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# A discourse on the nature of dental hygiene knowledge and knowing

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**Abstract:** *Objective:* Historically, dental hygiene has adopted theory and research from other health disciplines, without adequately modifying these concepts to reflect the unique dental hygiene practice context, leaving dental hygiene's research and theory base underdeveloped. Dental hygiene has yet to articulate its epistemological assumptions – the nature, scope and object of dental hygiene knowledge – or to fully describe the patterns of knowing that are brought to practice. *Methods:* This paper uses a method of inquiry from philosophy to begin the discourse about dental hygiene ways of knowing. In nursing, Carper identified four fundamental patterns of knowing: empirics or the science of nursing; aesthetics or the art of nursing; personal knowledge and ethical or moral knowledge. These patterns were used to explore this concept within dental hygiene. *Results:* There is more to the nature of dental hygiene knowledge and knowing than rote application of technique-related or research-based information in practice, including judgements about when and how to use different types of information that are used. Currently, empirical forms of knowledge seem to be disproportionately valued, yet evidence was found for all of Carper's four patterns of knowing. *Conclusions:* Carper's work on patterns of knowing in nursing provided a useful framework to initiate the discourse on ways of knowing in dental hygiene. These results are submitted for others to challenge, refine and extend, for continuing the discussion. Dental hygiene leaders and scholars need to engage in discourse about extending the epistemological assumptions to reflect reality.

**Key words:** dental hygiene epistemology; dental hygiene theory; dental hygienists; knowing; knowledge; patterns of knowing; ways of knowing

In Canada of late, dental hygiene has been making great strides to emerge from the dominant parent profession dentistry. The majority of Canadian dental hygienists practice in self-regulating jurisdictions. Recent legislative changes in several jurisdictions have resulted in the removal of restrictive supervisory requirements, allowing dental hygienists to self-initiate treatment in independent practice settings. The need for the services of dental hygienists appears to be increasing: the ageing population is retaining their teeth longer, and studies are linking oral and systemic disease. While dental hygienists contribute to the improvement of the health of the individuals and communities that they service, their expertise is not recognized. The public often cannot distinguish between dental hygienists and dental assistants (1), and other health professionals do not engage readily in interprofessional consultations with dental hygienists. This lack of acknowledgement from others may be the result of a lack of understanding. But it may also exist because dental hygienists have not adequately articulated their perspective, which in turn has impeded the development of an adequate body of theories and knowledge to guide dental hygiene practice.

Dental hygienists are educationally and in practice moving from an occupationally based set of technical skills to a licensed professional partner within a healthcare team (2, 3). The American Dental Hygienists Association (ADHA) has identified the roles and functions of dental hygienists: clinician, oral health educator, manager, consumer advocate, change agent and researcher. They convened a theory development panel that conceptualized dental hygiene as '...the study of preventive oral healthcare, including the management of behaviours to prevent oral disease and promote health'. (3) A *metaparadigm*, the major concepts studied by the discipline, was conceptualized that included major concepts of health/oral health, dental hygiene actions, the client, the environment, their interactions and the factors that affect them based on a modification of a metaparadigm from nursing.

Historically, dental hygiene has 'adopted' theory and research from other health disciplines, without adequately testing these concepts to reflect the unique dental hygiene practice context (4–6). Fones was the dentist who created the first school of dental hygiene to teach dental hygienists to provide dental procedures for children that were deemed more suited to the smaller hands and greater patience of women. Fones wrote that the dental hygienist must regard him/herself as the channel through which dentistry's knowledge of mouth hygiene is to be disseminated (7, p. 3).

Dental hygiene originated from a perspective afforded by dentistry and evolved by using a metaparadigm informed by work begun in nursing. Dental hygiene incorporates research findings from periodontology and cariology and utilizes theories such as behavioural theories from psychology or human needs from nursing. The problem is that the application of these findings in the dental hygiene context has not been studied adequately. Darby (8) stated that 'Society has a right to dental hygiene care provided by professionals who possess a substantial theoretical foundation for exercising judgement and improving oral health care. A profession's research efforts are closely linked with its service role, responsibility and accountability to the public, therefore, practice can be only as good as the research and theory base that supports it' (p. 3). Dental hygiene's research and theory base are underdeveloped, which raises questions about how the profession should move forward to establish theories that are specific to the prevention of oral disease and the promotion of health. By addressing these issues dental hygiene could simultaneously improve the image being portrayed to the public and other health professionals as well as providing the necessary research and theory base.

Evidence-based practice is viewed by many to be a panacea, a guarantee that the services are based on hierarchically ordered research findings that provide assurance to the public regarding the quality of care and services. Such a perspective, however, is overly simplistic and does not include all of the knowledge that informs practice. Dental hygiene has yet to articulate its *epistemological assumptions* – the nature, scope and object of dental hygiene knowledge – or to fully describe the patterns of knowing that are derived from experience and inform dental hygiene practice. Kikuchi (9) identifies the need to distinguish between public and private ways of knowing. Public ways of knowing and public knowledge are derived from the products of science, and in some disciplines philosophy, are considered to be objective, and available to the public for scrutiny, verification, or debate. Private ways of knowing and private knowledge derive from personal experiences and, as such, emanate from the individual alone. Such knowledge includes intuition or the intuitive knowing that derives from experience and are considered subjective and unverifiable. Dental hygienists, especially experienced dental hygienists, bring additional knowledge to their practice in the form of knowledge derived from their experience, but the individual nature of this knowledge is such that dental hygienist researchers cannot develop nor verify it. In this paper we use a method of inquiry from philosophy to begin the discourse about ways of knowing specifics to dental hygiene. Prior to the discussion, it is important to first describe the assumptions that underlie the premise of the paper.

## Assumptions

To enable readers to make judgements about the points we are putting forward, we begin by clarifying definitions and *assumptions* or taken-for-granted beliefs inherent in the position taken in this paper. We begin by assuming that dental hygienist researchers seek the whole truth as they progress in the development of knowledge for dental hygiene practice, with pursuit of the whole truth '…getting to *know* all that is *knowable*…' concerning the discipline and its practice (10, p. 7). Kikuchi and Simmons (10) equated the pursuit of truth, with the whole truth being the goal, with the pursuit of knowledge.

There are three general theories of truth: the pragmatic theory that holds that truth is what works; the coherence theory which views truth as part of a consistent whole; and correspondence theory which holds that truth corresponds to facts (11). Our perspective of truth in this paper is consistent with correspondence theory, as we are using facts from existing literature in our examination of patterns of knowing used by dental hygienists. The opposite of truth is falsehood and the activity of considering claims on truth further suggests verifiability and verification processes. The philosophical perspective of *realism* sees truth as larger than and external to human consciousness (12). Truth is objective, with its discovery being the goal of science, and differs from mere opinion. This pursuit of truth leads to advancement in dental hygiene knowledge.

For the purpose of discussion, the perspective of moderate realism will be drawn upon to inform this treatise. *Moderate realism* holds that 'reality exists outside and independent of the mind and is knowable' (13, p. 98). This particular perspective views truth as being probable, as opposed to being absolute. Further, moderate realism holds that 'philosophy can attain probable truths about reality through the use of reason' (9, p. 30). In this paper such an approach is through a process of reflection and discursive analysis of the literature addressing the patterns of knowing in nursing and dental hygiene. This philosophical pursuit, as with scientific inquiry, can result in knowledge that can be '…compared against reality and validated as true…' (14, p.8) and distinguished from 'mere opinion' (p. 9). Further, this knowledge is neither certain nor incorrigible, and is open to future challenge, again consistent with modes of scientific inquiry.

The nature of the body of dental hygiene knowledge that is in the public domain has been insufficiently described. Reviews of manuscripts in a prominent dental hygiene journal over time reflected a predominant practice orientation, with an increasing trend toward research and process information (related to practice) manuscripts. (15, 16). Nielsen-Thompson *et al.* (16, p. 124) suggest that their findings support 'a preference for an objective, credible basis for dental hygiene practice'. In their findings, Boyer and Nielsen (15, p. 30) suggest dental hygiene to be a 'practice-oriented profession which values or needs information on how to perform skills and which seeks to base, the practice on results of research'. Further, these authors suggest a perspective on the nature of dental hygiene knowledge that is objective and empirical. Such a perspective would seem to be manifest in the current evidence-based practice movement which privileges empirically derived knowledge (17, 18).

We suggest there is more to the nature of dental hygiene knowledge and knowing than rote use of technique-related or research-based information in practice. There are other forms of knowing that determine when and how to use these types of information, as well as other types of information; this has not been adequately understood or described in the dental hygiene literature. In this paper we will use Carper's patterns of knowing from nursing (19) to begin to explore this concept within dental hygiene. Carper uses the perspective of moderate realism, with its inherent assumptions that patterns exist and are knowable by others.

Understanding the forms of knowledge valued and used by dental hygienists is vital to the development of dental hygiene as a practice discipline. A practice discipline relies on its knowledge to inform the actions of its practitioners; further the problems of practice give rise to the questions pursued by the discipline in a reciprocal relationship (5, 20, 21). Donaldson and Crowley (22) also refer to this as a professional discipline, distinguishing it from purely academic disciplines. Carper (19) conducted an analysis of the conceptual and *syntactical structure*, the forms of inquiry and criteria for acceptance of statements as true, of nursing knowledge, and identified four fundamental patterns of knowing: empirics or the science of nursing; aesthetics or the art of nursing; personal knowledge and ethical or moral knowledge. Dental hygiene has a tradition of drawing on nursing literature, and while the knowledge used differs consistent with the differing practice settings and responsibilities, the many parallels to development of the respective professions suggest the use of a nursing model to be a reasonable course of action (3, 5, 7, 8, 20). Given that patterns of knowing used by dental hygienists have not been classified, it may be useful to question if these patterns could be applied to the knowing that dental hygienists bring to their practice.

## Patterns of knowing

### Empirics

Empirics or the forms of empirical knowledge that are specific to dental hygiene may be considered to be dental hygiene science. While the term dental hygiene science is used occasionally in the literature, there is no consensus on a clear definition at organizational levels nor is there common or consistent usage. For the purpose of this paper, the term dental hygiene science, relating to empirical patterns of knowing, shall refer to the systematically generated findings of inquiry that contribute to the body of knowledge used by dental hygienists for practice. Dental hygiene science is at a very early stage of development, considered the 'natural history stage of inquiry', which describes and classifies phenomena that can be ascertained by direct observation (19). There is some very early movement to the 'stage of deductively formulated theory' which seeks to explain the observed empirical facts (19), as seen in the intentional theory development program initiated by the American Dental Hygienists Association in the late 1980s (8).

This pattern of knowing can be readily observed in dental hygiene journals where the number of research manuscripts relating to practice has been increasing over time and is consistent with the evidence-based practice movement which privileges empirical forms of knowledge.

Dental hygiene's genesis was as a technique-focussed or technical occupation. However, the recognition of the increased contributions to the health of society that can derive from an expanded professional role coupled with an intentional professionalization agenda are contributing to awareness of the need to expand the body of empirical dental hygiene knowledge (8, 20, 21, 23). This body of knowledge takes the form of facts and emerging theories, and is publicly verifiable.

### Aesthetics

The second fundamental pattern of knowing is that of aesthetics or the art of dental hygiene. In Carper's classification, this pattern refers to the knowing gained through personal experiences; it is specific, unique and subjective. The art of dental hygiene is rarely described in the literature, perhaps because of a fear that this will be perceived as a throwback to earlier technical and apprentice-type forms of learning, which currently have less value than empirical ways of knowing. In the current climate of evidence-based practice, with its preference for quantitative empirical forms of knowledge, dental hygienists may be reluctant to publicly acknowledge or support experiential forms of knowledge that appear to detract from our hard earned emerging professional status. Discussions about the existence of the art of dental hygiene take place from time to time amongst dental hygienists, but this discourse rarely makes it into the literature, and this must change.

The use of aesthetic forms of knowing is an important and frequent aspect of dental hygiene practice, and indeed often occurs in conjunction with empirical forms of knowing. Aesthetic or artful forms of knowing are derived from previous experiences, and the integration of the knowledge gained from those experiences can then be applied to practice. An example of aesthetic or artful knowing is when an experienced clinician, while assessing the colour and form of the dental tissues, personalizes the selection of therapeutic interventions based on additional subtle characteristics of the patient/client that cannot be explained or appear to be based on an intuitive awareness. It is this ability to merge empirical knowledge with practical knowledge, the relationship of the universals to the particulars, that informs aesthetic knowing with this perception or perceptual ability that is the creative art of practice.

It is important to recognize that this aesthetic form of knowledge exists, and that this knowledge is reported frequently. In a study of knowledge sources used by dental hygienists, personal experience was the second most frequently reported source of knowledge for practice, with intuition also ranking high (24). While it is subjective, personal and not publicly verifiable, the aesthetic pattern of knowing exists and is used frequently in dental hygiene.

### Personal knowledge

Carper's third pattern of knowing is that of personal knowledge. The therapeutic relationship between the client and the dental hygienist needs to be conceptualized as a process that involves interactions, relationships and transactions. Evidence in the nursing literature supports an association between improved outcomes and the quality of interpersonal contacts (19). Dental hygiene clients may also benefit from this 'therapeutic use of self' in dental hygiene-client interactions. While the term 'dental hygiene care' is used liberally, this tends to refer to service provision rather than the intentional use of caring as a therapeutic intervention, and this distinction is rarely discussed. Certainly study is needed in this area.

Munhall (25) considers an 'intersubjective space' wherein the act of nursing takes place: two individuals with their own subjective views of reality interact and share a perceptual field. She suggests that the therapeutic care provider must first use a

form of 'unknowing' in which all biases, preconceptions, assumptions and stereotypes are held in abeyance to maximize the nurse's new knowing of this care recipient. This provides a 'situated context where nurses understand the essence of meaning that the patient's experiences have for them' (p. 242).

While the dental hygiene literature is void of studies on the intentional or therapeutic use of self within the dental hygienist-client interaction, the notion of client-centred care has gained prominence in recent years. The Canadian Dental Hygienists Association's document Dental Hygiene: Definition, Scope, and Practice Standards (26) promotes the use of collaborative, client-centred and relationship-centred approaches to practice. This has manifested in dental hygienists reporting that the use of information from the client is one of their top sources of knowledge for practice decisions (24). Not only is this personal form of knowing used frequently, but also valued by dental hygienists.

### Ethics

Carper's fourth pattern of knowing is that of ethics or the moral component. Ethical knowledge has long been held important to dental hygiene, with ethical codes developed early in dental hygiene's organizational history in North America. Ethics forms an important component of educational curricula. But this pattern of knowing goes beyond ethical codes to include forms of moral knowing about what is right and wrong with the oral health care delivery system and what ought to be carried out. This pattern of knowing is manifested increasingly at an organizational level, as evidenced in calls for increasing access to oral care and views of expanded dental hygienist roles as advocates for change in health policy. It is also evident in new graduates who encounter practice environments dissonant with their conception of dental hygiene, where worthwhile and valuable health services operate in a profit-driven market environment. This pattern of knowing has not been described in the literature as such, but there is anecdotal evidence that it exists.

## Summary and Conclusion

While there has not been a 'call from the grassroots' to define patterns of knowing for dental hygiene, it is nevertheless important that this be articulated. Both Dickoff and James (5) and Donaldson and Crowley (22) suggest *theoretical pluralism* and not just a single theory of dental hygiene as a way to expand knowledge development (20). The epistemology or nature of dental hygiene knowledge includes assumptions about syntax that are important to continued development of the body of dental hygiene knowledge. If acknowledged and valued forms of knowledge are considered to be only empirical, with only these forms of inquiry and criteria for acceptance of statements as true, the profession of dental hygiene will not be defined in its entirety, for we currently use other forms of knowing in practice. At this time, dental hygiene education continues to be primarily focused on technical skill development, without a large focus on the theoretical underpinnings of dental hygiene. The purpose of this article is to stimulate the grassroots clinicians who use dental hygiene's ways of knowing on a daily basis to actively participate in dialogues on this subject, inclusively with leaders and scholars, to contribute all views on dental hygiene's epistemology. Carper's four patterns are based on practitioners, not leaders or scholars or graduate students. The involvement of practitioners may allow Carper's patterns to be adapted to the unique requirements of dental hygiene curriculum and practice. Such work is necessary in the future. Given that there is so little discussion on this topic currently by dental hygiene leaders and scholars, let alone clinicians, we need to find ways of encouraging this among the range of those who practice dental hygiene in all of its diverse forms.

Walsh (21) has proposed that the dental hygiene perspective is to view the client as a whole person, interacting within their environment, and to consider the role of the environment in fostering or preventing oral disease. While not explicit, it appears that roles for aesthetic, personal and moral knowing are implicit in Walsh's conceptualization. Further, there is considerable interdependence between these patterns. The patterns of aesthetics and personal knowing are largely based on each clinician's individual experiences, but the existence of these patterns is confirmed by empirical approaches. Similarly, the pattern of ethical knowing is enhanced by aesthetic knowing.

What other forms of knowledge are necessary for us to understand how dental hygienists can best contribute to the improvement of oral health and the promotion of overall societal health and wellbeing? In the absence of any work of this nature in dental hygiene, Carper's work on patterns of knowing in nursing provided a useful framework to initiate the discourse on ways of knowing in dental hygiene. The moderate realist perspective enabled us to examine patterns and evidence from dental hygiene literature and to reflect on whether these are consistent with patterns identified by Carper. While it may seem that our perspective of moderate realism as existing outside of the mind and being knowable conflicts with the

personal subjective pattern of knowing, this broad pattern itself does exist and not just the specific product(s) of the individual knowing; it is in fact knowable and has been demonstrated empirically (24). One limitation of Carper's model may be that, given the differences in the practice settings of nurses and dental hygienists, dental hygienists may use additional patterns of knowing that are not identified in Carper's work. This needs to be explored further.

We submit the results of our reflections for others to challenge, refine and extend for continuing the discourse. Other philosophical perspectives may arrive at different answers to questions about dental hygiene's epistemology. Those who espouse a post-modernist perspective may question whether it is possible or necessary to be objective during the analysis. These additional perspectives and discussions will contribute to the body of knowledge about and for dental hygiene. Also, this paper has a North American perspective, having drawn on literature from North American sources. A more complete picture of dental hygiene on a global basis needs to include the study and discussion of patterns of knowing used in other countries where dental hygiene is well developed, including the Netherlands, Great Britain, Australia, etc. These additional perspectives will help us to further understand the evolving epistemology of dental hygiene.

If we do not ask and try to answer ontological questions about the nature, scope and object of dental hygiene itself, how can we pose epistemological questions about the nature, scope and object of dental hygiene knowledge? Posing such questions will help extend the body of dental hygiene knowledge through the results of such inquiry. These questions may emerge in our interactions with other disciplines, funding agencies, the public or the media. If we do not answer them, there may be a danger of inaccurate assumptions on the part of others. Identifying our answers may contribute to increased respect for dental hygienists' professional contributions.

The body of dental hygiene knowledge thus far has been characterized as being largely composed of atheoretical isolated research studies on multiple unrelated topics versus comprehensive research programs that contribute to building disciplinary knowledge (21). Much work needs to be completed to continue developing the body of dental hygiene knowledge for practice, including testing and refining theories for dental hygiene practice contexts. A challenge raised in our discussion of dental hygiene's ontology and epistemology is that they are not entirely consistent. The *epistemology*, as suggested by the nature and scope of the existing body of dental hygiene literature, would suggest that the knowledge for dental hygiene practice is only objective and empirical. Dental hygiene's *ontology* or substantial way of being suggests that other forms of knowing are brought to practice. Dental hygiene leaders and scholars need to engage in discourse about dental hygiene's ontology and extend the epistemological assumptions to reflect reality. The results of these discussions in turn will enhance the body of dental hygiene knowledge *of* practice and *for* practice. Given that dental hygienists should then have a more realistic understanding of the potential of their contributions to the health of society, it seems a reasonable assumption that others will also. As the work of developing dental hygiene to its potential continues, it will make possible the gaining of respect and understanding desired by dental hygienists.

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