

Pain, pain, go away...

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A challenge for everyone at times, but chronically debilitating for some. Systemic pain has been treated around the world since before the history books began, from potions, lotions and tablets to complementary methods and out-there ideas. One thing is for sure, advancements have continued from era to era.

Modern medicine, though, seems to be at somewhat of a standstill, with effective new approaches to improving pain relief efficacy and effectiveness seemingly not having made the leaps or bounds of past generations (McCracken, 2023).

This white-paper discusses the potential future improvements to pain management that could have the most impact on patients' lives. Particular focus is given to the opportunities that could present themselves to pharmaceutical companies to enhance their offering to maximise value for patients.

Section 1: Beyond drugs

Effective use of prescribed and over-the-counter medication is a critical part of patient care. Alternative therapies have been used since time began, which could range from yoga to acupuncture. However, what is breaking on the horizon for the patient of the near-future?

The healing powers of nature

With a significant drift amongst consumers towards natural product reportedly representing 42% of the overall OTC market (Rocha, 2023), hot-choices like vegan or plant-based options can often be accompanied by a perception that 'natural is best'. The US government's National Center for Complementary and Integrative Health are

quick to remind us that natural doesn't always equal safe or effective (NCCIH, 2024). Despite this, consumer demand for these products appears to be increasing with brands developing products to satisfy these new desires. Brands like Benylin have come to market with a herbal chesty cough syrup with ivy leaf extract (Johnson & Johnson, 2024) for example. This movement looks to herbal and natural solutions with promise to improve physical and mental wellbeing, preferably accompanied by scientific validations (Rocha, 2024).

The most in-vogue development in the market though, has to be legalised use of cannabinoids, with various regulatory status around the globe. Indeed, around thirty thousand British people have been prescribed cannabis for conditions including pain management so far (Segalov, 2024). There is clear evidence of quality, safety and effectiveness when used in the prescribed way for the prescribed conditions. The practice of selling low-THC products (Hemp) is also well established on the high street, with The Body Shop, Boots and others listing brands containing the ingredient for various purposes (Shmerling, 2020). Growth projections in this space are only set upwards; indicated by a move in recent years from just 12 NHS prescriptions for cannabis medication to over 89,000 by the end of 2022 (Releaf, 2023). For natural based product navigating often complex regulatory environments can be a challenge (Rocha, 2023). Despite this impressive growth in the market, over a third of the UK population still believe that medical cannabis is illegal, despite over half a decade since legislation change (Releaf, 2023).

Despite this innovation/legalisation, traditional categories are still within growth for natural product: cough cold +24.8%, digestive health +9.3%, skin treatment +8.5% (Rocha, 2023). Yet despite value share for pain relief representing around \$4bn within a \$50bn market for naturals, the growth in the pain category is falling short of these comparable achievements.

Taking an alternative route

As an extension of this new age approach to nature, people have been taking more of a focus on wellness activities to help with aspects of pain management, including

practices such as yoga, mindfulness etc. This is true particularly in the case of patients dealing with chronic pain. Studies have shown that mindfulness meditation can be particularly effective with management of chronic low back pain and migraine. This is achieved through a process of uncoupling the pain-processing part of the brain (the thalamus) from the brain regions responsible for relating information from the external world to the self (Brincat, 2022). The resulting factors of mindfulness was reported in the BMJ as having potential to improve pain severity and reduce pain interference and psychological distress (Khoo et al., 2019).

Rise of the robots

It would be hard to write a paper in 2024 without mentioning Artificial Intelligence (AI). Perhaps this paper could be written by AI (it wasn't). Yet, beyond the potential to impersonate politicians in deep fake videos or to write your school homework, AI has serious applications in the health space.

With its ability to produce fast results on a range of data, it should be an asset to pain relief if modified to work in this space.

Discussions in the merger between healthcare and technology are well underway. Significant potential benefits were summarised by Forbes back in 2020:

1. "Track symptoms as they happen
2. Identify environmental factors that affect pain levels
3. Catch early warning signs of depression and anxiety
4. Walk patients through alternative therapies
5. Connect patients to peers who can offer support"

Asar (2020)

Yet, despite this four year lead-time, there seems minimal consumer facing implementation of these potential areas of improved resolution for patients. Indeed, trials and small projects are in place, but little has been reported on any widespread

implementation. Pain management must surely be an area where this type of technological application can bring improvements for patients.

It is no secret that platforms such as TikTok, with millions of monthly users, have become a place where people seek inspiration and advice on all aspects of their life; including healthcare. Yet limited engagement appears to be coming via these platforms on progressive technology in pain management. That said, accounts like 'Get Adjusted Now' that has over 2.8 million followers have achieved nearly 50 million views of their short video of how to 'crack your back'. This space can be a dangerous zone for brands, with social media content living on much longer than a brief TV ad of the past – meaning reputational considerations must be taken into account (both for brands and the products featured).

The introduction of technology is showing positive results in trials. For example, low back pain self-management interventions delivered through software-based programs were found in one study to effectively reduce pain intensity, disability, fear avoidance, and pain catastrophising (Hong et al., 2024).

Section 2: Ecosystem change

All for one and one for all

The traditional model of patient care, particularly in areas such as pain, has been widely reliant on a handful of active ingredients styled in different ways through brand expression. Take leading products in the market billed for specialist period pain treatment, ones for specific migraine pain and even ones offering the experience-changing express or rapid acting general relief... no shock that behind the branding all are ibuprofen lysine – itself a subtle salty development from the standard active first marketed in 1969.

That said, progression can also come from improving patient access – something being achieved by safely migrating medicines from prescription only to over-the-counter or even general sales list status. The economic impact here is also not to be

sniffed at, with potential NHS savings of £1.4bn and a notable quality of life increase for patients too (The Pharmacist, 2023). News is expected soon with the reclassification of Naproxen and how patients will start to benefit from this. The industry must remain vigilant though and react accordingly, focus is on pharmaceutical companies to ensure that not just in their own actions they are responsible for their accessible product, but also that patients themselves act appropriately. A view over the pond to the opioid crisis in the States demonstrates what can go wrong if suitable preventative measures aren't put in place soon enough.

So, from this incredibly generalised approach to pain relief, where next? One proposal is personalisation of treatment as the next logical step to create progress and improve patient results (McCracken, 2023).

Developing a personalisation approach can begin with the identification of the main contributing pain mechanism and the integration of the patients' view on their condition, including beliefs, preferences, concerns and expectations (Wirth & Schweinhardt, 2024). There can still be groupings of patients in the treatment profile and still having a credible personalisation approach; as long as accurate characterisation of patients is undertaken and outcomes remain relevant to the individual.

Experts have suggested that the personalisation mindset needs fundamental shifts in design. For example, considering coarse and imprecise organisation of patients' pain such as 'low back pain' or 'arthritis' does not tell the healthcare professional enough about what they need in treatment. To achieve this would need a shift away from disease models (or implicit disease models) and to move away from group thinking to individual thinking. Essentially this would be a move from decisions for the many based on studies of a few, to decisions on a few based on many datapoints such as observations. (McCracken, 2023).

Where previously this suggestion of using significant numbers of datapoints per patient may have seemed a pipedream for healthcare professionals, the potential use of tracking technology with extrapolation and interpretation by artificial intelligence

make this a potential reality. However, the balance may be a fine line. One study suggests that excessive attention to pain, or 'hypervigilance', is associated with negative outcomes in chronic pain conditions such as fibromyalgia (Hoffmann et al., 2024).

Mind over matter

Psychological approaches to treatment of chronic pain have been evidenced to be successful in assisting the patients' pain management journey. Yet, what has arguably held these back from progressing further or into the mainstream is failure to adequately consider the individual (McCracken, 2023); indeed the pace of progression in this space has become slow to non-existent.

A problem shared, is a problem halved

Studies propose that patients informed by other patients or knowledge of others' experiences have their response to pain shaped in different (positive) ways. This suggests an importance of social information on pain and arguably provides evidence that it can be used as part of pain management to improve the pain experienced. Of most importance though, is the potential to improve medicines compliance, with research demonstrating increased knowledge of others with a comparable pain profile increasing patients' willingness to continue treatment. (Bajcar, 2023)

On a scale of one to ten...

We've all been there, 'can you tell me how painful it is on a scale of 1-10'. The scale developed after many years of iterations (some familiar and others unrecognisable today) has been with us since the 1960s (first making it onto nurses charts in the 1990s) (Ball & Westhorpe, 2011). Despite commonly accepted flaws such as the potential for pain catastrophising (Hong et al., 2024), personal bias on the answer and lack of environmental consideration – little progression has been made to evolve this scale since its publication.

This opens up an opportunity to develop approaches to managing pain that consider the whole patient experience holistically, including their environment, healthcare professional interaction and comorbidities - in addition to the pain measure and medication compliance (Avallin et al., 2023). This represents a significant step-change in pain management inputs and is surely overdue in this technological age.

Recommendation

While many new technologies and approaches are proposed in the literature, there is one common thread amongst them which is holistic consideration of the patient. The word holistic here meaning the interconnected nature of each element (not to be confused with holistic medication). This concept of an interconnected approach with the patient at the centre of an eco-system of personalised care stalls under the pressure of modern complex healthcare systems. Individual operators attempt to make a dent on this space, but their efforts are dwarfed by the scale of national health services, major pharmaceutical companies and the main pharma-wholesale operators.

There is opportunity for a pharmaceutical company to take the lead in connected, patient-centric digital healthcare. Integrating traditional medication options with individual personal understanding; encompassing data-points from movement, pain measures through the day, environmental factors, involvement with others displaying pain symptoms, non-medicated support methods, peer knowledge sharing and so forth.

An idiographic, process-based approach, focused on evidence-based mechanisms of change, individually and dynamically addressed, based on contextually sensitive ongoing assessment could revolutionise how patients live with pain (McCracken, 2023). These individualised solutions creating tailored packages of care with compliance with medicated pain relief at their core could be the necessary next step-change in the evolution of pain management.

Methodology

Contributory information was gathered by literature review in three areas. Firstly, the most recent 14 issues of the *European Journal of Pain*, which covered the period of January 2023 to April 2024. Secondly, an academic search of pain management (covering the same time period as the previous point) was conducted, this was limited to the first 500 most relevant results. Finally, an overlay of contemporary sources on the world wide web was undertaken for additional social and commercial context.

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ALL eyes on...

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