HT01
Intraoperative CT (AIRO®) navigation as a new tool in percutaneous retrogasserian alcohol rhizolysis for trigeminal neuralgia.
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Background and objectives
The percutaneous alcoholization of the gasserian ganglion through the foramen ovale for the treatment of trigeminal neuralgia is well known and has been applied extensively since the early 1980s. It is usually less uncomfortable to the patient compared to radiofrequency thermocoagulation. Despite this, even today reaching the target is difficult, with the consequent possible ineffectiveness of treatment or an increased risk of serious complications, including carotid artery puncture or alcohol injection in the temporal subarachnoid space. This is because of the difficulty to visualize the foramen ovale on x-ray/fluoroscopy and to the anatomy of the foramen itself, whose walls could be very oblique or irregular due to arthrotic phenomena.

Our goal is to optimize the alcoholization procedure by improving the visualization and approach to the foramen ovale using intraoperative CT navigation.

Description
Under general anesthesia, the head is fixed in a carbon Mayfield clamp, slightly extended in neutral position; intraoperative CT-scan (AIRO®) is acquired and navigation precision (Brainlab®) is checked. The needle entry point is at 2.5 cm from the mouth corner. A 11 cm 18G needle is navigated applying a reference star to allow optimal navigation and visualization of the foramen ovale in the three planes. The needle is millimetrically carefully inserted beyond the foramen and between 0.7 and 1 ml of ethanol 96% is injected. If needed, a cisternography can easily be performed too. The slow insertion and the precise trajectory of the needle also minimize muscle trauma.

Conclusions
Percutaneous retrogasserian alcohol rhizolysis is a very effective and painless treatment for trigeminal neuralgia. Intraoperative CT navigation can improve precision, safety and effectiveness of the procedure.

HT02
Brainspotting, shaking and tapping: new approaches to the unholy trinity “trauma, anxiety and chronic pain”
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In recent years, the limitations of “talking cures” have become increasingly apparent. Even if patients are aware of their dysfunctional behavioral patterns and even if they would like to behave differently, these changes in thinking and behavior are often not successful. Therefore, many therapeutic techniques have been developed over the last 30 years that systematically incorporate physical sensations into the therapeutic process in order to achieve faster and more lasting improvements in health and well-being. From our point of view, the most promising techniques at present are the Emotional Freedom Technique EFT by Gary Craig, Brainspotting by David Grand, the Save and Sound Protocol SSP by Stephen Porges, and the Tension & Trauma Release Exercises TRE by David Berceli.

I. EFT is still a relatively conventional therapy approach, comparable to EMDR Eye Movement
Desensitization and Reprocessing. The “problem” and a positive self-affirmation have to be verbalised, so the therapeutic effect still requires the use of language.

Meta-analyses have shown that this standard intervention is more effective in panic and anxiety disorders than the previous gold standard cognitive behavioural therapy. EFT is now recommended as first choice intervention by the National Institutes of Health in the USA and UK.

II. Brainspotting is a further development of the proven trauma therapy technique EMDR. However, now painful experiences no longer have to be consciously recalled, but the client follows the therapist’s pointing stick to find areas of the brain where negative experiences are stored, not just traumatic ones. Through this systematic activation of points of view (“spots”) stress disorders are dissolved (Grand 2014).

III. The Save & Sound Protocol SSP by Stephen Porges (2016) is a result of his polyvagal theory, developed to help autistic children. Porges discovered that all mammals have a tiny muscle in the middle ear that is normally activated when in company with other mammals and their vocalization is amplified and ambient sounds are attenuated or even filtered out. Further, nerve fibres connect the musculus stapedius to the heart, so the heart rate and the contractions of the heart muscle are regulated towards well-being.

IV. The TRE Tension and trauma Release Exercises by David Berceli are based on the natural human reflex to move into the fetal position (“fetal response) when threatened and to release the tension of the psoas muscle when the threat is over.

We would like to introduce these four different intervention techniques by case studies or with volunteers from the audience.

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O01 Psychosocial resources and chronic pain in individuals with spinal cord injury: evidence from the second Swiss national community survey
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Study Design
Cross-sectional

Objective
To strengthen the evidence on the associations of a broad set of psychosocial resources with pain and pain-related factors in individuals with spinal cord injury (SCI) and chronic pain.

Setting
Community, Switzerland.

Methods
Data from 1,064 participants with chronic pain who participated in the second community survey of the Swiss Spinal Cord Injury Cohort Study (Survey 2017) were analysed. Multiple linear regression modelling was performed to test the hypotheses that psychosocial resources (self-efficacy, self-esteem, purpose in life, optimism/energy, hope, social support, sense of belonging) are negatively associated with pain and pain-related factors (pain intensity, pain interference, depressive symptoms). Study of the second community survey of the Swiss Spinal Cord Injury Cohort Study (Survey 2017)

Results
Higher self-esteem, optimism, and hope were related to lower pain interference in fully adjusted models and all psychosocial resources under study were negatively associated with depressive symptoms in final models. However, neither of the psychosocial resources was related to pain intensity when models were adjusted for pain interference and depressive symptoms.

Conclusion
These findings strengthen the evidence that psychosocial resources are associated with pain-related factors (i.e. pain interference and depressive symptoms), and support the notion that psychosocial resources might be promising targets for interventions in individuals with SCI and chronic pain.

P01 The role of endogenous opioids in mediating the pleasant feeling of pain relief in humans
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Background & Objectives

Endogenous opioids mediate the pleasurable responses to positively reinforcing rewarding stimuli such as palatable food [1]. Yet, also the reduction or omission of a negative experience can be rewarding (negative reinforcement). As such, pain relief leads to negative reinforcement [2] and evokes a pleasant feeling in humans [3]. While it has been shown that the feeling of pleasure associated with positive reinforcement is at least partly mediated via endogenous opioids [4], it is currently unknown if similar neurochemical mechanisms are involved in the pleasant feeling evoked by pain relief. The present study tested if endogenous opioid blockade using naltrexone diminishes the subjective feeling of pain relief in humans.

Materials & Methods

Twenty-seven healthy participants (mean age ± SD: 21.70 ± 2.77 years; 14 f) completed two identical experimental sessions, one with placebo and one with naltrexone, following a randomized, placebo-controlled, double-blind, counter-balanced, within-subject study design. Pain relief was induced by superficial cooling after heat stimulation of capsaicin-sensitized skin. Heat-stimulations were perception-adjusted to two pain intensities, i.e. ‘170’ and ‘195’ on an intensity rating scale ranging from 0 “No sensation” to 200 “Most intense pain tolerable” with 100 being the pain threshold. Participants rated the relief and pleasantness in response to the cooling.

Results

Endogenous opioid blockade by naltrexone diminished relief and pleasantness ratings compared to placebo (F[1,177.5]=9.29, p=0.0027). The relief/pleasantness reduction by naltrexone was greater in participants who reported higher relief/pleasantness in the placebo session (relief at ‘170’: rho=−0.37, p=0.060; pleasantness at ‘170’: rho=−0.56, p=0.0027, relief at ‘195’; rho=−0.49, p=0.016; pleasantness at ‘195’: rho=−0.43, p=0.04).

Conclusion

These results provide evidence that endogenous opioids play a role in mediating the pleasant feeling of pain relief in humans. Further, the results indicate that individual differences in the endogenous opioid system are related to the magnitude of experienced pain relief. Clinically, the rewarding nature of pain relief and its underlying mechanisms require consideration because of their potential reinforcing effects on behaviors that might be beneficial short-term but maladaptive long-term.

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variance. Pain and function(ing) loaded stronger on the second factor (up to 0.81 SF-36 Physical functioning). All scales showed improvements by ES ranging from 0.16–0.67.

Conclusions

High levels of explained variance in the factor analysis and improvements on all used scales illustrated the complexity of the CLBP syndrome comprising much more dimensions of health and quality of life than only back related function. Some of the physical scales of the pain-specific MPI and ODI showed moderate to high construct overlap as well as the affective health scales of the SF-36, the MPI, and the SCL-90-R. The broad spectrum of measured constructs was proven by the fact that many scales showed only partial convergence in the same domain.

P03

Pain trajectories based on routine pain scores predict chronic postoperative pain by early pain intensity, but not by the slope of pain resolution

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Background & Objectives

Chronic postsurgical pain (CPSP) remains highly prevalent and is a major cause of incomplete recovery (1). An effective prevention of chronic pain depends on the correct identification of patients at risk. Therefore, understanding risk factors is crucial. It has been hypothesized that the dynamic of the acute pain evolution should be more predictive than pain intensity (2,3).

In this study we aimed to investigate the predictive capacity of the acute pain trajectory modelled into a regression line and its parameters as compared to that of the daily average pain intensity.

Material & Methods

For our study, we included patients from the ongoing study ALDO who were randomly recruited from the operative room schedule. We selected only elective surgeries known to be at risk for CPSP. For the first five postoperative days, pain scores at rest were collected by nurses on the ward. Chronic pain was assessed 6 months later with a definition of CPSP being a score of ≥ 3/10 on the numerical rating scale (NRS). We used logistic regression to test the slope and intercept of the regression line as well as average daily scores as predictive factors for chronic pain 6 months after surgery.

Results

Of the initially 233 patients included, we had complete data for 99 patients. The analysis of those showed a predictive capacity for the intercept of the trajectory’s regression line (p-value =0.01) and for the daily average pain at 24, 48, 72 and 96 hours postoperatively (p-value < 0.01). The estimate of the beta-coefficient for the daily average pain yielded an OR =1.51 at 24 h, OR= 1.6 at 48 h, OR= 1.95 at 72 h and OR =1.49 at 96 h. The slope of the regression line failed to predict chronic pain in our study.

Conclusion

Our study confirms that acute pain intensity (mean daily scores and intercept of the pain trajectory) predicts chronic pain. We could not prove a better predictive capacity of a dynamic approach using the slope of a linear pain trajectory. There is a need to investigate whether a nonlinear statistical method would show otherwise.

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P04

Detection of Social Problems in Chronic Pain Patients Using A New Questionnaire

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Background and aims

According to the bio-psycho-social model of disease social problems may be the origin of chronic pain or may contribute to the persistence of pain. As social counselling in most countries is not part of the medical system social problems are often not addressed properly. Previous studies revealed a high burden of social problems in chronic pain patients.

Methods

Based on a previously developed structured interview a questionnaire was developed asking for unsatisfactory conditions in family relations, housing conditions, social contacts, income and insurance matters. The results are interpreted on the data background from our pain questionnaire, including information on pain intensity, chronicity of pain, pain grading scale, depression and anxiety symptoms etc.

Results

Correlations between social burden and chronic pain are described statistically. The results point out the necessity to address social matters assessing chronic pain.

Conclusions

The questionnaire offers an approach to social problems in chronic pain patients and allows to monitor progress in social counselling.
**P05**

**Fear avoidance beliefs limit lumbar spine flexion during object lifting in pain-free adults – A protective strategy with negative consequences?**

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**Background & Objectives**

There is a long-held belief that physical activities such as lifting with a flexed spine is harmful for the back and causes low back pain (LBP), potentially contributing to pain-related fear (PRF). In LBP patients, it has been demonstrated that elevated PRF is linked to less lumbar flexion during object lifting, probably to protect the back. Such a protective strategy is suggested to predispose individuals to persistent back problems in the long term. It is unknown if such protective strategies already exist in pain-free individuals which would yield potential insights into how a person might react when they experience LBP. Therefore, this study aimed at investigating a potential relationship between PRF and and spine kinematics during lifting in pain-free subjects.

**Material & Methods**

57 pain-free adults (mean age=29.5y, 27 females) completed the “Tampa Scale for Kinesiophobia” questionnaire for the general population (TSK-G). Task-specific PRF was evaluated using the “Photograph Daily Activities Series” scale (PHODA), including a picture of a person lifting an object with a flexed back (PHODA-lift). Participants were equipped with 58 retro-reflective markers, including markers on the spinous processes of C7, T3, T5, T7, T9, T11 as well as L1-L5 and the sacrum. A system with 20 infrared cameras was used to derive the 3D trajectories of the markers for the calculation of sagittal spinal curvature angles. Subsequently, subjects were asked to lift (lifting-up) and put back down (putting-down) a 5kg-box. Multiple linear regression analyses were carried out using one-dimensional Statistical-Parametric-Mapping (SPM 1D, alpha-level=0.05) which permitted time-sensitive analyses.

**Results**

A significant negative relationship between the PHODA-lift score and lumbar curvature angles during the lifting-up (time window: 9-92%, -0.313≤r≥-0.310, p=0.007) and putting-down cycles (time window: 17-60%, -0.315≤r≥-0.306, p=0.028) was found. Additional analysis revealed that these time-dependent relationships were driven by motion of the lower lumbar region (L4-L5). No relationships were found for thoracic curvature angles. Furthermore, no significant relationships between TSK-G, PHODA-total score and spinal curvature angles were found.

**Conclusions**

Our results indicate that protective movement strategies can be driven by distinct beliefs about the harmfulness of daily activities such as lifting with a flexed spine, in the absence of (experimental) pain.

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**P06**

**Imaging Neurovascular Uncoupling In Acute Migraine With Aura With Susceptibility Weighted Imaging**

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**Background and Objectives**

Migraine with aura (MwA) in the emergency setting is common and sometimes difficult to distinguish from mimicking conditions. Our study aimed at evaluating the frequency of regions of prominent focal veins (PFV) on susceptibility imaging (SWI) in the acute phase.

**Material & Methods**

Between 2011 and 2018 we evaluated symptoms and MR imaging of adult patients with acute MwA attacks (< 5 days after onset of symptoms). Abnormal imaging was visually scored in 12 ROIs on both hemispheres distributed on 3 slices. The severity score ranged from 0-3.

**Results**

638 patients (436 female) mean age 37.39 y, (18-89 ± 14.13) were included. SWI was abnormal in 18.8% of patients. The inferior and posterior medial temporal lobe and the occipital lobe were most often affected. SWI was more likely abnormal when MR was performed within 24
hours with an average around 5 hours after symptom onset. The side of aura symptoms and hemispheric imaging alteration in patients with abnormal SWI was highly significant (p < .001).

Conclusion
In the acute episode of MwA, SWI imaging can show a combination of increased deoxygenation. This study provides confidence in linking PFV to acute MwA.

P07
Extended overview of the longitudinal pain-depression association: a comparison of 6 naturalistic cohort studies of specific chronic pain conditions

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Background & Objectives
The cross-sectional relationship between pain and depression has stimulated research and generated a huge body of scientific literature over the years. The aim was to quantify and to compare the associations between longitudinal changes in pain and depression in different chronic pain conditions.

Material & Methods
Data were retrieved from 6 naturalistic, observational cohort studies. From baseline to the 6-month follow-up, the score changes on the Short Form (36) Health Survey (SF-36) bodily pain (pain) and the SF-36 mental health (depression) scales (0=worst, 100=best) were quantified, using partial correlations obtained by multivariate regression. Adjustment was performed by age, living alone/with partner, education level, number of comorbidities, baseline pain and baseline depression.

Results
Stronger associations were found between changes in levels of pain and depression for neck pain after whiplash (n=103, mean baseline pain=21.4, mean baseline depression=52.5, adjusted correlation r=0.515), knee osteoarthritis (n=177, 25.4, 64.2, r=0.502), low back pain (n=134, 19.0, 49.4, r=0.495), and fibromyalgia (n=125, 16.8, 43.2, r=0.467) than for lower limb lipedema (n=68, 40.2, 62.6, r=0.452) and shoulder arthroplasty (n=153, 35.0, 76.4, r=0.292). Those correlations were somewhat correlated to baseline pain (rank r=−0.429) and baseline depression (rank r=−0.314).

Conclusions
Moderate associations between changes in pain and depression levels were demonstrated across 5 of 6 different chronic pain conditions, in which relatively high pain levels persisted after conservative therapy. The associations between pain change and depression change tended to be stronger if pain and depression were worse at baseline. These two observed dose-response relationships are indicative of a certain degree of causal inference. Our results suggest that relieving pain may lead to the relief of depression and vice versa.

Angst F et al. J Affect Disord 2020:273:508.

P08
Role of Intravenous Ketamine in Aborting Cluster Headaches: A Retrospective Study

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Background
Cluster headache belongs to the spectrum of Trigeminal autonomic cephalalgias (TAC) along with chronic paroxysmal hemicrania (CPH), short-lasting unilateral neuralgiform headache with conjunctival injection and tearing (SUNCT) and short-lasting neuralgiform headache with cranial autonomic symptoms (SUNA).

This type of headache has a low incidence of 0.1% and a male predominance.

Triggers are various and non-specific, except for alcohol, which triggers attacks in most patients.

Our results suggest that intravenous ketamine with or without methadone plays a role in the prolonged interruption of cluster attacks, especially in patients with EC and if the above described regimen is initiated early in the episodic cluster cycle.

84% of all patients fell into the category of episodic cluster (EC) and 16% were chronic (CC).

New therapeutic options are urgently required.

The pain is stabbing and unilateral and in 90% of patients located in the general region of the eye, oftentimes radiating to the jaw, ear, back of the head, and neck, accompanied by ipsilateral eye tearing and nasal congestion.

While the value of this response is easy to comprehend in patients with chronic clusters (definition see below) the argument might be made that for patients with episodic cluster (EC) this finding is less significant because the "episode will go away at some point anyway".
It is noteworthy that the “super-responders” experienced relief regardless of their category (EC or CC).

The patients received intravenous ketamine, an NMDA receptor antagonist, once daily over 40 minutes, at a dosage of 0.5 to 0.75 mg/kg, administered in 3 to 11 sessions in intervals of 1 to 3 days for each infusion.

In patients in which the attacks were still present (although less in frequency, 50% had more than 50% reduction of attacks) we added methadone, another NMDA-receptor antagonist.

P09
Understanding and restoring dopaminergic function in Fibromyalgia patients using a mindfulness-based psychological intervention: A 18F-DOPA PET-study

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Background and Objectives
Fibromyalgia Syndrome (FMS) is a prevalent chronic pain disorder. Its etiology is still unclear, what makes the development of specific treatments difficult. Impaired dopamine (DA) function and altered DA response to reward in FMS in comparison to healthy participants has been shown previously (Ledermann, 2017). The aim of this study is to investigate whether a psychological intervention, the Mindfulness-Oriented Recovery Enhancement (MORE) intervention, that showed beneficial effects in chronic pain patients with opioid abuse as well as a potential ability to restore the neurophysiological and behavioural responses to reward, will be efficient in FMS participants to restore dopaminergic functioning.

Material and Methods
We will include 80 women with FMS, who will be randomly assigned to the MORE intervention or to a wait-list control group. The FMS participants will be compared at baseline with a group of age-matched healthy women. Before and after the intervention, participants will undergo 18F-DOPA Positron Emission Tomography (PET) and functional magnetic imaging (fMRI) while they perform a monetary reward and a positive emotion regulation task. We expect FMS patients to show a lower 18F DOPA binding in striatal regions and decreased striatal responses to reward measured with fMRI than the healthy control group before the MORE intervention; and the FMS patients participating in a 8 weekly sessions of MORE treatment to show an increased 18F-DOPA influx and increased neural responses to reward measured with fMRI after the treatment compared to a wait-list control group. Furthermore, we expect the 18F DOPA influx to correlate with the striatal activation during the reward task in the fMRI scanner.

Conclusion
This project will integrate imaging of the DA system in response to motivational stimuli with fMRI measures. The investigation of potential changes of the DA reactivity after an intervention will bring new hints on the functionality of the DA system. At a clinical level, MORE could be used in several clinical settings and at a larger scale for treating FMS. This highly multidisciplinary project will bring a better understanding of FMS as well as integrating neuroscience findings into treatment development by targeting dysregulated reward processing underlying FMS.

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P10
Reliable Elicitation of the Nociceptive Withdrawal Reflex in Human Participants

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Background & Objectives
The nociceptive withdrawal reflex (NWR) is a polysynaptic, involuntary, spinal response to an external noxious stimulus. It is widely used to study nociceptive processing on the spinal level. To that end, the NWR is elicited by electrical stimulation of either the sural nerve (SU) at the lateral malleolus or the medial plantar nerve (MP) on the foot sole and recorded by surface electromyography (sEMG) at the biceps femoris (BF) or the tibialis anterior (TA) muscle respectively. In turn, Central Sensitization (CS) is characterized as increased responsiveness of second order neurons to normal afferent input. To our knowledge, just 1 study (Ellrich J & Treede RD, Acta Physiol Scand 1998, 163, 391-401) looked at the NWR to read-out CS, induced by thermal stimulation. The goals of our study were: i) determine the more reliable of the 2 stimulation sites and ii) check the usability of the NWR to observe CS induced by thermal stimulation. We also analysed the NWR magnitude in TA, BF and rectus femoris (RF), all involved in the withdrawal.

Methods
We elicited the NWR by transcutaneous electrical stimulation on the right leg at SU and MP and recorded it by sEMG at TA, BF and RF.
16 volunteers (mean age 26.8 ± 4.7a, 8f) participated in the study and underwent 6 blocks of 8 increasing stimulations per site. 1 block lasted 90 s (followed by a 300 s break).

During blocks, a 3x3 cm² thermode proximal to the stimulation site was ramped up to a specified temperature (32 [baseline], 36, 39, 42, 45 & 46°C), rising with each block.

We calculated the %age of NWR per stimulation/recording site pair and compared them with a χ²-test for between subjects’ and a McNemar’s test for within subjects’ analysis.

To assess the influence of tonic heat on NWR we performed a multiple linear regression analysis with temperature as a predictor and stimulation number as a covariate.

Results
The best pair was MP/TA with 77.6 % of reflexes being significantly higher than SU/BF and SU/RF (67.2 % and 62.5 % resp.), both for between and within subjects’ analysis. All other pairs performed worse (i.e. < 50 %). For NWR elicitation in all 3 muscles SU stimulation is significantly superior to MP for between subjects’ analysis (58.6 % vs 55.2 %).

We saw no influence of tonic heat on the NWR.

Conclusion
i) The MP is the more reliable stimulation site to repeatedly elicit the NWR and record it at TA compared to SU stimulation recorded at BF.
ii) CS could not be observed in the NWR.

P11
Treatment of Neuropathic Pain After Brachial Plexus Injury by Body Schema Reorganisation - Case Report of a New Therapeutic Approach
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Background and aims
Neuropathic pain (NP) resulting from a nerve injury is often refractory to currently available treatments.

Neurosciences’ discoveries bring out body-schema into the focus by providing a fundamental new understanding of NP based on neural plasticity in the cortical areas. Treatments focusing on body-schema reorganization might thus positively influence NP. This report describes one case of NP partial recovery after a neuro-psychomotor treatment.

Methods
The patient has suffered since 2014 from a right traumatic brachial plexus injury (C5-7) with complete loss of motor function and sensory deficits. In 2016 nerve reconstruction and spinal cord stimulation reduced pain temporarily.

The neuro-psychomotor therapy consisted of 25 sessions lasting 1.5 hour spread out over 3 months and focused specifically on sensory-stimulation and body-schema reconstruction. Before therapy, the patient described persistent NP of 6-7/10 with paroxysmal peaks reaching 9 (numeric pain rating scale 0 to 10) in the mostly paralyzed right arm.

Results
Pain was observed to drop dramatically to 1 or even 0 within each session. Yet, pain went back to its regular level 2-4 hours later. Second, body-schema exercises allowed a radical change in the movement: the right hand totally lost its spasticity, movements adjusted in speed and accuracy in space. Improvement vanished after a couple of hours.

Conclusions
The dramatic improvement observed within each neuro-psychomotor session tends to indicate that exercises focused on body-schema reorganization may contribute to some extent to motor and pain recovery. In this sense, neuro-psychomotricity may offer a novel non-pharmacological gateway to NP treatment.

P12
The Interplay Between Anxiety, Insomnia and the Affective Component of Pain (And Its GABAergic EEG Counterpart) Discloses a Preliminary Mechanistic Model of Fibromyalgia
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Background
Fibromyalgia (FM) is characterized by chronic diffuse pain associated with sleep and mood disorders, but interaction between these determinants and underlying mechanisms are unknown. Our previous data showed that GABAergic EEG markers were reduced in chronic neuropathic pain, in correlation with pain intensity. This case-control study investigated the mutual influence between pain, mood disorders and insomnia, while characterizing GABAergic EEG markers in FM patients (FMP).

Methods
17 female FMP and 11 age/gender-matched controls (~55yrs, p>.05) were included. They were submitted to pain intensity (VAS), affective and sensory pain components (SF-MPQ-2: MPQa and MPQs), insomnia (ISI) and mood (HADa and HADd) assessments and to a resting-state high density (64 electrodes) EEG recording (Biosemi) measuring beta (β) oscillations in the low β (13-20 Hz) and high β (20-30 Hz) domains. Data were analyzed with MATLAB, R and SPSS (mean±SD, two-tailed Student t test and Pearson r, p < .05 significance threshold).
Results
FMP had moderate VAS (4.64(2.98)) with equivalent MPQA (5.11(2.74)) and MPQs (5.29(2.31)) scores. They had higher ISI than controls (16.75(5.89) vs 4.50(4.63), \( p = .001 \)) and contrary to the later had pathological HADd (10.56(3.95) vs 1.88(1.36); \( p = .001 \)) and HADa (10.06(4.20) vs 5.50(2.51); \( p = .026 \)). FMP with clinical anxiety (HADa \( \geq 8 \)) and clinical insomnia (ISI \( \geq 15 \)) showed higher MPQA (but not VAS or MPQs) scores than the group with normal scores (6.62(2.23) vs. 3.31(2.18), \( p = .008 \) and 6.67(2.15) vs. 2.67(1.39), \( p = .001 \)). The HADa score was highly correlated to ISI (\( r = .66, p = .004 \)), and the later to MPQA (\( r = .59, p = .012 \)) while correlation between HADa and MPQA did not reach significance (\( r = .41, p = .12 \)). The H\( \beta \) GPS was significantly lower in FMP than in controls (-8.00(2.28) vs. -5.78(2.23), \( p = .013 \)) and was correlated to MPQA (\( r = .59, p = .014 \)).

Conclusion
FMP had concomitant pain, insomnia and mood disorders, with high correlation between anxiety and insomnia. In the presence of anxiety (not depression) and insomnia, the affective component of pain (and not the sensory component or pain intensity) worsened. Lower H\( \beta \) EEG oscillations in FMP (compared to controls) further suggest defective GABAergic inhibitory control, more remarkably related to the affective component of pain. A model including anxiety, insomnia and the affective pain component emerges in FM and seems to be mediated by dysfunction in brain GABAergic inhibition.

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PI3
Galcanezumab in Patients with Treatment-Resistant Migraine: Results From The Open-Label Phase of The CONQUER Phase 3 Trial
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Objective
Assess 6-month efficacy and safety of galcanezumab in patients with treatment-resistant migraine.

Background
Many patients who need migraine preventive treatment either do not respond to or cannot tolerate existing oral preventives and may end up cycling through multiple medications.

Methods
During double-blind treatment (Months 1-3), 462 patients (18-75 years) with episodic or chronic migraine and 2-4 previous migraine preventive medication category failures were randomized 1:1 to injections of placebo or galcanezumab 120mg/month (with 240-mg loading dose). After completing double-blind treatment, patients could enter an open-label extension (OLE; Months 4-6), in which all patients received galcanezumab 120mg/month. Primary endpoint was mean change from baseline in number of monthly migraine headache days. Key secondary endpoints included response rate (\( \geq 50\% \) reduction in monthly migraine headache days) and mean change in Migraine-Specific Quality of Life Questionnaire Role Function-Restrictive domain score (MSQ-RFR).

Results
Of 451 patients who completed double-blind treatment, 449 entered the OLE, with 432 (96\%) completing. From a baseline (Month 0) of approximately 13 monthly migraine headache days, the mean change at Month 6 was -5.6 (prior galcanezumab group) and -5.2 (prior placebo group), with the prior placebo group showing a rapid reduction after first galcanezumab injection.

At Month 6, approximately 54\% of patients met the \( \geq 50\% \) response criterion. Of 87 galcanezumab-treated patients with \( \geq 50\% \) response at the end of double-blind treatment, 52\% maintained that response throughout the OLE. Mean MSQ-RFR scores improved from baseline (score=45) to Month 6 by approximately 27 points on a 100-point scale.

The most common treatment-emergent adverse events during the OLE phase were nasopharyngitis (4.2\%), injection-site pain (3.6\%), and injection-site erythema (2.7\%), with 5 patients (1.1\%) discontinuing due to an adverse event. There were no clinically meaningful changes in any safety parameters.

Conclusion
Galcanezumab was effective, safe, and well-tolerated during the CONQUER open-label extension in patients with treatment-resistant migraine.

PI4
Changes in Work Productivity and Interictal Burden: Results From a Randomized, Double-Blind, Placebo-Controlled Clinical Trial Evaluating Galcanezumab in Adults With Treatment-Resistant Migraine (CONQUER)
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Objective
To evaluate changes from baseline in work productivity/activity impairment and interictal burden attributed to migraine among patients treated with galcanezumab or placebo.

Background: The implications of migraine include reduced work productivity and activity impairment, both during and between migraine attacks; which are even greater among patients who did not receive benefit from prior preventive treatments.

Design/Methods
In the 3-month double-blind phase of a randomized, placebo-controlled galcanezumab study (#NCT03559257), patients with episodic or chronic migraine, who had multiple failures to previous migraine preventive treatments, received (1:1) subcutaneous injection of galcanezumab 120 mg/month (following initial 240 mg loading dose) or placebo. Absenteeism, presenteeism (impairment while working), work productivity loss, and activity impairment scores from the Work Productivity and Activity Impairment Questionnaire (WPAI) were calculated as impairment percentages; group comparisons were conducted using ANCOVA. The 4-item Migraine Interictal Burden Scale (MIBS) assessed migraine-burden between attacks over the past 4 weeks (total score range 0-12; 0 = none and ≥ 5 = severe); changes were evaluated using a mixed-model repeated measures approach. For both scales, higher scores indicated greater impairment, less productivity, and/or greater disruptions.

Results
Of the 462 patients randomized to galcanezumab (n=232) or placebo (n=230), 97.6% completed the 3-month, double-blind phase. At baseline, the majority of patients were working for pay (71.9% galcanezumab, 69.9% placebo). The least squares (LS) mean reductions of WPAI scores from baseline were significantly greater (all p < 0.0004) in the galcanezumab group compared with placebo in the percent of activity impairment (20.7% vs 8.6%), presenteeism (12.5% vs 2.6%), and overall work impairment (14.3% vs 3.5%); absenteeism was not significantly different. The LS mean change from the MIBS baseline (5.5, indicative of severe interictal burden) was greater for the galcanezumab group (1.8) compared with placebo (0.8; p < 0.0001).

Conclusion
Greater reductions in work productivity/activity impairment and interictal burden due to migraine were seen in galcanezumab-treated patients relative to placebo.

Additional Information
ClinicalTrials.gov: #NCT03559257 (I5Q-MC-CGAW)
reported pain yet none of them complained about neuropathic-type pain. 17 participants were anxious (HAD-A>7) and 5 also filled detection criteria for depression.

We found a high number of sensory loss compatible with SFN in this population, but in most patients it remains non painful and unnoticed. Further analyses are ongoing to address links between sensory profile, alcohol consumption and psychological profile.

**P16**

**Impact of Galcanezumab on Total Pain Burden: Findings From Phase 3 Randomized, Double-Blind, Placebo-Controlled Studies in Patients with Episodic or Chronic Migraine**

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**Objective**

Analyze the impact of galcanezumab 120 mg once-monthly injection relative to placebo on total pain burden among patients with episodic migraine (EM) or chronic migraine (CM).

**Background**

A composite measure incorporating multiple dimensions of pain (severity, duration, frequency) may better characterize pain burden and treatment response in patients with EM or CM.

**Design/Methods**

Patients in two randomized, double-blind, placebo-controlled episodic migraine 6-month studies (#NCT02614183, #NCT02614196) and one chronic migraine 3-month study (#NCT02614261) received (1:1:2) once-monthly subcutaneous injection of galcanezumab 120 mg (following an initial 240 mg loading dose) or placebo. Total pain burden for a given month was calculated as severity weighted duration by multiplying duration (hours) of migraine and maximum pain severity (0=none, 1=mild, 2=moderate, 3=severe) for each day and summing these over the days in a month. Least square (LS) mean change from baseline in total monthly pain burden across months was larger for galcanezumab 120 mg in patients with EM and CM (68.6 and 102.6) than placebo (36.2 and 44.4); mean difference (95% confidence interval) 32.3 (24.2, 40.4) and 58.2 (37.1, 79.3), respectively. Total pain burden in the EM and CM populations was correlated with MSQ total score (r= 0.35 and r=-0.37) and MIDAS (r=-0.34 and r=0.32).

**Conclusion**

Greater reduction in total pain burden was seen in patients treated with galcanezumab 120 mg once-monthly-injection relative to placebo for both EM and CM.

**Additional Information**

ClinicalTrials.gov: #NCT02614183 (15Q-MC-CGAG; EVOLVE-1), #NCT02614196 (15Q MC CGAH; EVOLVE-2), and #NCT02614261 (15Q-MC-CGAI; REGAIN)

**P17**

**Shake It Off: A New Approach to Chronic Pain and Other Chronic Health Issues**

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In recent years, the limitations of “talking cures” have become increasingly apparent, particularly for “psychosomatic” complaints. Therefore, many therapeutic techniques have been developed over the last 30 years that systematically incorporate physical experiences into the therapeutic process in order to achieve faster and more lasting improvements in well-being. Additional advantages of these approaches are that the painful experiences don’t need to be recalled actively nor is it necessary to talk about painful and embarrassing experiences.

One of the most promising therapeutic approaches are the TRE Tension and trauma releasing exercises. These seven simple physical exercises, known from traditional sports or yoga, starting with the feet and going up to the torso, shoulder and head. They are easy to learn and applicable almost everywhere. There are some books, videos on youtube and an app to make the exercises available for everybody as a self-help technique.

Data of several intervention studies in Germany, Switzerland and Ukraine will be presented. it could be shown, that neurogenic tremoring applied between a few times to several months reduces the average symptom load from about 11 to 8 from a list of 25 physical and mental symptoms (EU Erwerbstätigenbefragung), and decreases the need for health care interventions by 1/3.

Trauma and chronic stress are associated with specific physical symptoms like pain in the knees, back, neck and shoulders, heart and digestion problems and sleep disorders. The seemingly contradicting oral and written...
qualitative data and quantitative questionnaire data can be explained by the defence cascade by Kozlowski et al. (2015).

The topic of secondary traumatization by professional helpers (health care, social welfare, employees of insurance) will be discussed as well.

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P18
Does Inappropriate Behavior Hurt or Stink? The Interplay Between Neural Representations of Somatic Experiences and Moral Decisions.
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Embodied models suggest that moral judgments are strongly intertwined with first-hand somatic experiences, with some pointing to disgust, and others arguing for a role of pain/harm. Both disgust and pain are unpleasant, arousing experiences, with strong relevance for survival, but with distinctive sensory qualities and neural channels. Hence, it is unclear if moral cognition interacts with sensory-specific properties of one somatic experience or with supramodal dimensions common to both. Across two experiments, participants evaluated ethical dilemmas and subsequently were exposed to disgusting (olfactory) or painful (thermal) stimulations of matched unpleasantness. We found that moral scenarios enhanced physiological and neural activity to subsequent disgust (but not pain), as further supported by an independently-validated whole-brain signature of olfaction. This effect was mediated by activity in the posterior cingulate cortex triggered by dilemma judgments. Our results thus speak in favor of an association between moral cognition and sensory-specific properties of disgust.

P19
Leg Pain With Sensory Positive Signs: Is This Nociplastic Pain? A Case Report
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Objective
According to the current IASP classification, nociplastic pain is a new pain descriptor suggested for “Pain that arises from altered nociception despite no clear evidence of actual or threatened tissue damage causing the activation of peripheral nociceptors or evidence for disease or lesion of the somatosensory system causing the pain.” Literature suggests to use this term in patients with idiopathic pain showing sensory positive signs.

Material and methods
An 18 year old female presented for pain management with pronounced burning pain on her right side, pain intensity NRS 6–8/10 on lower legs and feet. A multimodal pain assessment including neurology, physiotherapy and psychology examinations as well as quantitative sensory testing (QST), according to the standardized protocol of the German network for neuropathic pain, to assess the somatosensory system, were performed. Contact heat evoked potentials (CHEPS) using a heat-foil thermode, starting with baseline temperature of 42°C and reaching peak temperature of 51°C were applied to the control site (hand) and pain site (foot). CHEPS were recorded from a single scalp electrode at Cz. Components (N2 and P2 latencies, N2-P2 amplitudes) were identified and analyzed.

Results
Neurological examination showed in the pain area sensory positive signs as allodynia and pinprick hyperalgesia, but loss of cold sensation. Psychological examination revealed a history of psychosocial stress factors as dissociative disorder with a self-harming behavior, suicidal attempts, anorexia and borderline personality disorder. Further, she had dissociative paraesthesia (sensory and motor function incomplete) without any abnormalities in MRI scan of brain and whole spine as well as normal neurophysiology including SEP and MEP of legs. CHEPS showed normal latencies and amplitudes which appeared to be relatively high. QST revealed no abnormalities with regard to sensory thresholds. Thermal positive signs were found for heat pain threshold on both sides, mechanical positive signs for pressure pain threshold and allodynia on the right.

Conclusion
While neurophysiology workup was not able to demonstrate a lesion of the somatosensory system but signs of hypersensitivity and patient presented with ongoing pain non-responsive to maneuvers to detect nociceptive pain, we suggest the diagnosis of nociplastic pain. Precise criteria for diagnosis of nociplastic pain are lacking in the literature and further research is required.