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MEETING ABSTRACTS

Signa Vitae

Abstracts of the 45th National Congress of the Italian Association for the Study of Pain

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The National Congress of the Italian Association for the Study of Pain (AISD) has represented for more than 40 years a significant moment of multidisciplinary scientific debate to which experts and professionals engaged in research and clinical practice contribute.

Due to the pandemic, the 2020 and 2021 Congresses took place in virtual mode, still enjoying great participation success, also thanks to the scientific contents, with constant reference to the most frequent and current clinical problems that are faced in daily practice.

For the 2022 edition of the National Congress, the AISD Board of Directors has decided to take a step towards normality proposing a hybrid event, accessible both onsite (Naples, 22–24 September) and online (www.congressoaisd.it).

The main themes of the scientific program and of the poster and communication session concern acute and chronic pain, osteoarthritis and postoperative pain, pharmacotherapy of chronic low back pain and minimally invasive spine surgery, pain and neuroinflammation, autoimmune and neurodegenerative diseases, controversies and challenges in fibromyalgia, gender differences in headache and neuropathic pain, pain in the general practitioner's office, palliative care, oncologic pain, pain and guidelines *etc.*, just to mention some of the main themes discussed, respecting, as it was always done,

research and assistance criteria, in the context of the multidisciplinary characteristic of our scientific society.
The Italian Association for the Study of Pain is the Italian Chapter of the IASP®, International Association for the Study of Pain and of the European Pain Federation, EFIC®. It has been active since 1976. More information are available on the website www.aisd.it.

01. Gender differences in chronic pain: cognitive and emotional patterns

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Background: Chronic pain (CP) is an umbrella term used to refer to an array of conditions [1] in which pain persists or recurs for longer than 3 months [2]. The psychological experience of CP may also reflect different strategies adopted by men and women to cope with their pain in daily life, with implications for CP management decisions [3]. Accordingly, the present study aims to investigate gender differences in CP sufferers and healthy controls (HC), with specific regard to quality of life (QoL), treatment adherence, and mood state.
Methods: This was an observational study: N = 204 participants (CP = 118; HC = 86) were recruited from the "Pain Therapy Clinic", University of Bari, Policlinico General Hospital. The clinical group met IASP (International Association for the Study of Pain) criteria for CP; exclusion criteria consisted of oncological and/or psychiatric medical history. The entire sample was assessed through: Brief Pain Inventory, BPI, HADS Hospital Scale for anxiety and depression, SF-36 Questionnaire for QoL, and BMQ Scale for adherence-related beliefs. Statistical processing performed through SPSS (all $p < 0.05$) relied on logistic regression models (*i.e.*, LR with forward selection). Two LRs were performed (*i.e.*, one on men and one on women, respectively) to predict in each gender the likelihood of receiving CP diagnosis based on various factors (*i.e.*, independent variables).
Results: LR analysis carried out on men's group showed that concerns about drug dependence and adverse effects were positively associated with the diagnosis of CP (B = 0.374; (Exp (B) = 1.45). Increased physical activity was, in contrast, strongly associated with a lower occurrence of CP diagnosis in men (B = −0.136; Exp (B) = 0.873). Also the LR conducted on women showed a lower likelihood of CP diagnosis associated with improved physical functioning (B = -0.200; Exp (B) = 0.819). Such risk, however, increases as the belief in the need for prescribed medication becomes higher (B = 0.440; Exp (B) = 1.53).
Conclusion: Our results suggest the predictive role of different factors of QoL and medical compliance in men and women. While women may be more prone to medication overuse and over-adherence, men could show poorer compliance with medical recommendations. In addition, men and women who engage in physical activity may be less likely to occur within the diagnosis of CP.
Overall, this evidence suggests an impact on patients' decisions concerning healthcare, highlighting the need for further directions of clinical integrated and personalized approaches to assist patients with their CP condition.

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02. Characteristics and causes of modification of the triage priority code in a pediatric emergency room: retrospective observational study

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Background: Triage is a nursing function, it consists of taking in patients who come to the paediatric emergency department and on the basis of their clinical condition and developmental risk, nurses assign a priority colour code to the child. The triage process requires that there is then a reassessment that confirms or modifies the code assigned to waiting patients. The aim of the study is to analyse changes in the priority code in order to identify what factors may influence the code assignment and its subsequent, eventual modification.
Methods: A retrospective observational study was conducted, selecting within the six-month period June–December 2021, the episodes of varying priority, regardless of the starting colour code and the patient's age, but including only the following symptomatology: headache, diarrhoea, dyspnoea, respiratory distress, fever, rhinorrhoea, cough, vomiting and excluding trauma.
Results: A total of 49 variant priority episodes were selected, of which 67% were upgrade episodes and 33% downgrade episodes. The median age is 1 year (range 0.1–18 years) and the diseases involved are infectious in 92% of cases, predominantly affecting the respiratory system (upper airways 42.86% and lower airways 16.33%). The most frequent changes are from code white to green (61%) and from code green to white (62%). In both cases, the most frequent cause of change is vital signs, and those most frequently affected are heart rate (53%) followed by body temperature (27%).
Conclusion: The study shows that the decision of the triage priority code taken on the basis of the vital parameters measured may result in the wrong code being assigned. It is therefore essential that the triage nurse can remodel the code by assigning a higher or lower priority according to the general clinical impression. In conclusion, a triage system based predominantly on the use of vital signs for code assignment needs to be re-allocated by the nurse taking into account the overall clinical impression of the patient.

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03. Adherence to spinal neurostimulation (SCS) implantation: the effectiveness of psychological intervention

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Background: It is estimated that more than 14,000 SCS implants are currently performed worldwide each year. The main indications for the use of this technique are: failed spinal surgery, complex regional syndromes, ischaemic vasculopathies of the lower limbs, and refractory angina.
The use of SCS in our centre takes place after a careful selection of the patient from a clinical and psychological point of view and is a therapeutic option for those patients who have experienced the failure of traditional treatments and would like to reduce the intake of drugs whose side effects worsen their quality of life.
Despite substantial evidence on the efficacy of SCS, the literature shows a high rate of explantations, due to loss of efficacy, of the pacing system from 12 months after implantation. The reasons for the loss of efficacy can essentially be of two types. Technical complications related to the implant system and psychological adaptation or tolerance to the treatment itself.
The aim of the present study is to investigate which psychological dimensions favour an effective treatment of the patient with chronic pain, in order to achieve an effective long-term antalgic therapeutic response and to succeed in reducing the need for explantation.
Methods: 20 patients (12 women and 8 men, mean age 68 years) were enrolled to undergo provisional SCS implantation in 2021. Inclusion criteria were: disabling pain in the lower limbs and/or lumbar region persisting for at least six months,

resistance to conventional analgesic treatments and rehabilitation, and intolerance to drug side effects. Following the clinical evaluation, the psychology service of our hospital carried out a psychodiagnostic assessment using Pdm2, Dsm5 and Tas20. 16 patients (9 women and 7 men, average age 66 years) passed this phase and were implanted with temporary SCS. The trial phase of stimulation lasted an average of 20 days and after clinical evaluation of its efficacy, definitive implantation was performed.
Results: With regard to the small sample treated, periodic quarterly follow-up was carried out to maintain control over the reduction of the algic component. Thanks to the psychological assessments of the patients treated, we were able to exclude those where the presence of psychological trauma and alexithymic traits was found, with consequent deficits in cognitive processing and emotion regulation and a tendency to somatisation. The multi-disciplinary approach made it possible to prevent requests for explantation in patients with psychological risk factors linked to low acceptance of the device, enabling increased adherence.
Only one patient did not pass the trial phase due to clinical inefficacy.
Conclusion: The results obtained from the present study support the effectiveness of a multidisciplinary patient assessment, given the complexity inherent in the perception of chronic pain. These results encourage the need for psychological pathways also aimed at patients with personality aspects negatively related to the acceptance of the SCS device. This is in order to promote greater acceptance of the neurostimulator.

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04. Ethics of pain is a beacon that guides health professionals in the management of health

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Background: Pain represents one of the fundamental problems that living beings have to face and in its various clinical expressions constitutes a significant obstacle to maintaining a quality of life that guarantees the individual a condition of well-being. On the economic level, moreover, pain accounts for significant financial expenditure and has important social consequences. The concept of ethical dilemmas has been well explored in nursing because of the frequency of ethical dilemmas in practice and the toll these dilemmas can take on nurses. Although ethical dilemmas are prevalent in nursing practice, frequently leading to moral distress, there is little guidance in the literature to help nurses resolve them.
Methods: The keywords ethics and pain were searched in PubMed over the last 5 years. Exclusion criteria were sources not available in English and without an available abstract. 689 studies were screened; only four were retained.
Results: Ethical dilemmas arose from end-of-life issues, conflict with physicians or families, patient privacy concerns and organizational constraints. Differences were found in study location, and yet international research confirms that ethical dilemmas are universally prevalent and must be addressed globally to protect patients and nurses. In 1997, the US Supreme Court denied the right to assisted suicide, but affirmed the right to palliative care to prevent death in overwhelming pain. Other guidelines and regulations extended this right to pain relief from end-of-life care to chronic pain care, along with the principle of tit-for-tat, which specified that the correct dose of opioids was the dose that relieved pain.
Conclusion: Patients have the right to pain management, but patients' rights have limits, which may interfere with other competing rights and also with the rights of their physicians. The treatment of pain must be medically, ethically and economically justified. Healthcare professionals have an obligation to continuously improve their knowledge of pain management, including the medical, legal and ethical aspects of pain.

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05. Effectiveness of a Khorasan wheat-based replacement on pain symptoms and quality of life in patients with fibromyalgia

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Objective: To investigate the effects of a replacement diet with Khorasan wheat products in patients with fibromyalgia (FM), in comparison with a similar replacement diet with control products made from organic semi-whole-grain modern wheat.
Design: Randomized, double-blinded crossover trial.
Setting: Outpatient clinic.
Subjects: Twenty subjects (19 female and one male, mean age = 48.9 ± 12.3 years) with fibromyalgia.
Methods: Participants were randomly assigned to consume either Khorasan or control wheat products (pasta, bread, crackers, biscuits) for eight weeks and then crossed. Validated self-administered questionnaires were collected from each subject at the beginning and end of each intervention period.
Results: A general linear model for repeated measurement, adjusted for potential confounders, showed that the overall score reported from each questionnaire improved after both intervention and control periods, but the effect was more evident after the intervention with Khorasan. In particular, a statistically significant difference in Widespread Pain Index (WPI) + Severity Scale (SS) and Functional Outcome of Sleep Questionnaire (FOSQ) was observed, which decreased significantly by 21.5% and 11.7% respectively, only after the Khorasan period, while no statistically significant variations were reported after the control period. Similarly, FM Impact Questionnaire scores decreased significantly only after the Khorasan period, with a reduction that was significantly different between the intervention and control periods (−22.5% *vs.* −0.3%, $p = 0.037$). The improvement was even greater in people with higher symptom severity.
Conclusions: A dietary intervention with Khorasan wheat products seems to benefit patients with fibromyalgia, especially those with greater symptom severity.

Keywords:
Ancient grains; Cereals; Diet; Fibromyalgia; Khorasan

06. Artificial intelligence for tailoring telemedicine-based cancer pain management

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Background: The most effective strategy for addressing the management of cancer pain remotely should be better defined. It is mandatory to design a hybrid pathway by combining remote consultations with face-to-face re-evaluations [1, 2].
Methods: The analyses of Artificial Intelligence (AI) were performed on a dataset (n = 267) obtained from video consultations for cancer pain management (March 2021 to February 2022). Different methods of AI were tested to design the more accurate predictive model. The models included the classification and regression tree (CART), random forest (RF), gradient boosting machine (GBM), single hidden layer artificial neural network (ANN), and the Lasso-Ridge algorithm (elastic model). Thirteen demographic, clinical, and therapeutic variables were adopted to define the process that can affect the number of hospital admissions (Fig. 1). Medical Ethics Committee: protocol code 41/20 Oss; date of approval, 26 November 2020.
Data were analyzed using the R software version 4.1.3. The toolkit included the Mice Suite for imputation of missing data, Caret for implementation of classifiers, pROC and pRROC for the construction and visualization of ROC curves. Graphics packages included ggplot, ggpubr, and cowplot.
Results: After the exclusion of 109 records due to not available or incomplete data, the AI-based predictive analyses

were carried out on 158 remote consultations. In the training set, the accuracy was about 90% for both ANN and RF. Nevertheless, the best accuracy on the test set was obtained with RF (77%) (Fig. 2).

Conclusion: AI-based analyses can allow clinicians to identify the best model for predicting the need for hospital access and in-person pain evaluation or treatment.

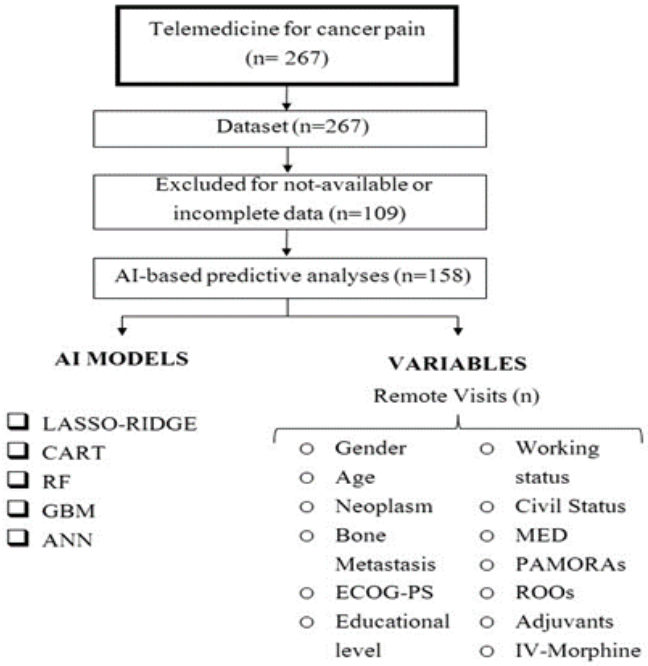

Fig. 1. Study flowchart. Abbreviations: AI, Artificial Intelligence; CART, classification and regression tree; RF, random forest; GBM, Gradient boosting machine; ANN, artificial neural network; ECOG-PS, Eastern Cooperative Oncology Group Performance Status; MED, morphine equivalent dose; PAMORAs, peripherally acting μ-opioid receptor antagonists; ROO, rapid onset opioids; IV-Morphine, intravenous morphine.

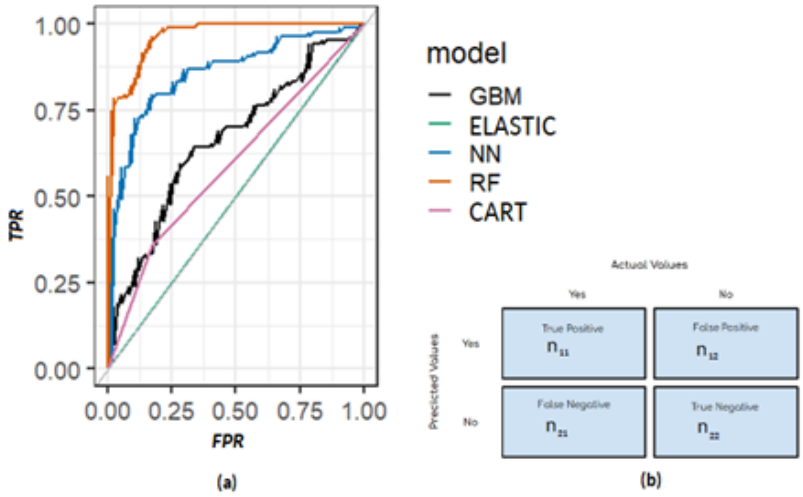

Fig. 2. The area under the Receiver Operating Characteristic (ROC) curve (AUC) of the considered models. The AUC allows you to identify the most specific and sensitive classifier among those examined (Fig. 2a). Reducing the false positive rate (FPR) and at the same time increasing the true negative rate (TNR). It means acting on the first row in the 2x2 confusion matrix (Fig. 2b), thus maximizing the element to the first term of the first row (n_{11}) and decreasing it to the second term of the same row (n_{12}). Abbreviations: LASSO (Least Absolute Shrinkage Selector Operator), LASSO-RIDGE regression; GBM, Gradient boosting machine; NN, neural network; RF, random forest; CART, classification and regression tree.

Keywords:

Telemedicine; Artificial intelligence; Machine learning; Cancer pain

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07. Neuraxial and ultrasound-guided loco-regional anesthesia in a patient with implanted deep brain stimulator

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Introduction: Deep brain stimulation (DBS) is a treatment for Parkinson's disease (PD). Here, we present a case with DBS in which we performed spinal anesthesia plus fascia iliaca block. A 66-year-old woman was scheduled for gamma nail removal and hip arthroplasty to correct a hip pseudoarthrosis due to a traumatic hip fracture. She received DBS implantation (Vercise, Boston Scientific, Valencia, CA, USA) for her PD control. Her PD symptoms were well controlled (pramipexole 0.7 mg OID). She had type 1 diabetes, hypertension, undifferentiated connectivitis, and restless legs syndrome.
Methods: We administered locoregional plus neuraxial anesthesia in view of the absolute lack of contraindications, her clinical status, and the high ASA Physical Status. In order to perform the spinal anesthesia without pain or discomfort for the patient we performed an ultrasound-guided fascia iliaca block with ropivacaine 0.375% 30 mL. After 15 minutes we administered 500 m of saline solution and we performed spinal anesthesia. We punctured with a 27 G Sprotte needle at lumbar L3–4 level with clear cerebrospinal fluid withdrawing. No intraprocedural complication were reported during the execution of spinal anesthesia. Then 14 mg 0.5% bupivacaine plus fentanyl 20 mcg were injected. The vital signs remained stable throughout the surgery. The surgeon requested monopolar electrocautery, so we turned off the DBS at the beginning of the surgery and the patient turned it on herself at the end.
Results: No complications were noted. The patient has never developed tremors, paresthesia, or other PD symptoms. Pain control was satisfying at the end of surgery and in the postoperative period (basal NRS, net root stimulus, 0, maximum NRS 3). The day after surgery the patient begun rehabilitation exercises.
Conclusion: Our case proves that spinal plus regional anesthesia may be a choice for high-risk patients with DBS even without inactivation. Sedation may be not necessary if patients feel no discomfort. Activation of DBS during spinal anesthesia appears to be safe and device shutdown is not required to perform regional or neuraxial anesthesia.

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08. Osteopathic manipulative treatment and pain matrix

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Osteopathy is a widely practised complementary medicine that has steadily grown over the past decade, particularly in pain treatment [1]. Several clinical studies have investigated the effects of osteopathic manipulative therapy (OMT) on various pain conditions, particularly low back pain (LBP). Short-term neurobiological effects indicate that OMT has a parasympathetic anti-inflammatory effect in the periphery [2–7].
On pain science, a recent meta-analysis of fMRI data revealed that the following structures play an important role in the pain matrix in chronic pain patients: bilateral precentral and postcentral gyri, bilateral insula, left S2, left dorsal anterior cingulate cortex, left cingulate gyrus, right medial frontal gyrus (MFG), bilateral basal ganglia, and bilateral thalamus [8].

Some of these brain regions, such as the bilateral midcingulate cortex, the left posterior and right anterior insula, and the left amygdala, are recognised as core regions of the autonomic system's central control [9].
In a recent randomised, placebo-controlled trials, we hypothesised that OMT would induce a change in a large network of brain regions, including (but not exclusively) the pain matrix, and an increase in parasympathetic activity as well measured by HRV.
Results indicated that OMT has a dual effect: central, which is a change in the brain by modifying cerebral blood flow in some but not all pain matrix-related areas, and peripheral, which is an autonomic effect as measured by a change in HRV, specifically on HF and DFA-a1.
To the best of our knowledge, this is the first experimental evidence of such combined changes, suggesting that a mutual interconnection response may primarily mediate this brain-and-heart effect caused by osteopathic treatment.
After OMT sessions, there was a significant decrease in CBF values in pain-related brain regions such as L-pINS, L-ACC, and L-thalamus, and an increase in CBF values in pain-unrelated regions such as L-PCC, lentiform nuclei, R-vaINS, R-daINS, and R-vplTHAL (Fig. 1). In addition, the CBF changes in six pain-related areas demonstrated significant correlations with baseline VAS pain reduction in the OMT group, but not in the control group. Positive correlations were identified for the L-pINS, L-ACC, L-MFL, and right lentiform nucleus, whereas a negative correlation was identified for the L-PCC and L-thalamus.
Previous fMRI studies in the same group of cLBP patients [10] and asymptomatic healthy subjects [11–13] have reported similar findings. Tamburella and colleagues reported that a single OMT session caused immediate changes in blood flow in L-PCC and L-SPL [11]. Cerritelli and colleagues expands on previous research by examining the effects of chronic LBP over an extended period of time and combining HRV measurements [10]. In other words, whereas prior research utilised CBF measurements immediately after a single OMT session and after three days, the authors reported not only that larger CBF changes are observed in response to a longer osteopathic treatment period (4 sessions over a 1-month treatment period), but also that these effects are associated with a change in the autonomic response. It is possible to interpret the accompanying decrease in CBF in pain-related regions as a reflection of the positive influence of osteopathic treatment on heart rate variability and pain perception in the physiological state of LBP patients, hypothesising an OMT effect on central mechanisms of endogenous pain modulation.
Analysis of CBF values in conjunction with autonomic responses provides additional support for the hypothesis that OMT may affect CBF via the ANS by reducing the inflammatory milieu of the tissue.
However, these variations may be associated with substantial alterations in the control of the central autonomic network (CAN). In a 2013 meta-analysis on CAN, Beissner and colleagues suggested that the prefrontal, anterior, and midcingulate, right ventral anterior insular, and left posterior insular cortices are involved with the sympathetic activity. In contrast, the PCC, lateral temporal, and bilateral dorsal aINS are involved with parasympathetic responses [9]. These brain regions appear to be uniquely linked to the cognitive output (ACC, INS, SPL) or somatosensory output (PCC) of the CAN. Recently, Valenza *et al.* [14] confirmed and extended these findings by identifying additional regions, including the precuneus, angular gyrus, and cerebellum.
Therefore, arguably the central effect of OMT, which elicited a change in brain perfusions within specific areas also related to CAN, namely bilateral ACC, R-vaINS, R-daINS, L-pINS, and L-PCC, is associated with the regulation of CAN on both sympathetic and parasympathetic components. Beissner *et al.* [9] proposal's regarding the distinction between sympathetic and parasympathetic may explain the different CBF reaction behaviours observed in the present study.
Cerritelli *et al.* [10, 15] only examined the immediate and one-month sustained effects of OMT on patients with chronic pain. Future research is required to determine whether this type of manual intervention has clinically and neurologically significant long-term benefits and, if so, what dosage, in terms of frequency and duration, is required.
In conclusion, osteopathic interventions may have some clinical benefits, but a deeper understanding of neurobiological mechanisms is required to optimise pain protocols and mitigate the long-term negative consequences of pain. Recent studies provides insight into the development and optimisation of novel pain management strategies by supporting the hypothesis that OMT can induce CBF changes by acting through autonomic responses.

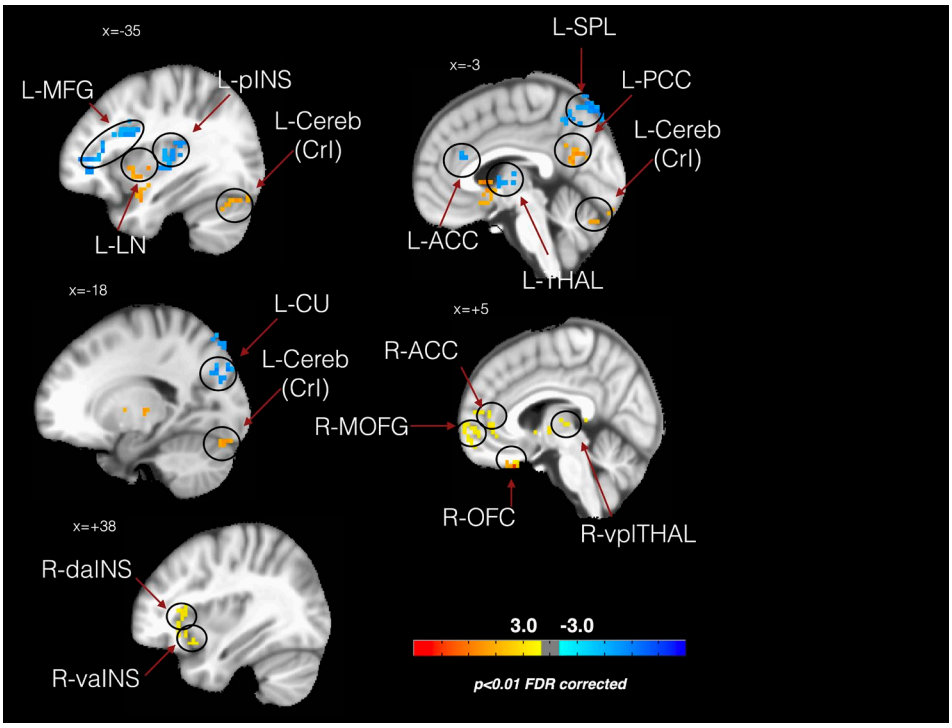

Fig 1. The effects of osteopathic treatment on pain matrix brain regions.

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09. Pediatric assessment in urgency-emergency pre-hospital settings: a cross sectional descriptive study introducing an assessment form

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Background: An effective paediatric emergency response in a territorial context requires early recognition of criticality, integration between the various professionals and coordination between the territory and the hospital. Therefore, a standardised and comprehensive assessment is necessary for optimal care and coordination between stakeholders. The aim of this study is to explore the assessment tools used to collect data on paediatric patients during 118 interventions in Italy. In the absence of a pediatric assessment tool in this context, the secondary objective was to develop a specific assessment form.
Methods: The 20 main emergency-urgency operating centres in Italy were contacted in 2020 through an e-mail asking them to send the assessment form used in pediatric settings. For the secondary objective a literature review for pediatric population (0–16) assessment tools used in emergency (last 5 years limit) was employed. On the basis, an assessment form was developed.
Results: Nine out of 20 units participated in the study (45%). The collection of anamnestic and symptomatological data from paediatric patients in pre-hospital settings in Italy is carried out using assessment tools used for adults and with a high degree of heterogeneity in data collection methods. Based on literature findings and adaptation from the adult assessment forms available, an assessment form specific for children aged 0–16 in urgency-emergency pre-hospital settings was developed. The main feature of the proposed tool is to standardize the working methodology and the quality of data collection for the best integrated care of the child on the territory.
Conclusion: The use of standardized assessment tools for the evaluation of pediatric patients in emergency territorial contexts is critical. Further research may be performed to evaluate the efficacy of the assessment form proposed in pediatric patients emergency pre-hospital assessments and to explore stakeholders' perceptions.

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10. Prolotherapy: a therapeutic strategy for the treatment of musculoskeletal pathologies and pain management

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Background: Prolotherapy is an infiltrative technique that involves use of hypertonic dextrose for the treatment of musculoskeletal disorders. A protocol of prolotherapy provides for the treatment of ligament injuries, tendinopathies and joint degenerations in order to restore the biotensegrity of damaged tissues stimulating a mild inflammation for regenerative purposes. The inflammatory response, generated by hyperosmolar glucose solutions, induces the healing process. Mild inflammation thus determines reduction in pain resulting in increased function of the anatomical structures involved. This is a pilot study to investigate the efficacy of prolotherapy on differentes musculoskeletal pathologies.
Methods: 26 patients considered candidates for prolotherapy treatment were examined and selected starting from December to May 2021 at the outpatiens Physical Medicine and Rehabilitation of the Internal Medicine Department of the Policlinico Umberto I. Treatment consisted in 3 infiltrations sessions (performed 1 a week for 3 weeks) and a subsequent one-month follow-up. For injections was used: Lidocaine 2%, Glucose 5% and Glucose 33%, lidocaine to

have loco-regional anesthesia, glucose to treat target entheses and joints. We assessed the patients with clinical examination and primary outcome measures was NRS scale for the staging pain. All patients underwent an RX or ultrasonography scanning, according the differentes pathologies before the treatment.
Results: Were included in the study: 7 patients with 1st trapeziometacarpal joint OA (NRS pre treatment 7.8 ± 0.8 post treatment 1.2 ± 1.1), 7 patients with knee pain (NRS pre treatment 7.5 ± 0.7 post treatment 3.2 ± 1.5), 4 lateral epicondylitis (NRS pre treatment 7.5 ± 0.9 post treatment 2 ± 1), 4 with lumbosciatalgia (NRS pre treatment 7.2 ± 1.2 post treatment 2.2 ± 0.2), 1 Morton's interdigital neuroma (NRS pre treatment 8 post treatment 1), 2 plantar fasciitis (NRS pre treatment 8 ± 0.3 post treatment 1.5 ± 0.7), 1 long head tendinopathy of the brachial biceps (NRS pre treatment 9 post treatment 5). 26 patients have been recruited, for a total of 80 infiltrative therapy sessions.
Conclusion: The clinical findings, one month after the last infiltration, shows a reduction in pain (as rated by NRS scale) and an improvement in the clinical and functional patients' conditions.

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11. Totally implanted vascular devices and the insertion of the Huber needle: a proactive protocol for reducing procedural pain

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Background: The use of totally implanted vascular devices (TIVADs) in cancer patients involves the introduction of the Huber needle in the subcutaneous reservoir for the infusion of liquids or blood sampling. The insertion procedure, inevitably, is painful for the patient, due to the characteristics of the non-coring needle and the skin puncture. Precedent studies evaluated pain during Huber positioning, rating on the numerical rating scale (NRS) on a range of 1–4. Procedural pain score is also different to the type of port: thoracic (CICC-port) NRS 1–3, brachial ports (PICC-port) NRS 2–4 and femoral ports (FICC-port) NRS 2–3. The Huber positioning technique is influenced not only by patients' characteristics and device placement but also by the clinician's skills and abilities. These can lead to procedural failure and the need to repeat the attempt. If the first attempt fails, subsequent insertion attempts will result in progressively more pain for patients, registering a high NRS score for pain.
Methods: A cross-sectional study has been conducted, implementing a proactive protocol in clinical practice based on the Subcutaneous Port Investigator Assessment (SPIA) and Needle Insertion Difficulty Algorithm (NIDA). The SPIA method evaluated the type of subcutaneous port implanted and is predictive of the degree of Huber needle inserting difficulty, into the port. NIDA algorithm matched the difficulty of the procedure with the skills of the clinician, basic or expert. The study has enrolled patients with TIVADs admitted to the day hospital, outpatient clinic or ward of an Italian Hospital. The NRS was administered to patients for assessing procedural pain related to Huber insertion using a range from 0 to 10.
Results: 297 patients have been enrolled, mostly with CICC-port and PICC-port. Implementation of the proactive protocol for the management of TIVADs has registered a diminution of the number of Huber needle failed insertions. Patients have rated a procedural pain score on a mean of NRS 2 (range 0–10). Furthermore, the patients showed more confidence in the clinician's skills, increasing compliance and avoiding triggering anxiety, fear, and agitation, registered in the case of the procedure failure.
Conclusion: Patients' pain perception related to Huber needle insertion procedure can be reduced using a dedicated and proactive protocol, integrating the evaluation of the difficulty to place the Huber and the healthcare expertise in placing it. Patients accuse unsuccessful attempts to the clinician's inadequate skills or to difficult needle insertion, becoming nervous, triggering a gradual physical discomfort and increasing pain perception. The proactive approach ensures clinical appropriateness, eliminating failed attempts of the procedural procedure and avoiding the occurrence of psychosomatic symptoms that strongly influence the perception of pain.

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12. High-frequency spinal cord stimulation in failed back surgery syndrome patient: a case report

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Background: The treatment of Failed Back Surgery Syndrome (FBSS) is still a clinical challenge. Neuromodulation with spinal cord stimulation (SCS) has been shown to be effective for FBSS especially when leg pain is the predominant symptom that is not well controlled by drug therapy. In the last decade, it was developed high-frequency stimulation (HF-SCS), an alternative to low frequency stimulation (LF-SCS) traditionally used. Some recent studies seem to prove that HF-SCS would guarantee a superior analgesia compared with LF-SCS. However, there remains a deficit of real-world data of the effectiveness of HD-SCS.
Methods: In March 2019, a 75-year-old man, with hypertension, underwent a laminectomy L2–L5 due to Lumbar spinal stenosis. After a year, MRI showed anterolisthesis of L2 on L3 with medial disc herniation and Facet Joint Syndrome and patient reported radiculitis at the legs and severe low back pain (VAS 8–9). In December 2021, because drug therapy (acetaminophen, tramadole, eterocoxib and pregabalin) did not control the symptoms, our multidisciplinary pain team decided to use HF-SCS. After trial phase lasted 21 days with percutaneous epidural placement of two HF10-SCS leads (10 kHz Senza system, Nevro®) in general anesthesia at the T11–L1 level, with 50% reduction of the VAS scores, it was placed a permanent implantable pulse generator (Senza II, Nevro®).
Results: In trial phase and follow-up (at 1, 3, 12 month from definitive device placement) both low back and leg pain significantly decreased with VAS score reduction from 8 to 3 and from 4 to 2 respectively. Patient was able to completely and permanently stop tramadol and pregabalin (tapering gradually over 2 weeks) on follow-up assessment, only using analgesics NSAIDs occasionally.
Conclusion: This case report proves that HF-SCS is a valid treatment for patients with FBSS with low back and leg pain. Since HF-SCS is a technique with a higher cost than conservative therapy, it is mandatorily to accurately identify the target patient population including psychological screening and evaluation of comorbidity so as to have a positive cost-benefit ratio.

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13. Efficacy of hyaluronic acid and scrambler therapy for pain control in elderly patients with knee osteoarthritis: have more than one string to one's bow

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Background: Knee osteoarthritis (KOA) is highly prevalent in elderly patients. It is characterized by joint pain, functional impairment and important reduction in quality of life. Patients with KOA often have multiple comorbidities. Therefore, special attention should be paid to the possible interactions and adverse effects that systemic drugs can determine in this type of patients. NSAIDs are first line drug but their long-term use is limited due to their gastrointestinal, renal, cardiac, and hematological adverse effects. Alternative treatments are necessary where conventional treatments cannot be used.
Methods: We report the case of three patients with KOA characterized by severe pain (VAS 8–9) for more than four months and not very responsive to NSAIDs, treated with two alternative therapies: Scrambler Therapy (ST) and local injection of Hialuronic Acid (HA). A 67-year-old woman and a 78-year-old woman, both with hypertension and diabetes in treatment with oral hypoglycemic drugs were treated with ST. It was conducted with a set frequency of 43–52 Hz and a set stimulus strength of 5 mA The therapy was applied for 40 minutes/session for 4 days consecutive followed by two days of rest, according to a cycle of 8 sessions. A 66-year-old woman, in radiotherapy for pancreatic cancer already treated with chemotherapy, without evidence of osteoarticular metastases, was treated with local injection of HA (1 mL lidocaine 2%, and 2 mL HA 800–1200 Kd). In all three cases VAS was evaluated at 7 days from therapy and after 3, 6 and 12 months.
Results: In the two ST patients there was a significant reduction in algic intensity for 4 months (VAS 2) with an important improvement in the quality of life and a slight increase to 6 months (VAS 3). At 12 months of follow-up only one of the two patients had to resort to analgesics when needed (VAS 3–4). The patient treated with local injection of HA reported moderate algia at 4 and 6 months (VAS 4), and significantly reduced to 12 months (VAS 2–3).
Conclusion: ST and local injection of HA have proven to be valid alternative treatments for severe pain from KOA with results that are quite similar. In elderly patients and even more in patients with cancer that involves frequent movements for followup, clinical examinations and therapies, be able to reduce pain and make less painful the autonomy of the movements of everyday life, is an objective that is imperative to pursue and the two proposed therapies are often well tolerated solutions for KOA.

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14. Effects of sodium butyrate supplementation on neuropathic pain induced by paclitaxel-based chemotherapy

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Background: Paclitaxel (PTX) is one of the most widely used chemotherapeutic agents with a good efficacy in several types of solid tumors [1]. However, it is often associated with debilitating side effects. In particular, it has been reported that paclitaxel-associated intestinal changes could be involved in important central conditions, involving development of neuropathic pain [2]. Previous studies underline the beneficial effect of Sodium butyrate (BuNa), a gut microbial metabolite, in several acute and chronic pain conditions, inflammation and central nervous system diseases through different mechanisms [3, 4]. Therefore, the goal of our study was to investigate the effects of the intake of BuNa in attenuating chemotherapy-induced peripheral neuropathy (CIPN) in mice.
Methods: Mice received four intraperitoneal injections of PTX at the dose of 8 mg/kg on alternate days, as previously described [5]. BuNa was administered daily in drinking water starting from 30 days before the first injection of paclitaxel. After treatments, we performed different *in vivo* animal behavioural tests in order to evaluate pain and mood. Then, *ex vivo* experiments were conducted on different tissues (colon, spinal cord, serum) for biochemical analyses.
Results: Mice treated with PTX showed a significant inflammation state both at peripheral and central level. The chemotherapeutic altered gut functionality, as assessed by tight junction (TJ) family proteins expression ($^{*}p < 0.05$ *vs.* vehicle). In contrast, we found that BuNa repristinated permeability and integrity at colonic level in PTX-treated mice ($^{\#}p < 0.05$ *vs.* PTX). Furthermore, our data describe the efficacy of BuNa as valid preventive approach to improve neuropathic conditions induce by PTX. Indeed, this compound reduced mechanical and thermal allodynia in Von Frey and Acetone tests ($^{\circ\circ\circ}p < 0.001$ *vs.* PTX) and hyperalgesia in Randall-Selitto and Hargreaves tests ($^{\S\S\S}p < 0.001$ *vs.* PTX). These effects were mediated by cannabinoid (CB1) and opioid (μ) as demonstrated by their up-regulation in spinal cord

BuNa mice with respect to PTX mice ($^{\#\#}p < 0.001$; $^{\#}p < 0.01$ *vs.* PTX). Moreover, preventive BuNa decreased serum (TNF-α, IL-1β, IL6) and spinal cord (COX-2, iNOS) inflammation mediators suggesting an important anti-inflammatory activity ($^{\#\#}p < 0.01$ *vs.* PTX).
Conclusion: For the first time we revealed the protective effects of Sodium butyrate in paclitaxel-induced chronic pain. In conclusion, we hypothesized that preventive supplementations of SCFAs could be an optional strategy for managing chemotherapy side effects, with the potential to change clinical practice.

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15. Treatment of chronic pain in the large burn victim with scrambler therapy. A case report

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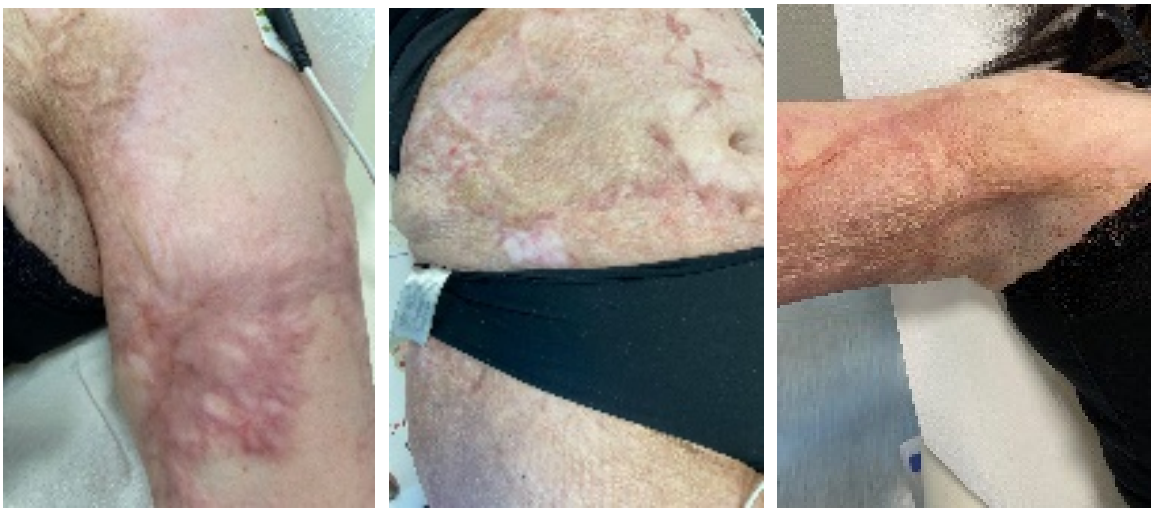
Patients surviving major burns often experience pain and itching of considerable intensity and difficult to control in both the acute and chronic periods. Chronic pain is accompanied by itching as a symptom, which is difficult to manage in clinical practice. Although there are numerous studies on the treatment of acute pain after severe burns, there is little knowledge on the treatment of pain and itching in the chronic period.
The aim of this paper is to report the results obtained in a 43-year-old patient with major burns over 45% of the body surface, resulting in keloid scars with development of chronic neuropathic pain refractory to medical therapy and itching unresponsive to treatment. Scrambler Therapy (ST) proposed as an alternative treatment for neuropathic pain is a non-invasive approach to treat pain by modifying pain perception in the brain. It is a safe treatment and requires further studies on neuropathic pain in the burn patient to evaluate its use in this patient population for symptomatic and quality-of-life improvement.



16. The importance of communication in the approach to the patient and the family

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I like to think that effective communication in the approach to patients with chronic pain is an acquired topic in the process of taking charge of citizens and their families who experience this condition. However, most of the courses in medicine and surgery do not include communication among their teachings. Thus, it becomes essential that communication tools and processes become a discipline of study and teaching where and as soon as possible. The perception of the quality of the assistance service offered is inevitably connected to the ability of health professionals to communicate.

Powerful communication in the medical field and, even more so, in the specificity of chronic pain is no longer an optional approach to be adopted at the discretion of the character predisposition of the operator on duty, it constitutes a practice that favors a path of reconciliation and pacification with respect to life of the patient and his total pain, which is one and only his Pain. A condition that inevitably involves the people who live their daily lives.

A strong description of how one can experience this uniqueness, combined with the need to see one's pain recognized, considered and treated as exclusive and incomparable to that of anyone else, comes to us from Tiziano Terzani in his pungent description of "fixers", dedicated to repairing his illness by detaching it from his person: "I was a body, a sick body to be healed. And I had a nice saying: but I am also a mind, perhaps also a spirit and certainly I am a heap of stories, experiences, feelings, thoughts and emotions that have probably had a lot to do with my illness! Nobody seemed to want or be able to take it into account ". What was attacked was an evil, with specific and manual approaches, with its incidence and survival statistics, an objective evil which, however, could never be the same as that experienced by another individual. "It can be anyone. But not mine! (...) To me as a person the good doctors-fixers asked for little or nothing. It was enough for my body to be present at the appointments that they set for it to undergo various 'treatments'".

The uniqueness is given by our Personal Reference System, that filter made up of knowledge, values, problems solved (or not) experiences, which each of us applies to read reality, ours. We carry it with us, we wear it like a pair of glasses, through whose lenses we decode the world, relationships, events, communication. The latter is particularly affected in delicate contexts such as medical and hospital ones, by the very personal parameters with which we welcome a communication process.

"(…) But the trouble that you, dear, will never know, nor will I be able to communicate to you how what you say translates into me. You didn't speak Turkish, no ... but what is your fault if the words are empty in themselves? Empty my dear. And you fill them with your sense, in telling me, and I in welcoming them, inevitably fill them with my sense. We thought we understood each other and we didn't understand each other at all."

This quote from Luigi Pirandello's "One, no one and a hundred thousand", introduces the theme of engagement and what I call the "communication tracks". To communicate and engage it is not enough to be competent, logical and rational. Because there is no dialogue between those who speak with their hearts and those who respond with their brains. Since communication is the act with which you share, an exchange of gifts between friendly walls, one cannot fail to take into account the multidimensionality that underpins the communication processes that have the ambition to be useful.

It is necessary to be aware of one's own communication style in order to activate the 3 main communication flows: verbal, non-verbal and paraverbal, not forgetting the percentages of incidence in the context of a communicative relationship: 7% verbal, 55% non-verbal, 38 % voice tone.

Communication processes, especially if in complex contexts such as in those of care, are never unidirectional (in this they differ from the mere flow of information), but live in the assumption of a circular structure, in which the actors of communication—it does not matter in what number are—in their healthy interaction, they build an ideal spherical structure, in which the roles of sender and receiver merge and interchange, in the game of verbal, non-verbal, paraverbal communication. An often unconscious "acting", which will be all the more successful in the objectives, in this case of refuge, safe harbor and therapeutic partnership, the more the actors are aware of the communication tools in their hands. In other words, communication will be all the more effective, the more the means are consciously chosen through which to establish a relationship made of analogue language (information on the content of the communication, objective, rational, clear) and digital language (the language of relationship: emotions , attitudes, expectations, experience), considering that, in different moments of the relationship, one type of communication can strategically prevail over the other.

Every request for treatment, precisely because it is never the same as itself, also contains a need for relationship. Ignoring this dimension would mean reducing medicine to the application of a technique, to the provision of services, bureaucratic distance. First of all, it is an encounter with a person, towards an approach that embraces the binomial pain therapy and relationship—medicine and humanity.

To be truly effective in the relationship of care with the patient and with those who are close to him, it is necessary to build a space for care and assistance that takes into account not only the physical but also the communicative needs of the relationship, for a true substantial process of humanization of the care, which does not remain a postulated void, but becomes a common and widespread practice. A new approach to care, made up of people who treat people.

At the center of attention there is not only the patient, in a moment of extreme fragility, with his clinical needs, but his needs for belonging and relationships with loved ones are equally important.
The patient, in a condition of extreme discomfort, faces a drastic and negative change in his own future or that of a loved one, whose perception varies from individual to individual, since it basically depends on the gap between one's expectations and reality (Gap by Calman).
In the fundamental communicative and relational approach that combines EBM (Evidence Based Medicine) with NBM (Narrative Based Medicine), the fragility given by pain, finds shelter and welcome in the sharing of the therapeutic path, in a true path of decision sharing and partnership.
Giorgio Bert writes: "(...) it is obvious that the interaction between doctor and patient will be guided by the doctor, who will take on the task of accompanying the patient in their choices and decisions; but accompanying does not mean pushing or forcing". The attentive and empathic modern doctor has at his disposal some approach methods that make the relationship with his patient valid and productive and that also give new meaning to Evidence-Based Medicine, such as Narrative Medicine.
During the negotiation process, compromises are reached on both sides and the decision is made together.
In chronic diseases the communication process is characterized by a mutual and reciprocal participation, however, whatever the doctor-patient relationship, it is necessary to keep in mind that one cannot not communicate, according to what is stated in the first axiom of communication defined by Paul Watzlawick, which represents, together with the other 4 postulates, one of the properties of communication. It is impossible not to communicate: there is no such thing as a communicative non-behavior. Words, silence or activity have message value, they influence others and others in turn respond to this communication with other reactive-adaptive communication or not.
Ultimately, the elements of an effective communication relationship can be contained in some golden rules: developing awareness of one's way of communicating, modifying it in relation to our interlocutor; listen actively, make use of feedback (make sure our message is reaching our interlocutor clearly); use of assertive communication; express yourself clearly; avoid medical jargon; use of metaphors, images, examples, brochures; pay attention to the consistency between what we say (what), how we say it (form) and our non-verbal communication.
Finally, dedicate quality time to building a communicative relationship with your client, especially if afflicted by a condition of chronic, total pain.
"You shouldn't heal the eyes without heal the head or the head without heal the body. So also you shouldn't heal the body without heal the soul. This is why the cure of many diseases is still unknown: since the Whole should be studied, since a specific part of the body cannot be well unless the Whole is well"
Plato (428–348 BC)

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17. miRNA-203b-3p induces acute and chronic pruritus via 5-HTR2B and TRPV4

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Background: Pruritus is an unpleasant sensation that causes the desire to scratch. It generally accompanies many inflammatory skin diseases, with devastating impact on patient quality of life. A subgroup of non-selective calcium permeable cation channels, predominantly expressed in a subpopulation of C- or Ad-fiber of dorsal root ganglion (DRG) neurons, namely the transient receptor potential vanilloid 1 and 4 (TRPV1 and TRPV4, respectively) and TRP ankyrin 1 (TRPA1) has gained increasing interest in a number of physiological and pathophysiological processes, including itch. TRPV1 and TRPA1 are implicated in signaling the acute and chronic itch evoked by histaminergic and

non-histaminergic stimuli. TRPV4 has also been reported to mediate serotonin (5-HT)-evoked itch, as around 90% of sensory neurons that respond to 5-HT express TRPV4, and neuronal response to 5-HT stimulation was reduced by TRPV4 genetic deletion.
MicroRNAs (miRNAs) are short, single-stranded, noncoding RNAs molecules which are increasingly investigated for their ability to regulate gene expression by binding the 3' untranslated regions of their cytosolic targets of mRNA (Hayes *et al.*). An unconventional signaling role of miRNAs associated with itch has been recently reported in a mouse model of cutaneous T-cell lymphoma. More recently, a miR-146a released from keratinocytes following TRPV4 stimulation by lysophosphatidylcholine, has been identified as key signaling molecule in cholestatic itch.
We speculated that miRNA dysregulation is mechanistically implicated in itch associated with inflammatory skin diseases. Since the miRNA signature of psoriasis is well characterized, we investigated whether miRNAs, including miR-203, miR-184, miR-135b, miR-142-3p, miR-21 and miR-31, which have been shown to be upregulated in skin biopsies of psoriatic patients could elicit and mediate itch in a mouse model of psoriasis.
Methods: Sprague-Dawley rats were used. The following strains of mice were used: C57BL/6J mice; wild-type ($Trpa1^{+/+}$) and TRPA1-deficient ($Trpa1^{-/-}$) mice; wild-type ($Trpv1^{+/+}$) and TRPV1-deficient ($Trpv1^{-/-}$), wild type ($Trpv4^{+/+}$) and TRPV4-deficient ($Trpv4^{-/-}$) mice, and Advillin-Cre (Adv-Cre^{+} and Adv-Cre^{-}) mice. Mouse model of psoriasis. Cell lines, primary culture of rat and mouse DRG neurons and mouse keratinocytes. Calcium imaging. Live cell labeling and immunocytochemistry in mouse DRG neurons. Fluorescent *in situ* hybridization (FISH). qRT-PCR. *In vitro* model of psoriasis. Virus Generation. miRNA measurement by qRT-PCR. Multi-analyte ELISA assay. Molecular modeling.
Results: We show that genetic deletion or pharmacological antagonism of TRPV4 attenuated itch in a mouse model of psoriasis induced by topical application of imiquimod. Human psoriatic lesions showed increased expression of several miRNAs, including the miR-203b-3p, which induced a calcium response in rodent dorsal root ganglion neurons and scratching behavior in mice *via* serotonin receptor 2B (5-HTR2B) activation and protein kinase C-dependent phosphorylation of TRPV4. Computer simulation revealed that the miR-203b-3p core sequence (GUUAAGAA), that causes 5-HTR2B/TRPV4-dependent itch, targets the extracellular side of the 5-HTR2B by interacting with a portion of the receptor pocket consistent with its activation.
Conclusion: We reveal an unconventional pathophysiological role of an extracellular miRNA as itch promoter *via* 5-HTR2B and TRPV4.

18. No evidence for an effect of selective spatial attention on the development of secondary hyperalgesia: a replication study

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Central sensitization refers to the increased responsiveness of nociceptive neurons in the central nervous system after intense or sustained peripheral nociceptor activation. It manifests as increased sensitivity to mechanical stimuli at the injured location, but also in the surrounding area (secondary hyperalgesia), and is hypothesized to play a key role in the development of pain chronicity. Because of their ability to control the transmission and the processing of nociceptive inputs, cognitive factors represent potentially flexible mechanisms that could affect the development of central sensitization, making attention a promising intervention target for preventing and treating chronic pain. In support of this hypothesis, it was recently shown that the experimental induction of central sensitization using high-frequency electrocutaneous stimulation (HFS) can be modulated by encouraging participants to selectively focus their attention to one arm, to the detriment of the other arm, resulting in greater secondary hyperalgesia on the attended arm as compared to the unattended one. Given the potential value of the question being addressed, we conducted a preregistered replication study in a larger independent sample to assess the robustness of this mechanism. In a double-blind, within-subject design, study we investigated the impact of selective spatial attention on the development of secondary hyperalgesia. Sixty-seven healthy volunteers performed a task that required focusing attention towards one forearm to discriminate innocuous vibrotactile stimuli while HFS was applied on both forearms simultaneously. Mechanical sensitivity was assessed using a probe exerting a force of 128 mN. The assessment was repeated three times throughout the experiment: at time T0 for a baseline measurement, at time T1, immediately after the bilateral delivery of HFS in combination with the detection task, and at time T2, 20 minutes after the whole procedure. At T2, we also assessed the spatial extent of mechanical sensitivity along (1) the proximal-distal and (2) the medial-later axes. Our results showed a significant increase in mechanical sensitivity directly (T1) and 20 minutes (T2) after HFS. However, in contrast to the previous study, we did not find a significant difference in the development of secondary hyperalgesia between the attended vs unattended arm. At face value, our results imply that spatial selective attention does not affect the

development of secondary hyperalgesia. Alternatively, the non-replication could be because the bottom-up capture of attention caused by the HFS pulses was too strong in comparison to the top-down modulation exerted by the attentional task. In other words, the task was not engaging enough and the HFS pulses, including those on the unattended arm, were too salient to allow spatial attention to be selectively focused on one arm and to selectively modulate processing of somatosensory inputs. To enhance the efficiency of selective attention modulation, we may need to reconsider the engagement and the role of goal-relevance of the task used to manipulate attention.

Keywords: Central sensitization; Top-down modulation; Replication study

19. Laser treatment in post-menopausal women with vaginal atrophy: pain perception. Preliminary data

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Introduction: The menopause is an event associated with reduced ovarian function resulting in a reduction in sex steroids. The menopausal transition is experienced by 1.5 million women each year and the average age of onset is 51 years [1]. Many symptoms are attributed to the menopause, but only vasomotor dysfunction and vaginal dryness are consistently associated with this condition [2]. Particularly, the Genitourinary Syndrome of Menopause (GSM), due to the natural decrease in estrogen levels, is a condition characterized by atrophy of the vulvovaginal tissues, with reduced lubrication, diameter and elasticity of the introitus and vaginal canal [3]. Treatment with "fractional CO_2 laser" appears to be effective and safe in improving GSM in postmenopausal women [4], but may be burdened by procedural pain.
Aims of the study are:
- measure the intensity of pain reported by women during the procedure (NRS 0–10)
- compare current pain with expected pain
- assess the degree of satisfaction expressed by the women

Methods: The prospective observational study is carried out at the "Pelvic Center" outpatient clinic of the S. Salvatore Civil Hospital in L'Aquila, in collaboration with the Department of Anaesthesia, Resuscitation, Pain Therapy and Palliative Care. Period considered: 15 March–31 May 2022 (study still in progress). (Authorization E.C. L'Aquila-Teramo, 09 March 2022). Patients who are candidates to receive treatment with "fractional CO_2 laser" undergo a preliminary interview, to provide information on the proposed treatment, collect their medical history and obtain, when the inclusion criteria are met, written informed consent to the performance of laser treatment and participation in the study. The procedure, performed on an outpatient basis, does not involve anaesthesia. The decision on how many treatment cycles are needed is made by the gynecologist.
Results: Twenty-five post-menopausal women were treated intravaginally with infrared CO_2 laser during the period under review, (number of treatments performed: 64). The treatments were generally well tolerated. The NRS score gave the following results (mean ± SD):
- at probe introduction: 3.5 (±1.9)
- at probe rotation: 4 (±2.1)
- during the laser pulse: 4.9 (±2.8)
- at probe removal: 4.2 (±2.2)

The pain experienced during the procedure was for 85% of the patients equal to expectations. 77% of the women were completely satisfied with the treatment, 22% satisfied; only 3% did not benefit from it.
Conclusion: These preliminary results support the premise that CO_2 laser treatment provides an effective treatment option for postmenopausal patients with vulvovaginal atrophy, with moderate pain during the procedure. The laser represents a suitable alternative to hormonal or topical therapies, when not recommended.

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20. Medical cannabis to reduce opioid-withdrawal symptoms in long-term opioid treatment for chronic pain: systematic review and meta-analysis

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Background: Preclinical studies attested the cross-regulation between cannabinoid and opioidergic pathways showing how cannabinoids can allosterically modulate opioid receptors influencing MOR activity. Furthermore, chronic exposure to opioids produces profound changes in the endocannabinoid system, contributing to behavioural abnormalities emerging during the early abstinence phases. This is presumably due to the implication of the endogenous cannabinoid system in the maintenance of drug addiction [1].
So, targeting the endogenous cannabinoid system is considered a viable therapeutic strategy for opioid use disorder and the administration of cannabinoid agonists is shown to reduce the severity of precipitated opioid withdrawal, possibly acting on the noradrenergic cells of coerulea-cortical modulating their signalling pathways [2].
Methods: The review protocol is under assessment on the PROSPERO International Prospective Register of Systematic Reviews (Registration ID 340937).
This Systematic review has been performed using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines (PRISMA 2020 Guidelines).
The formulation of the clinical question has been conducted following the PICO model.
A prior search on Medline has been performed to discover the Keywords and MeshTerms to assemble multiple query strings to find all the published studies that evaluate the efficacy of medical cannabis in reducing opioid withdrawal symptoms for patients with long-term opioid treatment. The search strategy aimed to find only RCT published in full in peer-reviewed journals. Only studies published in the English language have been selected with no restriction on publication date.
A bibliographic search has been performed consulting Ovid Medline, Embase, and Cochrane Library.
Two authors are independently evaluating the titles and abstracts of potentially eligible studies. Data will be extracted independently, using the Cochrane-Data collection for intervention reviews for RCTs only-template, and the results will be cross-checked. Two authors will independently assess study quality using the Version 2 of the Cochrane risk-of-bias tool for randomised trials (RoB 2), and results will be cross-checked.
Engaged papers will, where possible, be pooled in a statistical meta-analysis.
Where statistical pooling is impossible, the findings will be presented in narrative form.
Preliminary results: The search strategy provides 1056 studies from Medline, 429 from Embase and 50 from Cochrane Library. After duplicates have been removed a total of 1393 studies have been selected to be potentially included in this systematic review.
Conclusion: Preliminary searches and the study selection process have been completed and the formal screening of search results against eligibility criteria is ongoing.

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21. Treatment of neck and arm pain with CDT-Light carboxytherapy: a case report

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Introduction: Carboxytherapy is a treatment born around 1930 that originates in the area of thermal medicine through the use of carbon dioxide baths and showers.

Carboxytherapy performed in a doctor's office, on the other hand, consists in percutaneously injecting a gas: carbon dioxide, or carbon dioxide, a gas consisting of a carbon atom bonded to two oxygen atoms.
It is mainly used for the treatment of vascular diseases in aesthetic medicine, with an excellent action on microcirculation on localized fat deposits, on skin imperfections; in angiology in arteriopathic patients, in dermatology in the treatment of psoriasis.
Today it is now demonstrated that the insufflation of subcutaneous carbon dioxide (Carboxytherapy) also provides good support with an excellent analgesic effect on musculoskeletal pain, tendinopathies and tendinitis, with a clear reduction in the need for taking drugs and, consequently, for side effects.
Materials and Methods: In the medical clinic of the Dermoclinique center she underwent treatment with CDT-light carboxytherapy, a 50-year-old patient suffering from chronic cervicobrachialgia partially responsive to drug therapy with NSAIDs and paracetamol. At the time of the medical examination, the patient complained of algesia of intensity NRS >5 static and NRS >7 dynamic, peripheral paraesthesia and dysaesthesia of the right upper limb and multiple trigger points in the trapezius muscle and the sternocleidomastoid muscle hypertension.
The patient underwent 2 weekly sessions of carboxytherapy with CDT-light method for a total of 10 treatments. A 30 G/13 mm needle was used with therapeutic flow of 100 cc/min, temperature of 45 °C and needle inclination of 90° with deep infusion also intramuscularly according to CDT scheme with infusion per injection site of 10–15 cc.
Results: T0 total NRS 6, T1 (V session) NRS 3, T2 (X session) NRS 0. During the entire therapeutic process, the patient did not take NSAIDs and/or analgesics as needed. It was also noted the disappearance of trigger points.
Comments: CDT-light carboxytherapy finds significant indications and in this case in the field of analgesic therapy it allows the treatment of various acute, subacute and chronic pathologies on a basis. The studies carried out show that the results obtained from the application of carboxytherapy in the treatment of pain are the reduction of pain, in some cases in a decisive manner, the improvement of joint function, the reduction of the pain threshold, the resumption of normal daily activities in severe cases and motor activity.
Thanks to this analgesic and curative effect, carboxytherapy is also to be considered a good support to physiokinesitherapy.

Online resource

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22. Effect of opioid *vs.* nonopioid medications on pain management in acute musculoskeletal injury: a systematic review protocol

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Background: In the late nineties, the pharmaceutical industry reassured the medical community that patients would not become addicted to opioids prescribed to help relieve pain; based on this reassurance medical doctors have prescribed opioids at greater rates [1]. Increased opioid prescription led to more than 932,000 people having died since 1999 from a drug overdose [2]. In 2020, 91,799 drug overdose deaths occurred in the United States of America, and 68,630 overdose deaths (74.8% of all drug overdose deaths) involved opioids [3]. Because of the increasing recognition of the opioid crisis, several scientific societies have released guidelines for safe opioid prescribing [4, 5]. Unfortunately, no systematic review of the literature with a meta-analysis of the manuscripts that focus on the topic has been conducted. Thus, we aimed to produce a systematic review and meta-analysis that can be used by orthopaedic practices and other specialities to improve the management of acute pain following musculoskeletal injury.
Methods: We have prospectively recorded a protocol on the International Prospective Register of Systematic Reviews (PROSPERO): CRD42021279639. The review question is "How does the use of opioid medications, as compared to non-opioid medications in pain management, affect pain intensity over the short, intermediate, and long-term in adults with Acute Traumatic Pain?". A systematic electronic search will be conducted on MEDLINE and Google Scholar, only controlled studies published in full after peer-review will be considered. The PICO framework used to develop literature search strategies is P: Adult patients with traumatic injuries, I: Opioid medications, C: Non-opioid medications, O: A minimum clinically important difference (MCID) in pain. The overall quality of the evidence will be assessed using the

Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. Evidence will be defined as high quality, moderate quality, low quality, or very low quality. It can be downgraded by study quality (risk of bias), inconsistency of results, and imprecision. The risk of bias for individual studies will be rated by two authors at the study level using the Cochrane Collaboration Risk of Bias Tool.
Results: The review is expected to be completed at the end of September 2022
Conclusion: The opioid crisis is a major health problem. The recommendations that must be produced using a robust repeatable methodology. This is, to our knowledge, the only prospectively published systematic review protocol focusing on Pain Management in Acute Musculoskeletal Injury.

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23. Validation of E-health Tool as an appropriate referral and selection method for spinal cord stimulation in patients with chronic pain: an explorative cross-sectional study

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Background: Spinal cord stimulation (SCS) is an established treatment for chronic neuropathic, neuropathic-like and ischaemic pain [1–5]. In order to overcome the difficulty and variability in patient selection, due to clinical and psicosocial factors [6], a multidisciplinary team of experts has created the "E-health Tool" questionnaire, which is freely available at this link: https://www.scstool.org [7]. The aim of this study is to explore the degree of agreement between the opinion of the physician and the E-tool regarding the probabilities of success of SCS in order to validate the effectiveness of E-Tool in daily clinical practice.
Methods: An explorative cross-sectional study was conducted considering patients enrolled in the ICS Maugeri of Pavia in period of eight months.
At the baseline, namely the day of screening trial implant, we collect informed consent and the SCS success probability according to physician's (expressed in terms of "high", "medium" or "low"), and E-Tool's opinion (expressed in terms of "strongly recommended", "recommended" or "not recommended"). To evaluate agreement between two opinions data were compared as follow: "strongly recommended" E-Tool's opinion agrees with "high" physician's opinion, "recommended" agrees with "medium" and "not recommended" agrees with "low". We do not consider any difference between spinal cord or dorsal root ganglion stimulation or among different parameters of stimulation.
Descriptive statistics were used to summarize data. In order to evaluate agreement of the physician's and E-Tool's opinion Kendall tau coefficient was calculated (values ranges from −1 to +1 where 0 indicates no agreement and 1 perfect agreement). Statistical significance was set at $p < 0.05$, STATA13 was used.
Results: A total of 35 patients underwent trial implant . In the sample mean age was 63.26 ± 14.03 years and 51.4% were male. Among these patients, 3 did not success the trial and 3 didn't have concluded the trial yet, therefore 29 patients underwent to permanent implant (T1).
We observed that patients with a high probability of success according to the physician obtained an E-Tool rating "strongly recommended" in 59% and "recommended" in the remaining 41%. Patients with a medium probability according to the physician obtained an E-Tool rating "strongly recommended" in 25% of cases and "recommended" in 75%.
The Kendall coefficient in our results is 0.32, indicating a moderate agreement between the two opinions ($p = 0.053$).
Conclusions: Preliminary results show a moderate degree of agreement between E-Tool's and physician's opinion. Further studies, aimed to evaluate the agreement with a higher sample size, are needed in order to confirm our results.

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24. Pain assessment in autism spectrum disorder: cognitive behavioral approach

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Introduction: Autistic subjects frequently display sensory anomalies. Those regarding nociception and its potential outcome, pain, are of crucial interest. Indeed, because of numerous comorbidities, autistic subjects are more often exposed to painful situation. Despite being often considered as less sensitive, experimental studies evaluating this point are failing to reach consensus. Most often, in adults who are conscious and in children over 6, the methods used are direct and subjective, based on self-assessment. Due to communication deficits that characterize autistic individuals, as well as the associated potential intellectual deficits, is very difficult, except for high level functioning autism, to assess the pain using conventional self-assessment tests. Currently, no protocol for measuring pain in all ASD patients has been validated, but hetero-assessment scales, validated in children who are unable to communicate verbally or who have significant cognitive deficits, can be used in some autistic children.
Methods: Narrative literature review on PubMed, ILISI and Google Scholar. Limits: review, last ten years. After this, due to the lack of results in finding specific tools in the cognitive behavioral field, studies of lesser reliability were also included (like clinical trial).
Results: In literature there aren't instruments for assessing pain in ASD with cognitive-behavioral approach. Reported a cognitive-behavioral schedule in 2010 for cognitive behavioral approach in ASD.
Hetero-assessment scales, validated in children who are unable to communicate verbally or who have significant cognitive deficits, can be used in some autistic children. Recently, NCCPC scale (pain checklist of noncommunicative children) was validated in French, under the name of GED-DI (intellectual disability pain assessment grid). Use of Wong Baker FACES Pain (WBFPS) Scale. Results suggest a role for behavioral-based educational interventions to promote communication of pain in people with ASD.
Applied Behavior Analysis (ABA)—a cognitive behavioral approach—has repeatedly demonstrated improvements in cognitive, linguistic, adaptive, and social impairments in children with ASD.
Following the information gathered from a survey in a pediatric hospital in Italy, a behavioral cognitive schedule was drawn up to help nurses in the difficult task of taking care of the hospitalized and not autistic child. This schedule is finalized to the creation of an individualized behavioral planning during hospitalization and at home and is a help for care team in communication with autistic subject.
Conclusion: Implementation of cognitive behavioral schedule, adding a section for pain evaluation, could be an innovative approach in assessment of pain in ASD.

25. An atypical case of frontotemporal brain sagging syndrome successfully treated with two epidural blood patches: a case report

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Background: Frontotemporal brain sagging syndrome (FTBSS) is a rare syndrome caused by spontaneous intracranial hypotension (SIH), that mimics the clinical findings of behavioral variant frontotemporal dementia (FTD). The most frequent symptoms described are disinhibition, apathy or hypersomnolence, followed by hyperorality, dysphagia and dysasthria, togheter or not with typical SIH symptoms. The onset of FTBSS is insidious and progressive, similar to FTD, and, similarly, it involves middle-aged males. However, differently to FTD, FTBSS is a potentially treatable disease. Bed rest , hydration and epidural blood patch are the main treatments proposed if no leak is identified.
In the present case report, we describe a case of atypical FTBSS that was preceded by orthostatic headache in a middle-aged male, successfully treated with two epidural blood patches.
Case report: A 56-year-old man with no previous medical history presented to our hospital for the evaluation of intractable bifrontal orthostatic headache, started ten days before, with no history of trauma. The patient referred also vertigo and dizziness. The MRI of the brain revealed small subdural collections, and downward displacement of the cerebellar tonsils. with intense pachymeningeal enhancement and no cerebrospinal fluid leakage. Bed rest was prescribed, togheter with aggressive hydration for four days. Unfortunately, while subjective symptoms moderately improved (*i.e.* vertigo and headache), the patients developed agitation, disinhibition and personality changes, such as speaking loudly in a quiet waiting room, joking, and showing garrulousness during examination. No hypersomnolence, dysphagia or dysasthria was noticed. A second MRI confirmed the first findings. The combination of frontotemporal dysfunction and the appearance of a sagging brain on MRI suggested a diagnosis of FTBSS. The patient underwent an epidural blood patch at L2 L3 level, under fluoroscopic guidance. After infusing 20 mL of autologous blood, the patient complained of back pain, which prompted the stoppage of the procedure. His symptoms, such as disinhibition and agitation partially improved and a second epidural blood patch was deemed necessary after 14 days at L3 L4 level, under fluoroscopic guidance. The patient allowed the infusion of other 20 mL of autologous blood, but the procedure was stopped for pain and bradycardia, treated promptly with intravenous atropine. After 1 week the symptoms were markedly improved, all personality changes disappeared, the patient was discharged home and returned to work.
Discussion: In the present report, the patient presented orthostatic headache and other typical symptoms of SIH that were controlled by medical therapy, but developed later agitation and personality changes without apathy, dysphagia and dysasthria, suggesting an atypical FTBSS. The second MRI confirmed clinical suspicion, and therefore an epidural blood patch was performed. The partial resolution of symptoms suggested to repeat a second epidural blood patch, with other 20 mL, and this allowed a complete and rapid resolution of all disturbances.
Conclusion: The diagnosis of FTBSS should be considered also in patients with atypical presentation. Large volumes or repeated procedures can represent a successful early treatment when conservative treatment fails, even if the exact leak location is unknown.

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26. Effect of receptive music therapy on pain, anxiety and heart rate variability during percutaneous renal biopsy: a randomized controlled trial

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Background: Percutaneous renal biopsy (PRB) is the gold standard procedure for the diagnosis of glomerular kidney diseases in order to apply the most appropriate treatment options.
PRB is performed while the patient is awake. It usually required a local anesthesia but it is frequently associated to anxiety, stress and pain before, during and after the procedure.
Although emotional distress and pain may be managed by the administration of anxiolytic, analgesic, and anesthetic drugs, those are hampered by potential side effects.
Music therapy (MT), defined as the clinical and evidence based use of music, requires the implementation of a music

intervention by a trained music therapist, the presence of a therapeutic process, and the use of personally tailored music experiences.
The main objectives of the study were:
1. evaluate the effectiveness of music therapy (MT) in managing anxiety, pain and satisfaction in patients undergoing PRB.
2. investigate the effect of MT on heart rate variability (HRV).
Methods: This study was a two-arm, single-center, parallel-group, and pre-post PRB randomized controlled trial. Patients programmed for PRB were enrolled (n = 80) and assigned to the music therapy intervention group (MG, n = 40) or to standard treatment (CG, n = 40). MG received, from a FAMI (Fellow of the Association for Music and Imagery) certified music therapist, a tailored music listening according receptive MT techniques, administered before and during the PRB.
State Y-1 Trait Anxiety Inventory (STAI-Y1) was used to assess patient's anxiety before and after PRB.
Self-assessment of Pain and Satisfaction were collected with a Visual Analogic Scale (VAS-P; VAS-S).
Physiological stress parameters (PRE-POST) were assessed using HRV (SDNN - Standard deviation of normal-to-normal interval, RMSSD-Root-mean-square of successive difference, LF/HF (LF-Power in the low-frequency range, HF-Power in the high-frequency range, LF/HF- LF power in normalized units), SD1, SD2) from E4wrist bands medical device.
E4 was placed 5 minutes before the patient entered the operating room for PBR and was removed after the completion of the PRB. The data of each session were divided into 2 segments: (1) Pre, before the administration of the local anesthetic and (2) Post, after the conclusion of the biopsy.
Results: Lower VAS-P values (4.95 ± 1.377 *vs.* 6.28 ± 1.281; $p < 0.001$) and higher VAS-S values (7.75 ± 0.981 *vs.* 6.03 ± 0.800; $p < 0.001$) were recorded after PRB in MG compared to the CG group (Fig. 3). A statistically significant difference in anxiety levels was observed between the MG and CG groups (35.35 ± 6.208 *vs.* 42.83 ± 9.027; $p < 0.001$). The SDNN ($p < 0.034$), RMSDD ($p < 0.04$) and SD2 ($p < 0.027$) measurements of HRV were significantly higher in MG than in CG, while LF/HF decreased ($p < 0.033$).
Conclusion: This study supports the efficacy of MT in reducing pain and anxiety and improving satisfaction in patients undergoing PRB. MT affects the autonomic nervous system, increasing parasympathetic activity and inducing physiological relaxation.

27. Epidural injection with only local anesthetic for lumbosacral radicular pain: a case report

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Lumbosacral radicular pain is a syndrome involving patients who report radiating leg pain [1].
Epidural steroid injections (ESIs) are often combined with local anesthetic (LA) and injected to reduce pain associated with various chronic non-cancer pain (CNCP) complaints. The biological rationale behind injection of a steroid solution is unclear, and it is uncertain whether the addition of steroids offers any additional benefits over injection of LA alone [2].
Case Report: A 70 years old woman came to our clinic with acute pain in the left lumbar and left leg related to L5–S1 radiculopathy.
The patient reported skin rash and angioedema after a previous epidural with only triamcinolone.
The patient was unable to walk and was crying with pain.
The computer tomography (CT) showed disc herniation at the L4–L5 level.
Method: After having signed the informed consent, in a sterile way, the patient receives only the local anesthetic (bupivacaina 5 mg and ropivacaina 4 mg in a total volume of 6 mL with physiological solution) in the lumbar epidural space L4–L5 via interlaminar approache. Clinical evaluation was performed before, immediately after (24 hours) and 1, 3, and 6 months after injection with Visual Analog Scale (VAS) and Oswestry Disability Index (ODI).
Results: The patient had an immediate reduction that continued of VAS (before 10, immediately 4, 1 month 4, 3 month 3, 6 month 3) and ODI index (before 82% , immediately 40%, 1 month 35%, 3 month 30% , 6 month 30%).
Conclusion: ESIs have been widely used for over 50 years in the treatment of low-back pain with radiculopathy. Most interventional pain physicians strongly believe in their efficacy and safety [3]. Recent Cochrane systematic reviews have disclosed controversial results and have questioned the effectiveness of ESIs. Moreover, in selected patients, epidural injection with only LA is possible to eliminate the side effects of steroides (nausea, headache, dizziness, vasovagal attack, flushing of the face… [4]) and so repeat injection more frequently.
Further studies are needed to evaluate the true role of cortisones at the epidural level.

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28. Pain therapy: the family doctor's daily challenge

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The pain symptom is undoubtedly the "primum movens" inducing the patient to contact his/her doctor and it is present in its different manifestations in our studies practically every day.

Classification: Pain can be distinguished on the basis of chronological data and/or according to the response to a potentially algogen stimulus. Chronological Response: (a) acute pain, (b) chronic pain. Magnitude response (a) physiologic pain: (b) pathologic pain.

Acute pain: symptom deriving from the activation of a sensorial system signalling a potential or actual tissue damage. This symptom, which has a limited duration and a recent start, is connected with an identifiable lesion and/or pathology.

Chronic pain: pain lasting over 3–6 months: in this case it is no longer considered a symptom but an illness by itself.

Physiologic pain: adaptive response of the body to proper stimuli avoiding potentially malign lesions.

Pathologic pain: response of the body to stimuli which are physiologically incapable of causing pain; it is due to the development of phenomena of hypersensitivity which lower the threshold of pain.

Epidemiology of chronic pain

Neoplastic chronic pain

Chronic pain affects about 50% of all neoplastic patients and 75% of terminally ill patients. 96% of these patients feel pain at least once a month, 74% more than once a week, 50% feel pain every day (source: E.A.P.C. I European Association for Palliative Care/European Pain in Cancer)

Non-neoplastic chronic pain: Non-neoplastic chronic pain affects about 19% of the European population, with an incidence of 56% in female patients and 44% in male patients (source: Eurostat).

Data concerning Italy are in accordance with the European data, in fact chronic pain affects about 20% of the population, with an incidence of 70% in women and about 30% in men.

Pharmacological therapy: A correct therapeutic approach implies a measurement of pain intensity and criteria of appropriateness. Pain scales are helpful to measure pain intensity. The easiest ones to administer to patients are the following:

• VAS (visual analogic scale): no pain ---------- worst pain
• VNS (visual numerical scale): no pain O 1 2 3 4 5 6 7 8 9 10 worst pain

The WHO (World Health Organization) recommends to treat oncological pain with the sequential use of three categories of pharmaceutical drugs according to a step progression (sequential approach).

The three steps of the analgesic scale correspond to the following groups of drugs: (1) NSAIDs: (2) Minor opioids; (3) Major opioids.

Conclusions: The struggle against pain is as old as mankind but pharmacopoeia has had effective tools at its disposal only for a short time.

Among the "well-deserving" people of this battle mention must be made of the German chemist Serturner, who isolated morphine from opium, calling it after Morpheus, the god of dreams, in XVIII century. Now pioneer time is over and these pharmaceutical drugs cannot but be used correctly to free the patient, if not from illness, from ensuing physical suffering at least.

29. Case series: neuropathic pain and amyotrophic lateral sclerosis

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Introduction: Amyotrophic lateral sclerosis (ALS) is a rare neurodegenerative disease. Primary cause of neuropathic pain, very frequently present in these patients, may be impaired somatosensory pathways. Degeneration of IENF (intraepidermal nerve fiber), which are terminal nociceptors, greatly increases the risk of developing neuropathic pain in patients with peripheral neuropathy. The most commonly used pain medications in ALS are NSAIDs, acetaminophen, pregabalin, and tricyclic antidepressants. Opioids are the second option.
Case report: We report a case series of two patients suffering from amyotrophic lateral sclerosis and neuropathic pain. Both patients reported severe pain with mean VAS 80 mm and DN4 6/10 each. Both were treated with tapentadol 25 mg twice daily and pregabalin 25 mg twice daily. They were also treated with a non-drug therapeutic program featuring manual treatment, regular stretching, and passive and active mobility exercises. After 36 h from the treatment both reported an improvement of painful symptoms with an average VAS 40 mm and DN4 3/10. After 15 days of this multidisciplinary therapy, the VAS was 10 mm in both patients and the DN4 was 0. None had respiratory depression or worsening hypoventilation, deterioration of consciousness and impaired gastrointestinal motility.
Conclusion: This treatment has been shown to be safe and effective in treating ALS-related neuropathic pain, but an extensive literature review and several studies are needed to better understand the treatment of the painful condition of this type of patients.

30. Is electrocatheter-mediated high-voltage pulsed radiofrequency of the dorsal root ganglion an effective adjuvant to epidural adhesiolysis in the treatment of chronic lumbosacral radicular pain? A retrospective analysis

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Background: Despite the interest in the scientific community in the last decade, there is still poor evidence about pulsed radiofrequency (PRF) efficacy in the treatment of radicular pain. This study aims to determine if high-voltage PRF could be an effective adjuvant of epidural adhesiolysis (EA) in treating patients with chronic lumbosacral radiating pain (LSRP).
Methods: A total of 409 patients suffering from a single leg-radiating pain lasting for >6 months and unresponsive to previous treatments were divided into three different groups: group 1 consisted of 227 patients suffering from LSRP in lumbar stenosis, 84 treated with EA alone and 143 with PRF-EA; group 2 consisted of 99 patients suffering from LSRP in FBSS, 24 treated with EA alone and 75 with PRF-EA; group 3 consisted of 83 patients suffering for LSRP in discal herniation, 20 treated with EA and 63 with PRF-EA. Patients were randomly assigned to treatment with EA alone or PRF-EA. The outcome was evaluated by adopting the numeric rating scale (NRS) at rest and in movement, SF-12 Physical and Mental Health Summary Scales (in PCS and MCS scores), and present pain intensity scale (PPI), before the treatment and at 1 month follow up for all the patients included in the study. Descriptive statistics (mean ± SD) were reported for NRSrest, NRSmov, PPI, PCS, and MCS scores. *T*-test and Wilcoxon Mann Whitney test were used to evaluate differences in the outcome values between EA alone and PRF-EA. ANOVA test was used to detect any outcome differences between the two treatments considered in this study. p-values < 0.05 were considered statistically significant.
Results: A significant reduction of radiating pain was observed at 1-month follow-up in NRSrest and NRSmov, PPI scores, for all the three groups of patients, independently of the treatment adopted ($p < 0.001$). PCS12 and MCS12 significantly increased for all the three groups of patients at 1-month follow-up ($p < 0.001$). No significant differences in outcome were detected for both the procedures (EA *vs.* PRF-EA) in all the three groups ($p > 0.05$).
Conclusion: Both PRF and PRF-EA are effective in reducing radicular pain intensity and improving the quality of life in patients who suffer from lumbosacral radiating pain in the context of lumbar stenosis, FBSS, or discal herniation. Adding pulsed radiofrequency (PRF) to epidural adhesiolysis alone does not display any improvements in outcome.
These results deviate from previous RCT studies [1] showing an improvement in outcome in groups where PRF was added to EA. This could be justified by two limitations of our study: firstly, the presence of neuropathic features was not

investigated, while inclusion criteria were based only on the presence of radicular radiating pain, not discriminating between neuropathic, nociceptive, or mixed pain; secondly, follow up was restricted at 1 month (previous RCT study considered follow-up at 6 months).

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31. Simulation, didactics & research in pain neuropathophysiology: the "pain manikin"

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Introduction: 1:1 scale "dummies" for simulating the pathophysiology of pain are not currently widespread, or at least available, (as are those from CPR/ALS [1]) although acute and chronic pain are often emergency issues. Illustrated a possible implementation of "simulation dummy" for teaching, training research in Pain Therapy.
Materials and methods: An anatomical figure in 1:1 scale on plexiglass for holographic rear projection and hydraulic pipes and circuits with fluorescent pigments traceable through "black light" (UV Black Light), with implementation of the most studied and best described neuronal circuits in the pathophysiology of pain. All the materials, including infusion pipes, fluorescent dyes, taps, relays, *etc.*, have been purchased independently.
Results and implementation so far: 1. Anatomical parts in operation (mannequin version 1.1 2021), such as
• A pseudo-unipolar neuron: the strange neuron without dendrites
• the C fibers and their reaction after the pathogenic noxa, their conduction velocity (0.5–2 mt/sec) up to the Lamina II of the posterior horns of the spinal cord
• the functioning of the axonal reflex
• Aβ sensitive fibers with relative conduction velocity (visually comparable with slower fibers)
• The various neurotransmitters (GABA, Glutamate, NK1/Substance P) recognizable thanks to the fluorescent colors made brilliant by UV light
• Lamina II of Rexed and the neuronal-interneuronal functioning of the posterior horns of the spinal cord
• The paleo and neo-spinothalamic bundles
• Ascending analgesic systems such as Gate Control, with related inputs and outputs
• The "packet switching" routing of sensory and algic signals [2]
• Descendant analgesic systems (with related neurotransmitters, endorphin production, *etc.*, each of these substances identified by a well-distinguishable flow of color)
- Nuclei of the periventricular gray (III cerebral ventricle), with, cascade
- neuronal/functional connection with peri-aqueductal gray (PAG)
or interconnection with the Cerulean Loci or connection with the peri-gigantocellular nucleus of the reticular substance or connection with the nuclei of the Rafe
- production of norepinephrine, serotonin, endorphins
- relationship between the descending analgesic system and Lamina II of the spinal cord
• The role of the spino-mesencephalic bundle
2. Drugs action (local anesthetics, benzodiazepines, gabapentinoids, opioids, μ receptor agonists/Mor-Nri norepinephrine reuptake inhibitors, NSAIDs, *etc.*) with interactive display of:
• their loci of action
• their pharmacodynamics (simplified)
Discussion and Conclusions: A bibliographic search (PubMed/Medline and other databases) highlighted the need to make use of simulators—anatomical, interactive, computerized/AI based—in medical education in general (Emergency and Disaster Medicine, Pediatrics, Pneumology, Psychiatry , Medical Ethics, just to mention some of the many areas of interest that emerged from the scientific literature). However, in the specific area of Pain Therapy, there is a small number of articles, for the most part oriented to simulators to be used on patients (the mechanical horse, to evaluate back pain), and rare software and apps for use by the student.
If an Advanced Life Support mannequin contains all the mechanisms, the weights and counterweights, the springs and the sensors inside, appearing on the outside as a human figure, the Pain Relief Manikin appears with a human silhouette, and with neuronal, colored and interactive circuits, at sight. It will be interesting to follow other research groups in the world, in order to ascertain possible implementations of further pain pathophysiology simulators, with the possibility of

"interacting" with external noxae and drugs.

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32. The management of postoperative pain in the major oncological cervical and facial surgery: an observational study

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Background: Patients undergoing major oncological surgery in the cervical and facial district show a severe pain that reaches the peak after the first few hours next the surgery and gradually decreases over the following 48–72 hours [1]. If the post-operative pain is not controlled, it exposes the patient to the risk of numerous complications that affect their recovery and quality of life. To obtain a good compensation of pain, an analgesic therapy protocol was carried out and to evaluate the outcomes in terms of safety and efficacy [2, 3] a prospective observational study was performed.
Methods: From January 2018 to January 2020 was performed a prospective observational study in the ENT ward of the Molinette Hospital of Turin. In this study were included n = 60 patients (n = 51 men and n = 9 women) aged between 36 and 87 years.
Analgesic therapy administered:
—Starting dose (10 minutes before waking up): Paracetamol 1 g and Tramadol 1.5 mg/kg + Alizapride 50 mg
—Upon awakening: Tramadol 400–600 mg + Alizapride hydrochloride 150 mg in 70–76 mL of SF 0.9 % in elastomeric pump at the rate of 2 mL/h for 48 hours.
—Rescue Dose (if VAS >5): Morphine 2–5 mg
In the ward:
—Rescue Dose (if VAS >3): Tramadol 50 mg in 100 mL SF 0,9 % in 15 minutes (max 2 times/day) or Ketorolac 15–30 mg (every 8 hours, max 2 times/day)
The parameters studied were the following:
—Age
—Sex
—Concomitant pathologies
—Analgesic therapy
—Pain (48 hours after surgery)
—PAOS
—Nausea and vomiting
—Sedation level
Of these data, the distribution of each variable has been observed: mean and standard deviation are used; median and interquartile range (25–75 %) was used if any outlier values were present. To assess pain, VAS scale (0–10) was used.
Results: In the first 12 hours (T0–T12) the average pain was VAS = 0.57, of these the 74.77% were VAS = 0; in the T12–T24 the average pain was VAS = 0.67, with the 75.16% of VAS = 0; in the T24–T48 the average pain was VAS = 0.28, with the 87.34% of VAS = 0.
—Rescue dose administered n = 16.
—Nausea: 9/60 (15%)
—Vomiting: 2/60 (3.33%)
—No change in PAOS–FC–SaO_2
—Sedation level 2 (Ramsay Sedation Scale) in 60/60 patients.
Conclusion: The analysis of the results shows a good control of pain throughout the observation period with VAS <1. Cumulative data suggest that almost all 48 hour surveys were VAS = 0. The number of Rescue Doses was quite low; this proves the effectiveness of the antalgic therapy administered. The results for nausea, vomiting and vital signs were good. Finally, the analgesic protocol has been found to be effective in terms of good pain control and safe for the patients. Furthermore, this study showed important positive results on the patient's care and quality of life.

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33. Assessment and treatment of trauma pain in children in Friuli Venezia Giulia: from the territory to the hospital. Retrospective descriptive study

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Background: In children and adolescents, pain is little detected and treated, especially in out-of-hospital care. Trauma is one of the main causes of admission to the emergency department and is often associated with severe pain and a source of fear for the child and family. Because of its peculiarities, the child, if not treated adequately from an antalgic point of view, could have long-term and even permanent consequences. Assessing pain and treating it equals quality in the care provided. The aim of the study is to describe how pain is assessed and treated in children accessing paediatric emergency departments and territorial emergency services for traumatic causes.
Methods: Type of study. Retrospective descriptive study. **Setting.** Extraterritorial rescue and Emergency Department. **Sample**. Children aged 0 to 17. **Tools.** Two ad hoc collection tables were constructed**. Data collection.** All patients rescued by the local emergency department for trauma of any magnitude in the settings described above were considered in the study. **Data analysis.** Descriptive analysis.
Results: In the out-of-hospital the pain is detected in 15.6% and treated in 9.9%. In the emergency room it's detected 92.3% of the time and 7.7% of those isn't detected in the general emergency department. Pain is treated in 47% and on average is treated within 30 minutes of access in both settings.
Conclusion: The most penalised age group is the 0–5 age group. The paper 118 forms were incompletely filled out in 11.7% of the cases and in 84.4% of the cases the part concerning pain was left blank. Family-centred care is not very present in the emergency-urgency context, or at any rate not very well documented together with non-pharmacological treatments.

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34. The role of pain on motor and non-motor impairments in patients with early Parkinson's disease

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Background: Parkinson's disease (PD) is a progressive neurodegenerative condition with a prevalence of 1–2 out of 1000 people (GBD 2016 Parkinson's Disease Collaborators) and an incidence of 10 to 20 per 100,000 people/year, with a predictable increase in the next decade [1]. Several non-motor symptoms (NMS) are commonly observed in PD [2]. Among non-motor signs and symptoms, up to 50% of PD patients experience pain [3]. However, pain is often overlooked in the early stage of the disease.
Among non-motor signs and symptoms, up to 50% of Parkinson disease's (PD) patients experience pain. However, this symptom is often overlooked in the early stage of the disease. We aimed to evaluate the impact of pain on motor and other non-motor impairments in early PD patients.
Methods: We recruited consecutive patients diagnosed with PD according to the United Kingdom Parkinson's disease Society Brain Bank criteria. Inclusion criteria were: (a) age ≥45 years; (b) modified Hoehn and Yahr Scale (mH&Y) score ≤2 in "ON" stage; (c) optimized and stable PD drug therapy for at least four weeks before the enrollment. Exclusion criteria were: (a) dementia associated with PD according to consensus criteria [4]; (b) diagnosis of atypical or secondary parkinsonism; (c) clinically significant comorbidities. PD patients were assessed by our evaluation protocol, including walking kinematics including Timed Up and Go (TUG) and TUG Dual-Task duration (G-WALK®, BTS), sleep disorder (Epworth Sleepiness Scale ESS), global cognitive assessment (MOntreal Cognitive Assessment), fatigue (Parkinson Fatigue Severity scale) and mood disorders (Beck Depression Inventory, Parkinson Anxiety Scale). We divided our population into 2 groups according to the absence/presence of pain based on multidimensional pain assessment through Kings Parkinson's Pain Scale (KPPS).
Results: We included 24 patients, 17 males, and 7 females, with a mean age of 65.1 ± 8.9 SD years and a mean BMI of 28.63 ± 4.73 kg/m^2. Sixteen patients referred pain (mean KPPS 7.9 ± 8.4 SD). No significant between-group difference was reported for all outcomes except for TUG DT and ESS which resulted worse in PD patients with pain compared with those without pain (16.7 ± 5.5 *vs.* 12.7 ± 2.5 $p = 0.04$; 6.6 ± 3.8 *vs.* 3.6 ± 1.3; $p = 0.024$, respectively).
Conclusion: Pain is a disabling NMS in patients with PD, affecting up to 80% of patients during the course of the disease. Although it is considered a common NMS, pain is often underestimated in this population, as well as its impact on motor performance. Our data suggest that in early PD patients even mild pain might adversely affect gait and balance performance during the execution of cognitive tasks and sleep quality. Interestingly, it has been demonstrated the role of chronic pain as a distractor that contributes to slower gait speed also in healthy older adults, thus implicating an attentional involvement. More recently, huge interest in both diagnosis and management of pain in this population fosters the development of a new classification of PD-related pain, aiming to provide a mechanism-based treatment [3]. Large population studies are needed to further investigate this issue.

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35. Clinical experience and therapeutic options in a patient with complex regional pain syndrome type I and multiple drug intolerance

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Background: Complex regional pain syndrome (CRPS) is a painful chronic neurologic condition that impacts on quality of life [1]. CRPS typically develops in a distal extremity after acute injury (mainly trauma and surgery), although a small percentage of patients may have no inciting events [2]. CRPS is confined to a body region and characterized by continuing pain that has no dermatomal distribution and is disproportionate to any inciting event, together with sensory

(hyperalgesia and/or allodynia) vasomotor, sudomotor, motor/trophic signs and symptoms [3, 4]. Based on the absence or presence of a specific nerve lesion, it can be classified into two different subtypes: CRPS I and CRPS II, respectively [1]. We report the treatment of CRPS in an elderly woman with multiple drug intolerance.
Methods: A 69-years old Caucasian female patient (weight 65 kg, height 170 cm, BMI 22.49) comes to our attention for a 3-years history of severe burning pain in her right ankle along with oedema and alternating periods of colour changes (reddish or bluish) and/or temperature. Since the onset of these symptoms, which occurred after an ankle sprain, she reported being limited in work and activities of daily living. The severity of her pain was 10/10 on a numeric rating scale (NRS), with an impossibility to tolerate any mechanical stimulation, including sensory stimulation from clothing or blankets. She also reported impaired sleep, mainly difficulties in falling asleep. A diagnosis of CRPS type I was performed two years later, and anti-inflammatory drugs (both steroidal and non-steroidal) were prescribed with the development of adverse drug reactions (ADRs). Neridronate 100 mg every 3 days, was prescribed with the development of ADRs. Different efforts with physiotherapy (mainly with TECAR therapy), also failed to relieve pain.
After these treatments, she came to our attention where a new clinical examination confirmed the CRPS type I diagnosis, and a weekly diamagnetic therapy protocol was started since the patient refused further medications and interventional procedures. During each weekly session lasting 25 minutes, the treatment was carried out with the diamagnetic pump (CTU MEGA 20®-Periso SA. Pazzallo-Switzerland). Magnetic flux density was 86 mT at the site of treatment. Before each treatment, we evaluated the pain intensity and the presence of tissues' oedema through the NRS score and the measurement of the ankles' circumference, respectively.
Results: After 10 weeks of treatment, we documented a significant ($p < 0.01$) reduction in pain severity (NRS: 2/10) and the absence of oedema, with an improvement in both qualities of life and sleep. No adverse events were reported during the treatment.
Conclusion: we described the effect of diamagnetic therapy on CRPS, in an elderly woman with multiple drug intolerance. Although high-quality clinical evidence is still lacking, our case report suggests that diamagnetic therapy could be a potential non-invasive and safe adjunctive treatment for CRPS, also offering a useful alternative for patients who did not benefit from drugs and/or refuse invasive procedures.

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36. Hypnotic communication as treatment for phantom limb pain in pregnancy: a case report

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Background: Phantom limb pain management is often a clinical challenge, especially if the use of pharmacological therapy is contraindicated [1, 2].
We report the case of a 40-year-old woman with phantom limb pain resulting from the amputation of the left thigh, after a car accident in 2014, treated in the past with pregabalin (100 mg/day) with benefit.
The patient came to our attention due to the exacerbation of pain; pharmacological therapy was suspended because it was contraindicated by the patient's pregnancy (I trimester after multiple IVF/ICSI attempts [3].
Methods: The hypnotic communication technique was used to induce a hypnotic state in order to modify the painful experience [4], to assess the effectiveness of the strategy adopted, two rating scales were administered: the hypnotic induction profile (HIP) [5] and the SF 36 (Short Form Health Survey 36) questionnaire, [6] immediately before the communication session hypnotic and after 1, 3 and 5 months.
In hypnosis, an age regression was performed up to the moment before the accident. The qualitative aspects of conscious experience were reshaped, modifying her experience by making her imagine that she had a healthy limb. The analgesic abilities were then ratified and the experience anchored to the use of self-hypnosis at home.
Results: At one month there was an improvement in all 8 dimensions of the quality of life analyzed with the SF36 with an average increase of 75% and a subjective improvement reported by the patient more than good. At three months the average increase was 88% and at 5 months the improvement reached 100%.

Conclusion: the use of hypnotic communication is useful in the management of phantom limb pain, especially when pharmacological treatments are contraindicated.
Further clinical studies are needed.

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37. Music therapy in nursing care for pain therapy

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Introduction: Music Therapy (MT) is the use of music to facilitate communication, learning, feelings expression and motor skills, in order to meet the cognitive, social and emotional of the person (WFMT) [1]. The users may participate either actively, by practising music themselves, or passively, by listening to it [2]. MT effect would rely on three mechanisms: the resonance, stimulation of the limbic system and activation of the reward system (leading to dopamine release). The effectiveness of MT can be assessed by means of subjective parameters, such as pain and anxiety feeling reports, and by objective indexes such as physiological parameters [3]. Several studies demonstrated that MT exert positive effects on the treatment of pain, and the regulation of emotions, stress, anxiety, physiological (cardiac, respiratory, hormonal responses, *etc.*) and cognitive functions. The effects of MT were found both in healthy individuals and patients, especially in clinical populations suffering from neurodegenerative diseases.
Methods: This paper reviews a selection of studies on the psychological and medical benefits of MT, focusing in particular on its role as an adjuvant in pain treatment.
Results: The studies reviewed highlighted that MT can be effectively applied in the treatment of perioperative and postoperative pain. It contributes to pain-related anxiety regulation and the modulates pain perception, leading to a significant reduction in the dosages of opioids used [4, 5]. In addition, the studies reported suggested that palliative care [6] and surgery [4, 5] are the two main fields for which MT proved to be the most effective in nursing practice. As regards palliative care, it was suggested that MT facilitates the establishment of an empathic relationship between the nurse and patient and improves the general well-being of the person. Similarly, in the surgery, it improves the quality of the nurse-patient relationship, the nurse being the main and most present reference figure for symptom management in the preoperative and postoperative phases.
Conclusion: The studies reviewed suggested that MT an effective tool to establish the therapeutic relationship. Moreover, they revealed that in the context of nursing care, MT can be considered as a complementary, and not an alternative, method to be used alongside standard medical and pharmacological therapies to reduce anxiety and stress states, pain perception, and improve the patient's emotional responses.

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38. What is the association between pain intensity and risk of fall in the emergency department?

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Introduction: Physical and cognitive features related to the experience of pain could represent for patients predisposing or worsening factors for the risk of fall. This study evaluates the relationship between pain intensity and fall risk in order to understand whether patient-reported pain in triage can predispose to falls in the Emergency Department (ED).
Methods: Patients admitted at day time to an Italian ED during 15 days were assessed for fall risk (measured using the Morse and MEDFRAT scales), and pain intensity (using the NRS scale). The possible relationship between pain and fall risk with the main characteristics of ED admission (*e.g.*, sex, age, priority code) was investigated by multinomial logistic regression. Data were analysed with SPSS version 28.
Results: During the study period, a total of 346 patients were enrolled. Using the Morse scale, the risk of fall was "low" in 45.4%, "medium" in 41.3% and "high" in 13.3% of cases, whereas it was "low" in 53.2%, "moderate" in 22.0% and high in 24.9% with MEDFRAT scale. It was possible to measure pain intensity in 89.6% (n = 310). In cases where pain could not be measured (*e.g.*, altered mental status, cognitive difficulties) (n = 36), the probability of "medium" (OR = 27.255, $p = 0.002$) and "high" (OR = 94.889, $p < 0.001$) fall risk increased compared to "low" fall risk using the Morse scale. Using the MEDFRAT scale, in the same subjects, only the probability of "high" risk of falling increased (OR = 119.895, $p < 0.001$), also compared with "no pain" and "low" risk of falling. In the subsample to be administered the NRS scale, the level of "moderate" pain, compared with "no pain", increases the probability of "high" fall risk (OR = 2.607, $p = 0.041$), compared with "low" risk, using the Morse scale. The MEDFRAT scale shows no statistically significant relationship between the variables considered. In the same subgroup, it appears that in the "yellow" and "red" codes, compared with "white", the probability of having "severe" and "moderate" pain increases statistically significantly ($p < 0.001$), compared with "no pain". In "females", compared with "males", the probability of having "mild" pain increases statistically significantly (OR = 2.287, $p = 0.040$), compared with "no pain". Also, in the age groups "75–84 years" and "85–100 years", compared with "18-24 years", the probability of having "severe" pain decreases statistically significantly by 4.1% ($p < 0.001$) and 8.6% ($p = 0.007$), respectively, compared with "no pain".
Conclusions: Our results suggest an association between pain and fall risk. A bigger sample size and the use of different scales to evaluate these two variables could contribute to better assess if pain intensity can influence the risk of fall in the ED. If this would prove true, an early management of pain since the triage phase of the ED admission could allow the reduction of fall risk.

39. Non-pharmacological interventions in nursing care of cancer pain management

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Background: Pain is one of the most common and annoying symptoms that afflict cancer patients. Despite the availability of effective treatments, these may not be sufficient for pain control and this can adversely affect people's quality of life.
There are non-pharmacological interventions, which can be integrated into patient care, for the improvement of pain perception.
It is necessary to understand which non-pharmacological interventions are most effective to reduce pain and to increase the level of well-being of the person and how these interventions can be integrated in different settings care.
Methods: A bibliographic search was conducted, from March 2021 to January 2022, through the PubMed, CINAHL, Scopus and Google Scholar databases. The research questions were: 1. "What are the most effective non-pharmacological interventions for pain control in cancer patients?"; 2. "What are nursing competencies for these interventions?". At the end of the screening process, fourteen studies were included in the literature review.

Results: Therapeutic Touch (TT): is a holistic evidence-based practice that integrates the intentional and compassionate use of universal energy to further equilibrium and well-being. Was developed by nurse Krieger and by Kunz, and it has spread since the 1970s. In their study, Aghabati *et al.* [1] demonstrated that TT is effective in pain reduction, measured for five days with a visual analogue scale (VAS), in cancer patients undergoing chemotherapy.
Reiki: is a Japanese healing art developed by Mikao Usui in Japan in the early 20th century. The Japanese word reiki means universal energy. Oriental medicine work with this energy, which flows through all living things and is vital for well-being. One of the main objective is to promote relaxation.
Reiki is a type of energy healing and is a complementary therapy. It is sometimes used as a palliative or supportive therapy for cancer patients.
In their study, Birocco *et al.* [2], conducted on cancer patients of different stages of the disease and in chemotherapy treatment, demonstrated that, in the subgroup of patients undergoing the complete course of four Reiki treatments, the mean pain score VAS decreased from 4.4 to 2.3.
Acupuncture: is an ancient Chinese medical care, in which fine stainless steel needles are inserted into certain anatomical locations of the body surface to elicit neuro-hormonal responses of the body system via nerve stimulation. The National Comprehensive Cancer Network guidelines for adult cancer pain recommend acupuncture, as one of integrative interventions, with pharmacologic intervention. Vinjamury *et al.* [3] conducted a study on cancer patients suffering from pain, undergoing acupuncture sessions for eight weeks, demonstrating a reduction in pain from 18 to 95%.
Conclusions: Pain relief is a moral duty for nurses. Non-pharmacological interventions represent a valid resource for improving the perception of oneself in relation to illness and pain, the quality of life and well-being of patient. They are well integrated into nursing practice, as they provide for a holistic approach and consideration of the person, in order to rebalance his energy field. Nurses should implement such interventions in cancer patients care.

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40. Promoting equality in pediatric pain management in the Emergency Department: findings from a prevalence study

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Introduction: Pain has a relevant impact on the pediatric patients' care, and it influences the child's care outcomes in acute conditions. The assessment of pediatric pain is challenging and this leads to potential under- or over-estimated treatments. For this reason, an adequate and careful evaluation of pediatric pain by healthcare professionals is both as an ethical and legislative duty. An appropriate pharmacological approach is a pillar intervention in pediatric care in the emergency healthcare settings. This study aims to identify the prevalence of analgesic treatments and specific assessment scales in the pediatric population in the Emergency department.
Methods: A descriptive study was carried out from January 2020 to September 2020 within the Emergency Department of the "Madonna del Soccorso Hospital" in San Benedetto del Tronto, Marche, Italy. The data extraction through the Asur-AV5® "Primary Care" Health Network database, includes the admission of pediatric patients aged 0–15 years. Socio-demographic variables, reasons of access, diagnosis, pain measurement scales (NRS), administration, and outcomes of analgesic treatments have been correlated and analyzed through Microsoft Excel®2010.
Results: Our sample included 1663 pediatric patients (56% M; mean age = 7, SD = 1.0 years). The most frequent gravity codes at the "triage" were: green (49%) and yellow (49%). A stratification of health conditions related to the access to the Emergency Department was performed. Traumatic events (73%), fever (91%), chest pain (49%), abdominal pain

(87%), ENT disorders (54%), skin rash (71%), and dyspnea (83%). Pain assessment involved 401 patients (24%), with a mean score on the NRS scale of 4. Pain killers were administered to 184 patients. In detail, Paracetamol® (90%) and Ibuprofen® (10%). The most frequent conditions treated with pain killers were traumatic (40.9%) and abdominal pain (25%). 53% of patients showed benefit. Regarding NRS assessment, 2.7% of patients received an evaluation of pain and an antalgic treatment, while 21.5% did not receive any assessment but received analgesics. Most of the pediatric patients (67.2%) did not receive neither evaluation nor therapy. After treatment, 66% of patients were discharged, while 11% have been admitted to a hospital ward. Analyzing the admission diagnoses and outcomes, the painful phenomenon was underestimated; consequently, inadequate use of analgesic therapy and NRS scale appears evident.
Conclusions: Our study highlighted an underestimation of pain's assessment and treatment in the pediatric population admitted in the Emergency Department. Further improvements are needed to promote an effective pain management. Our study also identified a significant benefit in pediatric patients after administering analgesic therapy in the emergency department. It is urgent to promote a proper training and education among healthcare professionals to improve their knowledge in the management of pain.

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41. Animal assisted therapy in the management of chronic pain

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Working hypotheses:
1. Animal-assisted therapy improves mental status, reducing pain.
2. Physical recovery through physiotherapeutic activitiesin Animal Assisted Therapy reduces the duration and intensity of pain.
Objective:
• Identification of patients with chronic pain willing to undergo Animal Assisted Therapy.
• Elaboration of a protocol regarding Animal Assisted Therapy in the management of chronic pain, which should establish the type of patients responsive to the therapy, the type of activities and their duration.
• Sustainability of this method, by continuing therapy at home.
Material and method:
• The study was carried out between 01 November 2021 and 30 April 2022 in the "St. Pantelimon" Emergency Clinical Hospital, Bucharest, Romania, in the Surgery Department.
• The study was conducted in a multidisciplinary team: a nurse with skills in Animal Assisted Therapy, nurses, surgeons, and one psychologist.
• Study lots were composed of:
a: Experimental group: 20 patients with chronic pain, to whom only Animal Assisted Therapy was applied;
b: Control group: 20 patients with chronic pain, who were given analgesics, according to the medical prescription.
• As the main tool we used the pain visual analogue scale, used before and after each type of treatment.
Results:
1. For 14 patients in the experimental group, the pain was comparable to that in the patients in the control group.
2. For 4 patients in the experimental group, the pain was controlled more effectively than in the patients in the control group.
3. For 2 patients in the experimental group, the pain was more intense and longer lasting than in the patients in the control group.
4. 15 of the patients who received Animal Assisted Therapy decided to adopt a pet in order to continue this method at home.
Conclusion:
1. Animal-assisted therapy has proven to be an effective method in the management of chronic pain.
2. Animal-assisted therapy reduces the risk of painkiller abuse among patients with chronic pain, while lowering treatment costs.
3. Animal-assisted therapy improves the mental status and physical condition of patients with chronic pain.

Signa Vitae

42. Phase IV Study Comparing the Efficacy and Safety of Benzydamine Hydrochloride 0.3% Oromucosal Spray and Benzydamine Hydrochloride 3 Mg Lozenges in Patients with Acute Sore Throat

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Background: Acute non-complicated sore throat (ST) in adults is usually managed with self-medication including over-the-counter drugs with anti-inflammatory, analgesic and local anesthetic effects that allow a rapid resolution of the pain [1]. Benzydamine has been shown to be useful in the treatment of painful mouth and throat conditions, mainly due to the rapid pain relief provided by its local anesthetic activity [2]. The primary objective of the trial was to assess the efficacy of two different formulations of benzydamine hydrochloride (0.3% oromucosal spray or 3 mg lozenges) on ST pain relief, at 2 minutes after a single dose administration. Secondary objectives included description of any differences between the two treatments, in terms of time to pain relief onset, duration of the analgesic effect, effect on other symptoms related to sore throat and overall safety and tolerability up to a maximum treatment period of 7-days.
Methods: 363 patients (aged 18–75 years) with recent-onset (≤3 days), moderate-to-severe ST due to upper respiratory tract infection (URTI) and a confirmed diagnosis of tonsillopharyngitis, were enrolled in this multicenter, international study. ST relief was recorded at 1, 2, 5, 10, 15, 30, 60, 120, 240 minutes post benzydamine administration using the Sore Throat Relief Rating Scale (STRRS).
As primary endpoint, benzydamine 0.3% oromucosal spray was investigated for non-inferiority to benzydamine 3 mg lozenges (95% CI) considering that the difference between the study drugs in responder rates does not exceed the threshold of 10% (the responder rate being defined as % of patients who reported at least a STRRS score ≥1, at 2 minutes after the drug application). While for secondary endpoints, a comparative descriptive analysis was conducted.
Results: Results showed that at least a slight ST pain relief after 2 minutes post study drug application was reported by 91.7% of patients randomized to spray and 90.7% of patients randomized to lozenges in the m-ITT population (95% CI: −4.78% to 6.88%). Similarly, in the PP population 91.4% and 90.6% of patients (treated with spray and lozenges respectively) experienced a first perceived pain relief (95% CI: −5.18% to 6.73%). Confirmed by the TPA assessment, a clinical and statistically significant reduction from baseline in ST pain, swelling and pharyngeal inflammation was reached by both the formulations every day and even over a period of one week, while the pain relief was maintained from 2 minutes to 4 hours without difference between treatments. Finally, both treatments were well tolerated and demonstrated a good safety profile.
Conclusion: The non-inferiority of benzydamine HCl 0.3% spray with respect to benzydamine HCl 3 mg lozenges was demonstrated in both populations. Based on these results, both the spray and lozenges have shown to be effective for reducing sore throat pain starting already from 2 minutes after a single administration and their effect last up to up to 4 hours. The clinical efficacy after 7 days of treatment was also demonstrated. The confirmed clinical value of the benzydamine, which provides rapid relief from symptoms, and its high tolerability profile, along with the high product acceptability, could represent a valuable tool in the clinical practice for the treatment of sore throat.

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