

The healing touch: Where ancient wisdom meets modern technology in Chiropractic care

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Narrative: Artificial intelligence (AI) is transforming healthcare, offering tools for imaging analysis, decision support, documentation, and practice operations.

Machine learning has achieved strong performance in specific spine imaging tasks and can integrate patient history, imaging, and other clinical variables to support risk stratification and care planning.

I argue that the foundation of Chiropractic care rests not in algorithms, but in the skilled, compassionate touch of human hands and clinical reasoning developed over years of practice.

Our hands are richly endowed with finely discriminating receptors which through layered palpation from superficial to deep structures build us a 3D anatomical map with minimal effective pressure to optimise mechanoreceptor activation. With focused attention and avoidance of unnecessary pain that can induce guarding, we can build a predictive model to guide the intent of our adjustment.

Indexing terms: Chiropractic; AI; palpation; touch; touch receptors; 3D model.

Introduction

As we stand at the intersection of timeless healing principles and cutting-edge technology, Chiropractors face an opportunity to enhance patient care while preserving the irreplaceable essence of our profession.

Artificial intelligence (AI) is transforming healthcare, offering tools for imaging analysis, decision support, documentation, and practice operations. Yet, the foundation of Chiropractic care rests not in algorithms, but in the skilled, compassionate touch of human hands and clinical reasoning developed over years of practice.

This article explores how AI can augment Chiropractic practice while highlighting the neurobiological sophistication of palpation and the therapeutic relationship capabilities no machine can replicate. We review supporting evidence, opportunities, and limitations to ensure integration preserves purpose and patient-centred care. (1 - 7)

“... As useful as AI may be in our clinical practice, it can't replace informed, manual palpation”



AI integration

Enhancing practice without replacing purpose

The healthcare sector is rapidly adopting AI, and Chiropractic clinics are beginning to leverage similar tools used across musculoskeletal care. (8 - 12)

- Diagnostic enhancement: Machine learning has achieved strong performance in specific spine imaging tasks (e.g., classification of degenerative changes, deformity, trauma, and oncology) on curated datasets. (13, 14) Deep learning approaches for spine MRI/CT can assist with segmentation and detection, potentially improving consistency and reducing variability; however, external validation and workflow fit remain challenges. (13 - 16)
- Clinical decision support: AI systems can integrate patient history, imaging, and other clinical variables to support risk stratification and care planning. Reported performance varies widely by task, data quality, and validation setting, and models may underperform on external datasets if not rigorously tested. (10 - 12, 17, 18) These tools should inform, not replace clinician judgment.
- Practice management and operations: Generative models and chatbots can assist with patient communication, appointment scheduling, reminders, and basic education content; results are mixed and require oversight and safeguards for accuracy and privacy. (19, 20)
- Ambient AI ‘scribes’ show promise for reducing documentation burden and improving note completeness when used with clinician review. (21, 22) Predictive analytics may support retention and capacity planning. (8, 19)
- The promise and limitations: Benefits include efficiency, standardisation, and pattern recognition at scale. Limitations include data shift, bias from non-representative training sets, lack of explainability, and difficulty adapting to complex biopsychosocial contexts. (5 - 7, 10, 11, 17) Safe deployment requires governance, bias auditing, validation, and human-in-the-loop oversight. (5 - 7)

The primacy of hands

Chiropractic’s fundamental tool

While AI excels at computation, the human hand remains central to Chiropractic, both diagnostically and therapeutically. Therapeutic touch fosters communication, reduces stress, and promotes healing via neuroendocrine and affective pathways. (23 - 27) Oxytocin release, reduced cortisol, and activation of C-tactile afferent contribute to relaxation, bonding, and pain modulation. (23, 25, 27) Therapeutic touch also builds epistemic trust through patients’ confidence in the practitioner’s knowledge and intentions, supporting adherence and outcomes. (28)

In practice, therapeutic touch is both instrumental (e.g., during adjustments) and expressive (conveying reassurance and attunement). Skilled chiropractors integrate tactile assessment with patient feedback, adapting techniques in real time based on subtle sensory cues and clinical context. (23, 26, 28)

The anatomical sophistication of hand palpation

The fingertips contain some of the highest densities of low-threshold mechanoreceptors in the body, enabling exquisite tactile acuity. Classic neurophysiology identifies four major glabrous skin mechanoreceptor types with complementary functions:

- i. Meissner corpuscles (low-frequency vibration, motion)
- ii. Pacinian corpuscles (high-frequency vibration, deep pressure)
- iii. Merkel cell–neurite complexes (edges, texture, sustained pressure), and
- iv. Ruffini endings (skin stretch, hand shape). (29 - 33)

These populations collectively support fine discrimination on the order of sub-millimetre spatial acuity in the fingertips. (30 - 34)

Another aspect to consider in this context is that receptor density and function appear to be influenced by age and other factors; tactile sensitivity may decline with ageing, particularly in the fingers, underscoring the importance of ongoing practice to maintain palpation skill. (35 - 37) Skilled palpation leverages gentle forces to optimise receptor activation and avoid masking sensitivity. (23, 29 - 33)

From hand to brain: the neurological pathway of palpation

Fine touch, vibration, and proprioception from the hand ascend primarily via the dorsal column-medial lemniscus (DCML) pathway: first-order afferent (dorsal root ganglia) ascend ipsilaterally (cuneate fasciculus for upper extremity) to the medulla; second-order neurons decussate and ascend in the medial lemniscus to the thalamic ventral posterolateral (VPL) nucleus; third-order neurons project to primary somatosensory cortex (S1) with precise somatotopy. (38 - 41) Large myelinated fibres support rapid conduction and fine discrimination, enabling immediate feedback during palpation and adjustment. (38 - 42)

To provide a more comprehensive understanding, let's delve into how the Cortical 'magnification' of the hand in S1 reflects its behavioural importance and supports refined skill acquisition. Sensory processing is context-dependent, modulated at spinal, brain stem, thalamic, and cortical levels by attention, expectation, and prior experience factors central to clinical expertise. (42 - 44)

On a related note, it's worth highlighting that neurological effects of spinal manipulation have been observed in several small studies, including changes in motor evoked potentials and alterations in cortical activity during pain processing; these findings are preliminary, population-specific, and require larger confirmatory trials. (45 - 48)

Palpation as art

Developing clinical expertise

Beyond neuroanatomy, palpation expertise arises from deliberate practice that refines psychomotor control and perceptual discrimination. Key educational principles include:

- Layered palpation from superficial to deep structures to build a 3D anatomical map with minimal effective pressure to optimise mechanoreceptor activation.
- Focused attention and avoidance of unnecessary pain that can induce guarding.
- Dynamic assessment of joint play and end-feel. (23, 49, 50)

Shifting our focus slightly, we also find that the reliability of palpation varies by technique, region, and examiner confidence. Systematic reviews report mixed interexaminer agreement, with better reliability in some contexts (e.g., pain provocation, specific lumbar/cervical assessments) and lower agreement for certain motion palpation procedures, particularly in the thoracic spine. (51 - 55) Confidence and clear protocols improve agreement; integrating palpation with other examination findings enhances clinical utility. (52 - 55)

With experience, palpation can feel intuitive reflecting implicit learning and sensorimotor optimisation involving cerebellar, basal ganglia, and cortical circuits. (56, 57) This embodied expertise differs from statistical pattern recognition in AI, which lacks lived, interoceptive, and relational dimensions.

The irreplaceable human: empathy, intention, and clinical excellence

Chiropractic's traditional concept of 'innate intelligence' has been interpreted in modern terms as the body's self-organising, adaptive capacities (e.g., homeostasis, allostasis, emergent properties) rather than a metaphysical force. (58 - 62) Regardless of philosophical framing, clinical care hinges on empathy, intention, and ethical judgment.

Clinical empathy includes affective, cognitive, and motivational components; authentic affective resonance remains uniquely human. (63 - 66) While AI can simulate aspects of cognitive empathy, it cannot feel emotions, may dehumanise interactions if poorly deployed, and can erode trust if opaque. (5 - 7, 63 - 66) Human touch carries moral intention and accountability within therapeutic relationships; this cannot be replicated by automation.

The Chiropractic adjustment exemplifies the integration of

- art (skilled manual technique)
- science (biomechanics, neurophysiology), and
- therapeutic presence (intention, attunement).

Evidence suggests adjustments can modulate sensorimotor integration and pain processing in select contexts; clinical application should be individualised, evidence-informed, and patient-centred. (45 - 48)

The future: integration without replacement

AI can assist with data analysis, imaging support, documentation, and operational efficiency, potentially freeing chiropractors for more patient-facing time. The goal should be a hybrid model interacting within augment computational tasks while prioritising skilled palpation, individualised adjustments, therapeutic relationships, and holistic care.

A responsible safe and ethical use requires governance, bias auditing, validation, and transparency, with the clinician retaining responsibility for decisions and the relationship. (5 - 7, 10 -12, 17 - 22)

Conclusion

AI offers genuine benefits in improved efficiency, standardised support, and pattern recognition; however, it cannot feel tissue resistance, adapt techniques based on moment-to-moment patient feedback, or embody empathy and intention. Human hands, informed by science and guided by care, remain irreplaceable. The task ahead is to embrace AI as a tool while deepening what makes us uniquely effective: refined palpation, clinical judgment, and a healing relationship rooted in respect for the body's adaptive intelligence.

In this integration, we find not the dilution of Chiropractic principles but their fullest expression using every available tool to serve the ultimate goal of facilitating the body's innate capacity to heal, adapt, and thrive. This is the promise and the challenge before us: to evolve without losing our essence, to innovate while honouring what makes us human, and to embrace the future while remaining rooted in the timeless principles that gave birth to our profession.

Our hands, connected to minds trained in science and hearts committed to service, guided by respect for the innate intelligence that animates all life, these remain the irreplaceable instruments of chiropractic healing, no matter how advanced our technological tools become.

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