Reconceptualizing the therapeutic alliance in osteopathic practice: integrating insights from phenomenology, psychology and enactive inference.

Keywords: Active Inference, Enactivism, Embodiment, Therapeutic Alliance, Interoception, Touch, Narrative

Abstract (197 words)

This review presents key concepts from neurophysiology, phenomenology, psychology, and narrative medicine which underpin a developing enactive-ecological framework for osteopathic practice. This framework aims to provide a coherent theoretical basis for understanding healthcare processes and outcomes, based on the neuroscience principles of active inference and enactivism. It offers insights into factors that influence patients’ pain perception and behaviour and foster or inhibit the development of effective therapeutic relationships. Although this approach offers promising opportunities to increase the scope of care by harnessing potential in the unique embodied ecological niches created between patients and osteopaths, it raises challenges to traditional treatment agendas. Healthcare which frames the patient-as-a person, and acknowledges the multidimensional nature of the self, requires practitioners to be collaborative and self-aware, and be able to elicit patients’ lived experiences and body stories. Phenomenological and psychological studies into enactivism emphasise the complex, dynamic nature of therapeutic relationships and the need to understand each person’s unique lifeworld context. The new framework represents an important step forward, but further research is now needed to explore ways of integrating active and enactive inference into practice, of developing psychological or mindful self- and body-awareness, and narrative communication skills for shared sense-making.
Introduction

This review presents some of the concepts from neurophysiology, phenomenology, psychology, and narrative medicine which underpin a new ‘enactive-ecological’ framework developed by Esteves et al (2022). Their framework aims to provide a sound theoretical basis for osteopathic interventions using the principles of Active Inference (AI) to illustrate how human behaviour is based on inferences about interoceptive, exteroceptive and proprioceptive inputs, cognitive beliefs and prior experiences of engagement with the lived world. AI is a key neuroscience concept in models of predictive coding and Bayesian brain processing, and also in the broader approaches of predictive engagement and embodied perspectives of the mind (Gallagher and Allen 2018; Kirchhoff 2017). These concepts are currently influencing philosophy, neuroscience, psychology, mental health (Nielsen and Ward 2018; De Haan, 2020) and osteopathy (Bohlen et al 2021), where advances in understanding the role of AI include collaborative communication and shared meaning-making (Kim et al 2022).

The new enactive-ecological framework enhances our understanding about patients’ beliefs and pain-related behaviour, but it also has implications for clinical practice. This review does not aim to provide answers about the ‘proper’ scope of osteopathy but to outline aspects of AI that pose challenges to current approaches to practice. In the past, osteopathic education placed limited emphasis on the psychological, sociocultural and environmental factors considered central to person-centred healthcare. The new enactive-ecological framework suggests the benefits of collaborative therapeutic relationships which focus on the patient-as-a-person and awareness of the wide range of factors that affect pain perception and behaviour. For clarity, complex inter-related concepts describing the multidimensional nature of the ‘self’ are presented in separate sections exploring phenomenology, psychology, neuroscience, narrative medicine and clinical practice.

Active inference and Enactivism

Active inference provides a framework for understanding human behaviour in a wide range of contexts, but research is divided between studies that focus on brain processes or the brain-body-environment (Kirchhoff 2017). The philosophical assumptions of neurocomputational coding processes in the brain can be considered conflicting or complementary to enactive, embodied theories of mind, where engagement is key to conscious lived experience. Earlier neurophysiological research into AI is now complemented by theories of enactive inference, social cognition and phenomenological approaches to understanding lived experience. Gallagher and Allen (2018)
outlined three models of AI as a means of understanding sentient behaviour involving different philosophical assumptions and research methods: predictive coding, processing or engagement.

Humans navigate complex environments by making judgments about observations and interoceptive information, but our capacity to 'know' the outside world is limited by biological capacity. Parts of the world are hidden from our limited senses, so brains must make predictions. Predictive models are used to infer what is happening in and around us and assess what action to take: enactivism, which arose from embodied cognition (Varela et al., 1993; Damasio, 2000; Foglia and Wilson, 2013; De Haan, 2020). Stilwell and Harman (2019) proposed inseparable, interconnected states between the mind, body and environment (Stilwell and Harman, 2019:656), and paraphrased an enactive understanding of pain from Thompson (2014; 2020):

“Saying that pain is in the brain is like saying flight is in a bird’s wings. A brain is needed to have pain and wings are needed to fly – but to understand pain or flight, one needs to consider the whole picture and the relational nature between things like a person (with a body/brain) and their social/environmental context; or the bird and the atmosphere. It follows that the experience of pain will not be found in the blood, brain, or other bodily tissues. The tissues in the body or the networks in the brain are not the key to pain – instead they are pieces of a larger system that is adapting and striving to sustain into the future. This always involves the environment that we shape and that shapes us.”

Pain is an important factor in human survival mechanisms and has been conceptualised in the ‘5E’ model as Embodied, Embedded, Enacted, Emotive and Extended (Stilwell and Harman 2019).

Embodied – phenomenologically “It is through my body that I understand other people” (Merleau-Ponty 1962:186). Our bodies simultaneously enable and limit our understanding and capacity to act.

Embedded – we make sense of our world using sensory information and past experiences, influenced by cultural, social and environmental factors and cognitive processes.

Enacted – we create understanding by interacting with people, the environment and cognitive sense-making, and then enact what is significant or meaningful in the world we perceive.
Emotive – cognition and emotion are intrinsically integrated at “biological, psychological and phenomenological levels” (Thompson & Stapleton, 2009:26). Emotions enable people to make meaning, so they are “constructions of the world, not reactions to it” (Barrett, 2017:16).

Extended – this challenges the notion of internal representations of the world. “A person does not “have” a model of the world, instead ... it is the model” (Gallagher, 2018; p.441).

Enactive approaches emphasise relationships between people and their environments, where pain is a “relational and emergent process of sense-making through a lived-body” (Stilwell and Harman, 2019:637). This contradicts theories that pain is located in body tissues and raises challenges to the artificial boundaries between the domains in the biopsychosocial model.

The free energy principle (FEP) and predictive coding theories explain how organisms use perception, action and learning to optimise their environment (Friston, 2010). FEP is a “unifying theory of brain and bio-behaviour” (Ramstead et al., 2018:1), which explains how organisms aim to minimise variations in free energy by reducing differences between predicted and actual state (e.g., Friston, 2013). Predictive coding is based on Bayesian Brain theory (Friston et al., 2017; Ongaro and Kaptchuk, 2018; Ramstead et al., 2020), which assumes that brains make predictions using interoceptive, exteroceptive and proprioceptive information and past experiences. Differences between expectations and lived experience create ‘prediction errors’, which require updates to avoid being surprised by unexpected situations where the need to initiate sudden action would use valuable resources (Kuperman et al 2020).

For example, if patients expect to feel pain when bending, they may misinterpret normal sensations to minimise the gap between prediction and feelings by aligning sensory inputs with prior expectations. Internal states can be altered to reduce prediction error (changing perception), or action can be taken to confirm 'top-down' predictions (changing the body). Combining perception and action typically provides better outcomes (Ramstead et al., 2018; Parr & Friston, 2019b) and enactive inference links embodiment, enactment and adaptive agency (Ramstead et al., 2020), which aligns with osteopathic concepts of function and person-centred care (Tyreman 2020). Prediction errors can be used to challenge and update prior predictions. In osteopathic practice, for example, being ‘surprised’ when a feared movement is pain-free helps patients become aware of automatic reactions and conscious reflection on prior predictions can change expectations about their physical capacities.

Sense making and Affordance
Theories of enactivism propose that organisms have to make sense of their environment for short and long-term survival needs (Thompson & Stapleton, 2009; Arandia & Di Paolo, 2021). Sense-making involves interactive, relational processes dependent on the environment and the organism’s capacity for understanding. In allostasis, the body predicts and regulates energy needs before they occur (Barrett et al., 2016; Hutchinson and Barrett, 2019) and FEP minimises energy expenditure by making accurate environmental predictions. Enactivism focuses on how agents act on their surroundings, in contrast to ecological approaches which “select the opposite starting point, describing how the structure of the world shapes the subject’s possibility to act” (Coninx and Stilwell 2021:4). In ecological psychology, possibilities for action are described as ‘affordances’ (Gibson, 1977; Rietveld, 2014). People perceive different affordances, determined by the environment and their capacity to use objects in the environment (Coninx and Stilwell, 2021).

Enactive healthcare involves engaging with the patient’s story and clinical outcomes are dependent on participatory sense-making between two autonomous people (De Jaegher and Di Paolo, 2007; Fuchs and De Jaegher, 2009; De Jaegher, 2018). Patient-practitioner dyads create ‘ecological niches’ (Vasil et al 2020), where affordances can be increased by practitioners’ influence on patients, and vice versa. These concepts provide a framework for understanding complexity and dynamic intersubjectivity in therapeutic alliances (Shaw, 2003, 2004; Connolly, 2022).

In osteopathy, sense-making processes link enactivism and agency (Tyreman, 2013, 2018b). People who view the world as dangerous generate predictions to minimise free energy, so the world does not change but they limit activities which reduces agency in their lifeworld. The Skilled Intentionality Framework (SIF) is an ecological-enactive position where clinicians are sensitive to patients’ sense-making and aware of a wide range of affordances (Rietveld et al 2018). Skilled intentionality and participatory sense-making, including touch and non-verbal communication (McParlin et al 2022) can enable practitioners to expand patients’ beliefs about physical activity (Coninx and Stilwell 2021) and re-engage with a wider field of affordances (Morrison et al, 2009; Morrison, et al 2011).

In participatory sense-making, synchronisation occurs through collaborative communication (McParlin et al., 2022), and in strong therapeutic alliances, attuning to patients’ needs enables practitioners to challenge patients’ beliefs. “The precision of one’s prior beliefs relative to another agent with whom one is coupled, has important implications for the degree and the direction of attunement with and across couplings” (Vasil et al., 2020:12). Participatory sense-making requires active collaboration and engagement with patients’ beliefs and values, which contrasts with therapeutic relationships involving ‘expert’ practitioners. It also challenges biomechanical theories.
and reductionist biopsychosocial models (Stilwell and Harman, 2019), which are inadequate for understanding complexity (Mescouto et al. 2020). The next section explores the implications of participatory sense-making and affordances from a phenomenological perspective.

2 Phenomenology

Phenomenology focuses on lived experience and key concepts include embodiment and ‘the lived-body’. Embodied experiences are important foundations for therapeutic relationships and, in osteopathy, generate co-constructed narratives which enable deeper understanding of treatment interactions and management strategies (Shaw, 2004).

Embodiment

Embodiment is a phenomenological concept which rejects mind-body dualism and suggests the sense of ‘self’ arises through perception and engagement with the world (Merleau-Ponty 1962, 1968; Varela and Shear, 1999; Heinämaa, 2018). Bodies are imprinted with biographical and cultural meaning in learning processes that start before language (Teie, 2016). Embodiment aligns with enactivism as we learn how to ‘be’ in the world through bodies which help us navigate the unknown. Perceptions of the lifeworld are both constructed and limited by physical capacities and biographical factors construct the narratives that define relationships with people and the environment (Shaw, 2003, 2004). Healthcare practices are embedded in cultural stories about healing and metaphorical language (Lakoff and Johnson, 1999; Verghese, 2011; Benedetti, 2011) and individual bodily interpretations and inferences “bring forth our own world” (Bruineberg, 2017:15).

In osteopathy, opportunities to explore patients’ embodied experiences occur in dyadic ‘ecological niches’ (Vasil et al 2020), supported by practitioners’ embodied reactions which offer clues to the nature of the therapeutic relationship (Shaw, 2004; Kleinbub et al., 2020). Active inference provides a framework for understanding how individual psychophysiological states become synchronous in shared environments (Gallagher and Allen 2018). Sociocultural dynamics influence individual beliefs and behaviour, but cooperative communication (i.e., talk, touch and body language) functions to create shared narratives which contain niche-specific knowledge and meanings (Vasil et al 2020; Tison and Poirier 2021). Practitioners’ beliefs and behaviour can positively influence patients’ psychophysiological states (McParlin et al 2022) and practitioner awareness can be developed through psychological training, mindfulness, mentoring and peer discussions.

The Lived-body
The concept of the lived-body (Luciani and Cadoz 2007; Merleau-Ponty 1968) describes how meaning is created through embodied interactions and exercising agency, which depends on physical capabilities (Leder, 1990; Engelsrud, 2005; Dahlberg, 2019). Perception and action are based on predictions that influence how patients present symptoms and how they are perceived by practitioners. Encouraging patients to engage with active intention can have powerful psychological benefits, for example, when people in chronic pain re-engage with activities previously thought impossible. Change is most successful when activities align with patients' values and goals but capacity for change should be carefully assessed (Tyreman, 2018a; 2018b), an approach which requires time to explore lived body experiences and narratives (Norlyk et al., 2013).

In clinical practice, two body narratives meet. Osteopaths who are aware of their own body stories can gain rich information if they experience striking, repeated physical reactions to certain patients (e.g., headaches, back pain, nausea; Shaw, 2004). Active inference provides a framework for understanding attachment processes and attunement in therapeutic relationships (Gallagher and Allen 2018) and explains how osteopaths can utilise verbal and non-verbal cues to infer, explore and influence patients' internal states (Kim et al. 2022). Understanding attachment processes may help create effective alliances, based on attunement to a patient's unique lifeworld.

3 Psychological Concepts

National Institute for Clinical Excellence guidelines recommend psychological input for chronic pain (NICE 2021), but osteopaths do not need to become psychotherapists. Developing awareness of concepts such as therapeutic alliances and attachment theory can also help to strengthen practice.

Therapeutic alliances

Patients may view clinical settings as unknown or alarming, so it helps to develop safe, trusting therapeutic alliances. Psychological 'alliances' relate to boundaries in therapeutic contracts and 'relationships' relate to practitioners’ qualities (Castonguay, 1993; Weinberger, 1993; Russell, 1995; Glass et al., 1998; Drisko, 2004; Schenck and Churchill, 2012). “Many elements of the therapeutic context can play a role in enhancing predictions of well-being, especially in chronic situations” (Ongaro and Kaptchuk 2018:3). Positive alliances predict beneficial patient outcomes (Ferreira et al., 2013) and strong contextual predictors for improvement include effective alliances and clear communication about expectations (Bishop et al., 2021). Communication builds alliances through the social 'ritual of the therapeutic act' (Benedetti, 2011). “Placebo and nocebo effects are embodied psycho-neurobiological responses capable of modulating pain and producing changes at
different neurobiological, body at perceptual and cognitive levels. These modifications are triggered by different contextual factors presented in the therapeutic encounter between patient and healthcare providers, such as healing rituals and signs” (Rossettini et al., 2018:1). Listening builds alliances (Drisko, 2004; Schenck and Churchill, 2012), but requires time and space for stories to unfold. Common factors in successful therapeutic relationships include helping patients create new narratives (Prochaska and Norcross, 1994; Horvath, 2005; Wampold et al., 2010; Tschacher et al., 2012). In physical therapy, training in active listening and narrative medicine is still developing (Bishop et al., 2021), as biomedical communication often predominates (Mescouto et al., 2020).

**Attachment**

Neuroscience demonstrates how early experiences affect adults (Schore and Shore, 2008; Simpson et al., 2014; Rass, 2018; Lahousen, Unterrainer and Kapfhammer, 2019). Attachment theory describes childhood attachment patterns to caregivers and positive or negative effects on subsequent relationships (Bowlby, 1988). Early attachment problems predict psychopathologies, dissociation and anxiety disorders affecting adult relationships (MLSRA Institute of Child Development, 2021). In contrast, secure attachment leads to better self-agency, emotional regulation, self-esteem and ability to sustain relationships.

Early development is shaped by emotional experiences and attachment involves synchronising with others (Rass, 2018). Predictions about the world include past relationship experiences and secure attachment forms the basis of emotional regulation. Porges (2017) observed that practitioners can modulate patients’ emotional responses through calmness and voice modulation, emphasising the importance of attachment in therapeutic alliances. Trauma has profound effects on bodily systems (Doidge, 2007, Ogden et al., 2015), but relationships can restore positive attachment patterns in trauma psychotherapy (Van der Kolk, 2015; Dana, 2018). Secure attachment patterns help to modulate ANS activity (Murphy et al., 2018), and talking therapies are described as ‘down regulating’ and body work with sensorimotor inputs as ‘up regulating’ (Ogden et al 2015). Osteopaths who represent trusted attachment figures promote reassurance (Duquette & Ainley, 2019), creating alliances where patients feel safe to explore negative experiences and opportunities for change.

**4 Neurophysiological Concepts**

Neurophysiological research into interoception, touch and mindfulness are described below to illustrate links between enactive inference and phenomenological lived body experience.

**Interoception**
Interoception is a key feature of lived-body experience in which neuroanatomical pathways and neurophysiological processes transmit information from organs and tissues to the brain, and vice versa, via the autonomic nervous system (ANS) (Oldroyd et al., 2019; Paulus et al., 2019; Cerritelli et al., 2021). The system includes peripheral and central pathways, nuclei and cortical regions which continuously sense neurochemical and anatomical changes (Carvalho and Damasio, 2021). Conscious cortical processing of ANS activity is vital for homeostasis (Craig 2002, 2003) and interoception is also the neurobiological ground of feelings, emotions, and cognitive processes. This source of ‘how it feels being ourselves’ influences self-perception, decision-making and agency (Varela et al., 1993; Damasio, 2000; Seth et al., 2012; Craig, 2015). Specific pathways and mechanisms create internal bodily experiences, but we are unaware of isolated organs, neural centres or a separate brain and body as the sense of self is a whole person phenomenon that pre-dates language (Fotopoulou and Tsakiris, 2017; Owens et al., 2018). Biomedical explanations offer limited understanding about the sense of self in complex, chronic conditions (Kirkengen and Ulvestad, 2007; Stillwell and Harman, 2019). Inferential models propose that interoception and predictive processing generate feelings, emotions, and selfhood (Paulus and Stein 2010; Seth and Critchley, 2013; Barrett and Simmons 2015; Pezzulo et al., 2015; Van den Bergh et al., 2017), where subjective feelings are shaped by predictions, interoceptive inferences and expectations (Seth et al., 2012).

The interoceptive cortex (IC) has neuroanatomically distinct arms called the anterior insular cortex (AIC) and anterior cingulate cortex (ACC). They issue predictions and encode prediction errors based on viscero-sensory information ascending to the posterior and mid-insula (Seth and Friston, 2016; Marshall et al., 2018). They co-actively form a “salience network” with the amygdala and inferior frontal gyrus that selects which stimuli deserve attention (Craig 2009; Medford and Critchley, 2010). The AIC is the primary neurofunctional hub between top-down cognitive processes and bottom-up sensory experiences (Marshall et al., 2018; Paulus et al., 2019). Predictive coding in the AIC assesses prediction errors and influences context-dependent behaviour by tracing links between the feelings, affordances and actions that affect agency (Seth and Critchley, 2013).

The ACC is a viscero-motor centre with autonomic modulation functions for bodily arousal to meet behavioural demands (Holroyd and Yeung, 2012; Seth et al., 2012; Lavin et al., 2013). It connects to subcortical areas involved in internal regulation (Barrett and Bar, 2009; Harrison et al., 2010), and influences goal-oriented behaviour and decision-making about actions based on predicted effort and reward (Craig 2002, 2003; Holroyd and Yeung, 2012; Lavin et al., 2013; Watson et al., 2018).
Dynamic interplay between body sensations, environment, motivation and behaviour highlights the relevance of active inference and interoception for making sense of the world (Seth and Critchley, 2013; Bolis and Schilbach, 2020).

Perception is a process conducted by embodied agents with the capacity to make sense of interoceptive, exteroceptive and proprioceptive information from embodied experiences (Petersen et al., 2015; Zacharioudakis et al., 2020). Motivation to engage with the environment is guided by perceptions about what is relevant and meaningful (De Haan 2020). Perceptive engagement links active inference with enactivism as it is more than sensing and moving and includes sense-making and judgements about potentially useful or dangerous situations. In osteopathy, action-perception cycles may help to explain some treatment outcomes, as how links between sensing, perceiving, sense-making and physical engagement with the environment encourage people to explore reactions to pain and expand their field of affordances (Kim et al 2022).

Ecological healthcare emphasise how embodied interactions create unique interpretations of inner sensations, shaped by biographical experience. Enactivism adds a richer understanding of complex relationships between symptom perception and objective pathophysiological dysfunctions (Petersen et al., 2015; Pezzulo et al., 2015; Zacharioudakis et al., 2020). Together, they make sense of multi-faceted experiences which incorporate beliefs and body narratives co-created in ecological niches (Van den Bergh et al., 2017). Overlapping neurophysiological processing pathways for interoception, touch and mindfulness seen in fMRI studies highlight interactions between top-down cognition and bottom-up sensorimotor experiences (Casals-Gutiérrez and Abbey, 2020). Osteopathic care that combines touch and mindfulness appears to help patients with persistent pain (Abbey et al 2020), but research is needed to understand the complex sense-making processes this approach involves.

**Mindfulness**

Mindfulness is described as being non-judgmentally present to moment-to-moment experience, including thoughts, emotions, sensations and perceptions (Kabat-Zinn, 2012). People with persistent pain who struggle with bodily distress develop selective attention towards (hypervigilance) or away from discomfort (sensory attenuation) (Esteves et al 2022). Secular mindfulness (Harris 2009) and meditation enable people to focus at will on different sensorimotor experiences and improve interoceptive precision by focusing on top-down predictions of sensorimotor information (Laukkonen and Slagter, 2020). People can regulate their interoceptive states and predictions in changing environments (Fotopoulou and Tsakiris 2017; Fonagy and Campbell, 2017; Bolis and...
Schilbach, 2020), through precise observations including wider sources of information (Lutz et al., 2019). Non-judgmental perception of inputs categorised as 'pain' reduces avoidant responses by improving precision-weighting in the posterior insula (Pagnoni, 2019; Laukkonen and Slagter, 2020) and down-regulation of pain affect suggests successful suppression of top-down narratives (Zorn et al., 2020). Uncoupling affective experiences from pain also decreases catastrophising, nociceptive threat-based predictions, and reduces emphasis on past predictions.

Mindfulness is typically an individual practice but combining mindfulness and touch in osteopathy may strengthen interoceptive skills. Guided practices can reframe sensations perceived as harmful as 'normal' and influence pain responses (Abbey et al 2020). Effects are enhanced by cooperative communication, combining touch and verbal guidance, and alignment in patients' and practitioners' active inference systems (McParlin et al 2020) and may be strengthened through shared processing pathways (Casals-Gutierrez and Abbey, 2020).

**Touch**

Touch is the earliest functional sense to develop (Duhn, 2010; Crucianelli and Filippetti, 2018), and the primary modality for communication and interaction. In early life, it enables sense-making in the environment by conveying a sense of the physical presence of the ‘other’ (Björnsdotter et al., 2014). Interoceptive touch refers to emotional and motivational aspects of tactile experiences, separated into discriminative and affective touch (McGlone et al., 2014; Pawling et al., 2017). Affective touch is linked to the specialised C-tactile (CT) system, which sends information to the interoceptive cortex via the posterior insula (PI). It contributes to embodiment via bottom-up regulatory ANS pathways (Björnsdotter et al., 2009; D’Alessandro et al., 2016). CT fibres are triggered by gentle stroking and are important in building secure attachment in infancy (Duhn, 2010; Denworth, 2015; Murphy et al., 2018; Croy et al., 2019). Touch is important in the enactive inference framework as physical contact helps people infer each other’s mental states and influences prior beliefs and sensory arousal (Esteves et al 2022). Alliances are strengthened by repeated dynamic touching, similar to the neurophysiological effects of C-tactile afferents in social touch which promote synchrony and attunement (McParlin et al 2022).

Three factors differentiate touch from other senses; it is mutually-dyadic, multi-sensory, and generates homeostatic information (Crucianelli and Filippetti, 2018). Mutually-dyadic refers to the bidirectional process of physical contact: we cannot touch someone without being touched (Merleau-Ponty, 1968). Therapeutic touch has been conceptualised as intrinsically shared and...
synchronous (Ciaunica and Fotopoulou, 2017). The multi-modal integration of interoceptive, proprioceptive and exteroceptive information and spatial-contextual features shape the meaning and psychophysiological impact of touch. Homeostatic-informative aspects describe how touch contributes to neurophysiological regulation, including sensory cues from the body and outer environment. Homeostatic-physiological impacts are influenced by type of tactile stimulation (McParlin et al. 2022) and cranial touch may modulate parasympathetic nervous system activity (Edwards et al., 2018). Touch location, speed, pressure, expectation, predictability, temperature, and cultural biases and beliefs all influence individual interpretations (Ellingsen et al., 2015). Osteopaths create varied opportunities to 'touch' patients, with outcomes influenced by synchrony between a practitioner's intentions and the patient's perception. Enactive inference is therefore important for understanding an individual's awareness, agency and body narrative.

5 Narrative Medicine

There are important links between active inference, therapeutic relationships and narrative medicine as lived experiences influence symptom perception and narratives about the body and self. Interdisciplinary narrative medicine incorporates phenomenology, language, aesthetics and bioethics and proposes that thoughts do not exist outside the person’s lifeworld but are brought into being by speaking. It incorporates literature and art as creative representations of body-stories, as well as relational language and the social realities that underpin healthcare dialogues. Stories are central to lived experience and clinical encounters, as people make sense of themselves and their world through storytelling (Venema, 2000). Language conveys nuanced meanings, making it important to understand communication from individual's socio-cultural context to enable participatory sense-making. Speech is a cooperative embodied action through which individuals create shared meanings.

Friston et al (2020) analysed linguistic exchanges to explore how question and answer dialogues evolve. They demonstrated a communication hierarchy in which higher level beliefs, predictions and inferences sequentially influenced word selection to clarify meanings. Questions were answered quickly and precisely in linguistic exchanges where there were shared beliefs, but when beliefs were imprecise, exchanges demonstrated uncertainty until convergence emerged through a process of joint creative thinking. This indicates the value of narrative medicine for exploring patients’ word choices and understanding how dialogues illuminate beliefs and misunderstandings. Training in narrative medicine can increase empathy, relationship-building, perspective-taking, reflection and resilience and decrease burnout by developing narrative competence (Remein et al, 2019).
Narrative competence

Narrative competence is defined as the “ability to absorb, acknowledge, interpret and act on the stories and plights of others” (Charon, 2001:1897). Clinicians access the meaning behind words, silences and body language through listening, representation and affiliation. Close attendance to spoken experience is supported by exploring poems and visual art as analogies for the lived-body. Reading poetry has been described as akin to entering a complex system and may help clinicians to negotiate clinical uncertainty and ambiguous language more effectively (Maretic and Abbey, 2021). Uncertainty is part of clinical decision-making and the centre of a person’s illness experience when the familiar sense of agency changes. Tyreman (2015) argued that the role of practitioners is not finding solutions to problems but enabling people to regain trust in their own bodies but sharing patients’ journeys through uncertainty requires specific therapeutic attitudes and skills.

Phenomenology proposes that humans inhabit individual worlds that cannot be experienced by others but can be ‘expressed’. Clinical encounters involve the ‘voice of medicine’ and the ‘voice of the lifeworld’ (Mishler, 1984). Narrative medicine suggests that patients and osteopaths engage through a shared focus on the body where meanings is created in the dyadic space. Co-constructed narratives, however, depend on practitioners’ abilities to find points of entry into a patient’s world and requires narrative competence in imaginative thinking and radical listening skills.

Narrative humility

Narrative medicine is underpinned by humility (DasGupta, 2008), where practitioners acknowledge they cannot fully understand someone-else’s experience. Levinas’ philosophy of the ‘Other’ recognises that other people always lie outside our self-understanding (Irvine, 2005). We recognise common experiences but also parts of their world experience that we do not, or cannot, share. Recognition is about knowing and the limits of knowing (Felski, 2008), which has ethical implications for balancing power in clinical relationships. Narrative humility enables practitioners to collaborate and interact with patients’ stories without expecting to fully understand.

Sociology defines illness as a biographical disruption, with narratives that represent embodied chaos and breakdown in adaptive agency. These can be hard to hear because of lack of narrative sequence and painful loss of agency and require narrative listening (listening and thinking with and not to the person’s story; Frank, 1995), which focuses on plot, voice, space, temporality and meaning. Practitioners who can hold a listening space enable people to explore new possibilities in familiar stories and construct alternative meanings and sense of agency. People in pain are vulnerable and
often feel invalidated by healthcare communication (Carel and Kidd, 2014). Narrative training helps practitioners become reflective, trust patients’ stories, and bridge gaps between medical terms and the language of lived experience. It explores intersubjectivity in therapeutic alliances and puts patients’ stories centre stage, enabling practitioners to work with complex pain experiences. Narrative skills can therefore deepen understanding in clinical settings, but the process requires humility, witnessing, and deep, dynamic recognition of self and other (Charon, 2001).

6 Clinical applications and challenges

Concepts presented above suggest that active and enactive inference are not simply theories or tools to employ within traditional models of osteopathic practice. The enactive-ecological framework proposed by Esteves et al. (2022) raises challenges to familiar therapeutic relationships and modes of communication. Patients’ beliefs and goals may not fit with osteopaths’ agendas, so strong, flexible therapeutic alliances are needed to work with prior predictions and shared sense-making. The Osteopathy, Mindfulness and Acceptance Programme (OsteoMAP: Abbey et al 2020) illustrates one example of integrated manual treatment and psychological self-management interventions, with dual aims that are aligned with an ecological-enactivist approach.

‘Patients’ can be conceptualised as complex bio-medical or neurophysiological systems and biopsychosocially as ‘people’ within a unique lifeworld (Norlyk et al., 2013). ‘Pain’ can be interpreted as physical dysfunction and as part of an embodied narrative. Osteopaths can help patients to manage pain and encourage learning and dialogue to make sense of people’s experiences. Dual agendas can be conflicting or complementary, where both are used for different purposes using different skills.

The OsteoMAP study analysed outcomes from six-week courses for people with persistent pain (Carnes et al 2017; Abbey et al 2020). Psychological interventions aimed to develop flexibility, the core concept of Acceptance and Commitment Therapy (ACT) and included mindfulness to increase body and self-awareness (Hayes et al 2012). Quantitative outcomes showed improvements in quality of life, active coping behaviour, acceptance and mindfulness. Qualitative data suggested challenges for osteopaths in managing dual treatment aims included maintaining mindful awareness throughout sessions and choosing when to focus on treatment or patient self-learning.

Behavioural interventions are effective when grounded in personal learning (Harris 2009) and motivated by an individual’s goals (Michie and Johnston 2012). This raises challenges for expert practitioners, as facilitative communication is required for person-centred care (Thomson et al 2012; Thomson et al 2014; Tyreman 2020). Interventions to improve body awareness have physical
and psychological health benefits (Farb et al 2015; Mehling et al 2013) and self-awareness of habitual
reactions strengthens self-care. Enactivism offers insights into how changes occur, and predictive
processing explains the limits of pain education or cognitive reassurance for patients who do not
feel heard (Kube et al 2020). OsteoMAP results suggested better outcomes when osteopaths
created opportunities to notice differences between Patients’ prior predictions and actual bodily
sensations using mindfulness and graded exposure (George and Zeppieri 2009).

Barriers to using OsteoMAP effectively included challenges in learning when and how to shift
between treatment and exploring present-moment experience (Carnes et al 2017). When
osteopaths felt uncertain, they reverted to ‘expert’ treatment agendas and people who were less
aware of their own experience or less able to create open communication struggled to create
learning opportunities. Some practitioners were effective in generating interoceptive ‘surprise’ when
experiences did not fit with expectations and exploring sensations in detail to increase interoceptive
precision. Non-verbal clues about anxiety (i.e., facial cues, tensing muscles, posture) were used to
explore habitual reactions to feared sensations and avoided movements. Osteopaths who remained
open and curious created flexible interventions grounded in patients’ experiences that sometimes
led to transformational changes.

OsteoMAP was not, however, useful for all patients or osteopaths. Body awareness requires the
ability to describe sensations and willingness to share thoughts and feelings. Sessions using
enactivism or mindfulness differ from previous treatment and need careful communication and
consent to embody an effective model of person-centred care. This approach requires self-
awareness, developed through psychological skills training, mindfulness or narrative approaches.
OsteoMAP aligns with the new ecological-enactive framework for osteopathic practice (Esteves et
al., 2022), but both inevitably require the development of different attitudes, knowledge and skills.

7 Discussion and Conclusion

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Figure 1 illustrates biomedical and psychosocial healthcare concepts with an ‘enactive-ecological’
core that illustrates a multidimensional perspective of the patient-as-a-person. Concepts based on
different philosophical assumptions may conflict but are all relevant to varied models of practice.
The conclusions of this review are:
• Active inference and predictive engagement are important concepts that are best understood within a person-centred perspective

• Therapeutic alliances and attachment theory are central to healthcare process and outcomes

• Patients’ illness experiences of illness can be understood in a multi-dimensional context using neurophysiological and phenomenological concepts

• It is necessary to prioritise lived experiences over treatment agendas to enable patients’ narratives to unfold

• Using enactive inference in practice requires shifts in therapeutic relationships and the development of skills to facilitate patient learning

The enactive-ecological framework proposed by Esteves et al., (2022) is a promising means for understanding mechanisms of effect and outcomes in osteopathic healthcare. New approaches, however, require re-evaluation of traditional aims, working practices and education. Active inference and predictive processing were initially analysed in biomedical and neurophysiological research, but there are challenges in assuming that this identified tools that can be applied to patients in the traditional practitioner-led modes of practice. More recent phenomenological and psychological studies into enactivism emphasise the complex, dynamic nature of therapeutic relationships and the need to understand patients in their unique sociocultural lifeworld context.

The new framework represents an important step towards evidence-based osteopathic practice but would benefit from further research to assess:

• How to introduce concepts of active inference and enactivism in osteopathic education

• Effective methods of teaching psychological or mindful self- and body-awareness

• Narrative and communication skills training for participatory sense-making

Osteopaths have the potential to positively influence patients’ health beliefs, body awareness, and the prior predictions that influence avoidant behaviour. There is currently limited knowledge about how positive changes occur or the barriers that limit changes for patients and practitioners. Further research is recommended to explore how to create effectively integrated mind-body interventions in the conceptual framework of enactive inference to increase the scope of osteopathic healthcare.

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https://doi.org/10.1098/rstb.2016.0011


https://doi.org/10.1353/ppp.2020.0001


Murphy, M., Janicki-Deverts, D. and Cohen, S., 2018. Receiving a hug is associated with the attenuation of negative mood that occurs on days with interpersonal conflict. PLOS ONE, 13(10), p. e0203522.


