



## Tone as a health concept: An analysis



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### ABSTRACT

*Study design:* Concept analysis.

*Introduction:* This paper is a report on the analysis of the concept of tone in chiropractic.

*Purpose:* The purpose of this paper is to clarify the concept of tone as originally understood by Daniel David Palmer from 1895 to 1914 and to monitor its evolution over time.

*Methods:* Data was sourced from Palmer's original work, published between 1895 and 1914. A literature search from 1980 to 2016 was also performed on the online databases CINAHL, PubMed and Scopus with key terms including 'tone', 'chiropractic', 'Palmer', 'vitalism', 'health', 'homeostasis', 'holism' and 'wellness'. Finally hand-searches were conducted through chiropractic books and professional literature from 1906 to 1980 for any references to 'tone'. Rodgers' evolutionary method of analysis was used to categorise the data in relation to the surrogates, attributes, references, antecedents and consequences of tone.

*Results:* A total of 49 references were found: five from publications by Palmer; three from the database searches, and; the remaining 41 from professional books, trade journals and websites.

*Major conclusions:* There is no clear interpretation of tone in the contemporary chiropractic literature. Tone is closely aligned with functional neurology and can be understood as an interface between the metaphysical and the biomedical. Using the concept of tone as a foundation for practice could strengthen the identity of the chiropractic profession.

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## 1. Introduction

Tone has been described as the passive neurological condition of strength found in all body tissues [30]. For this reason, gymnasts quest for it, body builders exhibit it and personal health requires it. In the health discipline of chiropractic, tone is a foundational principle for practice [36]. Despite this, tone, and its relevance to contemporary practice, is not well understood [24,57,60]. A comprehensive understanding of tone may help explain the schism that has emerged in contemporary chiropractic practice between reductionism and holism [22].

### 1.1. Background

Since antiquity, 'tone' has had multiple meanings that have led to confusion and controversy about its meaning [30]. Tone evolved from the ancient Greek root word 'tonus' to describe the breath of

life that inhabits the human body [40]. This meaning extended into the realm of metaphysical constructs that were difficult to research and validate with scientific methods [13,40]. Donahue [7] discussed the two disciplines of Greek healing located at Cnidus and Kos in Asia Minor and compared them to modern chiropractic concepts. He explained that the Cnidian concept is similar to the modern medical theory of reductionism, or reducing the function of humans and nature into parts [4]. The Koan perspective is a holistic study of health and disease, similar to the chiropractic concept of tone [7]. The Koans regarded disease as a disruption of tone or functional unity, leaving the whole person out of balance with nature. They believed in the body's natural ability to heal itself. This ability has been referred to by Hippocrates as 'vis medicatrix naturae', a Latin term for his self-healing philosophy [36].

Both perspectives of reductionism and holism have continued to serve humanity over time. Around 200AD, Galen, the Greek physician, during his service to the Roman empire, successfully negotiated a middle ground of drawing from both perspectives [41]. Marcellus, a Roman historian, circa 410 AD, described choices for healthcare in Roman medicine as including both these healing

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perspectives [41]. Galen's work continued to refine and use Greek and Roman medicine in medieval times until the German-Swiss physician, Paracelsus, in the 16th century, reformed medicine from the superstitions of curses and devils to metaphysical arguments seeking cause and cure. It was a patient-centred approach to healthcare that supported a holistic foundation for the concept of tone. During the 16th century the Flemish/Netherlandish anatomist and physician, Versalius, and the French barber surgeon, Parè, used metaphysical reasoning to expand on Paracelsus' ideas of cause and cure, thereby further developing this holistic foundation and beginning the transition to more innovative methods of healthcare evidenced by their work continuing to be published in the 17th and 18th centuries [51]. During the 19th century, the scientific method of investigation was consolidated [9]. This brought great strides in the basic sciences of physics, chemistry, anatomy and biology, relegating tone from the spiritual metaphysical overtones of tonus to an expression of physiological health [49].

The word 'tone' was first used by Daniel David Palmer (D D Palmer), the founder of chiropractic, in the late 1890s to explain health [34]. Palmer's work on tone continued for a period of almost 20 years [36,38]. During this time, he observed that many personal health issues failed to respond to the healthcare provided [36]. This failure to respond, he argued, was due to a loss of tone in an organ or body system which, when restored or recovered, would build health and empower a person to reach their 'destiny'. Palmer used the analogy of musical tone to describe a cause-and-effect model of health and disease for chiropractic, which was at odds with cause-and-effect models of other health professionals [12]. Since then, the profession has evolved and basic concepts such as tone are being questioned [47]. The aim of this paper is to clarify the concept of tone as originally understood by Palmer and to monitor its evolution over time.

## 2. Method

Concept analysis is well established in the health sciences as a methodology to examine concepts. Of the many methods of concept analysis, Rodgers [43] method has been chosen for this analysis as it is systematic, with clear-cut phases. Also, it allows for the clarification, description and explanation of a concept by analysing how it is used within the discipline and in other health-related areas [52]. Rodgers described a 'concept' as a "cluster of attributes", and 'analysis' as the "breaking apart of a thing to identify its constituent components" [44]. She described her method as 'evolutionary' for she argued that concepts are not fixed, rather they are continually subject to change over time.

Rodgers [44] method involves six primary activities, many of which can be undertaken simultaneously during the investigation. First a concept of interest is identified, together with any associated expressions including 'surrogate' terms. Care must be taken that any 'surrogate' terms are indeed terms that are used interchangeably with the concept, and are not really a related concept. The second activity is to select an appropriate 'realm' (setting and sample) for data collection.

The third and fourth activities, the collection and analysis of the data, involve two components. Here the researcher examines the literature, using an inductive and discovery approach, to identify the 'attributes' or 'real' definition, or common usage, of a concept as opposed to its 'nominal' or dictionary definition [43,44]. As well, the contextual basis of the concept needs to be explored to "gain an understanding of the situations in which the concept is used, the use of the concepts in those varying situations, and its use by people with potentially diverse perspectives" [44]. Here the 'reference' of the data—actual situation in which the concept is used—needs to be collected to assist with clarifying the scope and

application of the concept. Where possible, the 'antecedent'—or events associated with the concept in the past—need to be identified. Similarly, where available, the 'consequences'—or results of the use of the concept—need to be determined [52]. A fifth activity requires the researcher to, if appropriate, identify an exemplar of the concept. The sixth and final activity involves identifying any hypotheses, as well as implications for the future of the chosen concept.

### 2.1. Data sources

Three sources of data were used to collect data for this concept analysis of tone. First, Palmer's 1896 to 1914 articles, chiropractic books and journals were reviewed and the five most relevant sources were selected. A 1910 document by Gregory, a student of Palmer, was also located. Second, searches were conducted for the period 1980 to 2016 in three main relevant databases (CINAHL, PubMed, MANTIS) using key search terms including 'tone' and combinations of the associated words—'chiropractic', 'Palmer', 'vitalism', 'health', 'homeostasis', 'holism' and 'wellness'. Three sources were discovered. Third, additional data were retrieved for the 1980 to 2016 period, primarily from chiropractic sources, although other health disciplines were also searched. A total of 41 sources were located from 1980 to 2016 trade journals, websites, private collections and books.

Data were entered on a spreadsheet with columns headed 'author,' 'year of publication', 'database', 'discipline', 'relevance', 'page number', and 'words and phrases used'. The reading, data entry and analysis were undertaken by the first author. Further analysis culminated in five main columns titled 'surrogates', 'attributes', 'references', 'antecedents' and 'consequences'. When final agreement was reached, interpretations were accepted. When agreement was unattainable, interpretations were omitted.

## 3. Results

The results for this concept analysis of tone, as related to the chiropractic profession, are summarized and tabulated according to Rodgers's [43,44] evolutionary analysis protocols. Table 1 provides a summary of the data. Following the table, the results will be discussed using Rodgers' categories of surrogates, attributes, references, antecedents and consequences.

### 3.1. Surrogates

A 'surrogate' is a word or words that are interchangeably with the concept being analysed [44]. This analysis revealed five surrogates. In 1900, Palmer interchanged 'tone' with the term 'inharmonicity' which he described as a lack of balance or lack of homeostasis. A decade later, Palmer [36] used 'neurological tension' which provided a clearer physiological understanding of tone. More than eight decades later, Donahue [7] was aware of the dilemma of tone being poorly understood. He proposed 'homeostasis' as an interchangeable term for a new and better version of tone arguing that homeostasis is an effect of tone, not a definition. Tutashinda [54] simplified the complexity of tone by describing it as 'balance'. Rosner [46] described tone as an optimum health gateway and recommended a better understanding of the chiropractic emphasis on tone as a function of the nervous system.

### 3.2. Attributes of tone and references

'Attributes' and 'references' are closely related: 'attributes' are the real definition or the common usage or characteristics of the concept, and the 'reference' is the actual situation in which the

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