NHS SCOTLAND
NHS RESEARCH SCOTLAND
PAIN

SPaRC

Scottish Pain Research Community (SPaRC)
13th Annual Scientific Meeting

24th Nov 2023
APEX Hotel, Dundee

Biographies & Abstracts for Research Presentations and Posters

We would like to encourage all of our delegates to complete the Evaluation form as this helps us improve the event year on year and you will also receive this via your email post event.
Once completed, CPD certificates will be emailed.

Introduction and Welcome

I am delighted to welcome you to this 13th Annual Scientific Meeting (ASM) of the Scottish Pain Research Community (SPaRC)/ NHS Research Scotland Pain! This is our first fully in-person meeting since March 2019, back in Dundee, after a brief foray to Edinburgh in 2022. It is heartening to be reaching a new "normal" where we can all benefit from the support and stimulation of meeting colleagues at face-to-face meetings. We are in a new venue this year, which we hope works for you today – please fill in the evaluation form (see QR code) and let us know how we can improve things for the 14th SPaRC ASM.

Previous meetings have been productive and stimulating days, in which we introduced ourselves to each other, shared our work, and learned about some of the exciting Scottish research aiming to address the problem of pain. I hope that today's meeting continues this tradition, with an exciting range of speakers and topics to stimulate your interest. Our first keynote speaker is Prof Tamar Pincus, from the University of Southampton, is one of the lead researchers in the CRIISP Consortium, exploring psychosocial mechanisms of pain. Our second keynote speaker is Prof Andrew Rice, from Imperial College London, President Elect of the International Association for the Study of Pain, continuing a long SPaRC ASM tradition of IASP Presidents giving keynote lectures. We had an excellent range of high-quality research submissions, with 12 oral presentations and as well as our popular "data blitz" session for poster presentations. The posters will be displayed around the conference room, with plenty of time to visit them at break time, or during our dedicated poster viewing session in the afternoon. Hopefully you can have some lively discussion around the posters, and a chance to network and meet with other attendees from around the country. As always, the research being presented covers wide ranging topics from opioid receptor mechanisms, pharmacogenomics, and involvement of people with lived experience of chronic pain. I am particularly pleased to have patient partners not only attending but presenting at the conference – one of the strengths of SPaRC is its broad membership, including preclinical scientists, multidisciplinary clinicians, clinical academics and people with chronic pain. I am also looking forward to getting an update from our National Lead Clinician for Chronic Pain, Nicola Rhind, about current pain initiatives from the Scottish Government, and finding out more about the National Addiction Mission, from the Health Innovation Team at Scottish Government.

This year we are continuing the tradition of prizes for both oral and poster presentations, along with one of the coveted SPaRC ASM rosettes which will be awarded in the final session. And you, the audience, can vote for the best posters, using the QR code on the programme and scattered round the event. Good luck to all participating!

I would like to thank the conference organizing committee: Professor Blair Smith, Dr Carole Torsney, Professor Sue Fleetwood-Walker, Professor Tim Hales, Dr Kathryn Martin, Professor Gary Macfarlane, Prof Paul Cameron, Dr Carrie Stewart, Dr Chloe Fawnes-Ritchie, Dr Andrew Bretherick, Dr Line Caes, Ms Mia Kopenen and Ms Heather Wallace. It has been a real pleasure and privilege to work with them in preparing for the meeting. Finally, a very big thank you to our conference organisers Jacqui Pearson, our NRS Portfolio Manager and Emma Smith, administrative support in the School of Medicine at the University of Dundee. They have both put in an enormous amount of work to ensure that all runs according to plan: the conference today would not be taking place without their input, and I would personally like to extend my thanks to them.

I hope that you enjoy the varied research being showcased today and get a chance to participate in discussions. We remain with the continued aim of bringing together researchers, clinicians and people living with chronic pain, so that we can learn from each other, informing our research ideas and outputs, and fostering collaborations, and our overarching aim to promote the aspirations that:

1. clinical practice in managing chronic pain is informed by current research, and
2. current research in chronic pain is relevant to clinical practice

Prof Lesley Colvin
Chair, Scottish Pain Research Community, Lead, NRS Pain Research

Biographies – Keynote Speakers

Tamar Pincus

Tamar Pincus is a Professor in Health Psychology, and a registered practicing practitioner with the Health and Care Professionals Council. Her research into psychological aspects of chronic pain spans 30 years, and has been cited by national guidelines, and changed practice on the ground. She was the Director of the Research Centre for the study of Pain and Well-Being at Royal Holloway, until her move to the University of Southampton, and she is a core member of the Consortium to Research Individual, Interpersonal and Social Influences in Pain (CRIISP), which focuses on how people perceive pain and how others affect their pain, as well as considering wider social and environmental influences on pain. Her research includes experiment approaches to explore psychological mechanisms in pain, observation studies to measure risk over time, trials to test effectiveness, and qualitative work, to examine the thoughts and beliefs of people living with pain and those who are part of their life. Examples include investigations of cognitive biases in people living with pain; the psychological predictors for poor outcome in low back pain, and the study of clinicians' beliefs and behaviours and their effect on patients with pain, especially in reference to effective reassurance and return to work. She has been a core team member of many randomized controlled trials, and regularly provides advice on behaviour change. Her practical work has focused on training practitioners in effective communication skills and fostering awareness of patients' psychological needs and concerns, and her on-line videos have been viewed widely across the world.

Presentation: Can interpersonal factors impact on patient outcomes?

Andrew Rice

Andrew Rice MB BS, MD, FRCP, FRCA, FFPMRCA, FFPMCAI is Professor of Pain Research at Imperial College London and Honorary Consultant in Pain Medicine at Chelsea and Westminster Hospital, London, United Kingdom. He received his medical degree from St. Mary's Hospital Medical School in 1982 and his research doctorate from St. Thomas' Hospital Medical School in 1991. He underwent specialist training in Oxford and at St Thomas' Hospital and joined the academic staff of Imperial College in 1995.

His translational research programme seeks to elucidate neuropathic pain and enjoys the benefit of a highly interdisciplinary group of researchers and collaborators. Andrew's research focuses covers both laboratory and clinical research spanning animal models, through deep profiling of patients with a view to personalized medicine, to clinical trials and evidence synthesis by meta-analysis. His focus is on neuropathic pain in the context of infectious diseases (HIV, Herpes Zoster, HTLV-1 and leprosy), diabetic neuropathy and peripheral nerve and cold induced trauma, especially in a military context. He has been a pioneer in the use of deep clinical phenotyping studies to elucidate stratification approaches to empower the concept of precision medicine for the clinical management of neuropathic pain. He is a vocal advocate for tackling the record of translation failure in his field by improving the internal and external validity of pre-clinical research and for innovating evidence synthesis methods in pre-clinical research. He collaborates with historians to "learn the lessons of history" particularly with regards to post amputation pain in First World War veterans and nutritional neuropathies in survivors of captivity in the Far East 1942-45. He has published nearly 250 peer reviewed papers and has a citation (H) index of 62.

Andrew chaired the International Association for the Study of Pain Presidential Task Force of Cannabis and Cannabinoid Analgesia and the Scientific Programme Committee of the 2020 World Congress on Pain. He has the privilege of serving as liaison between IASP and our Southeast and South Asian chapters. Having previously served as an IASP Councilor, he was elected President-Elect of IASP in 2022.

Presentation: Cannabinoid analgesia- what is the real evidence for benefit or harm?

Oral Abstracts

INDEX: Oral Presentations

Poster Abstracts

INDEX: Poster and Datablitz Presentations

Oral Presentations

Author (Scott MacKenzie) has not given permission to publish Abstract online.

Oral Presentations

Authors' Names: Mr R Stuart Anderson, Dr LaKrista Morton, Dr Martin J Stevens, Dr Elaine Wainwright, Prof Ira Madan, Prof Nicola Fear, Prof Suzanne Verstappen, Dr Paul McNamee, Dr Anne Stagg, Dr Nicola Goodson, Prof Karen Walker-Bone , Dr Rosemary J Hollick, Prof Gary J Macfarlane

Lead Author (including title): Mr R Stuart Anderson
Job Title of Lead Author: QUICK Project Coordinator / CMHW Centre Manager
Organisation of Lead Author: Versus Arthritis/Medical Research Council Centre for Musculoskeletal Health and Work (University of Aberdeen), Aberdeen, UK

Title:
QUantifying the Impact of Chronic pain on work (QUICK)

Background:
Chronic pain has a substantial impact on people's working lives in a range of different ways. We have previously identified that the range of impacts people experience are not currently captured by questionnaires on work and health.

Objective(s) – please include the "problem" being addressed in lay terms:
The study aims to create a new questionnaire which captures the broader range of impacts which are important to people working with chronic pain.

Methods:
We held focus groups with people with chronic pain and a range of stakeholders to identify key domains important to people, which informed the development of an initial draft questionnaire. Content and wording of questionnaire items were then refined through a multi-stage Delphi process with relevant stakeholders, and questions were taken forward if they met pre-defined scoring criteria. We are currently validating the instrument within general population, clinical, and occupational samples.

Results:
Focus groups with 50 participants identified impacts including financial consequences, consequences of the fluctuating nature of pain, and the impact on workplace relationships. Ten domains including cognitive impacts, hidden disability and degree of support for job modifications informed development of a set of draft questions, which were then refined via a Delphi process.
14 items are now undergoing final testing and validation.

Conclusions:
We have developed a new questionnaire, incorporating feedback from a wide range of stakeholders, to quantify the impact of chronic pain on work more comprehensively.
The QUICK questionnaire is scheduled to be available in 2024.

Relevance for patient care:
Once tested and validated the new questionnaire will be able to be used by researchers, clinicians and policy makers to gather data on a more complete and nuanced set of impacts of chronic pain on work that have been highlighted as most important by patients themselves.

Oral Presentations

Authors' Names: Katarzyna Mazur, Ying Sze, Lewis Scott, Carole Torsney

Lead Author (including title): Ms Katarzyna Mazur
Job Title of Lead Author: PhD student
Organisation of Lead Author: Simons Initiative for the Developing Brain, Centre for Discovery Brain Sciences, The University of Edinburgh

Title:
Investigation of spinal cord processing of pain and touch in a rat model of SYNGAP1 haploinsufficiency

Background:
Autism is associated with altered pain and tactile experiences (Moore, 2015). However, the underlying mechanisms are poorly understood. Mutations in SYNGAP1 are a common genetic cause of neurodevelopmental disorders linked to autism, intellectual disability, and epilepsy (Satterstrom et al., 2020). A rat SYNGAP1 haploinsufficiency model provides a new tool to study somatosensory processing in autism.

Objective(s) – please include the "problem" being addressed in lay terms:
Assess pain and tactile reactivity and underlying spinal processing in a rat model of SYNGAP1 haploinsufficiency.

Methods:
Adult male and female Syngap+/- and wild-type (n=11/genotype) rats underwent noxious mechanical, noxious thermal, and tactile behavioural testing. Spinal cord (n=7/genotype) was immunostained for markers of nociceptive (IB4) and tactile (VGLUT1) fibres. Glabrous skin (n=7/genotype) was immunostained for markers of tactile end organs (S100/NF200/ColIV). Isolated dorsal roots were stimulated at 1-500µA in compound action potential (CAP) recordings (n=8/genotype). Dorsal root-ventral root potential (DR-VRP) recordings (n=7/genotype) were performed by stimulating dorsal roots at 0.2Hz/2.5-300µA, while cumulative depolarisation was assessed in response to x20 stimuli at 2Hz/300µA.

Results:
Syngap+/- rats show unaltered pain reactivity but reduced reactivity to tactile stimuli. The spinal termination pattern of nociceptive and tactile afferents is unaltered. Glabrous hindpaw skin structure and the density of tactile corpuscles does not differ between genotypes. There are no differences in electrical properties of the Aβ/Aδ/C-fibre primary afferent components in CAP recordings. Spinal reflex networks have an unaltered maximal response and cumulative depolarisation, but show an increased response threshold in DR-VRP recordings.

Conclusions:
Acute pain reactivity is unaltered but tactile reactivity is reduced in Syngap+/- rats. Electrophysiological evidence of an increased threshold of Syngap+/- spinal reflexes suggests a spinal functional deficit contributes to the tactile phenotype.

Relevance for patient care:
It is important to determine whether acute pain processing and tactile reactivity are impacted in autism because this may have implications for healthcare interventions and pain management. Future preclinical studies will assess whether chronic pain is impacted.

Oral Presentations

Authors' Names: Georgia Antoniou, Blair H. Smith H, J. Douglas A. Steele, Lesley A. Colvin

Lead Author (including title): Georgia Antoniou
Job Title of Lead Author: PhD student
Organisation of Lead Author: University of Dundee

Title:
Insulo-Thalamo-Cingulate network in Chronic pain and Adverse Childhood experiences.

Background:
Adverse childhood experiences (ACEs) may result in persistent changes in behaviour and stress reactivity, associated with a greater risk of mental and physical health issues, such as chronic pain (CP) and mood disorders. We aimed to investigate whether the brain salience network is linked to self-reported ACEs and CP, while also exploring their effective connectivity (EC).

Objective(s) – please include the "problem" being addressed in lay terms:
We aimed to assess evidence for central neural changes associated with ACEs in subjects with CP.

Methods:
The Generation Scotland Scottish Family Health Study (GS:SFHS) dataset, a longitudinal community-based research dataset, was utilised. This contains socio-demographic and clinical data, including the Chronic Pain Grade. We analysed a subset of the GS:SFHS participants, who participated in the Stratifying Resilience and Depression Longitudinally (STRADL) study and completed assessments, including the childhood trauma questionnaire, neuroimaging, and the implicit emotional processing task. Dynamic causal modelling analysis was performed to test hypotheses linking the brain regions of interest and questionnaire data. Regions of interest were the anterior cingulate cortex (ACC), insula and thalamus.

Results:
The dataset included a total of 579 individuals with a mean (SD) age of 58.15 (10.00) years, 349/579 (60%) females. 238 had reported CP, of whom 159 (67%) were females. Higher EC from the ACC to the insula was associated with individuals reporting CP. The EC from the ACC to the thalamus showed an inverse association with both reported CP and emotional abuse, while there was a positive association with both reported CP and emotional neglect**.**

Conclusions:
The results highlight the involvement of the ACC and insula in neuropathology associated with CP and ACEs.

Relevance for patient care:
To understand who is the most vulnerable, and why, we need to examine and understand the structural and functional brain abnormalities in people suffering from those long-term comorbid conditions. This can help with developing new preventions and treatment strategies.

Oral Presentations

Authors' Names: Jungwoo Kang (Presenting Author), Kate Timmins, Gary J. Macfarlane, Marcus Beasley

Lead Author (including title): Dr Marcus Beasley
Job Title of Lead Author: Post-doctoral Research Fellow
Organisation of Lead Author: University of Aberdeen

Title:
Associations with Fibromyalgia Symptoms and Diagnosis in the UK Biobank

Background:
Recent research suggests fibromyalgia is better understood as a dimensional disorder, measured by the Polysymptomatic Distress (PSD) scale, challenging traditional categorical diagnoses. Given this perspective, this study explores factors associated with the likelihood of a categorical diagnosis, independent of PSD.

Objective(s) – please include the "problem" being addressed in lay terms:
To study how fibromyalgia symptoms, measured by PSD, vary in a large population-based sample, and to find other factors, besides symptoms, that might predict who gets a diagnosis.

Methods:

Data from UK Biobank participants (aged 40-69 during 2006-2010 recruitment) completing a 2019-20 pain questionnaire were analysed. Linear regression calculated adjusted mean differences in PSD by age, gender, BMI, deprivation, global health, EQ-5D, and rheumatoid and osteoarthritis diagnoses. Logistic regression, incorporating PSD and these factors, calculated adjusted odds ratios (AORs) for fibromyalgia diagnosis.

Results:
In 147,215 participants with complete data, age, gender, BMI, and health-related factors were significantly associated with PSD scores. Specifically, older age and better global health were linked to lower PSD scores, while female gender, higher BMI, and greater deprivation were associated with higher PSD scores. Rheumatoid arthritis and osteoarthritis were also associated with higher PSD scores.
For fibromyalgia diagnosis, each point increase in PSD corresponded to an AOR of 1.31. Women were significantly more likely to report a diagnosis with an AOR of 2.33. Rheumatoid arthritis and osteoarthritis were associated with increase odds of diagnosis (AORs of 1.37 and 1.35, respectively).

Conclusions:
In the largest population-based study of fibromyalgia symptoms to date, PSD scores significantly varied by age, gender, deprivation, and specific health-related factors. Likelihood of receiving a diagnosis was notably associated with gender and co-occurrence with rheumatoid arthritis and osteoarthritis, independent of PSD scores.

Relevance for patient care:
The findings can inform improved diagnosis and targeted care. Increased diagnosis in individuals with other musculoskeletal conditions emphasises that fibromyalgia cannot be considered in isolation.

Oral Presentations

Authors' Names: Dr. Carrie Stewart, Prof. Patricia Schofield, Dr. Nicole Thomas, Prof. Robert Witton, Prof. Ewan Mccoll.

Lead Author (including title): Dr. Carrie Stewart
Job Title of Lead Author: Research Fellow
Organisation of Lead Author: University of Aberdeen

Title:
Incorporating lived experiences into the development of a dental pain reduction intervention for those living with dementia

Background:
Despite its prevalence, dental pain experienced by people living with dementia is under researched. To date, no health service intervention or policies are in place to improve the situation.

Objective(s) – please include the "problem" being addressed in lay terms:
We aimed to develop a logic model to structure a co-developed intervention to improve mouth care and reduce dental pain for those living with dementia through exploring the experiences portrayed by family caregivers of those living with dementia.

Methods:
A public engagement discussion involving ten caregivers of individuals with dementia was conducted. Transcripts of the conversations based on three topics of discussion (dental experiences, dental challenges and thoughts on a dental pain risk assessment tool) were analysed using thematic analysis.

Results:
Key barriers reported were access to dental services, lack of alignment between dental, health and social care services, and low support for carers in how to carry out mouth care. Carers felt that preventing, monitoring and managing dental pain should form part of the care packages and not be the responsibility of unpaid carers. Carers wanted a flexible, multi-component intervention, which included provision of education and support to carers to assist with mouth care.

Conclusions:
Our findings support the urgency for innovation in this area and highlight the importance of involving key stakeholders in intervention development and policy decision-making. Our findings are directly informing the co-development of an intervention to be tested in future research.

Relevance for patient care:
We identified which areas of mouth care responsibility should be part of the unpaid caring role and which should form part of a healthcare professional role, and how this could be supported. The insights provided by family caregivers will help ensure an intervention reflects the needs of those it aims to help.

Oral Presentations

Authors' Names: Ying Sze, Katarzyna Mazur, Anna Regan, Chunyi Zhu, Carole Torsney

Lead Author (including title): Dr Ying Sze
Job Title of Lead Author: Postdoctoral Research Fellow
Organisation of Lead Author: University of Edinburgh

Title:
Post-surgical tactile pain – is BDNF-TrkB signalling involved?

Background:
The mechanisms that underlie post-surgical tactile allodynia are not well understood. Previous work from the Torsney lab, using a rat model of hindpaw incision surgery revealed the development of novel tactile corpuscles around the incision site, with a time course that matches tactile-evoked pain behaviour (Kirsten Wilson, PhD Thesis). This novel innervation may provide amplified tactile drive to spinal allodynia circuits. Given tactile corpuscles required BDNF-TrKB signalling in order to form, we investigated the requirement of BDNF-TrkB signalling for this novel tactile innervation and tactile allodynia.

Objective(s) – please include the "problem" being addressed in lay terms:
Investigate if blocking BDNF signalling can limit the development of new touch-sensing nerve endings surrounding an incision site and post-surgical touch-evoked pain.

Methods:
Hindpaw heel incision was performed under isoflurane anaesthesia in 24 adult Sprague-Dawley rats (Brennan et al. 1996). 200ng/50ul of TrkB-Fc dissolved in PBS was injected subcutaneously around the incision immediately after surgery and on post-surgical day (PSD) 2. Vehicle only group had 50ul PBS injected, and an additional group received no injections (N=8 per group). On PSD3, all rats underwent behavioural assessment of tactile sensitivity (paintbrush stroking) (Duan et al. 2014) and thermal sensitivity (Hargreaves). Skin tissue was collected, sectioned and immunostained for BDNF; PGP9.5 (intra-epidermal nerve fibres); NF200 and S100 (tactile corpuscles) alongside Collagen IV (N=6-8 per group).

Results:
In the surgical incision model TrkB-Fc administration reduced the tactile allodynia score as compared to no injection controls, whilst thermal hyperalgesia was unaltered. TrkB-Fc administration did not alter gross wounds scores, BDNF immunostaining intensity, intra-epidermal nerve fibre density, nor tactile corpuscle density, but reduced the size of the tactile corpuscles (S100+ bulb area) ($p<0.05$).

Conclusions:
BDNF-TrKB signalling is involved in the development of novel tactile corpuscles surrounding the incision and associated tactile allodynia in the rat hindpaw surgical incision model.

Relevance for patient care:
Identification of 'skin' mechanism that causes post-surgical tactile pain has the potential to identify treatments that could be applied locally, potentially even topically, to the skin.

Oral Presentations

Authors' Names: Kanakarajan S[1], Onyeakazi U[1], Adam R,[1] Columb MO[2], Galley HF[1st]

Lead Author (including title): Dr Kanakarajan S[1]
Job Title of Lead Author: Consultant in Anaesthesia and Pain Medicine
Organisation of Lead Author: NHS Grampian

Title:
Melatonin and sleep parameters in patients with chronic pain: per protocol results from the DREAM-CP trial

Background:
Chronic pain remains a burden for both clinicians and patients and the prevalence of sleep disturbance is high in chronic pain patients. Administration of exogenous melatonin reduces sleep latency and other sleep measures in primary insomnia [1]. There have been some small trials of melatonin in patients with chronic pain, often in combination with other therapies (reviewed in [2]). Chronic pain is associated with sleep disturbance and melatonin may improve both sleep and pain [3].

Objective(s) – please include the "problem" being addressed in lay terms:
We undertook a double blind randomised controlled crossover trial of melatonin in patients with non-cancer severe chronic pain to determine the effects on sleep and pain.

Methods:
The trial was prospectively registered (ISRCTN12861060) and the protocol has been published [4]. After ethical approval, clinical trial authorisation and written informed consent, 60 adult patients (aged 31-79, 36 female, 24 male), with an average pain intensity score of 7 or more were randomised and 51 completed both treatment arms as per protocol. Participants received either melatonin (Circadin™, Flynn Pharma) 2mg daily at night or placebo for 6 weeks, followed by a washout period, then a further 6 weeks of placebo or melatonin. The primary outcome measure was sleep disturbance measured using the Verran Snyder Halpern (VSH) sleep scale [3,4]. Secondary outcome measures included pain scores, sleep latency, efficiency and supplementation, plus Pittsburgh Sleep Quality Index (PSQI) and pain and sleep questionnaire-3 (PSQ-3) scores [3,4]. Crossover per protocol analysis was performed using mixed effects linear models with baselines as covariates for treatment, period and sequence effects using Stata 17 and NCSS 2020 with $P<0.05$ (two-sided) taken as being significant.

Results:
There were no significant differences in baseline measures between those receiving melatonin or placebo first and no significant sequence effects.
All participants had increased levels of sleep disturbance measured using VSH scale at baseline. There was a transient decrease in sleep disturbance during melatonin treatment ($P<0.001$) at 3 weeks but there was no significant difference between the melatonin and placebo treatment periods at end of trial period – 6 weeks. This transient effects on other sleep parameters including wake after sleep onset ($P=0.018$) and sleep latency ($P<0.001$) were also seen during the melatonin treatment period. Average pain intensity scores decreased during both melatonin and placebo treatment periods ($P= 0.006$ and $P<0.001$ respectively) but with no difference between treatment periods. Adverse events were similar during both treatment periods and there were no serious adverse events related to drug treatment.

Conclusions:
We showed that treatment with melatonin 2mg per night had transient beneficial effects on sleep parameters but the improvements were not sustained. In addition, during trial participation, patients with chronic pain reported lower pain intensity scores.

Relevance for patient care:
2mg melatonin does not have long term beneficial effects on sleep for chronic pain patients with sleep disturbances.

Oral Presentations

Authors' Names: Callum Leese, Devashri Gupte, Cassie Higgins, Rebecca Skinner, Pauline Adair, Philippa Dall, Blair H. Smith, Lesley Colvin

Lead Author (including title): Dr Callum Leese
Job Title of Lead Author: SCREDs Lecturer in General Practice
Organisation of Lead Author: University of Dundee

Title:
Facilitators and barriers to physical activity in people living with chronic pain: a systematic review and combined analysis.

Background:
Chronic pain (CP) is a prevalent and complex health issue associated with physical, emotional, and social consequences. Management of pain is multi-factorial and challenging; however, physical activity has repeatedly been shown to be beneficial. Despite this, physical activity (PA) levels in CP populations are low.

Objective(s) – please include the "problem" being addressed in lay terms:
This study aimed to identify facilitators and barriers to PA among adults with CP and analyse these within the COM-B behaviour change model. The primary objective was to inform future interventions and improve PA uptake and adherence in this population.

Methods:
We performed a systematic review (following PRISMA guidelines) and subsequent combined analysis including peer-reviewed primary research published in English up to October 4, 2022. Six databases were searched, with terms consisting of three components: pain, physical activity, and facilitators and/or barriers. Quality appraisal of studies was conducted using appropriate tools (CASP and MMAT).

Results:
The systematic search yielded 37 studies with a total of 2116 participants. The studies represented various CP conditions, locations, and study designs. The key barriers to engagement in PA included the impact of pain severity, comorbidities, lack of knowledge about PA benefits, and time constraints. Key facilitators included personalized care, social support, and awareness of the benefits. The findings were then categorised into the six sub-components of the COM-B model.

Conclusions:
The study identified numerous barriers and facilitators to PA in individuals with CP. The study emphasizes the importance of person-centred approaches, education, and accessible environments to promote PA among people with CP. Addressing these barriers and leveraging facilitators is crucial for successful future interventions aimed at increasing PA uptake and adherence in this population, which can lead to improved overall health and well-being.

Relevance for patient care:
-Physical activity is effective and important to managing pain but is underutilised.
-Future interventions should address barriers and utilise facilitators identified in this research.

Oral Presentations

Authors' Names: Samuel Singleton, Clara Diatreme, David J. Walker, Tyko Runeberg, Andrew S. Oswald, Greta Rosenqvist, Laura Robertson, Taylor McCarthy, Shuvam Sarkar, Daniel Baptista-Hon and Tim G. Hales

Lead Author (including title): Prof. Tim G. Hales (Presented by Dr. Sam Singleton)
Job Title of Lead Author: Professor of Anaesthesia
Organisation of Lead Author: University of Dundee

Title:
Distinctive mechanism of μ receptor activation by SR-17018 confers G-protein signalling bias

Background:
Opioids relieve acute pain through μ receptor activation although their long-term use is limited by tolerance and hyperalgesia, which involve β-arrestin2. Opioids biased against β-arrestin2 recruitment may be advantageous. However, the classification of bias is compromised by assays utilising overexpressed μ receptors leading to overestimation of efficacy for G-protein activation; some partial agonists appear to have full efficacy.

Objective(s) – please include the "problem" being addressed in lay terms:
We assessed the influence of μ receptor overexpression on apparent G-protein signalling bias.

Methods:
We depleted receptor availability in PathHunter CHO cells using the irreversible antagonist, β-funaltrexamine, and compared the efficacies and apparent potencies of twelve μ receptor agonists, including several previously reported as biased, in β-arrestin2 recruitment and cAMP assays.

Results:
With full receptor availability all agonists had partial efficacy for stimulating β-arrestin2 recruitment relative to DAMGO, while only TRV130, PZM21 and buprenorphine were partial agonists at inhibiting cAMP accumulation (efficacies of 60%, 73% and 43% of DAMGO, respectively). Limiting μ receptor availability by prior exposure to β-funaltrexamine (100 nM) revealed that morphine, oxycodone, herkinorin, U47700, tianeptine and U47931e are also partial agonists in the cAMP assay. Unlike the efficacies of the other agonists tested, which correlated between β-arrestin2 recruitment and cAMP assays when the number of available μ receptors was depleted ($r = 0.62$), the efficacy of SR-17018 to inhibit cAMP accumulation was resistant to β-funaltrexamine pretreatment. By contrast, exposure to β-funaltrexamine caused abolition of β-arrestin2 recruitment by SR-17018. Further pharmacological analysis revealed that naloxone and cyprodime caused limited competitive μ receptor antagonism of SR-17018 in the cAMP assay.

Conclusions:
These data reveal that apparent G-protein signalling bias of μ receptor agonists can be explained by partial agonism. SR-17018 may bind to distinct sites to preferentially engage G-protein mediated signalling.

Relevance for patient care:
Targeting alternative binding sites of μ receptors might improve long-term pain outcomes by providing sustained analgesia.

Oral Presentations

Authors' Names: Chloe Fawns-Ritchie, Fionna Chalmers, Harry L. Hébert, Blair H. Smith

Lead Author (including title): Dr Chloe Fawns-Ritchie
Job Title of Lead Author: Lecturer
Organisation of Lead Author: University of Dundee

Title:
Opioid prescribing and cognitive function in a large Scottish population sample.

Background:
Despite being associated with a range of adverse outcomes including respiratory depression and dependency, opioids are widely prescribed to treat patients with chronic pain. Another adverse outcome might be cognitive impairment.

Objective(s) – please include the "problem" being addressed in lay terms:
This study investigated whether opioid prescribing, compared with no opioid prescribing, was associated with lower cognitive function.

Methods:
This study used data from Generation Scotland, which consists of 24,000 adults aged 18-93 years when recruited in 2006-2011. Participants provided demographic and health data including answering questions about chronic pain and completing a cognitive assessment. Participants also consented to their study data being linked to their electronic health records.

Multiple linear regression was used to test whether being prescribed opioids in the year prior to the cognitive assessment was associated with lower cognitive function when compared to no opioid prescribing. A sub-sample of 10,896 participants (6,411 female; mean age=47.61 years, SD=15.62) who had a full year of complete prescribing data available was used here. A measure of cognitive function was created from scores on tests of processing speed, memory, verbal fluency, and vocabulary. Analyses adjusted for age, sex, years of schooling, deprivation, and pain severity.

Results:
555 (5.1%) participants received at least one opioid prescription in the year prior to baseline. Compared to no opioid prescribing in the prior year, receiving 3-9 opioid prescriptions (n=182) was associated with a 0.17 standard deviation lower cognitive function, and receiving ≥10 prescriptions (n=91) was associated with a 0.30 standard deviation lower cognitive function.

Conclusions:
Opioid prescribing in the previous year was associated with a cognitive decrement. Longitudinal studies are needed to confirm the relationship between prescribing and lower cognitive function.

Relevance for patient care:
Opioid prescribing is associated with a range of adverse outcomes. This study suggests that a cognitive decrement may be another adverse outcome of opioid prescribing.

Oral Presentations

Authors' Names: Timmins KA, Hales TG, Mcfarlane GJ and the CAPE Consortium Investigators and Patient Partners

Lead Author (including title): Dr. Kate Timmins
Job Title of Lead Author: Research Fellow
Organisation of Lead Author: University of Aberdeen

Title:
Maltreatment and chronic widespread pain in the UK Biobank: a preliminary descriptive analysis.

Background:
Childhood maltreatment, including abuse and neglect, is associated with adult chronic pain in cross-sectional studies. As part of the Consortium Against Pain InEquality (CAPE), we will investigate causal pathways using population cohort data, the UK Biobank being the first.

Objective(s) – please include the "problem" being addressed in lay terms:
Describe the prevalence of childhood maltreatment, chronic (widespread) pain, and acute pain (a negative control outcome).

Methods:
UK Biobank (application 1144): using socio-demographic data (collected 2006-10), 5 maltreatment questions from the Childhood Trauma Questionnaire (2016) and pain data (2019). We describe prevalence of maltreatment types, and three measures of pain: chronic pain (any location >3 months); chronic widespread pain (CWP, pain 'all over' >3 months); and acute pain (any location <3 months). Odds ratios are adjusted for age, sex and deprivation quintile.

Results:
Of 118,474 participants, overall 41.8% reported childhood maltreatment (males 41.4%, females 42.1%); 18.8% reported ≥2 types. Childhood maltreatment was more prevalent with higher levels of deprivation.
65,989 respondents (55.7%) experienced chronic pain, 6,207 (5.2%) CWP, 12,292 (10.4%) acute pain. Chronic pain and CWP were more common in women (59.4% vs 50.8% and 6.6% vs 3.4% respectively). 10.6 % men and 9.9% women reported acute pain. CWP was more prevalent in the most deprived quintile: 10.1% vs 4.0% in the least deprived. The reverse was true of acute pain.
Those reporting maltreatment had higher adjusted odds of chronic pain (OR 1.38, 95% CI 1.35-1.41) and CWP (OR 1.61, 95% CI 1.53-1.69) but not acute pain (OR 0.95, 95% CI 0.92-0.99). Odds of CWP, but not the other pain outcomes, differed by maltreatment type.

Conclusions:
There appear to be important relationships between childhood maltreatment and chronic but not acute pain. Next we will develop a causal framework for analysing these data, considering key biases (e.g. confounding, missing data).

Relevance for patient care:
Understanding the role of early life adversity and the mechanisms linking it to chronic pain can allow us to personalise appropriate care to those at risk of poor outcomes.

Poster and Datablitz Presentations

Authors' Names: Professor Sonia Cottom

Lead Author (including title): Professor Sonia Cottom
Job Title of Lead Author: Director and Visiting Professor at York St John University
Organisation of Lead Author: Pain Association Scotland

Title:
Service User Outcomes of Supported Self-Management

Background:
Pain Association Scotland provides professionally-led supported self-management education and training in the community providing key coping strategies and helping people explore new ways forward leading to an improved quality of life.

Objective(s) – please include the "problem" being addressed in lay terms:
These monthly groups have enabled chronic pain sufferers to make changes to their everyday lives in a positive and practical way, resulting in improved levels of coping and well-being and we wanted to be able to demonstrate from a patient perspective.

Methods:
People who had accessed the on-line monthly self-management group sessions, either on-line or in person, were invited to complete a questionnaire via Survey-Monkey.

We had 64 responses and the questions were based on the following categories:-

- Length of time they had the pain
- Benefits experienced
- The impact on their quality of life
- Coping mechanisms

Results:
Some of the key outcomes are:-

- 95% advised that attending the group heled them maintain their self-management skills
- 82% felt more in control
- 90% felt more able to cope on a daily basis
- 60% had fewer visits to the GP as a result of attending the groups
- 43% have been living with chronic pain for over 10 years

Conclusions:
The self-management programs do not claim to change pain levels but rather aims to reduce the suffering component and change maladaptive habits. As a result of understanding more and changing behaviours, some people do report a change in their pain levels or fewer flare-ups or reliance on medication, but most report a change in how they feel about their condition and their life.

Relevance for patient care:
Demonstrating how people can improve their quality of life despite the pain and have the potential for reduced levels of medical intervention.

Poster and Datablitz Presentations

Authors' Names: Laura O'Brien

Lead Author (including title): Laura O'Brien
Job Title of Lead Author: Specialist Pain Physiotherapist
Organisation of Lead Author: NHS Fife Pain Management Service

Title:
Virtual Reality in the Management of Lower Limb CRPS: Case Study

Background:
15-50% of Complex Regional Pain Syndrome (CRPS) sufferers can develop persistent symptoms. VR in CRPS can influence pain intensity and improve function (Sato et al 2010; Solca et al 2018; Chau et al 2020). Sato et al (2010) showed a 50% reduction in pain intensity after 3- 8 sessions. However limited research has been conducted in clinical settings.

Objective(s) – please include the "problem" being addressed in lay terms:
The project was to investigate the use of VR(oculus quest 2) on CRPS in a clinical setting and improve the Brief Pain Inventory (BPI) by 2 points (clinically significant minimal amount).

Methods:
Outcome measures (NRS, BPI, PSEQ) were collected pre and post treatment throughout the pilot.

The oculus headset was applied in a seated position with foot placed flat on the ground. The duration was gradually increased as tolerance improved. As tolerance and confidence improved, standing posture was adopted on initiation by the participant.
10 sessions of up to a maximum of 30 minutes was provided and home use of a personal VR headset was encouraged.

Results:
BPI showed a reduction in the Pain severity by 0.5 points, while the pain interference showed a reduction of 0.43.
PSEQ demonstrated a 6 point difference within 10 sessions.
Tolerance levels from Session 1 to Session 10 showed a doubling in their sitting tolerance as well as a 500% improvement in their standing tolerance.

Conclusions:
Although the pilot did not meet the aim of a minimal clinically significant amount on the BPI , the participants weight bearing tolerance has significantly increased over 10 sessions which had not been achievable over 5 years with more established clinical treatments.

Relevance for patient care:
It may be that the VR was able to alter neural functioning in a different way to standard treatments but the mechanisms behind this process are unknown.

Poster and Datablitz Presentations

Authors' Names: Sam Mason, Sigrun Groves-Raines and Dr Linda Pollock

Lead Author (including title): Sam Mason
Job Title of Lead Author: People and Operations Manager
Organisation of Lead Author: Pain Concern

Title:
Pain Concern's Telephone Helpline targeting patients on a Pain Waiting List

Background:
This is a co-produced project with NHS Forth Valley and is an example of joint working with a territorial health board and the third sector.

It continued Pain Concern's interest in self-management and supporting people in pain and built on its track record of creating resources for people in pain and, capitalised on Forth Valleys' capability to communicate regularly with its pain waiting list patients.

Objective(s) – please include the "problem" being addressed in lay terms:
The aim of the project was to provide pain education and emotional support to pain patients waiting to see Pain Specialist services.

Methods:

Three methods gathered information: a caller feedback form, and outcome measurement and indicators, capturing casual moments and observations of the call handlers. Quantitative and qualitative data were thus collected.

Results:
Almost 20% of NHS Valley's pain waiting list patients used the helpline service and five patients were escalated to the Health Board for urgent attention.

Conclusions:
Most callers stated that:

- they felt empowered to tackle the broader problems of daily living, and
- felt able via self-management advice to understand pain, & activity management
- and deal with emotional distress to prevent further decline in function
- they would be better able to make best use of NHS pain services when seen

The project reach extended beyond individual benefits with NHS Forth Valley becoming increasingly aware of Pain Concern's resources, and the latter more aware of primary and secondary care, and how services link up with local groups.

Relevance for patient care:
An innovative research tool was developed to get helpline feedback from users. Consistent messaging (by Pain Concern and Forth Valley pain services about each service) is now possible, and a long-term relationship has been establish.

Posters and Datablitz Presentations

Authors' Names: Sarah-Anne Milne, Saravana Kanakarajan

Lead Author (including title): Sarah-Anne Milne
Job Title of Lead Author: ST5 Anaesthetics
Organisation of Lead Author: NHS Grampian

Title:
Patient-Centered Pain Management: Evaluating Scoring System in Selection

Background:
The Chronic Pain Service in Aberdeen provides an interventional service and 703 patients received interventional procedures between February 2022 – February 2023.

Objective(s) – please include the "problem" being addressed in lay terms:
The Chronic Pain team in Aberdeen employs a locally devised scoring system, informed by factors pertinent to recovery as identified in existing literature. Patients undergo an assessment, where they receive scores across three domains: Body Mass Index (BMI), Pain Intensity assessed using the Brief Pain Inventory, and the presence of Chronic Overlapping Pain Conditions. When the cumulative score surpasses a threshold of five, an interventional procedure is not recommended. This project was undertaken with the objective of ascertaining the extent to which patients offered interventional procedures over a 12-month period adhered to our local scoring system.

Methods:
A retrospective review of 703 patient records was performed to assess their scores in three categories. The combined score was then compared to our local scoring system.

Results:
All patients who underwent pain interventions between February 2022 and February 2023 met the criteria stipulated by the scoring system.

Conclusions:
In this review of 703 patients, it was observed that all individuals met the criteria outlined in our local scoring system. This suggests that the scoring system effectively guided patient selection during the 12-month study period.
Further work is needed to determine if compliance with the scoring system was associated with a reduction in complications and enhanced pain relief.

Relevance for patient care:
The findings highlight the significant relevance for patient care, affirming the effectiveness of our scoring system in guiding interventional pain procedure selection. This aims to ensure optimal patient outcomes, resource allocation, standardised care, and a patient-centred approach, enhancing the quality and safety of care delivery.

Poster and Datablitz Presentations

Authors' Names: Christine Pacitti, Deborah Cairns, Laura Ward, Barbara I Nicholl

Lead Author (including title): Mrs. Christine Pacitti
Job Title of Lead Author: Baily Thomas Doctoral Student, Clinical Pharmacist
Organisation of Lead Author: University of Glasgow

Title:
Investigating Pain Related Medication and contribution to polypharmacy in Adults with Intellectual Disabilities: A Systematic Review

Background:
People with intellectual disability (ID) experience multiple long-term conditions (multimorbidity), with many conditions associated with pain. Barriers to communication may cause pain to be expressed in unfamiliar ways in people with ID. This presents challenges for recognising, assessing and diagnosing painful conditions, resulting in under-reporting and under-treatment of pain in people with ID, contributing to health inequality. There is a lack of evidence on pain medication prescribing for people with ID.

Objective(s) – please include the "problem" being addressed in lay terms:
This systematic review aims to examine;

- Types of medication used for treatment of pain in people with ID and factors that may affect prescribing.
- Medication use for diagnosed painful conditions.
- Associations with pain medication being prescribed (e.g., comorbid illness)
- Use of both pain and other medications to treat underlying health conditions.
- The views of adults with ID, caregivers, and health professionals on pain medication prescribing.

Methods: Systematic review methodology is followed. Eight bibliographic databases searched using terms for ID, pain, analgesia, and drug therapy. Searches restricted from 2000 to date of search and studies published in English. Narrative synthesis describes the findings.

Results:
Keyword search produced 20222 references, the process of title and abstract screening resulted in 342 articles for full text screening, and this should be complete by the date of conference. Findings will be reported by narrative synthesis and if data allows subgroups will be analysed. E.g., age, gender, or ID diagnosis.

Conclusions:
This systematic review is expected to provide us with a basis of what is known about pain medication prescribing for people with ID and give context to subsequent research using patient data.

Relevance for patient care:
Increased understanding of how medication is used for pain in adults with ID will allow us to improve patient care when pain is experienced within this vulnerable group.

Poster and Datablitz Presentations

Authors' Names: Jennifer Taggart and Gillian Ward

Jennifer Taggart - Clinical Specialist Occupational Therapist
Scottish National Pain Management Programme
NHS Greater Glasgow and Clyde

Gillian Ward - Specialist Occupational Therapist
Scottish National Pain Management Programme
NHS Greater Glasgow and Clyde

Title:
Does practice, practice, practice on an intensive PMP lead to doing more of what matters most?

Background:
Living with persistent pain can interfere with daily activities and life roles; bringing rise to becoming disconnected with what matters most in life. An intensive PMP aims to support participants to identify what matters to them and to promote behaviour changes in line with value based occupational engagement. Guidelines for PMPs encourage data collection capturing changes in satisfaction with social roles and activities (BPS guidelines 2021).

Objective(s) – please include the "problem" being addressed in lay terms:
To measure if participants are doing more of what matters to them after attending an intensive virtual PMP.

Methods:

Over a one year period, participants in an intensive virtual PMP completed a values compass and measure of important activities (MOIA). Values compass identifies what is important to participants in the domains of relationships; leisure and social roles; work and productivity; health and wellbeing. Ratings gathered at start and end of programme measure the extent participants live life in accordance with their values. MOIA identifies activities which participants are doing less of, or not doing due to pain and would like to do in life. Participants rate importance, performance and satisfaction with their important activities at start and end of programme. The MOIA has been adapted from a standardised outcome measure where a 2 point change is a clinically important difference. Experiential learning is a core element of the programme.

Results:
Data presented includes response rates and mean change scores for these measures along with patient reported feedback. Results demonstrate participants are living life more in line with their values and have increased satisfaction with doing more of what matters to them at end of programme.

Conclusions:
The measures capture person centred changes which indicate increased satisfaction for participants who have been disconnected to what is important to them in life.
Implementing the measures virtually posed challenges. Returning to in-person programmes may improve long-term data collection.

Relevance for patient care: Measures could be considered for use more widely in PMPs.

Poster and Datablitz Presentations

Authors' Names: Mia Koponen, Emily Naray, Timothy Hales, Patrice Forget

Lead Author (including title): Ms Mia Koponen
Job Title of Lead Author: PhD student
Organisation of Lead Author: University of Dundee (Chronic Pain Research Group)

Title:
Pharmacological Interventions for Remifentanil-Induced Hyperalgesia: A Systematic Review and Network Meta-Analysis of Preclinical Trials

Background:
To improve perioperative pain management, several interventions have been suggested for the prevention of increased pain sensitivity caused by opioids (called opioid-induced hyperalgesia [OIH]). It is currently unclear which intervention is the most effective in preventing OIH. Remifentanil is the most investigated opioid causing OIH. Thus, to guide future research, we conducted a systematic review and a network meta-analysis of preclinical trials investigating pharmacological interventions for remifentanil-induced hyperalgesia (RIH).

Objective(s) – please include the "problem" being addressed in lay terms:
Several medications have been tested to resolve increase pain sensitivity after opioid use, but it is not known which medication is the best one. Our objective was to statistically compare results from rodent experiments on this topic to find the best medication.

Methods:
Electronic database searches were conducted in Embase, PubMed, Web of Science, and Google Scholar. Study characteristics were extracted, and the risk of bias were evaluated. Studies were included in the network meta-analysis if they shared similar characteristics with at least one other study. The interventions were ranked based on P-scores.

Results:
Sixty-two eligible studies tested 86 individual interventions and 6 combination interventions. Thirty-five studies eligible in the network meta-analysis formed five groups which were further divided into subgroups based on quantitative sensory test types. The best-ranked interventions were Anxa12-26, MRS2179, salicylaldehyde isonicotinoyl hydrazone, ANA-12, TDZD-8, ketamine, dexmedetomidine, JWH015, and the combination of KN93 and ketamine.

Conclusions:
The current literature is too heterogeneous to produce a clear answer on which intervention is the most effective in preventing RIH. Future research in this field should prioritise finding the most effective intervention over testing the efficacy of new options. The results of our work can be used in planning which comparisons should be included in new trials.

Relevance for patient care: Currently, there is no guidance to help clinicians to select the best intervention to prevent OIH. This leaves postsurgical patients with increased acute pain and a higher chance of pain chronification.

Poster and Datablitz Presentations

Authors' Names: Lars Williams & Rachel Atherton

Lead Author: Lars Williams
Job Title of Lead Author: Consultant in Pain Management
Organisation of Lead Author: Scottish National Pain Management Programme, NHS Greater Glasgow and Clyde

Title:
Does mode of delivery (virtual vs face to face) affect outcomes from an intensive Pain Management Programme (PMP)?

Background:
The Scottish National Pain Management Programme (SNPMP) offers intensive pain management programmes (approximately 100 hours of group time). Prior to the pandemic, programmes were delivered face to face. Social distancing requirements necessitated development of a virtual intensive PMP, delivered online. There is little in the literature comparing these modes of delivery for intensive PMPs.

Objective(s) – please include the "problem" being addressed in lay terms:
To reflect on the outcomes of this novel method of service delivery and review whether mode of delivery affects outcomes of an intensive PMP.

Methods:

- The content was identical for both types of programme, only the mode of delivery changed.
- Participants on all programmes completed a range of standardised outcome measures, including measures of distress, disability, fear of movement and psychological flexibility.
- Complete pre- and post-group data (n=166 face to face, n= 48 virtual) were analysed by t-test and Cohen's d for effect size.
- Baseline scores were compared.

Results:

- Baseline scores were similar in both cohorts, with the exception of fear of movement, which was higher in the virtual cohort.
- Significant pre-post improvements were found in all domains in both cohorts, with the exception of the CFQ, which didn't change in the virtual cohort.
- The magnitude of pre-post change was greater for all domains for the residential programme.

Conclusions:

- Results suggest that whilst both modes of delivery lead to improvement, the magnitude of change was greater following a residential programme.
- Caution is required in interpreting these results due to small numbers, the novelty of online treatment, and the unique circumstances of the pandemic and insufficient data for longer term comparison.
- More research is needed to explore the effectiveness of virtually delivered programmes.

Relevance for patient care:

- Provision of remotely delivered services increases access to services and previous work suggests high patient satisfaction. The service is keen to reflect on initial outcomes in order to continue to improve the experience of patients and optimise outcomes.

Poster and Datablitz Presentations

Authors' Names: Aleksandra Vučković, Keri Anderson, Sebastian Stein, Mariel Purcell

Lead Author (including title): Dr Aleksandra Vuckovic
Job Title of Lead Author: Reader in Rehabilitation Engineering
Organisation of Lead Author: University of Glasgow

Title:

Prediction of Central Neuropathic Pain in Subacute Spinal Cord Injury Based in EEG Biomarkers

Background:

Central neuropathic pain (CNP) affects 50% of people with spinal cord injury (SCI), and most develop this pain within 6 months post-injury. Widely used thermal and mechanical tests may not be adequate to predict CNP in people with a complete or partial lack of sensation. Electroencephalography (EEG) biomarkers of CNP could be universally applied to all patients with SCI. In a previous study, we achieved 85% accuracy when predicting CNP in SC based on EEG, but the dataset was small (10 patients per group)
A major challenge in defining EEG markers of pain is the lack of repeatability of small dataset results when applied to larger datasets.

Objective(s) – please include the "problem" being addressed in lay terms:

Test validity of predictive electroencephalography (EEG) markers of CNP in subacute SCI based on machine learning when tripling the side of the patient cohort (30 per group).

Methods:

The experiment consisted of recording EEG in a relaxed state and during cue-based movement imagination. All participants had no pain at the time of EEG recording. Six months later they were split into a group that developed CNP and a group that did not develop pain. EEG biomarkers were derived from both experimental conditions and classified using two different machine learning methods (linear discriminant analysis (LDA) and support vector machine (SVM))

Results:

Comparable classification accuracy was achieved with larger as with smaller datasets, with increased confidence interval due to larger sample size. The best accuracy of 86% was achieved with EEG biomarkers defined during cue-based motor imagery combined with SVM classifier. Biomarkers based on resting-state EEG achieved an accuracy of 82%

Conclusions:

There are several EEG biomarkers of CNP in SCI that are robust and repeatable in different datasets.

Relevance for patient care:

Early diagnosis of CNP to enable preventive treatments.

Poster and Datablitz Presentations

Authors' Names:
Mia Koponen, Ewan R. Pearson, Weihua Meng, Colin N. A. Palmer, David L. H. Bennett, Blair H. Smith, Lesley A. Colvin and **Harry L. Hébert**

Lead Author (including title): Dr Harry L Hébert (presenting author)
Job Title of Lead Author: Postdoctoral Research Assistant
Organisation of Lead Author: University of Dundee

Title:
A cross-sectional study of factors that influence the prescribing of recommended medications in people with neuropathic pain.

Background:
Despite the existence of clinical guidelines on neuropathic pain (NP) pharmacotherapy (including from SIGN, NICE and NeuPSIG), studies suggest a large proportion of people with NP are not receiving a recommended medication. To date, there has been no evaluation of whether guidelines for NP are being followed, nor who is likely to receive a recommended medication.

Objective(s) – please include the "problem" being addressed in lay terms:
To identify patient factors that predict being prescribed a recommended medication, in patients with chronic NP.

Methods:

The study used DOLORisk Dundee questionnaire data on pain and related traits, from participants who originally took part in Generation Scotland (n=7240). Questionnaire data were linked to prescribing electronic health records (May 2016-September 2017). People with chronic-NP (pain duration≥3 months, DN4-interview score≥3) prescribed recommended NP medications (Rx_{NP}) were compared to people prescribed only non-NP medications ($Rx_{Non\text{-}NP}$). Rx_{NP} and $Rx_{Non\text{-}NP}$ were derived from SIGN, NICE and NeuPSIG guidelines. Multiple logistic regression was used to identify factors associated with Rx_{NP}. Statistical significance was set at $P < 0.05$.

Results:
Of 859 people who had chronic NP and linkage to prescribing data (median age: 59 years, 67.6% female), 187 (21.8%) had received a Rx_{NP}, 138 (16.1%) had only received a $Rx_{non\text{-}NP}$ and 534 (62.2%) received neither. Having hip pain (Odds Ratio [OR]=1.83, P-value=0.03) and a lower EQ5D index score (OR=0.06, P<0.01) was significantly associated with Rx_{NP}.

Conclusions:
The majority of people with chronic NP were not prescribed a recommended NP medication, nor any other pain medication studied. These people may have received non-pharmacologics, or have previously been on NP medications. People most likely to be prescribed a recommended NP medication were those with poor health-related quality of life.

Relevance for patient care:
Further work is needed to understand the reasons for the apparent disparity between current guidelines and practice in the treatment of NP. This is likely to involve both prescriber and patient factors.