech impairments when they try to interact with others who are unfamiliar with sign language. Communication is the only medium through which people with disabilities (dumb and deaf) can share their thoughts and communicate with others. However, there are numerous difficulties in communicating with disabled people. As a result, a disabled person cannot compete in a race with a normal person. Dumb people typically communicate using sign language, but they have difficulty communicating with others who do not understand sign language as a result, communication between these two communities is hampered. The use of smart gloves by people with disabilities helps the state grow and allows them to interact with the general population.

Poster ID: 1808202307

"Tracing Veins using Near Infrared Imaging Techniques"

Anoosh Fatima, Shanzae Zubair, Amna Wagley, Gul Munir, Muhammad Amir

ABSTRACT:

Venipuncture is widely used in hospitals for a variety of treatments like drug administration, supplying nutrients, drawing blood samples etc., with a reported 95% of hospitals reporting its use on daily basis. Phlebotomists mainly depend on use of tourniquets and skin palpitation for detecting and locating the site of a venipuncture that leads to a 46% error rate due to peripheral difficult venous access (PDVA) which is often a result of dehydration, baby veins, dark skin complexion etc. This leads to hematoma, nerve damage, extravasation, arterial puncture, thrombus and emboli which can sometimes prove fatal. A vein locator is a device that aids in reducing this error by clearly drawing out the venous patterns. It uses principles of nor infra-red (NIR) to capture vein patterns as NIR can be absorbed by deoxygenated blood whereas the peripheral structures reflect it. The obtained images aren't very lucid which is why it is to be processed. After preprocessing, the vein will be trace by using medical image technique such as CLAHE and RSIHE. Gaussian filters, Gabor filters etc. which draws out a clear pattern of the vein in terms of its eigenvalues. The processed images are subjected to feature extractors like BSIF and HoG that are used to define these images into distinct features like different histogram and eigenvalues that can be used to train a supervised machine learning algorithm using KNN (k nearest neighbor) and decision tree techniques. CNN is used to produce an elaborate model that is integrated with the camera to trace a pattern that assists phlebotomists during venipuncture, significantly reducing the error in interpreting the veins pattern.

Poster ID: 1808202308

"Decoding The Protein Folding Mystery: Alphafold To The Rescue"

Muhammad Ali Jawaid, Noor Ain Shah

ABSTRACT:

AlphaFold is a deep learning system developed by DeepMind, a subsidiary of Alphabet Inc. that predicts the 3D structure of proteins. It uses artificial intelligence (AI) techniques, particularly deep neural networks, to model and predict the folding of proteins based on their amino acid sequences.AlphaFold addresses this problem by leveraging deep learning algorithms and vast amounts of genomic data to predict the 3D structure of proteins with remarkable accuracy.

Poster ID: 1808202309

"Fabrication of PVA films for in Vivo Wound Healing"

Anoosh Fatima, Shanzae Zubair, Amna Wagley, Tooba Khan

ABSTRACT:

Wound closure techniques have been used for centuries, but there is a need for biocompatible and biodegradable alternatives. This research focuses on bioabsorbable adhesives for wound healing in stress-prone tissues. Films were developed using polyvinyl alcohol (PVA) as the base material, along with dilute acetic acid, magnesium, and alpha ketoglutarate (AKG). These films aim to provide mechanical stability, mimic the body's environment, and promote cell proliferation. Tests were conducted to validate their effects. The results show potential for minimizing scarring and promoting healing.

Poster ID: 1808202310

Development of ECG & CPR Patient Simulator

Ahsan Mirza[1], Naqi Chattha, Waheed Sultan, Tooba Khan, Muhammad Zeeshan ul Haque

According to research, almost 440,000 people lost their lives every year due to obviated medical errors. All these preventable medical errors are mainly caused due to lack of practice of medical students, doctors, and nurses. To reduce preventable medical errors and to improve the clinical practice of doctors and nurses Simulation-Based medical education (SBME) can be an effective technique. SBME is a rapidly evolving technology, used widely by medical universities to improve patient safety. This research work focuses on the development of a human patient simulator with Electrocardiogram and Cardiopulmonary resuscitation (CPR) parameters. This simulator provides realistic and effective training to medical doctors, nurses, and clinicians, helps them identify different healthy and non-healthy ECG signals, and practice CPR without the need for real patients. The ECG circuitry was created using real patient data, mimicking heart conditions. The CPR circuitry utilizes a Force Sensitive Resistor sensor and feedback system to provide instant compression information. Fulfilling the recommended 2-inch threshold value by the American Heart Association, the CPR circuit helps determine compression effectiveness. A significant advantage of this human patient simulator is its cost-effectiveness compared to existing solutions while maintaining accuracy equivalent to real ECG and CPR scenarios. The project also allows for further enhancements with modules like the Intravenous insertion and Heart sounds simulator, creating a comprehensive training experience for medical professionals.

Poster ID: 1808202311

"Efficiency redefined: Affordable-automated plasma thawer with multi bag capacity & precision control"

Ghayoor Ahmed Khan Ghauri, Bisma Mushtaq, Rabeea Adeen, Zawyar Siddique,
Muhammad Danish Mujib

ABSTRACT:

In the realm of blood transfusion readiness Introducing the "Automated Plasma Thawer": an ingenious fusion of cost-effectiveness, precision, versatility and automation, engineered to meet the diverse demands of modern medical facilities. Through our automatic switching system, each thawing cycle evolves seamlessly, allowing healthcare providers to allocate their valuable time where it matters most. Moreover, its multi-bag capacity liberates medical professionals from the confines of single-bag thawing and facilitates the simultaneous thawing of multiple plasma bags, enhancing operational efficiency and streamlining blood product availability. Witness the future of blood transfusion unfold before your eyes—where budget-conscious innovation meets life-enhancing potential.