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4th Scientific Initiation Journey

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Welcome Address

We are pleased to announce the arrival of the 4th Scientific Initiation Journey, a moment eagerly awaited by all of us. This gathering is a testament to the dedication and hard work of our students over the past two years, showcasing the research conducted within our institution. It is also a special edition as it marks the first Scientific Initiation Journey to take place in our new campus, Albert Einstein Teaching and Research Center - Cecília and Abram Sjazman Campus, symbolizing growth and potential.

As we transition from virtual interactions to in-person gatherings, there is a sense of anticipation in the air. This event goes beyond the traditional conference; it represents the coming together of brilliant minds and a celebration of scientific exploration, especially in the face of the challenges posed by the COVID-19 pandemic.

Within the summaries presented here, you will find the essence of the relentless dedication and unwavering effort of both students and teachers. Each presentation opens a door to the world of research, discovery, and innovation. It is our hope that as you delve into this pool of knowledge, you will discover inspiration and perhaps even find your own path in the realm of research.

The 4th Scientific Initiation Journey reflects a collaborative effort between students and teachers, highlighting the enduring spirit of our institution. The research presented here is a manifestation of our collective commitment to expanding the boundaries of knowledge.

As we embark on this intellectual journey, we encourage you to savor each moment, engage in enriching discussions, and let the ideas presented here ignite your own intellectual curiosity. We hope that this 4th Scientific Initiation Journey becomes an unforgettable experience that propels us towards future breakthroughs and innovations collectively.

The Organizing Committee

Editorial

Scientific Initiation as a gateway to developing *scientific habitus*

Rômulo Gonçalves Leão [1], Luiza Collet Janny Paschoarelli Veiga[1]

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In common parlance, the term "initiation" may evoke images of secret ceremonies or mysterious rituals in which participants are inducted into hidden secrets. Far from esoteric practices and "mysterious" ceremonies, "Scientific Initiation", or "*Iniciação Científica*", as its known in Brazil, can be understood as an pedagogical activity that provides support for the early stages of undergraduate students' scientific education. Unlike well-kept secrets, science is an open field accessible to all, and its methodology contributes to the development of critical thinking and the making of more informed decisions.

Scientific Initiation, as it is practiced in Brazil, contributes to "initiating" undergraduate students precisely because it serves as a first step towards the development of the so-called "*scientific habitus*". *"Habitus" is* a concept developed by the French sociologist Pierre Bourdieu[1] to describe how individual experiences and interactions within a specific social setting gradually mold a person's inclinations and choices. *Habitus* is a set of implicit dispositions that guide individual's actions and choices in a specific social context. These dispositions are acquired over time through socialization and life experiences. As a result, they influence how a person acts and thinks without them necessarily being aware of it.

In this regard, the *scientific habitus*[1] can be defined as the way in which scientists, researchers, and, most notably, students internalize the norms, values, and practices of the scientific community, which guide work in the field of science. Thus, one learns science not only by reading about *scientia* but by doing science while observing and discussing *scientia*; in a comprehensive process guided by qualified professionals willing to teach the scientific *modus operandi* through the *scientific habitus*. The *scientific habitus* involves not only the language, etiquette, and intricacies of scientific discourse, but it might also entail the acquisition of skills such as the pursuit of objectivity, a commitment to evidence-based research, intellectual honesty, and transparency in presenting results. Therefore, Scientific Initiation can serve as a gateway to understanding how science operates, not only because the student is actively conducting

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research but also because it enables the development of the *scientific habitus* through the close and extended contact it establishes with more experienced researchers. This is essential for the education of not only future researchers but also future healthcare professionals who will work directly in patient care, in a context of a large volume of information, misinformation, and continuous scientific advancements.

Interestingly, despite its importance, the encouragement of undergraduate research is relatively recent in the global context:[2] although there were isolated experiences in the early 20th century, the main milestone in its emergence occurred in the 1960s with the founding of the Undergraduate Research Opportunities Program (UROP) at the Massachusetts Institute of Technology (MIT) in 1969. Similarly, in Brazil, there was some financial support for undergraduate research dating back to the 1950s, with the establishment of the National Council for Scientific and Technological Development (CNPq - *Conselho Nacional de Desenvolvimento Científico e Tecnológico*). However, formal encouragement only solidified in 1988 when CNPq created the Institutional Program for Scientific Initiation Scholarships (PIBIC - *Programa Institucional de Bolsas de Iniciação Científica*), a program exclusively dedicated to funding undergraduate research. According to Mairinque and Tintel,[2] this program introduced a new way of awarding scholarships, as they are distributed to higher education institutions rather than directly to individual students.

The way undergraduate research encouragement is structured in Brazil, through the model of Scientific Initiation, can be seen as highly beneficial for nurturing the *scientific habitus* during this stage of healthcare professionals' education. Unlike other places, the Brazilian model involves the voluntary execution of long-term projects, with or without scholarships. According to Bazin,[3] the Brazilian model drew inspiration from both the French and American models. In the United States, research incentives typically take the form of a mandatory thesis in the final year of undergraduate studies. In France, this activity occurs through less formal laboratory internships. The fact that Scientific Initiation is not mandatory in Brazil is interesting because it likely encourages the participation of students with genuine curiosity about the researched topics – a quality that is also a part of the skillset of a good scientist.

Hence, it becomes evident that Scientific Initiation plays a crucial role in the education of undergraduate students in Brazil, not only by providing a practical foundation for understanding science but also by cultivating the *scientific habitus* that can guide their thinking and actions in the healthcare and research environments.

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Editorial

Nelson Wolosker[1,2], Fernando Bacal[2,3], Sérgio Podgaec[2,4]

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The *Sociedade Beneficente Israelita Brasileira Albert Einstein* (SBIBAE), created in 1956, has in its letter of intention a commitment to offering the Brazilian Society medical care of the highest level and medical teaching of excellence, represented by the Faculty of Medicine, created in 2016.

To maintain its two foundations at high levels, producing Knowledge to deal with health problems in all their spectrums is essential. To this end, in 1998, *Hospital Israelita Albert Einstein* (HIAE) created a branch of the Society, the HIAE Teaching and Research Institute (IEP - *Instituto de Ensino e Pesquisa*), which later expanded to 3 autonomous institutes: Teaching, Innovation, and Research. With this significant investment, in addition to the increase in patents and improvement in teaching, hundreds of research studies have been conducted in all areas of health.

To carry out high-level research, good researchers must follow the basic principles of science:

– Ask meaningful questions that can be investigated empirically.
– Link the research to a relevant hypothesis.
– Create methods that allow objective investigation of the issue.
– Analyze the data coherently and explicitly, comparing it with what is known about the topic so that appropriate conclusions can be generalized and;
– Provide to Society through publications or events.

All of these research steps have to be learned to be fully employed, and scientific Initiation is an opportunity for learning for undergraduate students at Brazilian universities in all areas of knowledge.

In 2023, the 4th *Jornada de Iniciação Científica* (JIC) will be held at the HIAE Teaching and Research Center. A day of presentations of scientific works by scientific initiation students. Fifty-five studies with complete results and twenty with partial results were presented. In these studies, we can evaluate the mentoring activity between the institution's researcher and the student in different areas of medical Knowledge: Neurology, Molecular Biology, Clinical Medicine, Allergy and Immunology, Nursing, and finally, Physiotherapy, a new *Faculdade Israelita de Ciências da Saúde Albert Einstein* undergraduate course.

At the 4th JIC, the day of presentations demonstrates the large quantity of articles produced, the high quality, and the many students involved. It is clear

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once again that when a Scientific Policy is adopted, the results appear consistently. There is clearly a connection between teaching, research, and extension at the *Faculdade Israelita de Ciências da Saúde Albert Einstein*.

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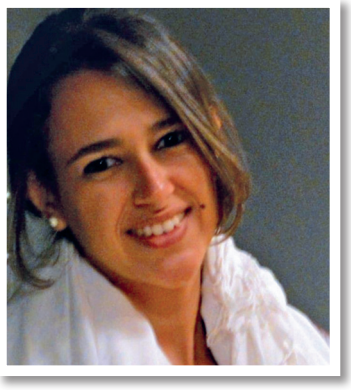
- Juliana Magdalon - Professor at Faculdade Israelita de Ciências da Saúde Albert Einstein, Hospital Israelita Albert Einstein, São Paulo, SP, Brazil.

Speakers

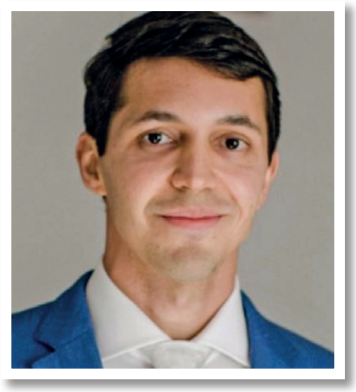
Nelson Hamerschlak, MD, PhD

Medical Doctor graduated from the *Universidade Federal de São Paulo*, holding specializations in Hematology/ Hemotherapy and Clinical Medicine, along with a PhD in Immunology from the *Universidade de São Paulo*. He serves as an Associate Professor at the Department of Pediatrics (Discipline of Clinical Pediatrics) at the *Faculdade de Medicina* of the *Universidade de São Paulo* since 2014. He is currently a hematologist and hemotherapist at *Hospital Israelita Albert Einstein*, where he also coordinates the Postgraduate Course in Hematology/Hemotherapy and conducts research as an affiliated researcher at the *Instituto Israelita de Ensino e Pesquisa Albert Einstein*. Additionally, he practices hematology at *Américas Oncologia* and holds a position on the Scientific Council of the Brazilian Association of Leukemias and Lymphomas (ABRALE - *Associação Brasileira de Linfoma e Leucemia*). He has held esteemed leadership roles including the presidency of the Brazilian Society of Hematology and Hemotherapy, the Hematology Center of São Paulo, and the position of Clinical Director at the *Hospital Israelita Albert Einstein* from 1996 to 1999. He also served as Superintendent of the *Instituto Israelita Albert Einstein* from 2000 to 2003 and was President of the Brazilian Society of Bone Marrow Transplantation from 2018 to 2021.



Ilana Eshriqui Oliveira, PhD

Graduated in Nutrition at the *Universidade Federal do Rio de Janeiro* in 2014, and then completed a Master's degree in Human Nutrition in 2017. She concluded her PhD in Sciences at the Public Health Nutrition Program in *Universidade de São Paulo* (2020) that was partially completed in Helsinki (Finland) at the Folkhälsan Research Center. Currently, Dra. Ilana is a Senior Research Analyst at *Hospital Israelita Albert Einstein* and a leader of the *Núcleo de Estudos e Pesquisas em Planificação da Atenção à Saúde* (NEP.Planifica) at *Centro de Estudos, Pesquisa e Práticas em Aps e Redes - CEPPAR*. She has experience and interest in public health, nutritional epidemiology, practice-based research and implementation science.



Vagner Madrini Junior, MD

Cardiologist. Assistant at the Department of Cardiomyopathies and Aortic Diseases at the Heart Institute of the *Faculdade de Medicina* of the *Universidade de São Paulo*. Researcher at the Academic Research Organization of *Hospital Israelita Albert Einstein*. Guest professor at the *Universidade de São Paulo* Faculty of Medicine.

Carlos Augusto Cardim de Oliveira, MD, PhD

Medical Doctor graduated from the Faculty of Medicine of the *Universidade de São Paulo*. Pediatrician and Neonatologist (SBP/AMB). Master and Doctor in Medicine from *Universidade de São Paulo*. Professor of Medical Knowledge Subjects I, V and VI (research methodology, epidemiology, evidence-based medicine of the medical degree at the *Faculdade Israelita de Ciências da Saúde Albert Einstein*). Professor of Evidence-Based Medicine for postgraduate and stricto sensu courses at *Hospital Israelita Albert Einstein*.

Scientific Program

8:30–9:00	Welcome and opening *Fernando Bacal, MD, PhD* *Nelson Wolosker, MD, PhD*
9:00–9:30	Cell therapy in hematology: perspectives *Nelson Hamerschlak, MD, PhD*
9:30–10:00	Implementation science: impacts on primary health care *Ilana Eshriqui Oliveira, PhD*
10:00–11:20	1st Poster viewing and coffee break
11:20–12:50	1st Oral presentations
11:20–12:50	Parallel programming: presentation of works by PIBIC/CNPq fellows
12:50–13:50	Lunch
13:50–14:20	Exploring opportunities for health students in clinical research *Vagner Madrini Junior, MD*
14:20–14:50	Impacts of research biases on clinical practice *Carlos Augusto Cardim de Oliveira, MD, PhD*
14:50–16:10	2st Poster viewing and coffee break
16:10–17:40	2st Oral presentations
17:40–18:00	Closing session *Luiz Vicente Rizzo, MD, PhD*
18:00	Awards session & closing cocktail

001

Psychometric properties of morphology tests for medical students: application of classical and item response theories

Category: Health Education

Marcella Moura Ceratti[1], Carlos Augusto Oliveira Cardim[1], Ângela Tavares Paes[1]

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Introduction: This study investigates the challenges in creating effective examinations to measure medical students' knowledge. Despite advances in the educational system, traditional evaluative methods are still commonly used and do not necessarily reflect the students' proficiency. Some important educational institutions have already started using statistical tools to create examinations and measure grades, but this practice is still unknown among teachers in some schools, colleges, residencies, and postgraduate programs. **Objective:** This study aims to measure the quality of medical graduation examinations using statistical tools. Based on comparisons between the two methodologies, the study suggests approaches to create examinations that reflect students' knowledge better. **Methods:** We analyzed data from three examinations in a morphology course administered to medical students at the *Faculdade Israelita de Ciências da Saúde Albert Einstein* (FICSAE). The examinations comprised multiple-choice questions: Examination I with 35 questions, Examination II with 35 questions, and Examination III with 25 questions. Classic Test Theory (CTT) and Item Response Theory (IRT) were used to assess the quality of the questions. The CTT was applied using four parameters: facility index, discrimination index, biserial correlation, and Cronbach's alpha, whereas the IRT analyzed the items based on a three-parameter logistic model: difficulty, discrimination, and chance of random guessing. Characteristic curves were constructed to illustrate IRT results. The final grades were obtained using the CTT and IRT and compared using scatter plots and descriptive statistics. **Results:** This study analyzed the responses of 100 medical students across three examinations. The general quality of the examinations was similar, with more than 80% of the questions classified as easy or very easy. The tests also did not present a good discrimination capacity; only 22% of the questions had a good discrimination rate, which meant that they were unable to accurately distinguish between students with high and low proficiency. Nearly 70% of the questions presented an adequate biserial correlation (>0.4), which means that the students' performance on these questions corresponded to their performance in the final grade. Examinations I, II, and III demonstrated satisfactory reliability, with Cronbach's alpha values of 0.77, 0.75, and 0.66, respectively. According to the IRT models, the tests presented 30% of the questions with a high probability of being correctly answered by chance, and two questions (2%) presented negative IRT characteristic curves, suggesting that students with lower proficiency are more likely to answer these questions correctly. The final scores obtained by the IRT were correlated with the traditional grades (Pearson's correlation coefficients were 0.93 in Examination I, 0.94 Examination II, and 0.95 in Examination III). This correlation was expected, but grades based on IRT presented greater granularity because they vary within a continuous scale instead of only positive integer numbers obtained from a simple sum of points. **Conclusion:** The quality of the analyzed examinations were below the ideal standards and presented items that could be improved or removed. This highlights an alternative way of calculating students' grades in a more faithful manner using IRT. The findings reinforce the scientific opinion that assessing the quality of examinations through statistical methods is both useful and readily

applicable in practice, thereby contributing to the creation of more reliable and effective examinations to measure students' knowledge.
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Research funding: Not applicable.

002

Association between biological brain age and physical tests in an older population of São Paulo

Category: Neurosciences

Gustavo Henrique de Melo Ultchak[1], Raymundo Machado de Azevedo Neto[2], Edson Amaro Junior[3]

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Introduction: Although morphological changes during brain aging are well documented, individuals experience the process of brain aging differently. Different disease burdens and lifestyles can influence brain aging calculation in individuals and result in "accelerated aging biomarker processes, which indicates an older brain age decades earlier than other people the same chronological age. Using quantitative neuroimaging techniques, it is possible to determine the "brain age" compared biological brain age of an individual. Although the aging process is a result of accumulated genetic and environmental factors, quantitative measures of the brain tissue based on neuroimaging may be more suitable predictors of disease and functional decline than chronological age. Complex mechanisms interact and can modulate brain age calculations, such as variations in diet, inflammatory status, acute and chronic diseases, and lifestyle habits; however, not all variations and their influence in this process are known. Herein, we considered several variables encompassing psychological, physical, and lifestyle assessments available in the OCTAGENE and SABE databases, applied machine learning techniques as well as statistical association tests to investigate the relationships of the variables in predicting brain age, and evaluated the prediction performance of these models. **Objective:** To assess the associations among cognitive function, physical tests, lifestyle habits, and brain age using magnetic resonance imaging (MRI). **Methods:** The participants were aged >59 years and lived in São Paulo, Brazil. A database (OCTAGENE) containing T1-weighted brain MRI scans was used. These images were analyzed using the FreeSurfer software, which generates volumetric measures of the brain, such as sulcal thickness, gyri thickness, and cortical volume. A second database (SABE) was used to examine sleep, sexual activity, timed up-and-go test, and grip strength. The data from the SABE included only direct questions and no scoring was available. Volumetric measures were used to train a machine-learning-based regression model to predict the biological brain ages of the participants. Several regression models were used. The model of choice was ElasticNet, which had the lowest mean absolute error. Of the 511 participants, 70% were used to train the machine learning model and the other 30% were used to train the prediction model, resulting in the predicted brain age. This age was subtracted from the chronological age of the participants to determine the variable "predicted age difference," which was applied in tests of association with the variables of interest. The OCTAGENE data used included cognitive assessment variables. For quantitative variables, association tests and linear regressions adjusted for sex and body mass index were performed. An analysis of variance and Tukey's tests were conducted for categorical variables. **Results:** The mean absolute error of the prediction model was 5.1. The R values of the Pearson correlation test for timed up-and-go and grip strength for men and women were -0.12, -0.28, and 0.082, respectively, (all $p<0.05$). The linear regression of grip strength for the males had a factor of -0.2 ($p=0.0476$). None of the other tests were statistically significant. **Conclusion:** This study found neither positive nor negative associations between biological brain age and the variables investigated, despite the small effect of brain age on male grip strength.
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CAAE Number: 68482423.7.0000.0071.
Research funding: *Hospital Israelita Albert Einstein*.

003

Acute kidney injury and the use of ventricular assistance devices

Category: Critical Care Nursing

Kamila Adriano Mazzeu[1], Filipe Utuari de Andrade Coelho[1], Eduarda Ribeiro dos Santos[1]

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Introduction: Currently, the use of ventricular assist devices (VADs) has increased as an alternative in the management of cardiogenic shock. However, renal function alteration is a frequent complication in this context, and the literature regarding the relationship between the kidney and VADs remains scarce. **Objective:** To identify the overall prevalence of patients with acute kidney injury (AKI) using VADs and of AKI associated with each type of VAD. **Methods:** This retrospective study was conducted in the adult intensive care unit of a large hospital and included patients who were using VADs between 2012 and 2018. The definition and classification of AKI were based on the Kidney Disease Improving Global Outcomes (KDIGO) criteria. Variables related to demographic and clinical characteristics and data on mechanical circulatory assist devices and renal function were collected. The descriptive analysis of qualitative variables was performed using absolute and relative frequencies, while quantitative variables were analyzed using mean and standard deviation because the data were normally distributed. **Results:** Ninety-six patients were included in the study, with none excluded. The majority of the patients were male (83.3%), with a mean age of 53.9±16.2 years. Heart failure was predominant (83.3%) in the patient group. Mechanical ventilation was observed in 86.5% of the cases, and all patients required vasoactive drugs, with 49.0% needing renal replacement therapy. The overall prevalence of AKI was 83.3%, with 84.0%, 83.3%, and 80.4% of cases being related to the use of intra-aortic balloons (IABs), Centrimag® acute circulatory support system, and venoarterial extracorporeal membrane oxygenation, respectively. The KDIGO classification that predominated was Stage 3 (50.0%), followed by Stage 1 (19.5%), and Stage 2 (13.5%). The mortality rate was 52.1%. **Conclusion:** A high overall prevalence of AKI was noted in patients using VAD, and the same trend was observed when AKI was stratified by the type of VAD used, with the highest prevalence of AKI being in patients using IABs. This study indicates a significant alteration in the renal function of patients using VADs, highlighting the need for rigorous monitoring of clinical parameters to prevent the development of AKI and its complications.

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Research funding: Not applicable.

004

Clinical complications and Nursing Activities Score in patients undergoing extracorporeal membrane oxygenation

Category: Critical Care Nursing

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Introduction: Nursing is closely involved in the care of patients on extracorporeal membrane oxygenation (ECMO), which is associated with complications. The development of these complications is likely dependent on the workload of the nurses involved in the care of patients on ECMO. However, currently, a gap exists in the literature on the issue, thus necessitating a deeper exploration of this topic. **Objective:** This study was aimed at examining whether the nursing activities score (NAS) pertaining to admission to the intensive care unit (ICU), on the day of ECMO initiation, and 24 hours after ECMO initiation are correlated with complications in patients on ECMO. **Methods:** This retrospective ICU-based study included patients who underwent ECMO between 2012 and 2020. Various variables related to clinical and demographic characteristics, ECMO functioning, and the presence of clinical complications were collected. Workload was measured using the NAS upon ICU admission, on the day of ECMO initiation, and 24 hours after ECMO initiation. A significance level of $p<0.05$ was applied to all conducted analyses. **Results:** Overall, 122 patients were included, with none being excluded. The prevalence rates of the main ECMO complications comprising acute kidney injury (AKI), thrombosis, pressure injury (PI), and healthcare-associated infection (HAI) were 80.3%, 57.4%, 46.7%, and 13.9%, respectively. The NAS upon ICU admission was 98.5%; it increased to 135.4% at ECMO initiation and was 123.0% 24 hours after ECMO initiation. **Conclusion:** No relationship was found between the NAS upon ICU admission, on the day of ECMO initiation, and 24 hours after ECMO initiation, with regard to complications such as AKI, PI, thrombosis, and HAI.

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005

Comparison of different 30-day readmission risk prediction models for patients with cancer

Category: Hematology and Onco-Hematology

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Introduction: Thirty-day hospital readmission is an important quality indicator in healthcare and is associated with a high mortality risk. The LACE index is a widely-used clinical tool that predicts the combined risk of mortality and 30-day unplanned readmission based on the length of stay, admission type (urgent or not), Charlson comorbidity index, and number of admissions to the emergency department in the last six months. This index has a moderate discriminating ability for medical or surgical admissions, though its performance for patients with cancer is limited. The Big Data and Analytics Department of *Hospital Israelita Albert Einstein* (HIAE) developed machine learning models to predict unplanned 30-day readmissions in patients with cancer. **Objective:** This study compares the performance of the LACE index with the novel machine learning model developed at the HIAE to predict 30-day unplanned readmission in oncological patients. **Methods:** This retrospective cohort study used data from the electronic medical records of 761 adults (aged ≥18 years) who were admitted to the HIAE between January 2018 and December 2020 for at least 24 hours and were followed up by the Oncology Department due to solid malignant tumors. This sample was used to test the generalization of an extra tree classifier (ETC) and a light gradient boosting classifier (LGBC), which were the best-performing machine learning models developed at the HIAE. The LACE index was calculated for each participant (cut-off=10). To assess the global performance of the different models, the sensitivity, specificity, area under the receiver operating characteristic curve (AUROC, indicating the discriminative ability), and area under the precision-recall curve (AUPRC, an overall performance assessment in this unbalanced context, in which readmission is less frequent than no readmission) were compared. The discriminative ability of the models and the LACE index, measured using the AUROC, was verified using the DeLong test. **Results:** The sample mean age was 64.9±14.7 years (44.9% female). The LACE index had a sensitivity of 76.9%, specificity of 48.1%, AUROC of 0.67, and AUPRC of 0.31. The ETC had a sensitivity of 73.4%, specificity of 59.4%, AUROC of 0.74, and AUPRC of 0.51. The LGBC had a sensitivity of 72.8%, specificity of 61.3%, AUROC of 0.72, and AUPRC of 0.51. The discriminative ability of the machine learning models was similar (p=0.09) and higher than that of the LACE index (p<0.001 *versus* ETC and p=0.005 *versus* LGBC). **Conclusion:** Both novel machine learning models exhibited better overall performance than the LACE index in predicting 30-day unplanned readmission for patients with cancer. Therefore, these prediction models can contribute to data-driven decision-making as they can be used to identify individuals at higher risk who may benefit from care transition strategies that mitigate the risk of readmission.

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006

Impact of low anterior resection syndrome (LARS) on patient quality of life: a prospective observational cohort study

Category: Surgery

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Introduction: Rectal cancer is one of the most prevalent cancers worldwide and the second leading cause of cancer-related deaths. Low anterior resection (LAR) with total mesorectal excision is primarily indicated for medium and distal rectal cancers. However, after LAR, a large majority of patients suffer from low anterior resection syndrome (LARS). LARS leads to bowel dysfunction, evacuation disturbances, and anal incontinence, which negatively influences patient

quality of life. **Objective:** In this study, we aimed to evaluate and quantify the physical, psychological, and social impacts caused by rectal cancer LAR surgery. **Methods:** This prospective observational cohort study was conducted to evaluate patients who underwent LAR surgery between January 2021 and March 2022. The LARS score and Fecal Incontinence Quality of Life (FIQL) questionnaire score were assessed two months after ileostomy closure. Forty three patients were enrolled and 11 were excluded from analysis. All data were compiled and interpreted using descriptive analyses and nonparametric statistical tests; a p-value of less than 0.05 was considered statistically significant. **Results:** The mean time between the first surgery and ileostomy closure was 175 days (range: 24-318 days). The mean LARS score was 31.5. According to the LARS scores, five patients had no LARS (15.6%), five had minor LARS (15.6%), and 22 had major LARS (68.8%). A statistically significant difference was observed between the "no LARS" and "major LARS" groups when "Lifestyle" and "Behavior" factors were considered. **Conclusion:** In this cohort, a large majority of patients presented with LARS after LAR surgery. In addition, rectal cancer treatment results in significant physiological impacts. Patients' lifestyle and behaviors are significantly affected by LARS.

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007

Influence of extracellular matrix on cell migration in a 3D model of glioblastoma-on-a-chip technology for magneto hyperthermia therapy

Category: Oncology

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Introduction: Glioblastomas (GBMs) are the most common and aggressive brain tumors in adults, and although GBM incidence varies among countries, the number of GBM cases has been increasing worldwide. Current therapies for the treatment of GBM have a high failure rate owing to the survival of self-renewing GBM stem cells, which repopulate treated tumors. However, nanotechnology-based therapies, such as magneto hyperthermia therapy (MHT), have shown promising results in preclinical models. This therapy offers advantages such as tumor targeting, small size effect, and intracellular hyperthermia. The improvement of MHT effectiveness involves the development of new magnetic nanomaterials, by exploring different alternating magnetic field (AMF) configurations, and efficient evaluation methods, including 2D and 3D cell cultures, organoids, animal models, and glioblastoma on-a-chip (GoC) systems. Organ-on-a-chip technology provides a biomimetic environment for the investigating tumor behavior, testing anticancer drugs, and developing therapeutic strategies. These models enable cell organization, nutrient and waste flow control, high-resolution microscopy, and the combination of essential molecular, biophysical, cellular, and tissue components. Furthermore, tumor-on-chip models using human cells recreate cell-cell and extracellular matrix (ECM) interactions, spatial-temporal gradients, and hydrodynamic properties. Therefore, they are valuable tools for drug development and for clarifying human system behavior. **Objective:** Evaluate the influence of an extracellular matrix on the cell migration in a 3D model of GoC technology for subsequent application of MHT therapy. **Methods:** To implement the GoC model, a microfluidic device developed in a larger project was used with cultured U87-MG cells. Experiments were conducted to evaluate the influence of ECM on cell migration in GoC. Two types of matrices were used, namely, Geltrex (Thermofisher) and Matrigel (Cornig), at concentrations from 50μg to 200μg. These were administered in lateral channels, and cell migration was observed in the central chamber through channels that communicate both cavities via 4 μm pores. The evaluation of cell migration was conducted for 18–24 hours. After selecting the best ECM condition, MHT therapy was evaluated. Cell culture was performed by changing the culture medium every 3 hours, with a flow rate of 10μL/min, for a 100μL target maintained in an oven at 37 °C and under 5% CO_2. To evaluate the effectiveness of MHT therapy in GoC, 20μL of iron oxide nanoparticles at a concentration of 50μg/mL was administered, and an alternating magnetic field of 300 gauss was applied with a frequency of 557kHz. To evaluate the therapy, the LIVE/DEAD kit was used with a fluorescence microscope. **Results:** The analysis of the migration concerning ECM composition revealed

that migration occurred at values higher than 100μg for Geltrex and 80μg for Matrigel. In addition, the 3D conformation was better evidenced with Matrigel. Therefore, the results demonstrate the possibility to apply MHT therapy in GoC. **Conclusion:** The study assessed the significance of ECM composition and concentration in a 3D organ-on-a-chip culture. The results provide a useful background for the future evaluation of therapeutic effect of MHT with tissue in a possible translational study. The findings indicate that the Matrigel ECM at a concentration of 80μg is the most suitable to implement the GoC model.

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008

Tranexamic acid in the management of traumatic brain injury: a systematic review and meta-analysis combined with trial sequential analysis

Category: Urgent and Emergency Medicine

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Introduction: Traumatic brain injury (TBI) is a major cause of death and disability worldwide. Tranexamic acid (TXA), an antifibrinolytic agent, is potentially useful for the management of intracranial hemorrhage secondary to TBI. However, its efficacy and safety remain controversial. **Objective:** To improve our understanding of the efficacy and safety of TXA in the management of intracranial hemorrhage secondary to TBI and evaluate whether further randomized clinical trials and meta-analyses are warranted. **Methods:** We performed a systematic review and meta-analysis combined with trial sequential analysis (PROSPERO CRD42021221949 - "Use of tranexamic acid in head injury: A systematic revision and meta-analysis with trial sequential analysis"). We searched electronic databases (CENTRAL, Embase, LILACS, MEDLINE, SciELO, Scopus, and Web of Science) and studied repositories (ICTRP, CT.gov, and ISRCTN, as well as the Brazilian, Canadian, European, German, and Chinese registries). Additionally, we screened the lists of references of both the primary studies included and those in other published meta-analyses between January 2021 and January 2022 for randomized controlled trials (not restricted by publishing status, language, or date of publication) that included patients aged 15 years or older with TBI (but not brain death on admission) who received intravenous TXA and were compared with those treated with placebo or standard care. The primary outcomes were all-cause mortality and hemorrhagic complications during treatment. This review incorporated the elements of PRISMA, Cochrane risk-of-bias evaluation, and GRADE. Two researchers independently performed the literature search and data collection. Heterogeneity was verified using quantitative methods. Trial sequential analysis (TSA) and sensitivity analyses were performed. **Results:** Of 6,958 retrieved references, 17 randomized controlled trials were included in this review; 14 of which included reports available for analysis, resulting in a total of 15,017 patients. Most studies were classified as having a high risk of bias. The reasons for the risk of bias downgrades included insufficient reporting, selection bias, insufficient blinding or open labeling, methodological flaws, conflicts of interest, and funding. Ten results were obtained. Analyses for the first primary outcome of all-cause mortality (11 studies; 14 572 patients) did not show any statistical significance (traditional fixed-effects model RR 0.95, 95%CI=0.88–1.02; TSA-adjusted fixed-effects model RR 0.95, 95%CI=0.87–1.03), whereas the second primary outcome and hemorrhagic complications during treatment was statistically significant for progressive intracranial hemorrhage (7 studies; 1235 patients) (traditional fixed-effects model RR 0.82, 95%CI=0.68–0.99; TSA-adjusted fixed-effects model RR 0.82, 95%CI=0.38–1.78). A sensitivity analysis for the second primary outcome, which included only primary studies not evaluated as high risk of bias, showed a high protective effect of 23% (fixed-effects model RR 0.77, 95%CI=0.61–0.98). Analyses of secondary outcomes, such as unfavorable neurological outcomes and other adverse effects, did not show any statistical significance for any method used. No publication bias was observed in any of the analyses. **Conclusion:** Use of TXA did not demonstrate any efficacy in terms of all-cause mortality in the management of intracranial hemorrhage secondary to TBI but was safe in terms of all-cause mortality, unfavorable neurologic outcome at

discharge, and serious thromboembolic complications. Additional clinical trials, especially focusing on all-cause and head trauma-related mortality under the effects of relevant covariables, may shed light on the remaining clinical uncertainties.
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009

Effects of FGF19 on lipolysis and cytokine expression in human white adipose tissue

Category: Endocrinology and Metabolism

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Introduction: Obesity is a global epidemic that currently affects more than 2 billion people. It is a chronic disease associated with an increased risk of developing cardiovascular diseases, type 2 diabetes, dyslipidemia, cancer, and several other diseases, primarily due to the proinflammatory environment present in patients with obesity. Metabolic surgery is the most effective treatment against severe obesity. Patients who had undergone this procedure were found to have increased fibroblast growth factor 19 (FGF19) levels in the plasma. FGF19 is a hormone produced by enterocytes and has been shown to have antidiabetic effects and reduce adiposity in rodents. However, the mechanisms behind such changes are unclear, and little is known about the direct effects of FGF19 on human adipose tissue and its contributions to the benefits of metabolic surgery. Identifying potential targets involved in the regulation of metabolism and inflammation may contribute to the development of noninvasive therapies for obesity. **Objective:** To investigate the effects of FGF19 on lipolysis and the expression of adiponectin, leptin, and inflammatory cytokines in human white adipose tissues. **Methods:** With informed consent, abdominal omentum and subcutaneous adipose tissue fragments were obtained from patients who went under metabolic surgery. The experiments were performed on adipose tissue explants that were plated and treated with vehicle or FGF19 at a physiological human plasma concentration (0.5ng/mL) or 10x this concentration (5ng/mL) for 1 week, with the medium change on the third day. Lipolysis was measured through glycerol quantification at tissue supernatant collected after the last 4 days of incubation. Adiponectin secretion was quantified in the supernatant collected after the last 4 days of incubation via enzyme-linked immunosorbent assay (ELISA). Data from glycerol quantification and ELISA were normalized by protein concentration, which was measured using a Pierce bicinchoninic acid protein assay kit. Finally, adiponectin, leptin and inflammatory cytokine (TNFa, IL-6, and IL-10) gene expression was evaluated in the tissue after 7 d of treatment using qPCR. Paired *t*-test was used to compare control with 0.5ng/mL and 5ng/mL FGF19. Statistical significance was set at $p<0.05$. **Results:** For lipolysis, both omentum (n=4) and subcutaneous adipose tissues (n=3) treated with 0.5ng/mL or 5ng/mL FGF19 did not differ from the control. No change in adiponectin secretion (omentum: n=4, subcutaneous: n=3) and expression (omentum: n=4, subcutaneous: n=2) was observed in both types of tissues treated with 0.5ng/mL or 5ng/mL FGF19 compared to the control. Similarly, omentum (n=4) and subcutaneous (n=2) tissues treated with 0.5ng/mL or 5ng/mL FGF19 did not significantly differ from the control in terms of leptin and inflammatory cytokine expression, although subcutaneous adipose tissue treated with 5ng/mL FGF19 showed a tendency towards reduced IL-6 ($p=0.1$) and increased IL-10 expression ($p=0.1$). To confirm the significance of these trends, further experiments will be performed. **Conclusion:** The results suggest that FGF19 does not alter lipolysis, adiponectin gene expression and secretion, and leptin and inflammatory cytokine expression. Additional experiments will be conducted in the future to further elucidate this.
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010

Use of therapeutic play as an enabler of physiological functions for children hospitalized with respiratory disease

Category: Child Health Nursing

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Introduction: Therapeutic play (TP) is used by professionals to communicate with children and relieve their tension, and it can be used to clarify the needs and feelings of pediatric patients. Therapeutic play helps in the preparation of therapeutic procedures, in the dramatization of feelings according to lived experiences, and in enabling the physiological function of patients. In this study, the effectiveness of TP in improving the ventilatory training of children hospitalized with respiratory diseases was investigated. **Objective:** To verify the respiratory and heart rate, oxygen saturation, and signs of respiratory distress in hospitalized children before and after the physiological enabling TP and to identify whether vital signs (respiratory rate, heart rate, and oxygen saturation) were improved and respiratory distress is reduced after this type of TP. **Methods:** A randomized trial was conducted in the pediatrics department of a general private hospital in the city of São Paulo among 57 children aged 3–10 years. Data were collected through observation of vital signs and signs of respiratory distress before and after the TP session. Data are presented in absolute and relative numbers, through tables and graphs, and the Wilcoxon signed-rank test was used to assess the significance of the results. **Results:** There was a significant decrease in respiratory and heart rates after the TP session, with average reductions of 2.44 and 4.23, respectively. The oxygen saturation increased significantly after the TP session, with an average increase of 1.79. Respiratory distress presented an average reduction of 0.25 in the total score after the TP session. **Conclusion:** The results suggest that the use of TP as an enabler of physiological functions is beneficial for children with respiratory disease. Nursing teams should implement TP in the routine care of patients to enable the physiological functions of children with respiratory diseases in pediatric units, thereby improving their quality care.

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011

The association between hyponatremia and clinical outcomes in patients with severe sepsis

Category: Intensive Therapy

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Introduction: Electrolyte and acid-base imbalances are common in many types of serious illnesses. Hyponatremia, characterized by a serum sodium concentration below 135mEq/L, is a prevalent electrolyte abnormality commonly observed in critically ill patients. Its association with increased hospital mortality underscores the crucial importance of accurate diagnosis and appropriate managment. Optimizing such an imbalance can reduce medical costs and improve the probability of survival and quality of life among critical ill patients. **Objective:** To investigate the association between hyponatremia and outcomes in critically ill patients within the intensive care unit (ICU) setting, particularly those with sepsis. The outcomes of interest will encompass the presence of acute kidney injury (AKI), necessity for renal replacement therapy, utilization of vasoactive medications, blood transfusion requirements, and mortality rates. **Methods:** In this cross-sectional, retrospective study, we evaluated the medical records of patients in the ICUs of a large private hospital in São Paulo. The study cohort comprised 145 adult patients with sepsis. Data collection involved an extensive review of medical records. A descriptive analysis of the nominal categorical variables was conducted, encompassing tabulation of frequencies and percentages. Subsequently, to compare independent qualitative variables, the χ^2 test was performed. Student's *t* test was conducted to compare two groups. Finally, binary logistic regression was performed, employing variable mortality (yes/no) as the response variable. **Results:** Lower sodium levels were observed in patients who needed vasoactive drugs, blood transfusion, dialysis, or died. Furthermore, patients

who required vasoactive drugs, blood transfusion, and those who did not survive, displayed elevated serum potassium levels. In the context of mortality, high levels of oxygen partial pressure were observed. **Conclusion:** Hyponatremia, higher potassium levels, and hyperoxia were independently associated with mortality, in addition to the former being related to other outcomes mentioned. Therefore, these factors serve as predictive indicators for unfavorable prognosis in sepsis cases within ICUs.

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Research funding: Not applicable.

012

Dog bite injuries treated in the emergency department during the COVID-19 pandemic: an audit of a private hospital in Brazil

Category: Surgery

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Introduction: Dog attacks are relevant in emergency rooms (ERs), with high-mortality injuries due to rabies and morbidity. During the COVID-19 pandemic, social isolation increased the interaction between dogs and their caregivers, bringing about an apparent increase in dog bite cases. However, there is conflicting data regarding the profile of dog bite cases worldwide during this period. At the Brazilian hospital *Hospital Israelita Albert Einstein* (HIAE), there has been an increase in the number of victims of dog attacks admitted to the emergency department. **Objective:** To evaluate whether there was a significant increase in ER visits due to dog bites during the COVID-19 pandemic, and to evaluate changes in the demographic pattern and use of the plastic surgery (PS) on-call team in these consults. **Methods:** This multi-center retrospective observational study was conducted in five emergency department units at HIAE, from January 2019 to June 2021. We included patients with a main diagnosis of "bitten or struck by dog" (ICD-10 code W54), as recorded in their medical records. This collected data on age (years; age group), sex, date and time of admission (working day or not; daytime or nighttime), and PS interconsultation, and grouped participants into Group 1 (pre-pandemic: January 01, 2019, to February 29, 2020) and Group 2 (during the pandemic: May 01, 2020, to June 30, 2021). The total number of visits to the units was evaluated. Statistical analyses were conducted using R software. **Results:** A total of 1,129 victims of dog bites were included; 558 before the pandemic (Group 1) and 571 during the pandemic (Group 2). The proportion of bites by sex (53% women) and age (mean age: 38 years) were the same in the two groups. The variables of age group, time of the week, time of admission, PS interconsultation, and average number of monthly calls differed between the groups; however, the differences were not significant. The total number of admissions to the emergency units was 399,115 during the pre-pandemic period and 187,641 during lockdown; among these, the rate of dog bites increased significantly (0.13 ± 0.02 and 0.29 ± 0.06, respectively; $p<0.001$). **Conclusion:** This study shows that there was no absolute increase in dog bite cases during the COVID-19 pandemic. However, there was a 2.2-times relative increase among the total number of ER visits when compared to the pre-pandemic period. This can be attributed to the greater urgency of these cases, fear of the rabies virus, and doubts about vaccination, the management of wounds, and antibiotic therapy. No demographic changes in age, sex, or time of occurrence were observed, which suggests a better relationship between caregivers and dogs, and a better level of training. This finding is corroborated by the 3.8% increase in dog adoptions during this period in the country, especially considering that emergency consults for dog bites tend to increase as adoptions increase.

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Research funding: Not applicable.

013

Breastfeeding Self-Efficacy Scale – Short Form (BSES-SF): evaluation of maternal self-efficacy for breastfeeding in the immediate puerperium

Category: Gynecology, Obstetrics and Human Reproduction

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Introduction: The World Health Organization and Pan American Health Organization recommend exclusive breastfeeding in the first 6 months and continued until the age of 2 years or older. Among its benefits are the formation of a bond between the mother and the child, promotion of the child's nutrition, and protection against gastrointestinal infections. Although breastfeeding is a natural practice, some women experience difficulties, and maternal self-efficacy influences the entire breastfeeding period. Self-efficacy in the context of breastfeeding corresponds to a woman's perception of her ability to breastfeed and the belief that she has sufficient skills to carry out efficient breastfeeding. The Breastfeeding Self-Efficacy Scale – Short Form (BSES-SF) measures the self-efficacy of mothers in their ability to breastfeed and targets issues that hinder breastfeeding, allowing health professionals to understand their expectations and maternal limitations. **Objective:** Assess the level of maternal self-efficacy in relation to breastfeeding during the immediate puerperium through the application of the BSES-SF. **Methods:** This was a descriptive-exploratory field study with quantitative data analysis conducted in a private institution of extraordinary size and high complexity in the southern zone of the city of São Paulo. The sample included lactating women in the immediate puerperium who were hospitalized during the data collection period and were eligible according to the inclusion and exclusion criteria. Data collection was performed with the participant in bed using two forms: one with information on the sociodemographic profile and obstetric history and the other containing the BSES-SF scale. Data were analyzed quantitatively and presented as absolute numbers and percentages in tables and graphs. **Results:** The sample consisted of 97 lactating women in immediate puerperium, with a mean age of 35 years, most of whom were primiparous. Data were collected in May 2023 using the BSES-SF and a sociodemographic profile form. The scale score ranged from 27 to 69 points, with three participants classified as Low Efficacy, 50 as Medium Efficacy, and 44 as High Efficacy. Based on the analysis of the variables related to the number of children and the score obtained in the BSES-SF, it was possible to observe greater self-efficacy among those with two or more children compared to primiparous women. In addition, regarding the domains, the technician presented a higher score than the intrapersonal thoughts. **Conclusion:** This study's findings highlight the importance of assessing the individuality of each case, as different factors may alter the level of self-efficacy of breastfeeding women. Nursing performance through guidance and individualized interventions is critical.

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Research funding: Not applicable.

014

Fabrication of endosteal bone marrow niche via 3D bioprinting

Category: Hematology and Onco-Hematology

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Introduction: Acute myeloid leukemia (AML) is the predominant hematological cancer in adults. It is characterized by the multiplication of abnormal myeloid precursors (blast) in the bone marrow which disturbs hematopoiesis and the immune system. Bone marrow (BM) microenvironments, including endosteal and endothelial niches, exhibit cell-to-cell, autocrine, and paracrine interactions with AML cells. However, the precise mechanisms of these interactions remain unclear. Treatment options for this type of leukemia are still limited to chemotherapy and BM transplantation because new treatment options have been ineffective for this type of cancer. Under standard induction therapy, most patients experience minimal residual disease, in which a small population of resistant cells leads to a relapse, even after long periods of remission. The study of bone marrow microenvironment can potentially be used to reveal whether AML uses its niches to gain drug resistance, thereby revealing new strategies to eliminate these undying cells. However, the study of these relationships is not simple. Although co-culturing of leukemic and BM cells has been employed for this purpose, the two-dimensional nature of the culture deprives the cells of the three-dimensional interactions they undergo *in vivo*. In this context, 3D bioprinting, an innovative approach for cellular studies, has emerged as a promising alternative to investigate AML and BM niches more reliably. This technique involves the incorporation of live cells into biomaterials and a layer-by-layer deposition to create defined structures that

mimic a genuine 3D tissue environment. This method enhances the accuracy of the correlation analysis between observed effects *in vitro* and *in vivo*, thereby supporting the effectiveness of pharmacological research on AML. **Objective:** The overall goal of this project was to develop a microenvironment model compatible with the endosteal niche of bone marrow (BM) through 3D bioprinting. **Methods:** Biomaterials were prepared immediately before printing by mixing gelatin and alginate in phosphate-buffered saline (PBS), both at a 4% m/v concentration, on a 39 °C heating plate. This concentration was achieved after conducting padronization trials, testing different combinations between 1% and 8%. Endosteal niche lineage (U2OS)-cultured cells were then gently mixed to a final concentration of 10e6 cells/mL. The bioink was printed at room temperature (approximately 20°C) in a squared structure sized 10mm × 10mm × 1mm (height), using 20% infill percentage in an extrusion 3D printer. Subsequently, a 2% (m/v) $CaCl_2$ solution was added for crosslinking. To verify cell survival, the U2OS culture was dyed with cell-trace (CFSE), which marks the cellular membrane with a green fluorescent structure, whereas the printed structure was dyed with propidium iodide (PI), which marks nuclear proteins with red fluorescence. The model was analyzed using a laser confocal microscope. Based on the produced images, the living (marked with CFSE only) and dead (marked with PI only or PI and CFSE) cells were manually counted. **Results:** The printed scaffolds exhibited satisfactory form and uniformity. Confocal microscopy enabled a clear visualization of the cells, which displayed a cohesive and rounded morphology. Cell-trace CFSE and PI staining were highly effective in ensuring distinct cell marking. Through image analysis, viable and non-viable cells were quantified in two distinct regions (0,4 x 0,4 x 1mm) of the structure. The collective data unveiled 130 viable and 26 non-viable cells, which indicated an 83% cell viability. **Conclusion:** The bioprinting protocol provided endosteal cells with good viability for the production of 3D models. This method can be used to associate AML with endosteal cells to better understand their interactions.

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CAAE Number: Not applicable.

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015

Acute-on-chronic liver failure: a retrospective review of cases at a transplant center in Brazil

Category: Nephrology and Solid Organ Transplants

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Introduction: Acute-on-chronic liver failure (ACLF) is an acute deterioration of pre-existing chronic liver disease related to a precipitating event. Currently, it is one of the leading causes of death among patients with liver cirrhosis on the transplant list. Therefore, adequate knowledge of its epidemiology and outcomes of the affected patients is essential. **Objective:** This study aimed to characterize the prevalence, precipitating factors, and outcomes of patients with ACLF at a liver transplant center in Brazil using the European Association for the Study of the Liver (EASL) and Chronic Liver Failure Consortium (CLIF) diagnostic criteria. **Methods:** This retrospective observational study reviewed data from patients in the transplant program with chronic liver disease who were admitted between June 2017 and June 2022 in the Intensive Care Unit (transplanted or who died on the transplant waiting list) and those admitted on the ward regimen before transplantation with liver failure (total bilirubin >12 mg/dL) or coagulopathies (INR ≥2.5). The participants were classified by the occurrence of organ failure according to the EASL-CLIF consortium criteria. The assessment was repeated on days 3-7 after the diagnosis of ACLF. Precipitating factors, as well as outcomes, were analyzed. **Results:** Among the 434 patients evaluated, 9.2% (n=40) had ACLF. Infection was the most common trigger (45%), followed by other causes (22.5%) and upper gastrointestinal bleeding (12.5%). Kidney failure was identified in 65% of participants, followed by liver failure in 52.5% and coagulopathy in 37.5%. The overall 28-day mortality rate was 35% and varied according to the ACLF severity at diagnosis, from single system failure (ACLF-1) with 22% to three system failure (ACLF-3) with 60%. Eighteen patients (45%) were transplanted in a median of 8 days (min 0,

max 27), with a mean MELD of 34 (min 25, max 48) and survival rate of 100% at 28 days and 83% at 1 year. For ACLF-3 cases at diagnosis (n=15), the 28-day and 1-year survival rate with transplant (n=4) was 100% and 80%, and without transplant (n=11), 10% and 0%, respectively. **Conclusion:** ACLF was associated with a high mortality rate, with bacterial infection as the main precipitating event. Liver transplantation was an excellent therapeutic option when amenable.

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Research funding: Albert Einstein Scientific Initiation Programme Institutional Scholarship.

016

Prospective study of long-term totally implantable catheters behavior in patients with mammary hyperplasia

Category: Surgery

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Introduction: Totally implantable central venous catheters (TICV) are widely used in medical practice and are commonly used for chemotherapy in oncology patients. Complications can arise from their implantation due to the surgical technique and anatomical conditions of the patient. Since the device's proximal segment is fixed (subcutaneous reservoir), upon insertion in the subclavian or internal jugular veins, the supine position may elongate mediastinal structures and alter the position of the distal tip of the catheter, deviating from its optimal position. Mammary hyperplasia may exacerbate this by increasing the thoracic wall mass and gravitational caudal retraction in orthostatic conditions. **Objective:** We aimed to evaluate the change in the position of TICV tips installed in female patients in supine and upright positions and compare the occurrences based on breast volume. **Methods:** A prospective study was conducted on 116 consecutive female patients, aged 18 or older (with indication for TICV implantation), who underwent the procedure by the same team at HMVSC between August 2020 and January 2023 using the same type of catheter (LIFE-PORT Catheter - IBEG). Patients were included if they provided an informed consent. The clinical and demographic characteristics of patients were obtained from their medical records. Mammary volume was determined using the Sacchini index, which was collected preoperatively in an upright position using a measuring tape. Breasts were considered non-hyperplastic (9–11cm) or hyperplastic (>11cm). Each breast was measured individually, and the patients were grouped according to the distance from the ipsilateral breast to the chosen implant site. The final position of the device tip at the cavo-atrial junction was determined intraoperatively. Once the device was secured, its position was documented using fluoroscopy with a properly positioned radiopaque ruler to visualize the carina tip distance. All TICV implants were followed by an orthostatic control radiograph, which was obtained using a radiopaque ruler. The intraoperative and postoperative carina tip distances were assessed by two independent observers. Variations were considered negative when caudal dislocation of the catheter tip was observed. **Results:** The clinical and demographic characteristics of the patients were assessed and the groups were considered homogeneous. The concordance of carina-tip distances in the intraoperative and postoperative assessments between the two observers was 85.3% and 92.6%, respectively. The concordance of the mean variation between the observers was 77.3%, indicating good reliability for Observer 1, who was used as a reference. Pearson correlation analysis assessed the variation in catheter tip distances with respect to the occurrence of prior breast surgery, neoplastic sites, concomitant presence of a peripherally inserted central catheter (PICC) during TICV implantation, previous venous catheter in the implanted vessel, prior ipsilateral thrombosis, thoracic deformative mass, and the implant side. Significant postoperative displacement was observed only with prior breast surgery (p=0.028) and concomitant presence of PICC (p=0.042). Prior breast surgery correlated with a mean caudal displacement of 20.5mm, whereas the concomitant presence of a PICC correlated with a mean cranial progression of 2.97mm. **Conclusion:** These findings suggest that the presence of prior breast surgery and concomitant PICC implantation are statistically significant with regard to postoperative catheter tip displacement. Postoperative changes in the catheter tip location did not have statistical significance for the mammary volume.

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Research funding: Not applicable.

017

Validation of the use of artificial intelligence for the identification of delirium in older patients

Category: Geriatrics

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Introduction: Delirium affects up to 2/3 of hospitalized older adults and is associated with adverse events. Early diagnosis can prevent complications and reduce suffering in both patients and caregivers. The confusion assessment method (CAM) is the current gold-standard screening tool for delirium; however, its correct use requires extensive training. Artificial intelligence (AI) may be able to assist nonspecialists in screening for delirium. To this end, an AI model based on natural language processing (NLP) for identifying delirium based on free texts from clinical notes was developed by the big data and analytics department of *Hospital Israelita Albert Einstein* (HIAE). **Objective:** We aimed to validate this MLP-based AI model in terms of its ability to identify delirium based on clinical notes regarding older adults admitted to hospital wards, by comparing its results with CAM scores reported in electronic health records (EHRs), as well as with identifications of delirium made by experts in the field through chart reviews. **Methods:** This retrospective study included a subset of clinical notes used to assess the performance of the NLP-based model. It comprised 100 admissions of older adults to relevant HIAE wards that lasted for at least 48 hours, between January 2018 and June 2022. The NLP model used a bidirectional encoder representations from transformers approach, which identified symptoms of delirium reported in clinical notes, and thus included the four items of the CAM. The presence of three or more items indicated delirium. Medical records were reviewed by geriatricians who determined whether delirium occurred during the hospital stay. CAM is routinely applied for older adults who are hospitalized in HIAE, and its results can be readily extracted from the EHRs. The model was validated by comparing its results with the CAM results reported in the EHR, as well as with the diagnoses made by experts through chart reviews. These comparisons were done through parameters such as sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). Results: The mean age of the study population was 78±8.9 years, and 55% were female. The NLP model identified delirium in 49% of the patients, whereas the experts diagnosed delirium in 39%. Additionally, 30 patients were determined to be positive for delirium via CAM screening, 46 were negative, and CAM screening on admission was not reported in the EHR for 24 of the patients. When compared to the chart review-based diagnoses made by the experts, the NLP model had 97.4% sensitivity, 81.9% specificity, a PPV of 77.6%, and an NPV of 98%. Compared to the CAM results reported in the EHR, the model showed a sensitivity of 86.6%, a specificity of 60.9%, a PPV of 56.1%, and an NPV of 83.3%. **Conclusion:** The NLP model showed an adequate performance for identifying delirium using clinical notes on hospitalized older adults when compared to diagnoses done by experts via medical chart reviews, and a higher performance when compared to CAM scores reported in EHRs. These results demonstrated the potential of the model as a valuable tool in clinical settings that can aid healthcare professionals in the prompt and accurate diagnosis of this complex condition. Improved patient outcomes and enhanced quality of care for hospitalized older adults may thus be achievable by leveraging advanced AI techniques.

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018

Impact of the COVID-19 pandemic on prostate cancer outcomes at an uro-oncology referral center

Category: Urology

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Introduction: The coronavirus disease 2019 (COVID-19) pandemic has led to an overload in the Brazilian national health system, causing elective surgical procedures to be canceled or postponed due to the prioritization of beds for urgent and emergency cases. Thus, from a urological perspective, the impact of delaying treatment for patients with cancer has been questioned. Evidence suggests that a delay in treating patients with prostate cancer leads to worse oncological outcomes. Therefore, identifying the impact of the pandemic on delays in the diagnosis and treatment of patients with prostate cancer is essential for uro-oncological services to better organization and resource management when handling future pandemics. **Objective:** To evaluate the effects of the COVID-19 pandemic on oncological outcomes of patients with prostate cancer regarding clinical staging, adverse outcomes, and perioperative complications compared to the pre-pandemic group. **Methods:** This observational, retrospective, non-randomized study included patients with non-metastatic prostate cancer who underwent radical prostatectomy with or without lymphadenectomy with curative intent. The patients were divided into the pre-pandemic (November 2018 to February 2020) and pandemic (March 2020 to June 2021) groups. Patients undergoing treatments other than radical prostatectomy or without curative intent and those with synchronous or metachronous neoplasms were excluded. Clinical data were extracted from patient medical records, including age, initial prostate-specific antigen (PSA) levels, lymphadenectomy, International Society of Urological Pathology (ISUP) grade, surgical margin, extracapsular prostate involvement in a surgical specimen, PSA levels 30 days after surgery, time between biopsy and first medical consultation, time between first consultation and surgical procedure, time between biopsy and surgery, and severe surgical complications in the early and late perioperative period after radical prostatectomy (Clavien-Dindo III or IV). **Results:** A total of 226 patients were included; 88 in the pre-pandemic group and 138 in the pandemic group. There were no differences between the groups regarding age, body mass index, American Society of Anesthesiology (ASA) score, presence of locally advanced disease, proportion of patients who underwent lymphadenectomy, or ISUP grade. Surgical margin positivity, extracapsular extension, and 30-day PSA levels were also similar between groups. The mean time between consultation and surgery was longer in the pandemic group than in the pre-pandemic group (124 *versus* 107 days, $p<0.001$), and the mean times between biopsy and medical consultation (69.5 *versus* 114 days, $p<0.001$) and biopsy and surgery (198.5 *versus* 228 days, $p=0.013$) were shorter in the pandemic group. The incidences of early and late perioperative complications were similar between the two groups. **Conclusion:** There were no delays in the treatment of patients with prostate cancer at our institution during the COVID-19 pandemic. Thus, the pandemic did not lead to worse oncological outcomes compared with the pre-pandemic period. These results reinforce the importance of a well-structured health center aligned with efficient hospital management and allowing health professionals to offer adequate treatment to the population even during the pandemic.

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019

Prevalence of hemorrhagic events in patients receiving extracorporeal membrane oxygenation

Category: Critical Care Nursing

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Introduction: The use of extracorporeal membrane oxygenation (ECMO) has increased significantly in recent decades. The management of ECMO involves various factors designed to prevent complications; however,

the occurrence of ECMO-related hemorrhagic events appears to persist nevertheless. Literature regarding the occurrence of hemorrhagic events in adult patients receiving ECMO is currently limited. **Objective:** We aimed to Identify the overall prevalence of hemorrhagic events in patients receiving ECMO. **Methods:** This was a retrospective study conducted in an intensive care unit (ICU), involving adult patients with ECMO between 2012 and 2018. The collected variables pertained to clinical and demographic characteristics, ECMO, and hemorrhagic events. A hemorrhagic event was defined as blood loss requiring blood transfusion, confirmed by a decrease in hemoglobin level of up to 2.0mg/dL. A descriptive analysis of the qualitative variables was performed using absolute and relative frequencies. For the quantitative variables, means and standard deviations or medians were used because of the variable distributions. Inferential analysis of the variables of interest for the qualitative data was performed using the χ^2 test. A $p<0.05$ was considered statistically significant for all analyses. **Results:** Overall, 122 patients were included, with none being excluded. Among these, 83 (68.0%) were male, the mean age was 50.5±15.3 years, and the primary comorbidity was systemic arterial hypertension (35.2%). The average ICU length of stay (LOS) for our patient cohort was 29.0±27.2 days, the average hospital LOS was 48.8±55.1 days, and ECMO support was provided for an average of 14.6±19.4 days. The overall mortality rate was 62.3%. Hemorrhagic events during ECMO support were observed in 36.9% of the patients, with ECMO cannula insertion sites being the most frequent site of bleeding (37.7%). The most frequent diagnosis justifying ICU admission was immediate postoperative complications (35.6% *versus* 15.6% for hemorrhagic *versus* non-hemorrhagic patients; p=0.011). The presence of fluid overload after ICU admission was higher in the group with hemorrhagic events (48.9% *versus* 28.6%, p=0.024). **Conclusion:** A 36.9% prevalence of hemorrhagic events was observed in patients recieving ECMO. Notably, the most common site of hemorrhage events was the site of ECMO cannula insertion, and postoperative period and fluid overload were both higher in patients who experienced hemorrhagic events.

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CAAE Number: 05805818.9.0000.0071.
Research funding: Not applicable.

020

Neuro-palliative care in a tertiary hospital in Brazil

Category: Palliative Care

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Introduction: Palliative care is care provided in a medical setup with an aim to improve the quality of life for patients facing a serious or potentially fatal illness. However, despite the known benefits, its practice is limited in neurology. **Objective:** This study aims to determine the frequency of neurological inpatients with a need of palliative care and evaluate their symptomatology (Edmonton Symptom Assessment Scale), demographic profile, need for supportive measures (like Oxygen, enteral or parenteral nutrition, Intensive Care Unit (ICU) admission), advanced directives for life, and medical history. **Methods:** This cross-sectional analytical study evaluated 198 patients with neurological conditions admitted to the Neurological Semi-Intensive Care Unit at *Hospital Israelita Albert Einstein* (HIAE) between February and August 2022. The Palliative Performance Scale (PPS) was used for this study to determine the hospice eligibility of a patient. It was found that weight loss greater than 5% associated with bodily changes, and a negative response to the question: "Would you be surprised if the patient died within one year?" were used to indicate the need for palliative care. The patients were divided into three groups: patients with indication for palliative care (Groupindication), patients without any indication for palliative care (Groupwithout-indication) and patients who received at least one session with a palliative care team (Grouppalliative). Demographic data from groups were analyzed using the χ^2 test for qualitative variables and the non-parametric Kruskal-Wallis test for quantitative variables. **Results:** Our study showed that the majority of patients admitted to the neurological semi-intensive care unit had an indication for palliative care. Of the 198 patients included in the study, 115 (58%) had an indication for palliative care (Groupindication). Of the total, only 6.9% received evaluation by the palliative care team (Grouppalliative); and 9.56% had advanced care directives in their medical records. Patients in

the Groupindication category had a higher prevalence of symptoms, such as fatigue, depression, shortness of breath, and lack of appetite, and required more supportive measures, such as oxygen therapy, enteral/parenteral nutrition, admissions to intensive care units (ICU) and hospital stays. **Conclusion:** Despite the high demand for palliative care in neurology, few patients receive treatment, resulting in decreased quality of care. In our study, patients in the Groupindication category had more symptoms and a greater need for supportive measures. Discussion on palliative care in neurology is thus necessary to improve the quality of care for patients with serious or potentially fatal neurological conditions.
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021

Stereotactic ablative radiotherapy in combination with nivolumab for early-stage operable non-small cell lung cancer: a phase II study

Category: Oncology

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Introduction: Surgical resection is the main treatment for patients diagnosed with stage I non-small cell lung cancer (NSCLC). However, in cases with major comorbidities related to tobacco exposure and advanced age, surgery cannot be safely performed. For such patients, the standard treatment is stereotactic ablative radiotherapy (SABR), in which high radiation doses are delivered to the tumor region while sparing the adjacent structures. SABR leads to adequate local tumor control but suffers from a high rate of regional and distant failure. SABR as a neoadjuvant therapy for stage I NSCLC results in a pathological complete response (pCR) rate of only 60% when surgery is performed after 10 weeks. In addition, despite complete resection, relapse occurs in up to 40% of patients. These findings indicate the need for improvements in the management of both operable and inoperable early-stage NSCLC. Treatment with immune checkpoint inhibitors reestablishes immune activity against tumor cells. The synergy between radiotherapy and immunotherapy might occur through the disruption of the tumor microenvironment in the irradiated lesion, destruction of tumor cells, consequent neoantigen release, and immune response against neoantigens. Therefore, these inhibitors are active not only in irradiated lesions but also in all micrometastatic cells expressing neoantigens. Recently, an I-SABR study showed that the addition of nivolumab to SABR to treat inoperable patients improved their event-free survival by 24%. We designed this phase II trial for patients who were surgical candidates and received neoadjuvant SABR plus nivolumab. **Objective:** This study aimed to assess the pathological complete response (pCR) rate after the addition of nivolumab to SABR. **Methods:** This was a phase II, single-arm, open-label study that evaluated neoadjuvant treatment in patients with NSCLC measuring up to 4cm, no clinical lymph node involvement, and adequate surgical prerequisites. The treatment consisted of nivolumab 360mg every 3 weeks until the completion of three doses or the appearance of unacceptable toxicity. SABR was initiated on D1 of nivolumab and continued for 1–2 weeks, depending on the lesion size and location. Standard-of-care surgery was performed at 10±2 weeks after the last radiotherapy dose. The primary endpoint of the study was the postoperative pCR rate. Tissue, blood, and stool samples were collected during the treatment. **Results:** We included 25 patients, most of whom were females (68%) and smokers (88%), who had a mean tumor size of 2.8cm. All but one patient received a full course of treatment and underwent surgery. The pCR rate of 80% was higher than that of historical controls treated with SABR alone. No neoadjuvant treatment-related grade 3–5 adverse events were observed. However, two patients died from surgical complications that were considered unrelated to the experimental treatment. A single patient who did not undergo surgery died during the study due to a relapse of acute alcoholic hepatitis. During follow-up, three additional patients died due to comorbidities, and none have relapsed to date. **Conclusion:** This trial demonstrated a pCR rate of 80% when SABR was used in combination with nivolumab. In future studies, biomarkers will be assessed to identify the mechanisms of resistance associated with the lack of pCR. Further studies are warranted to compare this strategy *versus* surgery in patients with operable stage I disease.

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Research funding: Bristol-Myers-Squibb.

022

Feasibility, accuracy, and usability analysis of MapAML, a first-in-class application for the integrated diagnosis of acute myeloid leukemia

Category: Hematology and Onco-Hematology

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Introduction: The comprehensive diagnosis of acute myeloid leukemia (AML) is complex and involves the integration of clinical information, bone marrow morphology, immunophenotyping, and cytogenetic and molecular analyses, which can be challenging to the general hematologist. **Objective:** The aim of this study was to evaluate the usability and accuracy of MapAML, a smartphone application for the integrated diagnosis of AML, created to aid the hematologist in the clinical practice. **Methods:** The accuracy of MapAML was evaluated in dedicated sessions, in which 21 hematologists or fellows in hematology performed integrated diagnosis of deidentified clinical AML cases, first without and afterwards with the aid of MapAML. After the input of clinical and laboratorial information, MapAML generates a report with the following criteria: a) WHO classification, b) European LeukemiaNet risk stratification, c) targeted therapies with potential clinical benefit, d) biomarkers for monitoring of residual disease, and e) evidence suggesting a germline predisposition syndrome. A comparative analysis was performed between the proportion of correct and incorrect answers obtained by the physicians before and after the use of the application based on the 5 report criteria. The usability of the application was analyzed by comparing the expectations and impressions of physicians before and after using the application, as well as by recording their perceptions regarding ease of use, satisfaction with the tools and features of the application, confidence in each diagnostic sublisting provided, and intentions of using the application in medical practice. **Results:** Diagnostic accuracy increased after MapAML utilization, with the average score rising from 7.08 without the application to 8.88 with application use (on a scale from 0 to 10), representing significant accuracy improvement (p=0.002). Usability evaluation was very favorable, with 81% of users considering the application very or extremely simple to use. A significant increase in confidence to perform a complete and accurate diagnosis of AML was observed after application use with 61.9% of physicians willing to use it in the clinical practice. **Conclusion:** We showed the improved accuracy in the integrated diagnosis of AML with the use of the smartphone application MapAML. The application also had good usability, with the participating physicians demonstrating willingness to adopt it in clinical practice. A potential benefit of using MapAML is the storing of structured clinical and laboratorial information from patients with AML, which could be used to create centralized artificial intelligence algorithms for the integrated diagnosis of AML, hence improving the diagnosis and management of patients with AML in the future.

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Research funding: Not applicable.

023

Experience of families at discharge from pediatric intensive care: focusing on satisfaction and lack of support

Category: Child Health Nursing

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Introduction: Hospitalization of children in pediatric intensive care units (ICUs) is a stressful event, especially for parents. Therefore, there is a great demand for clear and succinct information that must be offered to parents in such cases. Although discharge is perceived as a positive event, it can also cause anxiety, worry, and fear. For an effective planning regarding a smooth hospital discharge, the related education process must be continuous. Furthermore, the involvement of the nursing team is also fundamental in this regard, as it

is necessary to evaluate parents' learning skills and experience in such procedures, along with considering their involvement and participation, to ensure the continuity of care. The nurses' role in this aspect was to prepare the parents for discharge. **Objective:** This study aimed to understand parental perceptions of preparations for hospital discharge of children from the pediatric ICU. **Methods:** For this, a descriptive exploratory research using a qualitative approach was conducted in the Pediatric ICU of a private general hospital in São Paulo, Brazil from January to July, 2023. The hospital is accredited by the Joint Commission and Planetree. The study participants were 14 families of children discharged to a regular ward from the pediatric ICU. Of these, 10 were mothers and four, fathers. Most had higher education and were first admitted to the ICU. The mean length of the hospital stay in ICU was four days. Data were collected through participant observation and semi-structured interviews (average time: four minutes) after discharge. The data were analyzed using Thematic Content Analysis. **Results:** Two thematic categories were identified from the data retrieved: "Feeling satisfied and safe when preparing for discharge from the intensive care unit", which reveals, from the parents' perspective, that this process was done timely and correctly. They received sufficient and effective information on the transitions of units. For example, the difference between units, suspension of continuous monitoring, and routines in general can help families adapt. Furthermore, "Revealing dissatisfaction when detecting flaws in the intensive care unit discharge process" explains how the lack of information and support can generate more suffering and insecurity for families in this delicate moment. From the speeches of families, it was observed that even simple care, like bathing or feeding the child, could generate fear and insecurity after admission to ICUs. **Conclusion:** The study found that the parents noticed two conflicting situations. Some of them received important guidance, like suspending monitoring, reducing dependency on the nursing team, and changing routines. Nevertheless, other parents did not feel welcome and revealed a lack of information and failures in communication that culminated in dissatisfaction. The findings of this study provide information that can help improve the discharge process in institutions. The principles of child- and family centered care reinforce sharing of information and family participation in care as central pillars for improving the experiences of families of children facing illness and hospitalization. Proposing a discharge preparation protocol or checklist can help nurses during this journey. Study limitations: This survey was conducted in a single health institution. Thus, other studies must be replicated in different realities with the aim of expanding the diversity and generalizability.

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024

Idiopathic toe walking: What is new? An integrative review

Category: Locomotor

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Introduction: Idiopathic toe walking (ITW) refers to a gait pattern characterized by forefoot initial contact that persists beyond the age of three, without any orthopedic, neurological, or other justifiable causes. This pathology results in significant concerns for parents and multiple health consultations. **Objective:** This literature review aims to organize recent knowledge on this topic and highlight the updated evidence to guide further studies. **Methods:** From September 2022 to June 2023, the Ovid MEDLINE, EBSCO, Embase, CINAHL Plus, and PubMed databases were searched. The Population, Intervention, Comparison, and Outcomes (PICO) model was used to define keywords. Inclusion criteria were studies that included children with ITW, diagnostic criteria, risk factors, severity criteria, treatment options, and prognosis. Only studies published in index journals in English or Portuguese were included. **Results:** Although there was heterogeneity among studies regarding the methodology, there was a strong tendency to investigate the etiological factors, including genetic disorders and sensory problems, as well as prognostic factors, such as age and gender. A new classification based on anatomical characteristics, gait analysis, and electromyography was proposed to determine the disease severity, prognosis, and differential diagnosis. Treatment options included conservative and surgical alternatives. Among conservative alternatives, toe walking seemed to improve with orthosis and serial casts but not when it was associated with botulinum toxin. Furthermore, pyramidal insoles were used in a few

studies, but the positive effect may be seen as a natural history of the pathology. Although there is no evidence of gait improvement with isolated physical therapy and stretching, their use combined with other treatments is recommended. Regarding surgical procedures, better results have been obtained in severe cases with significant Achilles tendon shortening and older ages, especially with triceps surae zone III lengthening. Nevertheless, more methodologically rigorous studies are needed. **Conclusion:** Further studies with higher levels of evidence are needed to elucidate the exact etiology, classification, and treatment of ITW. However, ITW tends to resolve spontaneously in most children, and treatment is indicated in persistent cases. Serial casts and orthosis have shown promising results in less severe cases, in children aged between 5 and 12 years. For older children, with significant contractures, zone III surgical triceps surae lengthening is recommended because of higher effectiveness.

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Research funding: Not applicable.

025

Comparative evaluation of the accuracy of an institutional preoperative protocol for liver transplant surgery and the Lee and American College of Physicians indices

Category: Cardiology

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Introduction: The Lee and American College of Physicians (ACP) algorithms are commonly used for surgical risk assessment. However, they have been reported to be less accurate for patients undergoing liver transplantation. Therefore, a specific protocol for these patients was developed in our program, wherein every patient classified as high risk undergoes cardiac catheterization. However, with clinical experience, a high number of diagnostic catheterization indications has been observed without the need for surgical intervention. Therefore, a better assessment tool is necessary. **Objective:** The primary objective of this study was to evaluate the sensitivity, specificity, accuracy, and area under the receiver operating characteristic (ROC) curve (AUC) values of the institutional protocol in comparison with those of the ACP and Lee indices. The secondary objective was to analyze the impact of unnecessary diagnostic catheterizations indicated by the institutional protocol. **Methods:** This was a retrospective cohort study that included 187 patients on the waiting list for liver transplantation in São Paulo from 2015 to 2019. The most relevant analyzed variables were as follows: institutional protocol, Lee, and ACP indices; catheterization; intervention; and post-surgical cardiovascular events. The Shapiro-Wilk test was conducted to verify normality. Furthermore, computations were performed to determine accuracy, sensitivity, specificity, and the AUC values. **Results:** The accuracy, sensitivity, specificity, and AUC values for the institutional protocol were 0.461 (95% confidence interval [CI]: 0.36-0.56), 0.714 (95%CI=0.41-0.92), 0.422 (95%CI=0.32-0.53), and 0.603 (95%CI=0.44-0.701), respectively. The corresponding values for the Lee algorithm were 0.731 (95%CI=0.63-0.81), 0.428 (95%CI=0.18-0.71), 0.777 (95%CI=0.68-0.86), and 0.603 (95%CI=0.46-0.74). The sensitivity, specificity, and accuracy of the ACP algorithm were 0, 1, and 0.865, respectively, with no patients considered to be moderate/high risk. Additionally, 57 catheterizations were performed, of which only three resulted in interventions. **Conclusion:** The institutional protocol exhibited high sensitivity and low specificity, which resulted in a considerable number of catheterizations that were not beneficial to the patients, led to high costs, and were not devoid of risks. The Lee protocol demonstrated the best balance between sensitivity and specificity, although it was not the most suitable for the study population. This study indicates that further studies are needed to develop a more accurate protocol, despite the need for change having being already identified.

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026

The impact of the Magnet designation on the first Hospital in Latin America: Nurses' Perception

Category: Administration

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Introduction: The Magnet Recognition Program was created by the American Nurses Credentialing Center with the aim of certifying excellence in nursing practice in the United States. After 11 years of its Magnet journey, the first Brazilian hospital obtained this important designation for the national nursing scene. **Objective:** To identify the relationship between the Magnet designation and the work process of nurses at the first Magnet institution in Latin America and the impact of the designation on the present and future nursing care in the institution. **Methods:** A qualitative descriptive-exploratory study was carried out with nurses involved in the dissemination of the Magnet culture in the institution. Data were collected through a semi-structured interview and analyzed using Thematic Content Analysis. The interviews were transcribed using the Transkriptor software, and data were analyzed using MAXQDA. Eight nurses participated in the study. **Results:** Eight dimensions emerged, which were grouped into three main categories: 1. expressing the nurses' feelings after being assigned, 2. reflecting on the challenges after designation, and 3. understanding the relevance of working at a Magnet Hospital in Brazil. **Conclusion:** The Magnet journey seems to have had a positive influence on the participating nurses. The active role of the professionals in the decision-making process and in the organization of the workplace and their participation in shared governance was highlighted. The nurses reflected on their professional relationships and on how they think about nursing practice in the institution and its representativeness on the national scene.

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027

Indoleamine 2,3-dioxygenase-1 (IDO1) and AHR receptor play a role in renal fibrogenesis in patients with COVID-19

Category: Nephrology and Solid Organ Transplants

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Introduction: COVID-19 is caused by the Sars-CoV-2 virus, with acute inflammation being one of its main characteristics. Some patients develop a chronic form of the disease in which various organs, including the kidneys, are compromised and progress to fibrosis and loss of function. In the acute phase, there is an intense release of interferon-gamma (IFN-gamma), which induces the immunomodulatory enzyme indoleamine 2,3-dioxygenase-1 (IDO1). IDO1, through its catabolites, induces interleukin-6 (IL6), which maintains positive feedback with IDO1 in specific tissues. Increased IDO1 activity activates the aryl hydrocarbon receptor (AHR), a receptor that exacerbates fibrogenic mechanisms. Thus, COVID-19 possibly contributes to the establishment of fibrogenisis in the kidneys through this mechanism, triggered by the injuries caused by Sars-CoV-2 in renal cells. **Objective:** This study aimed to verify if the expression of IDO1, IFN-gamma, and IL6 is upregulated in renal tissues of patients with COVID-19 and if there is an association with the expression and activation of AHR and genes linked to renal fibrogenesis. **Methods:** Analyses were conducted using RNA sequencing databases provided by the public platform GEO DataSets (National Center of Biotechnology Information, NCBI). The search terms "Covid 19 AND geo2r" were used. Additionally, studies that included only humans and provided renal tissue samples from healthy individuals and patients with COVID-19 or acute kidney injury were filtered. The analyzed genes were IDO1, IFN-gamma, IL-6, AHR, CYP1B1 (an indicator of AHR activation), and genes related to renal fibrogenesis, such as transforming growth factor beta-1 (TGF-beta-1), collagen type I, matrix metalloproteinases 2 and 9, and plasminogen activator inhibitor-1 (PAI-1). Expression data were collected using the Geo2R tool on the NCBI platform, which was also used for intergroup analysis. SPSS version 23 was used for correlation and linear regression

analyses. **Results:** Using the search and selection criteria described above, 98 studies were identified. However, only one study was conducted using renal tissue specimens (series GSE202182). This was a next-generation RNA sequencing study (Illumina NovaSeq 6000), including data from 10 healthy individuals (Control Group) and 13 COVID-19 patients with acute kidney injury (COVID Group). The expression of IDO1 (arbitrary unit (AU) 0.59±0.11 *versus* 0.23±0.07) and IFN-gamma (AU 1.76±1.07 *versus* 0.05±0.03) was significantly higher in the COVID Group compared to the Control Group ($p<0.05$). Additionally, the expression levels of IL-6, AHR, and CYP1B1 were also higher in the COVID Group ($p<0.05$). The expression of IDO1 was significantly associated with IL-6, AHR, and CYP1B1 expression ($p<0.05$). The expression of all genes involved in renal fibrogenesis was upregulated in the COVID Group, which positively correlated with the expression of IDO1, AHR, IL6, and CYP1B1. **Conclusion:** Renal expression of IDO1 is increased in the acute phase of COVID-19 with renal injury, possibly due to increased IFN-gamma and IL6. The expression of these molecules is positively associated with AHR expression and activation, which may contribute to renal fibrogenesis. Experimental studies, including molecular interventions, are necessary to better understand this pathophysiological axis.

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Research funding: Not applicable.

028

Comparison of clinical factors between patients with COVID-19 and those with sepsis

Category: Nephrology and Solid Organ Transplants

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Introduction: Sepsis frequently results in admission to the intensive care unit (ICU). It is associated with multiple organ dysfunction syndrome (MODS) that may progress with concomitant acute kidney injury (AKI). COVID-19 is a highly transmissible infectious disease, mainly affecting the respiratory tract. In addition, several cases of COVID-19 require admission to the ICU due to the severity of this condition, which may result in MODS involving AKI. **Objective:** We conducted a comparative analysis regarding the clinical factors correlated with AKI and the need for kidney replacement therapy (KRT) between two cohorts of critically ill patients: those with COVID-19 and those with sepsis. **Methods:** In this cross-sectional retrospective study, we analyzed the medical records of patients in ICUs of a large private hospital in the city of São Paulo. The inclusion criteria were: patients aged >18 years, and those diagnosed with either sepsis or COVID-19 and admitted to the ICU. The exclusion criteria were patients admitted to the ICU for neoplasms, cirrhosis, heart failure, and external bleeding, and those who died within 3 days of admission. In addition, patients in the COVID-19 cohort who were on antibiotics during ICU admission were excluded. The final analysis included 200 patients, of which 145 were diagnosed with sepsis and 55 with COVID-19. The main foci of sepsis were the digestive, pulmonary-respiratory, and urinary tracts; as well as septicemia. From the ICU admission, we retrospectively collected demographic and clinical data. The demographic data included the variables of sex and age. Clinical factors included comorbidities; arterial blood gases; and laboratory tests, such as the complete blood count and involving renal and hepatic function. Furthermore, we evaluated the outcomes within 90 days of ICU admission, including the development of AKI; the need for blood transfusion, KRT, and mechanical ventilation; vasoactive drug use; and mortality rate. We subsequently compared two groups. **Results:** We observed a higher frequency of male sex (72.7% *versus* 45.5%; $p=0.001$) and diabetes (47.3% *versus* 29.6%; $p=0.02$) in the COVID-19 Group than in the sepsis group. A higher frequency of the need for kidney replacement therapy (21.8% *versus* 8.3%; $p=0.008$), mechanical ventilation (70.9% *versus* 22.1%; $p=0.02$), and blood transfusion (43.6% *versus* 26.5%; $p=0.03$) and mortality (25.4% *versus* 6.2%; $p<0.001$) were observed in the COVID-19 Group than in the sepsis group. There were higher arterial levels of lactate (23.5±2.6 *versus* 13.8±0.9mg/dL; $p=0.02$) and serum total bilirubin (1.1±0.7 *versus* 0.4±0.1mg/dL; $p=0.002$), but lower arterial bicarbonate (21.8±0.5 *versus* 24.1±0.7mEq/L; $p=0.01$) in the sepsis group compared to the COVID-19 Group. **Conclusion:** A comparative analysis between two cohorts of critically ill patients revealed a higher mortality rate; and greater need for ventilatory support, blood transfusion, and KRT in patients with COVID-19 than those of patients with sepsis. Moreover, lower tissue perfusion was observed in patients with sepsis, as

evidenced by the lower arterial bicarbonate and higher arterial lactate levels.
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029

The impact of extended criteria for donor organs on clinical outcomes following liver transplantation

Category: Surgery

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Introduction: The use of organs from extended criteria donors (ECD), despite being associated with higher postoperative mortality, is necessary to meet transplantation demand. **Objective:** We aimed to evaluate the impact of using ECD organs on patient and graft survival following liver transplantation; to assess the survival of liver grafts and patients undergoing liver transplantation at 3, 12, 36, and 60 months post-transplantation; to identify donor characteristics associated with post-procedure mortality and retransplantation occurrence; and to evaluate the significance of the Donor-Model for End-Stage Liver Disease (D-MELD), Donor Risk Index (DRI), and Balance of Risk (BAR) severity scores as predictors of liver transplantation outcomes. **Methods:** This was a retrospective observational study of liver transplants performed between 2016 and 2020 at the *Hospital Israelita Albert Einstein*. Clinical and demographic variables, the presence of marginality criteria from the Eurotransplant Manual, and severity scores (D-MELD, DRI, and BAR) were correlated with mortality and retransplantation outcomes. **Results:** Among the 414 participants, hepatitis C virus was the most frequent pathological etiology necessitating transplantation (29%), with a median MELD score of 18 (interquartile range: 13–25). Of the donors, 62% (n=258) were ECD (≥ 1 marginality criterion), with 23% (n=97) having 2 ECD criteria and 9% (n=36) having ≥3. The 1-year and 5-year patient survival rates following the procedure were 89.5% and 82.5%, respectively, with no statistically significant difference between the ECD and standard donor groups (log-rank test, p=0.074). Among the tested scores, BAR was the only one that had an impact on both patient and graft survival (log-rank test, p<0.001). A Cox regression model identified that a one-point increase in the score increased the risk of death by 7.3% (hazard ratio [HR=1.073; 95% confidence interval [CI]=1.016–1.133; p=0.012) and the risk of graft loss by 17.4% (HR=1.174; 95%CI=1.073–1.284; p<0.001). The rate of primary non-function was 3%, and the rate of graft loss was 6%. **Conclusion:** The results of this study support the use of ECD organs. The BAR score was effective in predicting unfavorable outcomes and should be routinely considered in clinical practice.
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Research funding: *Fundação de Amparo à Pesquisa do Estado de São Paulo* (FAPESP).

030

School-age children's satisfaction with healthcare professionals' care during hospitalization

Category: Child Health Nursing

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Introduction: From the early 20th century, proposals have been made to recognize the rights of children and adolescents. In Brazil, the 1990 Law 8.069 enacted the Statute of the Child and Adolescent (ECA), which guarantees their right to freedom, including the expression of opinion in its Article 16. This study explores school-age children's perceptions of healthcare professionals' care. **Objective:** To understand the perceptions of school-age children regarding satisfaction with healthcare professionals' care during hospitalization. **Methods:** This descriptive-exploratory study employed a qualitative approach. The sample comprised children aged 6–11 years from the pediatric inpatient unit of a private hospital in São Paulo. The children's legal guardians provided informed consent. Semi-structured interviews were conducted with the children using illustrative play materials. The obtained

data were analyzed using the inductive thematic analysis method by Braun and Clark. **Results:** Six themes were extracted: "Receiving information from the team during hospitalization," "Expressing dissatisfaction with certain situations during hospitalization," "Identifying moments that provide pleasure and satisfaction," "Identifying situations that caused pain and discomfort," and "Proposing suggestions to improve children's care in the hospital." **Conclusion:** Despite children's positive perceptions of healthcare professionals' care, there are some areas that could be improved. Using clear, honest, and developmentally appropriate language allows children to freely express their feelings and opinions, providing valuable insights to professionals and facilitating children's engagement in their care.

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031

Evaluating psychometric properties of tests in a course of Scientific Method for medical students

Category: Health Education

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Introduction: Due to an increasing number of medical courses offered in Brazil and the rise of new teaching methodologies, there is a pressing need to discuss effective methods for student evaluation. Difficulties faced by teachers in preparing questions, such as high creative demand, add to the students' eagerness to identify question patterns from previous examinations, which can compromise the fundamental aim and meaning of conducting an evaluation: verifying students' proficiency level. Additionally, the development and application of statistical approaches have witnessed a recent increase, with tools such as the Item Response Theory (IRT) gaining prominence. Instead of simple sum of points adopted by Classical Test Theory (CTT), the IRT has emerged as an alternative method that measures examinees' proficiency using a statistical model that considers three parameters: item difficulty, item discrimination, and guessing probability. Applying and comparing both theories would allow for improvement of a given examination, and the creation of question datasets, leading to potential benefits for teachers and their students. **Objective:** This study aimed to improve the tests administered to medical undergraduates. It analyzed the quality of a set of test questions in a Scientific Methodology course. By applying CTT and IRT, this study aimed to evaluate the following hypotheses from two consecutive semesters. First, a presence of consistency in exam patterns from one semester to the other; once similarity in exam patterns is observed, it is reflected in parameters such as student discrimination and the percentage of correct responses. Second, the use of IRT, compared to CTT, enables a better assessment of each student's proficiency from both semesters in the exams of the analyzed discipline. **Methods:** Two exams with 20 questions each from the course "Medical Knowledge I" administered in 2019 to the classes 2019-1 and 2019-2 of the undergraduate Medicine program at *Faculdade Israelita de Ciências da Saúde Albert Einstein* (FICSAE) were analyzed. For each question, the difficulty index, discrimination index, biserial correlations, and Cronbach's coefficient were computed to evaluate the consistency of the examinations under CTT. Rasch logistic models with three parameters were used to assess the quality of the questions according to IRT. This study used R and RStudio software to conduct the statistical analyses. **Results:** The two tests applied to 2019-1 and 2019-2 included 50 and 60 respondents, respectively. Patterns such as "all the above are correct" answers were observed in which those alternatives were always correct, indicating potential student biases. The preliminary analysis showed that the consistency of both examinations was low: Cronbach's alpha was 0.5417 and 0.3757 for 2019-1 and 2019-2, respectively. Seven of the 40 questions were answered correctly by all students: three from class 2019-1 and four from class 2019-2, which indicated a similarity between the students of the two groups. Furthermore, a high percentage of correct answers (>80%) and poor discrimination (<0.2) was observed for 13 questions. Once generated, the Item Probability Function graphs revealed contradictory performances for the nine questions when the IRT with three parameters model was applied, implying that students with higher total scores had a lower probability of answering correctly. The results reinforce the importance of statistical approaches as useful tools for teachers, to optimize question elaboration as well as to evaluate exam performance with more detailed information, creating large datasets of good-quality questions.

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032

RELN and *CACNA1H* rare variants lead to impaired neurogenesis in oligogenic autism spectrum disorder

Category: Cellular and Molecular Biology

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Introduction: Several studies showed that patients with oligogenic inheritance of autism spectrum disorder (ASD) can carry gene-disruptive variants in more than one gene, which confers a higher risk of the disease than the individual risk. However, there is still a lack of data on how risk variants are related to neurobiological pathways. One case that provides great insight into the molecular pathways of oligogenic ASD is the Brazilian patient F2688, who carries two rare compound heterozygous missense variants in the *RELN* gene, which encodes the reelin glycoprotein responsible for neuronal migration and synaptic plasticity, as well as one de novo splicing site variant of the *CACNA1H* gene, which encodes the T-type calcium channel Cav3.2 that controls neuronal excitability. Previous studies using induced pluripotent stem cell (iPSC)-derived neural progenitor cells from this patient have shown that the variants in *RELN* and *CACNA1H* are deleterious, with crosstalk occurring via the mTORC1 signaling pathway. However, many questions regarding the pathomechanisms of these co-occurring variants remain unanswered. **Objective:** This study aimed to verify whether neurogenesis is impaired in patient F2688 and to analyze whether rapamycin, an inhibitor of the mTORC1 pathway, can rescue the altered cellular phenotypes. **Methods:** Monolayer cultures of iPSCs obtained by reprogramming stem cells from human exfoliated deciduous teeth (SHED) of patient F2688 and healthy control individuals (n=3) were subjected to neuronal differentiation using a previously established protocol Griesi-Oliveira et al. (Mol Psychiatry. 2021;26:1589-605). We used western blotting and immunocytochemistry to characterize the expression of the mTORC1 pathway component pPRS6, as well as markers for cell proliferation (Ki67), neural progenitor cells (Nestin, SOX2), intermediate progenitors (TBR2), and neurons (Synapsin, MAP2). **Results:** Preliminary immunofluorescence and western blotting showed that F2688-derived iPSCs expressed significantly higher levels of Ki67, a proliferation marker, and pPRS6, a downstream effector of the mTORC1 pathway, suggesting that hyperactivation of this pathway occurs even before neuronal differentiation. Neuronal differentiation of patient-derived iPSCs showed significantly higher expression of Ki67, Nestin, and SOX2, which are markers of neural progenitor cells and control-derived in patient-derived neuronal samples. These results suggest a high number of proliferating neural progenitor cells in patient-derived samples. Furthermore, the expression of the intermediate progenitor marker TRB2 and the neuron markers Synapsin and MAP2 is significantly lower in patient-derived cells than in control-derived cells, suggesting impaired neuronal differentiation of iPSCs. The next step will be to investigate whether treatment of iPSCs with rapamycin during neuronal differentiation can reverse these abnormalities. **Conclusion:** The higher expression levels of ki67 and pPRS6 observed in iPSCs derived from patient F2688 strongly indicate that hyperactivation of the mTORC1 pathway impairs neuronal differentiation in these cells, which could open avenues for the development of novel therapies.

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033

Specialized outpatient care for maternal and child health in 16 health regions in Brazil

Category: Public Health Nursing

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Introduction: In Brazil, owing to its unique setup, the healthcare system must respond to the epidemiological situation of the triple burden of diseases, with a predominance of chronic conditions, infectious diseases, and external causes. However, traditional systems that are fragmented into silos, predominantly address acute conditions and exacerbations of chronic conditions in a reactive and episodic manner. To overcome the fragmentation of care and respond to the country's epidemiological situation, in 2010, Brazil published a guideline for the organization of healthcare networks (HCN) within the country's public health system (Unified Health System (UHS)). Considering the high rates of maternal and child mortality in Brazil and worldwide, the Stork Network stands out as one of the thematic networks prioritized by the UHS, which aims to organize a model of care for childbirth, birth, and maternal and child healthcare to reduce preventable death cases of children and pregnant women. Given this scenario, the methodology of Health Care Planning (HCP) proposed by the National Council of Health Secretaries (NCHS) represents a step in deepening the organization of the HCN as an instrument of management and organization of PHC and Specialized Outpatient Care (SEA). For implementing HCP on a large scale to organize SEA in a network with PHC, the *Sociedade Beneficente Israelita Brasileira Albert Einstein* (SBIBAE) has been running the PlanificaSUS project in 2018 via the UHS Institutional Development Support Program of the UHS (IDSP-UHS). **Objective:** This study aimed to describe the organization of specialized outpatient clinics according to the Outpatient Secondary Care Point (OSCP) model using the HCP methodology. **Methods:** This descriptive cross-sectional study used secondary data from the PlanificaSUS project. Sixteen SEA units in the maternal and childcare lines participated in the study, covering five Brazilian geographic regions. A structured questionnaire was used to self-assess the implementation of 12 parameters related to care, education, and supervision functions (provided in the OSCP model) at two time points: in 2019, at the beginning of the operationalization of HCP in the units, and in the second half of 2020. **Results:** In the first self-assessment, 62.5% of SEA units were noted to not have any completed parameters. Among the six units that reported having complete parameters, two were located in the southern region, two in the Midwest, and two in the southeast. Up to 18% of the units reported completion of at least one parameter of the care function, whereas no parameters of the educational and supervision functions were completed. In the second self-assessment 93.7% of the SEA units reported having at least one parameter "completed," identifying progress in the three functions that were evaluated. The parameter with the highest percentage increase was the multidisciplinary team, followed by the use of the same criteria for risk stratification by the Primary Care and SEA teams, both of which are related to the care function. **Conclusion:** The HCP methodology fostered reflections on the reorganization of the work process and induced changes in maternal and child healthcare practices in the EAC, in an integrated manner with PHC, from the perspective of HCN. It is believed that such advances will enhance access to equitable care for high-risk pregnant women and children in different geographic regions of Brazil.
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034

In silico evaluation of the impact of a non-linear microvascular network on the effectiveness of thermal processes

Category: Oncology

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Introduction: Glioblastoma is the most common tumor of the central nervous system and has a poor prognosis; therefore, new treatment regimens are being investigated. Several factors are involved in angiogenesis that result in complex and random vascularization, which determine tumor behavior. Angiogenesis promotes the proliferation and recruitment of endothelial cells via a complex interaction between these and tumor cells. Therefore, alterations in the mRNA of endothelial cells affect the progression of glioblastomas. Because of its importance in tumor behavior, research has focused on the development of treatments that target the tumor vasculature, and success has already been achieved

with angiogenesis-related chemotherapy. Moreover, tumor microvasculature may be involved in other types of therapy, including hyperthermia. One type of hyperthermia treatment is magnetohyperthermia (MHT), which is based on magnetic nanoparticles (NPs). When these NPs are subjected to an alternating magnetic field, heat is generated upon transformation of magnetic energy to thermal energy, increasing local temperature. The MHT technique for glioblastomas has been highlighted because it results in higher patient survival rates than that seen with other treatments without causing collateral effects. This treatment approach can be studied using glioblastoma-on-a-chip modules, wherein a microfluidic structure is designed to simulate the growth site of the tumor in a microfluidic system. This model is superior to other *in vitro* techniques because it generates a 3D cell culture with microfluidics that mimics blood flow, leading to tumor growth in a more realistic fashion. Therefore, the effects of MHT can be accurately determined using glioblastoma-on-a-chip models. However, simulations of this model are required to predict *in vitro* behavior to design better systems. **Objective:** This study aimed to perform an *in silico* comparison between the effectiveness of a hyperthermic process on linear and non-linear microvascular networks. **Methods:** The Inventor Autodesk program was used to design microfluidic structures. The design of the non-linear microvascular network was based on *in vitro* capillary structures with a designated location for tumor growth and channels that transport the culture medium to the tumor. *In silico* evaluation was performed using the COMSOL Multiphysics version 5.6. software, using which a microfluidic environment was created. A single flow simulation with a velocity of 10μL/minute and wall share stress was used. Furthermore, in the case of single-phase flows under laminar conditions, the Navier–Stokes equations were employed, and Fick's and conservation laws were considered when studying the transport of diluted species. We included a temperature factor to understand heat dissipation in the two microfluidic devices. **Results:** The results showed that heat dissipation was slower in glioblastoma-on-a-chip designs with non-linear microvascular systems than in those with linear systems and was possibly even greater in sites with channel confluence. **Conclusion:** Heat dissipation differed between linear and microvascular microfluidic systems because of the increased difficulty of heat dissipation in microvascular systems. Therefore, there is an urgent need to develop microvascular-type microchips that can more reliably simulate the vascular conformation of tumors and thus increase the predictability of tumor treatment outcomes *in vivo*.

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035

Is there a correlation between hepatic cirrhosis etiologies and the risk of cardiovascular events in patients undergoing liver transplantation?

Category: Cardiology

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Introduction: The high risk of cardiovascular events in patients with liver cirrhosis often poses a significant challenge to medical interventions. Identifying the factors that can be used to predict surgical outcomes in patients who are selected for liver transplantation may prove advantageous for therapeutic decision-making. The etiology of cirrhosis may represent one such predictor. **Objective:** In this study, we aimed to assess and describe the potential association between different etiologies of hepatic cirrhosis and risks of cardiovascular events. We also sought to delineate the predominant hepatic cirrhosis etiologies in our study population and elucidate their corresponding primary postoperative cardiovascular outcomes following liver transplantation. **Methods:** This was a retrospective cohort study analyzing the medical records of 360 patients who underwent cardiovascular assessment for potential liver transplantation between 2015 and 2019 at a municipal hospital located in São Paulo, Brazil. Patients aged 18 years or older and with indications for liver transplantation were selected, regardless of whether transplantation was performed or not. All patients underwent an evaluation and stratification for perioperative cardiovascular risk, according to the institution's standard protocol for liver transplantation. This classification involved non-invasive procedures (myocardial scintigraphy or dobutamine echocardiogram), as well as an invasive

diagnostic procedure (coronary angiography). The variables of interest included: comorbidities; etiological diagnosis of cirrhosis; risk stratification; execution of catheterization and presence of coronary artery disease (CAD); completion of liver transplantation; and the occurrence of postoperative cardiovascular events. Comparisons of quantitative and qualitative variables were conducted using the Mann-Whitney U test. Associations among qualitative variables were analyzed using χ^2 or Fisher's exact tests. **Results:** Cirrhosis caused by hepatitis (B or C) had the highest prevalence (22.5%), followed by alcoholic cirrhosis (20.28%). Among the patients who underwent transplantation, 15 (13.8%) had post-transplant cardiovascular events, with six of these (40%) being acute coronary syndrome, which represented the most prevalent event. Tests assessing the associations between disease etiologies and the occurrence of cardiovascular events did not show statistical significance. The association tests between the qualitative variables "cirrhosis etiology" and the variable "post-transplant cardiovascular events" also did not show statistical significance. Among the patients undergoing coronary angiography, an association was found between alcoholic cirrhosis and the presence of coronary artery disease (p=0.027), but there was no statistical significance when considering the presence of alcoholism in association with other etiologies. **Conclusion:** There was no correlation between the cirrhosis etiologies and the occurrence of postoperative cardiovascular events. Alcoholic cirrhosis is associated with CAD, which may be a predictor for catheterization requests during preoperative evaluations. Further studies are warranted to fully assess this potential correlation.

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036

Nurse's role in HIV prevention in the primary health care setting

Category: Public Health Nursing

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Introduction: The acquired immunodeficiency syndrome (AIDS) is a public health care issue due to the large number of hospitalizations, treatment-related expenses, and the social impact of the disease on individuals' lives. The human immunodeficiency virus (HIV) can be transmitted in several ways, such as unprotected sexual intercourse; blood contact; and vertical transmission during pregnancy, childbirth, and breastfeeding. In this context, primary health care stands out as a promoter of care at all levels of healthcare and should function as the user's gateway to the system. The role of professional nursing is particularly emphasized as a nurse is the main actor implementing actions related to this disease, providing care that meets the health needs of the patients. **Objective:** Understanding the nursing interventions in HIV prevention in primary health care. **Methods:** This is a qualitative field study research. Data were collected using semi-structured interviews with nursing professionals who are students of the Postgraduate Program in Primary Health Care and have been working in Primary Care for more than six months. Interviews were recorded using an electronic device. Interview responses were transcribed for data analysis, which was conducted following Bardin's Content Analysis. **Results:** From the interview analysis, it was possible to distinguish three categories: HIV knowledge, targeted population and strategies employed, and challenges in HIV prevention. The interviewees reported that the conducted trainings focused only on rapid testing, highlighting a gap given the need to involve prevention, counseling, referral to specialized care, and treatment, thus promoting a holistic approach to care. In addition, analysis revealed that it is essential for professionals to identify situations of vulnerability and evaluate the patient in their totality and overall health, being able to provide methods that best match their lifestyle. Likewise, all participants mentioned the lack of condom adherence as a difficulty in HIV prevention as well as low uptake of adolescents in the health system, showing that these actions are a challenge in primary health care. **Conclusion:** In this study, nurses reported how challenging it is to promote HIV prevention. This reveals a gap in this care and a need to enhance nurses' knowledge of HIV strategies.

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037

Quality of life in patients undergoing chemotherapy: peripherally inserted central venous catheter *versus* totally implantable central venous access

Category: Hematology and Onco-Hematology

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Introduction: Chemotherapy often requires vesicant medications that cannot be infused through peripheral veins. Two types of venous catheters are commonly used for such cases: peripherally inserted central catheters (PICCs) and totally implantable tunneled central catheters (PORT). PICCs are placed under local anesthesia in an outpatient setting. They comprise an exposed catheter that requires constant local care and specific bandages, which may limit patients' abilities to participate in normal social, work, and recreational activities. However, PICCs do not require a puncture for every usage. PORTs, on the other hand, are surgically implanted under local, regional, sedative, or general anesthesia, thus requiring significantly more extensive facilities and resources. These are fully implanted and do not require any bandage after the surgical incision heals. However, they do require a new puncture each time they are used. The complications, costs, and psychosocial impacts of both types of catheters on patients' lives have been addressed in previous studies; however, the literature on the subject still lacks studies evaluating the perceptions of patients who have had both types of catheters in terms of each one's impact on daily routine and quality of life. **Objective:** We aimed to prospectively analyze the impact of PICCs and PORTs on quality of life in patients with cancer undergoing chemotherapy, using a standardized questionnaire. **Methods:** A prospective observational study was conducted on 100 patients with cancer who were referred for catheter implantation for chemotherapy at the ambulatory vascular surgery division of *Hospital Municipal da Vila Santa Catarina Dr. Gilson de Cássia Marques de Carvalho*. We analyzed partial results from 52 of these patients. All patients were initiated on chemotherapy via a PICC, then had a PORT implanted through which they continued treatment. A quality-of-life questionnaire was administered to each patient at two time points: a minimum of 30 days following PICC installation, and a minimum of 30 days following PORT implantation. This survey evaluated the biopsychosocial impacts of using each type of device. Demographic data (age, sex, origin, weight, and height), clinical data (oncological diagnosis), and catheter data (time of use, laterality, complications) were collected. For our comparative analysis, quantitative variables were analyzed using the Wilcoxon test, and qualitative variables were analyzed using the χ^2 test. **Results:** The analyzed population was predominantly male (67.3%), with a mean age of 59.8 years. The main oncological diagnoses were colon/rectal adenocarcinoma (43.2%) and gastric adenocarcinoma (17.3%). Of the total cohort, 63.5% of the patients had metastases. In terms of the catheters, 86.5% of the PICCs and 98% of the PORTs were implanted on the right side, and the median durations of use for the PICCs and PORTs were 113 and 120 days, respectively. Over the study period period, six cases of infection and four cases of thrombosis were reported in patients with PICCs. However, no intra- or postoperative complications were reported for the PORTs. Analysis of the questionnaire revealed that the PORT performed better in all categories and had the lowest negative impact on patients' lives ($p<0.001$). Although the scores for the two methods were quite close for the "impact on eating" question, 11.5% of the patients still believed the PICC had at least some impact on the activity, while all the patients reported absolutely no discomfort when using the PORT system ($p<0.024$). Both catheters performed the worst on the "fear of infection and damage" question, but the PORT system still had a more favorable evaluation ($p<0.001$). **Conclusion:** Our partial results indicated that patients reported less discomfort in their daily lives when using PORT catheters, which in turn translated into lower impact on quality of life.

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038

Incidence of low anterior resection syndrome after oncological rectal surgery

Category: Surgery

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Introduction: Colorectal cancer is the third most prevalent type of cancer in Brazil and worldwide. The *Instituto Nacional de Câncer* (Inca) estimates the occurrence of 44,000 new cases of the disease annually between 2023 and 2025. With advancements in surgical techniques and neoadjuvant therapies, it has become possible to increase the chances of preserving the sphincter and reduce the indications for permanent colostomies. In contrast, the standard treatment of surgical resection with total excision of the mesorectum can cause a series of functional changes in the bowel, known as low anterior resection syndrome (LARS), in addition to greatly affecting the quality of life of patients. **Objective:** To evaluate the incidence of LARS and its associated risk factors in patients treated for colon and rectal cancer at a single oncology center. **Methods:** This prospective cohort study evaluated patients who underwent low anterior resections. The inclusion criteria were as follows: medium or low rectal cancer, surgical treatment with curative intent, and total mesorectal excision. The exclusion criteria were metastatic disease, non-reconstruction of intestinal transit after treatment, and inability to understand and respond to questionnaires. The LARS score was applied approximately 2 months after the stoma was closed, from October 2022 to April 2023. Clinical and operative data were collected from the charts or databases prospectively obtained from the service. Data were compiled using the REDCap platform. Informed consent was obtained from all participants. Jamovi software was used for statistical analyses. The χ^2 test was used to evaluate categorical variables, while the Fisher, Welch, and Kruskal-Wallis tests were used for continuous variables. Post-hoc tests were used for multiple comparisons to investigate differences between groups. Statistical significance was set at $p<0.05$. **Results:** Of the 29 patients included in the study, 15 (51.7%) were female, with a mean age of 60.1 years. Sixteen (55.2%) patients underwent neoadjuvant radiotherapy. The average anastomotic distance from the dentate line was 4.24cm, with a minimum of 1.5cm and a maximum of 8.5cm. The median time since ileostomy closure was 73 days, with a minimum of 24 days and a maximum of 283 days. More than half the patients (55.2%) had major LARS, 20.7% had mild LARS, and 24.1% had no LARS. In comparative analyses, neoadjuvant radiotherapy showed a statistical difference ($p=0.025$) between the groups; in the major LARS category, 12 patients (75%) underwent radiotherapy before surgery. In addition, the distance of the anastomosis from the dentate line revealed a statistically significant difference between the major LARS group, with a mean distance of 3.63cm, and the minor LARS group, with a mean distance of 5.58cm. **Conclusion:** The prevalence of anterior resection syndrome in patients treated for rectal cancer in this series was consistent with that reported in the literature, with 55.2% presenting with major LARS and 24.1% with minor LARS. In addition, the anastomotic distance and radiotherapy appeared to be associated with a greater frequency and intensity of symptoms. Although previous studies have identified the time since ileostomy closure as a risk factor, in our results, the variable was not statistically significant.

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039

Impact of newborn screening and genetic testing on the progression of cystic fibrosis in Brazil: a 12-year follow-up study

Category: Pneumology

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Introduction: Cystic fibrosis (CF) is a disease caused by a mutation in the *CFTR* (cystic fibrosis transmembrane conductance regulator) gene, which can compromise lung, pancreatic, liver, and intestinal functions. Newborn screening for CF involves various tests, such

as genetic analysis, sweat testing, and immunoreactive trypsinogen or immunoreactive trypsin assays. Despite improvements in CF care in Brazil, there is a lack of early diagnosis, and the consequences of this failure on disease progression remain poorly explored. In recent years, the Brazilian Cystic Fibrosis Group (GBEFC) has diligently registered and updated the Brazilian Cystic Fibrosis Registry (REBRAFC), which contains epidemiological data of patients diagnosed with CF treated in Brazil. The registry is updated annually, but only descriptive analyses have been performed. The aim of this project was to conduct a more detailed analysis of patients registered in the REBRAFC, focusing on the relationship between newborn screening and clinical outcomes. **Objective:** This study is part of the research project "Brazilian Cystic Fibrosis Registry - New Era," which aims to evaluate the long-term prognosis of patients with CF in Brazil. The aim of this study is to assess the impact of newborn screening and genetic testing on the prognosis of patients with CF. **Methods:** In this study, we analyzed the epidemiological data of patients with CF who were treated between 2010 and 2021. The patients were divided into two groups based on their diagnosis type: newborn screening and clinical aspects. These groups were compared in terms of demographic characteristics, clinical features, genetic data, and microbiological information. Data were compared using the χ^2 test for categorical variables and ANOVA with log-transformed data for numerical variables. The progression of patients with respect to spirometry parameters and overall survival was analyzed using mixed linear models, Kaplan–Meier curves, and Cox regression. The statistical programs R and JAMOVI were used. **Results:** A total of 6,427 patients were included, 48.8% females and 51.2% males. The median age at diagnosis was 7 months, and patients ranged from 0 to 83 years. Most patients were white (69%) and from the southern and southeastern regions (45.5% and 23.8%, respectively). Newborn screening was performed in 2,513 patients (39.1%). Genetic testing was performed on 5,319 patients (82.8%), of whom 3,658 (56.9%) tested positive for CF-causing variants. The F508delta variant was detected in 77.5% of the positive cases. Notably, newborn screening was less frequently performed in the North and Northeast regions than in the South and Southeast regions (24% *versus* 43%, $p<0.001$). Patients identified through screening exhibited a significantly younger median age at diagnosis (1.7 months *versus* 4 years for clinically diagnosed cases). The clinically diagnosed patients had a higher frequency of growth deficits (40.9% *versus* 25.2%, $p<0.001$), persistent respiratory symptoms (75.1% *versus* 18.4%, $p<0.001$), and steatorrhea (38.7% *versus* 22.2%, $p<0.001$). A preliminary analysis of 3,240 patients followed in 2021 indicated that those who had undergone neonatal screening exhibited better pulmonary function (predicted FEV1 of 82.6±23.8% *versus* 69.3±40.5%, $p<0.001$) and a lower frequency of positive cultures of mucoid *Pseudomonas aeruginosa* (9.3% *versus* 24.7%, $p<0.001$). **Conclusion:** The results demonstrate some advantages of prenatal diagnosis. Further analysis of the spirometric progression and survival of patients will reinforce the benefits of initiating CF treatment at the earliest stages to achieve more favorable prognoses.

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040

Correlation between viral etiological agents of acute respiratory infections and clinical outcomes in children

Category: Infectology

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Introduction: Respiratory infections are a common cause of emergency department (ED) visits, particularly in children. Clinical features and severity of upper and lower airway infections vary according to the etiology and patient's age; these infections can be severe, leading to hospitalization and death. **Objective:** We aimed to evaluate the association between the etiology of acute respiratory infections and age in children with acute respiratory infections of different clinical features and severity. We also analyzed treatment and hospital admission, according to age and etiology. **Methods:** In this retrospective observational study, we evaluated the results of positive multiplex polymerase chain reaction (PCR) tests of nasopharyngeal swab specimens of children aged 10 years and younger treated at EDs between January 2017 and June 2020. The multiplex PCR test can detect 15 respiratory viruses and 4 bacterial targets in a single reaction. Children were classified into three age groups: 0–24 months (under 2 years), 24.1–60 months (2 to 5 years), and 60.1–120

months (5 to 10 years). Data on the clinical features, prescribed treatment, and outcomes (discharge, readmission to the emergency room, admission to the hospital, and admission to the intensive care unit) were obtained from medical records. **Results:** The analysis included 404 children (58.4% male) with a median age of 24.2 months. Their age category was under 2 years (49.3%), 2 to 5 years (34.2%), and 5 to 10 years (16.6%). Of the positive PCR tests, the most common pathogens were rhinovirus/enterovirus (45.3%), respiratory syncytial virus (RSV) (17.1%), and adenovirus (14.9%). Bacteria were identified in 3.5% of samples. The incidence of RSV infection was higher in children under 2 years ($p<0.001$), whereas the incidence of influenza was higher in children aged 5 to 10 years ($p<0.001$). Bronchodilator prescriptions were frequent in children under 2 years, both in the ED (56.9%) and after discharge (47.5%). Of the 404 children, 35 (8.7%) received an antibiotic during their ED stay, and 134 (33.1%) were prescribed an antibiotic on discharge. The incidence of hospital and intensive care unit (ICU) admission was higher among children with RSV infections. **Conclusion:** Rhinovirus/enterovirus were the major causes of respiratory infections in children; however, RSV infections was more frequent in those aged under 2 years, and influenza was more frequent in those aged 5 to 10 years. Children aged under 2 years were more frequently treated with bronchodilators. Approximately one-third of children were treated with antibiotics, although less than 4% had a confirmed bacterial infection. RSV infections had greater severity than other infections and were more likely to require hospital and ICU admission.

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041

Comparison of discriminative abilities of machine learning models with LACE index in predicting 30-day hospital readmissions

Category: Geriatrics

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Introduction: Hospital readmissions are frequent, expensive, and often preventable. The LACE[1] index is a simple tool to predict deaths or hospital readmissions of patients thirty days after their discharge, based on information easily obtainable at the time of discharge; however, it has a relatively poor discriminative ability in elderly population. Additionally, models applied at discharge do not allow for risk-mitigating interventions during the hospital stay. The development and validation of models to predict hospital readmissions that can be applied at the beginning of a patient's hospital stay, using more detailed data from electronic health records, may be very useful. In this context, the Big Data department at *Hospital Israelita Albert Einstein* (HIAE) developed machine learning models to predict 30-day readmissions in elderly patients hospitalized at HIAE. A model applied with data gathered from the first 48 hours of hospitalization and another applied at the time of discharge were chosen because they had the best discriminative ability among the explored machine learning techniques. **Objective:** Our aim was to compare the performance of machine learning models in predicting 30-day readmissions based on data from the first 48 hours of admission, and at the time of discharge of elderly population hospitalized at HIAE with the LACE index. **Methods:** A retrospective cohort study was conducted using electronic medical records of elderly patients admitted to HIAE for at least 24 hours between January 2018 and June 2021. The sample consisted of 3415 admissions; for each individual, one admission was chosen to extract the predictive variables used in the models (index admissions). The best performing models were observed to be those based on logistic regression for the 48-hours data and random forest for the discharge-time data. The LACE discrimination metrics were then compared to those of the best performing predictive models. The Delong Test was used to compare the area under curve (AUC) of the receiver operating characteristic (ROC) curves. Statistical analyses were conducted using R software. **Results:** The population of admissions included in the study had a mean age of 73.8 ± 9.6, with 45.8% of them being female. The model applied in the first 48 hours of hospitalization showed an AUC of the ROC of 0.734. The model applied at discharge yielded an AUC of 0.740. On the other hand, the LACE index yielded an AUC of 0.646. Thus, the 48-hours and discharge-time models provided better discrimination than the LACE index (Delong test $p<0.001$). **Conclusion:** The machine learning models developed to predict 30-day readmissions in hospitalized elderly population using data from 48 hours after admission and at discharge had better discriminative ability than the LACE index.

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042

Attributes of primary healthcare in childcare in São Paulo, Brazil

Category: Public Health Nursing

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Introduction: In 1978, the World Health Organization (WHO) conducted the International Conference on Primary Health Care, resulting in the Declaration of Alma-Ata, in which health was recognized as a right for all individuals. It highlighted the need of participation of people and the community as a whole, focusing on universal access to health services and declaring Primary Health Care (PHC) as the first level of care to achieve these objectives. In this context, Starfield proposed a systematized methodology for assessing PHC composed of essential attributes (first contact, longitudinality, completeness, and coordination) and derivatives (family and community orientation and cultural competence) using the Primary Care Assessment Tool (PCATool-Brasil), which was approved for use in Brazil with two versions, intended for adults and children. The attributes were analyzed separately during the use of the instrument, despite being related to each other in individual and collective care practices. It can be thus deduced that Health service evaluation studies are essential for understanding the functioning, working processes, and outcomes of the healthcare system. It helps to form a thorough comprehension of quality of the services provided. Interestingly, regarding PHC services, the need for evaluation according to their principles and guidelines is recognized in this study, especially regarding children's health. **Objective:** This study aimed to assess PHC attributes in the healthcare of children in Basic Health Units (BHUs) in the southern region of São Paulo, Brazil. **Methods:** This observational, cross-sectional study adopted a quantitative approach. It was conducted from January to November 2021 in 13 Basic Health Units (BHUs) located in the southern São Paulo. The extended version of the Primary Care Assessment instrument (PCATool Child) was applied to caregivers of children registered at the BHUs, and electronic versions of the questionnaires were prepared using the RedCap platform for data collection and storage. Descriptive analyses and average score calculations were performed for each PHC component, to arrive at the essential score, and the overall score. **Results:** A total of 242 children participated in the study, of which, 52% were female. The mean age of the participants was 3.3 years. Of the total, 47.9% were white, and 85.1% did not have private health insurance. The essential PHC score was 6.41, which was calculated by the sum of the scores of the components that constitute essential attributes (first contact access–accessibility, longitudinality, coordination–integration of care, coordination–information system, comprehensiveness–available services, and comprehensiveness–services provided) divided by the total number of essential components.) The general score was 6.20, which was the sum of the scores of all components that form the essential attributes and the derived attributes (the same variables mentioned earlier in bracket), divided by the total number of components. "Access first contact - Use" with a score of 7.78 and "Coordination - Information systems" with 7.87 were the ones with a high evaluation. Whereas "Community orientation" with a score of 5.09 and "Comprehensiveness - services provided" with 5.35, were the worst in the evaluation. **Conclusion:** The results of the essential and general scores were low and, therefore, in need of improvements in PHC services, there is a constant search for their evaluations, aiming at a qualified management that brings greater resolution to PHC.

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043

Effects of mesenchymal stem cell and empagliflozin treatments on the expression of mouse kidney-derived c-Kit stem cell population

Category: Nephrology and Solid Organ Transplants

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Introduction: *Diabetes mellitus* affects approximately 1 in 10 people aged 20–79 years worldwide. Approximately 30%–40% of diabetic patients develop diabetic kidney disease (DKD). Metabolic changes, such as glomerular hypertrophy, tubulointerstitial inflammation, and fibrosis, are found in the DKD setting. Therefore, new therapeutic strategies have aimed to mitigate the occurrence of these changes. Empagliflozin is a renal sodium-glucose cotransporter 2 inhibitor. It is used as a therapy to reduce tubular reabsorption of glucose, which promotes better glycemic control and fluid overload, in addition to an environment with lower oxidative stress. Another therapeutic approach uses mesenchymal stem cells (MSCs), whose reparative and immunomodulatory behavior combine anti-oxidative, anti-fibrotic, and anti-apoptotic effects. The clonogenic, multipotent, and self-renewal capacity of kidney cell populations that present the c-Kit+ proto-oncogene has been demonstrated. However, studies using animal models seek to establish their potential for the recovery of damaged renal tissues. **Objective:** We aimed to verify whether empagliflozin or MSC-based cell therapy modulates the c-Kit+ cell population in the kidney of diabetic and obese BTBR ob/ob mice. **Methods:** Four groups of male BTBR ob/ob mice were analyzed (n=6 animals/group) according to their treatment: (a) BTBR ob/ob animal with no treatment, (b) wild-type BTBR animal with no treatment, (c) BTBR ob/ob animal on empagliflozin treatment, and (d) BTBR ob/ob animal on MSC treatment. At 10, 14, and 20 weeks, animals from each group were euthanized for tissue sample collection. Immunohistochemical (IHC) analysis and quantification using CellSens (Olympus) software were performed. Quantitative PCR is ongoing. We used two-way ANOVA because of the variables time and treatment. Relevant significance was established at $p<0.05$. **Results:** Preliminary results indicated an increase in the detection of c-Kit+ cells in distinct compartments after MSC and empagliflozin therapies, including Henle's loop, distal tubules, and collecting ducts, but not in proximal tubules. Moreover, c-kit cells were found within the glomeruli. The mixed effects analysis revealed a significant p-value for the treatment variable, but not for the time variable in the cortex ($p=0.0008$). Medulla and glomeruli data are still being obtained. **Conclusion:** MSC-based cell therapy and empagliflozin can regulate the c-Kit+ stem cell pool within mice kidneys, which indicates significant biological properties.

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044

Physical activity and socio-emotional learning intervention reduces depressive symptoms: a randomized controlled trial

Category: Neurosciences

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Introduction: The COVID-19 pandemic has not affected everyone equally. Populations in socioeconomically vulnerable areas were affected more intensely owing to several factors, such as inadequate housing and poor access to quality healthcare. The poor mental health of such populations was exacerbated by socioeconomic deterioration, social isolation, and the deaths of loved ones. Recent studies indicate that some health interventions can be inexpensive yet powerful tools for promoting mental health; thus, we piloted a simple, yet effective, intervention program. **Objective:** To evaluate the effects of physical activity and a socioemotional learning intervention on the symptoms of depression, anxiety, and stress in a socioeconomically vulnerable population. **Methods:** Two hundred inhabitants of the Paraisopolis community participated in a physical activity and socioemotional learning intervention once a week. Physical exercises consisted of low-impact exercises that used body weight as an overload and focused on improving general mobility and core strength. Socioemotional learning was based on cultivating emotional balance training, which combines modern psychology and contemplative practices to help raise emotional self-awareness and regulation. Participants were randomized into two

groups (A and B). Both groups underwent the three-month intervention, but in a crossover schedule: Group A volunteers participated in the intervention first, while Group B volunteers continued with their regular routines for three months. Group B volunteers then participated in the intervention, while Group A volunteers continued their regular routines for three months. Outcomes were measured using the depression, anxiety, and stress scales (DASS-21), which were administered before both interventions (T0), after A's intervention (T1), and after B's intervention with all volunteers. Statistical analysis was performed using two statistical tests: the Mann-Whitney test to compare T0 and T1 between the groups and the Wilcoxon test to compare T0 and T1 in each group. **Results:** Data were collected from 43 and 45 individuals in groups A and B, respectively. The preliminary analysis presented here includes data from T0 and T1. At T1, Group A showed a reduction in DASS depression scores (Mann Whitney p=0.006; Wilcoxon p=0.006), whereas Group B did not (Wilcoxon p=0.552). However, there was no significant improvement found in anxiety (Mann Whitney p=0.812; Wilcoxon p=0.633 (A), 0.561 (B)) or stress scores (Mann-Whitney p=0.552; Wilcoxon p=0.293 (A), 0.814 (B)), or in the total DASS score (Mann-Whitney p=0.280; Wilcoxon p=0.061 (A), 0.823 (B)) when comparing both groups. **Conclusion:** These initial findings suggest that physical activity and socioemotional learning, when performed regularly, can positively impact socioeconomically vulnerable populations by reducing depressive symptoms.

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045

Analysis of the expression of immunomodulatory enzyme indoleamine 2,3-dioxygenase-2 (IDO2) in bladder carcinoma using bioinformatics

Category: Oncology

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Introduction: Indoleamine 2,3-dioxygenase-2 (IDO2) is a homologous isoform of the enzyme indoleamine 2,3-dioxygenase-1 (IDO1), with regulatory mechanisms that differ in cellular expression and immunomodulatory potential. IDO1 is a crucial molecule in tumors, as it promotes immune escape, thereby contributing to tumor progression. Unlike IDO1, the expression of IDO2 isoform in bladder carcinomas has not been analyzed. If its participation is evidenced, new prognostic and therapeutic perspectives could be implemented with adjuvant therapies. **Objective:** Investigate the expression of IDO1 and IDO2 in urothelial bladder carcinoma and normal bladder tissue to verify whether the expression of the enzymes increases in tumor tissue and whether it is correlated with disease stage, tumor progression, or recurrence. **Methods:** The analysis was performed using microarray-generated databases published by the public GEO DataSets platform (National Center of Biotechnology Information, NCBI). A search using the descriptor "Bladder Cancer" was conducted, and series containing transcriptomic analysis of non-muscle invasive and muscle invasive bladder carcinoma of human specimens were selected. Series containing clinical data on tumor staging, progression, and recurrence were also selected. Expression data were collected by the Geo2R program, which is available in the NCBI platform. For the statistical analysis, Geo2R features were used for an intergroup analysis, and SPSS version 23 was used for correlation and ROC curve analysis. **Results:** Sixteen series were selected, with a total of 1,169 cases. Nine series presented cases of normal bladder tissue and urothelial carcinoma, and fourteen presented cases of non-muscle invasive and muscle invasive carcinoma. Of the clinicopathological data, 433 cases presented information on tumor progression and 402 presented data on recurrence. IDO1 and IDO2 were positively correlated ($p<0.05$). The expression of IDO1 and IDO2 did not differ between normal bladder tissue and tumor tissue. In the analysis of tumors only, the IDO1 expression was higher in muscle-invasive cases than in non-muscle-invasive cases ($p<0.05$), while the IDO2 expression did not differ. The ROC curve demonstrated that IDO1 expression was effective in predicting staging (area under curve of 0.584, $p<0.05$), which corroborated the mean comparison analysis. IDO1 and IDO2 expression was not effective in predicting tumor progression but was effective in predicting disease recurrence ($p<0.05$). **Conclusion:** IDO1 expression at transcriptional level may be of interest in the prediction of bladder cancer stage and recurrence, whereas IDO2 expression may be used to predict recurrence. These preliminary results

provide a useful background for further studies on the prognosis of bladder cancer.
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046

Residual neuromuscular blockade in surgical patients: Knowledge and interventions of the nursing team in the post-anesthesia recovery unit

Category: Perioperative Nursing

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Introduction: Neuromuscular blockers are drugs used for general anesthesia. Their function is to facilitate intubation and surgical manipulation of the patient to reduce postoperative complications. However, the absence of blockade-reversing drugs and adequate monitoring to ensure complete recovery of neuromuscular reflexes can lead to residual neuromuscular blockade. Complications related to neuromuscular blocker use (such as muscle weakness, decreased oxygen saturation, and respiratory depression) may necessitate reintubation. A nursing team is essential for identifying and managing residual neuromuscular blockade and providing adequate care. Therefore, it is important to assess the knowledge of the nursing team in post-anesthesia care units regarding residual neuromuscular blockade. **Objective:** To determine the knowledge of the nursing team in the post-anesthesia care unit regarding the evaluation of residual neuromuscular blockade in surgical patients and the interventions to be adopted by these professionals. **Methods:** This quantitative cross-sectional study was conducted in two post-anesthesia care units of a private hospital in São Paulo, Brazil. The sample consisted of 18 nurses and 32 technicians who assisted surgical patients during the recovery phase from anesthesia. Data were collected using a questionnaire created by the authors and validated by experts. It consists of questions on sociodemographic characteristics and 12 questions on the concepts of neuromuscular blockade, neuromuscular blocker drugs, and interventions related to residual neuromuscular blockade. After validation, the instrument was entered into the REDCap platform for data collection. Data were analyzed using descriptive statistics, measures of central tendency, and inferential Pearson's correlation or Student's *t*-test. **Results:** Fifty professionals participated in this study, of which 18 (36%) were nurses. The average training duration for nurses and technicians was 6.1 and 7.2 years, respectively, with the corresponding averages for working in the post-anesthesia care unit being 5.6 and 7.6 years. Only three nurses (9%) reported having graduated from a surgical center. Regarding questions in the questionnaire, the average percentage of correct answers was 43%: 44.4% among nurses and 42.2% among technicians. Six professionals (12%) had already received some training in neuromuscular blockade, and 10 (20%) had already treated patients with residual neuromuscular blockade. No statistically significant differences were observed in the average number of correct answers, graduation time, professional experience, post-graduation, and training. **Conclusion:** This study revealed the nursing team's lack of knowledge regarding residual neuromuscular blockade and care. Therefore, continual education is important to train nursing professionals to deal with this complication and improve nursing care in the post-anesthesia recovery unit so as to guarantee patient safety.
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047

Fabrication of leukemic niche by 3D bioprinting

Category: Hematology and Onco-Hematology

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Introduction: Acute myeloid leukemia is a hematological malignancy characterized by the expansion of blasts in the bone marrow (BM). The rampant expansion and

immortalization of blasts can disrupt hematopoiesis and the immune system. In this case, the BM microenvironment allows the survival of leukemia stem cells (LSC), resulting in resistant leukemic blasts that can multiply, even in patients undergoing treatment. Induction chemotherapy is the first-line treatment that aims to reduce the blast count (<5%). This strategy has been responsible for remission in 50% of patients since 1970. After this period, relapses are frequent, with more drug-resistant leukemic clones leading to death due to disease complications; the 5-year survival rate is only 24%. The BM microenvironment consists of multiple niches where cell-cell interactions and paracrine/endocrine effects occur. Kumar et al. (Leukemia. 2018;32:575-87) showed that leukemic blasts remodel the BM niche to form a microenvironment that is permissive to leukemia growth and suppresses normal hematopoiesis. However, these interactions are not well understood and the mechanisms by which they occur and whether they contribute to treatment resistance or disease recurrence are unknown. In 3D bioprinting, living cells and biomaterials are deposited layer-by-layer to build structures. This makes it possible to create complex structures that mimic a 3D environment, which allows the analysis of the interactions between cells, cytokines, and growth factors, constituting a more appropriate model for studies in relation to 2D culture and conventional scaffolds. The production of tissue analogs has consolidated this strategy in research, which, in addition to avoiding ethical issues associated with animal models, allows reproducibility and scaling due to process automation. **Objective:** To develop an *in vitro* leukemic niche model through 3D bioprinting capable of allowing contact, paracrine, and autocrine communication involving the BM microenvironment. **Methods:** First was a standardization phase for biomaterial concentration. A combination of 4% gelatine and 4% alginate dissolved in phosphate-buffered saline (PBS) was prepared. The scaffold design was 1cm × 1cm × 1mm with 20% density, using a "BioEnder" extrusion 3D bioprinter. THP-1 leukemia cells were marked with a cell trace (CFSE) and added to the biomaterial at a concentration of 10^6 cells/mL. This was homogenized using a 6× horizontal and 6× vertical mixing pattern and was repeated twice. PronterFace software was used for bioprinting the configuration. After printing, the scaffold was crosslinked with $CaCL_2$ 2% and propidium iodide (PI) was added for cellular viability analysis using confocal microscopy (Z-Stack). Live cells were stained green, whereas dead cells were stained red. The cells were then counted manually. **Results:** We developed a biomaterial model with consistency for printing. Microscopy showed that the stains used (CFSE and PI) were efficient in enabling the visualization of THP-1 cells within the scaffold. The cells were round and showed 87% viability. **Conclusion:** A leukemic niche using THP-1 cells was successfully fabricated. We could visualize the cells within the alginate-gelatine scaffold. We next plan to mimic the bone marrow microenvironment using endosteal, vascular, and leukemic niches to analyze contact, paracrine, and autocrine communications.

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048

Brazilian consensus recommendations on the diagnosis and treatment of autoimmune encephalitis in adult and pediatric patient populations

Category: Neurosciences

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Introduction: Autoimmune encephalitis (AIE) is an inflammatory disease characterized by the presence of antibodies against neuronal surfaces. It primarily affects children and young adults, with a prevalence rate of 7–13.5 cases per 100,000 individuals. The most common manifestations include psychosis, seizures, memory and cognitive disturbances, and abnormal movements. The most common types of AIE are associated with anti-NMDAR and anti-LGI1 antibodies. The disease has a long clinical course and causes considerable functional impairment that requires costly treatment. AIE was first described recently; therefore, most recommendations for the condition are based on expert opinions and retrospective series, because few clinical trials have been conducted. The Delphi methodology is a validated technique that centers around scientific discussions among experts to generate knowledge regarding topics for which there is limited evidence, such as AIE. **Objective:** We aimed to provide an evidence-based

national consensus in Brazil, structured according to the Delphi methodology, for the diagnosis, treatment, and follow-up of patients with AIE. **Methods:** A steering committee designed and conducted the study. Associates of the Brazilian Academy of Neurology (ABN - *Academia Brasileira de Neurologia*) and the Brazilian Child Neurology Society (ABNI - *Sociedade Brasileira de Neurologia Infantil*) were invited by mail to join the study. We approved registrations from experts with a specialty training time of >3 years, experience treating at least five patients with AIE over the past 2 years, and who had enough availability to participate. Those who were actively undergoing sub-specialty training, exclusively dedicated to working in the pharmaceutical industry or diagnostic laboratories, or in arrears with their scientific society were excluded. A convenience sample was selected that aimed to enroll approximately 30 participants in the panel of experts. Statements regarding the diagnosis, treatment, and follow-up of patients with AIE were developed by the steering committee based on previous data and clinical expertise. We performed two Delphi rounds based on online surveys, in which participants voted on their agreement with statements using a 5-point Likert scale. The rounds were interspersed with an online meeting in which experts discussed those topics for which a consensus was not reached. The consensus threshold was set *a priori*, as a requirement of 75% of the votes falling between Likert 4–5. A third-party consultant was employed to aid in conducting the study. **Results:** Twenty-five participants were enrolled. In the first round, 52 statements were voted on, and consensus was reached in 88.4% (n=46) of them. Six statements were discussed at the online meeting, rewritten, and included in the second survey, in which a consensus was reached for all statements. All participants completed the first survey (n=25). One participant missed the online meeting and was excluded from the second questionnaire. The second round included 100% (n=24) of the participants. The experts reached a consensus on the cases in which AIE should be suspected and on performing paired autoantibody testing (of cerebrospinal fluid [CSF] and serum) in all patients who meet the diagnostic criteria. The panel agreed that treatment should be promptly initiated, preferably with methylprednisolone and intravenous immunoglobulin, or by adding methylprednisolone to plasmapheresis. The other agreed-upon treatment options included rituximab, cyclophosphamide, bortezomib, and tocilizumab. The panel also agreed that patients should be screened for malignancies and cognitive outcomes must be monitored during follow-up. **Conclusion:** Suspected cases of AIE should be approached using a standard procedure throughout Brazil, with efforts made toward correct diagnosis, early treatment, and best practices, to ensure better patient prognoses. The results of this study constitute a national-level document aimed at aiding physicians with the management of this patient group and codifying the best practices for AIE management in Brazil.

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049

Relationship of hyponatremia with outcomes in hospitalized, critically ill patients with cirrhosis

Category: Intensive Therapy

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Introduction: Hyponatremia is associated with increased in-hospital mortality, which makes its early diagnosis and therapy essential. Optimizing hyponatremia can reduce medical costs, improve the likelihood of survival for critically ill patients, and enhance their overall quality of life. This study aimed to assess the association of hyponatremia with outcomes in critically ill patients with liver cirrhosis undergoing intensive treatment. **Objectives:** To analyze renal function (urea and creatinine), sodium levels, hemogram indices, and prognostic index in patients with liver cirrhosis hospitalized in the intensive care unit (ICU); to compare renal function, anemia parameters, mortality as well as the need for renal replacement therapy, blood transfusion, and mechanical ventilation in critically ill patients with cirrhosis and hyponatremia with those without hyponatremia, both admitted to the ICU; and to evaluate the association of hyponatremia with outcomes and mortality as well as with the need for mechanical ventilation, renal replacement therapy, and blood transfusion in patients with liver cirrhosis. **Methods:** This was a retrospective cohort study in which the medical records of patients with cirrhosis admitted

to any ICU of the Intensive Care Center at *Hospital Israelita Albert Einstein* (HIAE) between March 1, 2020, and February 28, 2021, were evaluated. **Results:** A total of 28 patients were admitted in the ICU with the diagnosis of liver cirrhosis and were divided in two subgroups depending on the serum sodium concentration at the time of admission to the ICU (hyponatremia group [n=11] *versus* no hyponatremia group [n=17]). There was no difference in sex between the groups (72.7% of males had hyponatremia *versus* 70.6% without; p=0.93). Six (54.5%) and 3 (17.6%) patients from the hyponatremia and no hyponatremia groups presented active etilism, respectively. Five (45.4%) and 1 (5.9%) patients from the hyponatremia and no hyponatremia groups presented with acute renal failure, respectively. Serum albumin levels were lower in the hyponatremia group (2.1.0.4, 3.2.0.7; p=0.02). Given that none of the patients without hyponatremia (54.5%; p=0.001) after 8.2.3.7. days of ICU hospitalization evolved to death, we divided our cohort in two new subgroups: survival and non-survival till 60 after hospitalization. Serum sodium levels upon admission to the ICU were lower in the non-survival subgroup (n=6,129 1.1 mEq/L) than in the survival subgroup (n=22, 138 3.2mEq/L; p=0.001), with lower arterial pH (7.31±0.02 *versus* 7.42±0.01; p=0.03). However, arterial lactate levels were higher in the non-survival (65.4±15.3 *versus* 24.2±5.1 mg/dL; p=0.03) subgroup. There were four patients (66.7%) in the non-survival and five patients in the survival subgroups (22.7%; p=0.04) with acute renal failure who required renal replacement therapy. **Conclusion:** The was an association between alcholism and hyponatremia in patients with cirrhosis, and patients with hyponatremia were more likely to present with acute renal failure. There was increased mortality in the hyponatremia group. This demonstrates that patients with cirrhosis and hyponatremia have poor prognoses than those without, despite intensive treatment.

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050

Validation of molecular markers through *in silico* analysis for screening of cervical cancer in pregnant women

Category: Women's Health Nursing

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Introduction: Cervical cancer (CC) is a type of neoplasm caused by a persistent infection with the human papillomavirus (HPV), which is sexually transmitted. Prevention and early detection through exams, such as the Pap smear, are important. Primary HPV infection culminates in the development of CC. In pregnant women, HPV infection contributes to miscarriages, fetal genetic abnormalities, and preterm births, in addition to vertical transmission to newborns. In this study, we analyzed the expression of CC tumor markers in normal pregnant women to investigate a possible influence of pregnancy on these markers, thereby validating their use in the screening of CC in pregnant women. **Objective:** Analyze the expression of the molecules SCCA, CYFRA, CD44, HER2, Tu-M2-PK, NOTCH3, and CEA in pregnant and non-pregnant women through a transcriptome analysis and verify if they are altered by gestation. In addition, correlate the expression of these molecules with gestational age. **Methods:** Transcriptome database analysis, which characterizes a quantitative cross-sectional study, was applied to the faculty via the internet. Data on pregnant and non-pregnant women were obtained from the National Center for Biotechnology Information (NCBI) platform. Studies that provided transcriptome information for pregnant and non-pregnant women were selected, excluding pathological conditions. The gene expression value of each gene of interest (arbitrary unit) was collected and transferred to a separate table. **Results:** Data revealed that the SCCA marker showed no statistical difference between pregnant and non-pregnant women or between gestational trimesters. The markers CD44, HER2, CEA, and NOTCH3 showed statistical differences between pregnant and non-pregnant women. Contrary to HER2, the markers CD44, CEA, and NOTCH3 showed no statistical difference among the gestational trimesters. **Conclusion:** The present study demonstrates that the most suitable tumor marker for CC screening in pregnant women is SCCA because its gene expression is not altered by pregnancy.

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051

Appropriate use of echocardiography in the emergency ward of a Brazilian quaternary hospital

Category: Cardiology

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Introduction: Echocardiograms (echos) have become important tools for the management of critically ill patients. In São Paulo, Brazil, there has been an exponential increase in indications for echo testing in public hospitals (from 4,771 exams in 2007 to 126,260 in 2017), causing a sharp increase in healthcare costs. In such scenarios, precise information regarding the appropriateness of all ordered exams is highly necessary. **Objective:** We aimed to assess whether the current indications for echo examination are in accordance with the criteria for its appropriate use. Furthermore, we aimed to correlate echo indications with the clinical impacts of the test results when used in the treatment of children at an emergency care unit, as well as correlate which demographic characteristics were associated with the most appropriate use of echos. **Methods:** This was a prospective study that included all of the emergency echos performed in 2022 at the *Hospital Israelita Albert Einstein* (HIAE) in São Paulo, Brazil. The main indications were arrhythmia, syncope, chest pain, murmur, fever, systemic diseases, and congenital heart disease. These were classified as appropriate, possibly appropriate, and rarely appropriate by both echocardiographists and emergency pediatricians. Clinical impact was considered positive whenever there was a change in treatment. **Results:** A total of 90 echos were performed. The mean patient age was 4.05 years (3.24), with a relatively equal sex ratio (male: 47.5%; female: 43.47%). The most common indications were prolonged fever of known origin (n=23, 25.5%) followed by prolonged fever of unknown origin (n=20, 22.2%), for which Kawasaki disease was the most prevalent hypothesis (8/20; 40%). Fever with recent onset was found in 17.7% of the indications, (n=16; 17.7%), dyspnea without cardiovascular abnormalities signs in 3.3%, and central cyanosis in 1.1%. Most of the echos were normal (n=66; 73.3%). Echocardiographists considered the indications to be appropriate in 24.4% (n=22) of the cases, while emergency pediatricians considered them appropriate in only 7.8% (n=7). Positive clinical impact occurred in 21.4% (indication or change in treatment in 3.4%, additional exams in 3.4%, and ward admission in 14.6%). **Conclusion:** The low clinical impact from echo results reflects a waste of resources that needs to be promptly addressed. The rate of appropriateness was higher in the evaluations of echocardiographists, which was generally in accordance with the rate of positive clinical impact.

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052

Effects of FGF19 on human browning

Category: Endocrinology and Metabolism

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Introduction: Obesity and type 2 *diabetes mellitus* are chronic diseases of worldwide relevance. Bariatric surgery is a treatment option associated with increased plasma concentration of fibroblast growth factor 19 (FGF19), which is a hormone produced in enterocytes. FGF19 has a wide spectrum of functions, from modulation of bile acid synthesis to metabolism of carbohydrates and lipids. Many studies have demonstrated that FGF19 has antidiabetic effects and reduces adiposity in rodents. A suggested mechanism underlying these alterations is the increased browning of adipose tissue, which leads to higher energy expenditure. The direct effects of FGF19 on human adipose tissue have not been fully

investigated, and its contribution to metabolic benefits promoted by bariatric surgery remains unknown. Therefore, the potential metabolic effects of FGF19 on human adipocytes should be investigated as a basis for the development of therapeutic strategies for the treatment of obesity and diabetes. **Objective:** Investigate the effects of FGF19 on human adipose-derived stromal vascular fraction cell proliferation and browning in vitro. **Methods:** Fragments of abdominal subcutaneous and omentum white adipose tissues were collected from elective abdominal and bariatric surgeries after patient consent. Part of the samples was used to isolate cells from the stromal vascular fraction via collagenase. These samples were treated in vitro for 3 days with a vehicle or FGF19. Subsequently, an MTT assay was performed to assess proliferation. The other samples of adipose tissues were minced and treated in vitro for 7 days with the vehicle or FGF19 for the browning assessment via gene expression analysis of beige adipocyte markers, including genes involved in thermogenesis and mitochondrial function (UCP-1, PGC-1α and CIDEA), using qPCR. In vitro FGF19 treatment was performed at two concentrations: one close to healthy individual plasma concentration (0.5ng/mL), and the other 10 times higher (5ng/mL). Paired t-test was used to compare the control and 0.5ng/mL FGF19 or 5ng/mL FGF19 samples. The level of statistical significance was set at $p<0.05$. **Results:** Stromal vascular fraction cells from subcutaneous and omentum adipose tissues treated with 0.5ng/mL (subcutaneous: n=5; omentum: n=7) or 5ng/mL (subcutaneous: n=4; omentum: n=4) did not present any difference in proliferation compared to the control. The browning analysis showed that subcutaneous adipose tissue treated with 0.5ng/mL (n=2) or 5ng/mL (n=2) did not present any significant difference in UCP-1, PGC-1α, and CIDEA gene expression compared to the control, although more experiments are needed. Omentum adipose tissue treated with 0.5ng/mL FGF19 (n=4; p=0.02) or 5ng/mL (n=4; p=0.04) showed reduced UCP-1 expression compared to the control. The PGC-1α gene expression decreased only when the omentum tissue was treated with 5ng/mL FGF19 (n=4; p=0.03). As for the CIDEA gene expression, there was no significant difference between omentum treated with 0.5ng/mL (n=4) or 5ng/mL (n=4) and the control. **Conclusion:** Although more experiments should be conducted to finish this project, the results suggest that FGF19 does not change the proliferation of stromal vascular fraction cells, and it reduces browning in omentum, which can reduce whole-body energy expenditure.

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053

Relationship between clinical factors for intensive care unit admission and the need for kidney replacement therapy in patients with neoplasia

Category: Intensive Therapy

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Introduction: Patients with solid or hematologic malignancies admitted to the intensive care unit (ICU) due to acute kidney injury (AKI) or chronic kidney disease who needed kidney replacement therapy (KRT) have poor prognosis. AKI may occur due to glomerulonephritis, neoplasm invasion, dehydration, or nephrotoxicity caused by chemotherapy or radiotherapy. Therefore, we studied the relationship between ICU admission clinical factors and the need for KRT. **Objective:** To evaluate the association between ICU admission clinical factors and the need for KRT in patients with malignant neoplasms. **Methods:** This cross-sectional retrospective study analyzed the medical records of patients in the ICU of a large private hospital in São Paulo. Adult patients diagnosed with malignant neoplasms admitted to the ICU were included. We excluded patients admitted to the ICU for sepsis, COVID-19, external bleeding, and those who died within the first 3 days of admission. We collected demographic and clinical data upon ICU admission, including sex, age, primary site of neoplasia, comorbidities, complete blood count, kidney function, enzymes, liver function, arterial blood gases, outcomes within 90 days of ICU admission, need for blood transfusion, mechanical ventilation, need for KRT, vasoactive drug use, and mortality. We compared the following two groups: those who needed KRT (KRT group) and those who did not (non-KRT group). Finally, binary logistic

regression was performed using the response variable KRT. **Results:** The study sample consisted of 54 adult patients from the ICUs diagnosed with solid or hematological neoplasms after exclusion. The primary sites of malignant neoplasms were the hematological, genitourinary, skin, and gastrointestinal tracts, followed by the respiratory tract. We observed that seven patients developed a need for KRT within 14.7±5.9 days of ICU admission. There were four male patients in the KRT group (57.1%) and 20 (42.5%; p=0.47) in the non-KRT group. Three patients in the KRT group (42.8%) and six (12.8%; p=0.04) in the non-KRT group were diagnosed with chronic kidney disease. We found lower serum sodium levels in the KRT group (135±1.35, 138±0.9; p=0.04) than in the non-KRT. We found lower arterial bicarbonate (19.4±1.7, 24.7±0.55; p=0.02), serum sodium levels (135±1.35, 138±0.9; p=0.04), but higher arterial lactate (34.5±9.2, 22.7±1,7; p=0.04), serum transaminases, and creatinine (2.39±0.65, 1.37±0.12; p=0.001) in the KRT group than in the non-KRT group. In the multivariate analysis, the highest arterial bicarbonate level showed an independent protective association with the need for KRT (OR 0.537, 95%CI=0.322–0.855, p=0.02). **Conclusion:** Higher arterial bicarbonate levels were protective and independently associated with KRT during ICU stays for malignant neoplasm within 90 days of follow-up. Therefore, metabolic acidosis is a predictive factor for poor prognosis in patients with malignant neoplasms and kidney disease in ICUs.

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054

A "breast cancer-on-a-chip" platform to evaluate the therapeutic efficacy of magnetic hyperthermia therapy

Category: Oncology

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Introduction: Breast cancer, which mostly affects women, is one of the most common diseases worldwide. In 2018, more than 2 million cases were diagnosed and almost 627,000 deaths were reported globally. Among its different subtypes, triple-negative breast cancer is highly invasive and has a high rate of early recurrence. This subtype is not responsive to most endocrine treatments and targeted therapies, indicating the urgent need for new therapeutic alternatives. In recent years, magnetic hyperthermia has emerged as a novel therapy that uses magnetic nanoparticles exposed to an alternating magnetic field to create a heated environment that induces cancer cell lysis while preserving healthy adjacent cells. This therapy is minimally invasive compared to conventional therapies such as chemotherapy and radiotherapy. Microfluidic technology allows for the analysis and processing of biological samples using a low fluid volume, as well as the establishment of more accurate models of tumor microenvironments compared to 2D cell cultures and animal models. A "breast cancer-on-a-chip" system enables a 3D culture that accurately mimics the *in vivo* tumor tissue microenvironment and provides a more physiologically relevant platform for studying responses to therapy. **Objective:** We aimed to develop a microfluidic "breast cancer-on-a-chip" device to accurately evaluate the therapeutic efficacy of magnetic hyperthermia therapy. **Methods:** The microfluidic device comprised an elongated hexagonal prism chamber with an inlet and outlet for the administration of cells, an extracellular matrix, and magnetic nanoparticles. Stereolithography 3D printing was used to create the physical device. The negative mold was designed using Autodesk Inventor with post-cutting and 3D printing. The mold was then cured using ultraviolet radiation, and polydimethylsiloxane was poured into it to cure at room temperature. Once the polydimethylsiloxane

cured, it was pasted onto a glass slide following an oxygen plasma treatment. The device was seeded with MDA-MB-231 breast cancer cells and Matrigel. The cells were cultured in Dulbecco's modified Eagle's medium F-12 containing 10% fetal bovine serum, 1% penicillin, and streptomycin. The culture was monitored using an Eclipse Ti-E microscope (Nikon), and a syringe pump at a flow rate of 0.8μL/min was used to maintain the medium. After the cells were cultured, iron oxide nanoparticles were administered, and an alternating magnetic field (200 Gauss, 551 kHz) was applied for 30 min. Therapeutic efficacy was determined using a live/dead fluorescence kit. **Results:** Stereolithographic 3D printing and PMDS polymer allowed for the successful development of the microfluidic device. When the cells were cultured along with the extracellular matrix (geltrex) containing collagen IV, entactin, and heparin sulfate, it was possible to observe the culture in 3D for approximately 2 weeks. The heating potential of the iron-oxide nanoparticles coated with aminosilane was evaluated, and the specific absorption rate was found to be 240W/g. The magnetohyperthermia method was applied following the addition of the nanoparticles for 30 min. An evaluation of the therapeutic efficacy was then carried out by performing live/dead counting assays on 10μL samples, through which a viability reduction of >50% was observed, compared to that with the control. **Conclusion:** We developed a tumor-on-a-chip platform and evaluated the therapeutic efficacy of the magnetic hyperthermia treatment approach for breast cancer.

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055

Nursing students' perception about the possibility of working in pediatric oncology

Category: Oncology

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Introduction: The estimated incidence of childhood cancer in 2023-25 (Brazil) is found to be 7,930 cases. Thus, several families and patients must deal with difficult diagnoses. This calls for the requirement of specialized professionals in the field of pediatric oncology. Given the characteristics of this type of patients and their family, the motivation to work in this area is crucial. However, beyond the challenges, the choice of specialty during graduation is influenced by the learning opportunities to which students are exposed and the support of the academic environment. **Objective:** This study aimed to understand nursing students' perceptions of working in pediatric oncology. It aimed to find answers to the following questions: What are the perceptions of nursing students about pediatric oncology?; What were the experiences of these students in caring for children with cancer and their families? Understanding nursing students' perceptions can contribute to the proposal of suitable actions to dispel negative stereotypes about pediatric oncology and expand interest in this specialty. **Methods:** This descriptive, exploratory field study used a qualitative approach at a private university in São Paulo. Six third-year undergraduates who had worked in oncology and/or child health sector, were included in this study. Data collection was performed through semi-structured and individual interviews in 2022 after obtaining approval from the Research Ethics Committee (# 5320179). Data were analyzed using Thematic Content Analysis. **Results:** The study sample comprised nursing students with an average age of 21 years. The majority expressed a desire to work in Gynecology and Obstetrics (33%), while only one, in oncology (17%). Based on the data analysis, thematic categories were elaborated: imaging through common sense pediatric oncology as a difficult area of activity, where they fantasized that caring for children with cancer trumped the experience of the patients' suffering and death. Hence, negative feelings and prejudices persistent among the nurses were identified. Experiencing pediatric oncology in the training, in which they were positively surprised when facing the disease and to what extent a nurse performed an essential role in the relief of suffering, both physically and emotionally, was new to them. Furthermore, feeling emotionally unprepared to handle children affected by cancer was also something to be considered among the participants. Despite some initial modifications in relation to the negative perception about childhood cancer, the students experienced some amount of conflict because they were not prepared psychologically to deal with the challenges that come with caring for children afflicted with cancer. They still feel that there is a shortage of initiatives at graduation that support them in the selection of this area of work. **Conclusion:** Nursing students perceived the role of nurses in providing care to children with cancer and their families

in terms of both their knowledge and technical abilities. Nevertheless, it is an extremely restricted area in the academic sphere owing to the existing stereotypes. The interviews had a therapeutic effect, enabling the expression of feelings and reflections during these stages. These findings are significant for sensitizing health professionals and universities to promote actions that encourage psychological preparation and the handling of negative feelings that may emerge during internships. Considering that mental health and emotional support are relevant to nursing students, the interest of future nurses in caring for cancer-afflicted children may increase. Emphasizing more studies on subjects with different realities is thus important.

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Articles from journals
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Books
Ritchie S. Science fictions: how fraud, bias, negligence, and hype undermine the search for trusth. New York: Metropolitan Books; 2020.

Chapters of books
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Works presented in conferences
Rivarola E, Dimuro CA, Scandolo MC, Quintero Florez A. Design of gourmet menus high in fiber for diabetic patients of the French sanatorium: evaluation of the nutritional content, acceptability, organoleptic characteristics and glycemic control. Clinical Nutrition ESPEN. 2021;46:S690. [ESPEN 2021 Virtual Congress; 2021 Sep 9-14].

Thesis
Pinheiro LL. Avaliação da aorta torácica de brasileiros tabagistas por tomografia de tórax de baixa dose: diâmetros e prevalência de aneurismas [tese]. São Paulo: Faculdade Israelita de Ciências da Saúde Albert Einstein; 2021.

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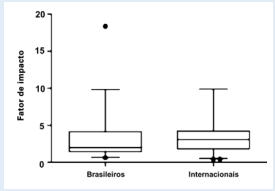
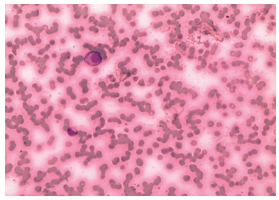
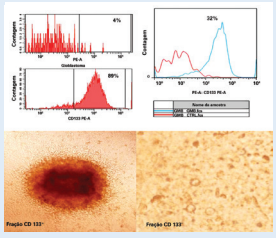
Line art	An image composed of lines and text, which contains no tonal or shaded areas		tif or eps	Monochrome 1 bit or RGB	900 to 1,200 dpi
Halftone	A continuous tone photograph containing no text		tif	RGB or Grayscale	300 dpi
Combo	Image contains halftone plus text or line art elements		tif or eps	RGB or Grayscale	500 to 900 dpi

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