

UNIVERSITY *of*
INDIANAPOLIS[®]

School of Occupational Therapy

Facilitating Evidence-Based Practice at the Indiana Hand to Shoulder Center

Kathryn Boomershine, OTS

May, 2019



A capstone project submitted in partial fulfillment for the requirements of the Doctor of Occupational Therapy degree from the University of Indianapolis, School of Occupational Therapy.

Under the direction of the faculty capstone advisor:

Ms. Erin Peterson, DHSc, OTR, CHT

A Capstone Project Entitled

Facilitating Evidence-Based Practice at the Indiana Hand to Shoulder Center

Submitted to the School of Occupational Therapy at University of Indianapolis in partial fulfillment for the requirements of the Doctor of Occupational Therapy degree.

By

Kathryn Boomershine

OTS

Approved by:

Faculty Capstone Advisor

Date

Doctoral Capstone Coordinator

Date

Accepted on this date by the Chair of the School of Occupational Therapy:

Chair, School of Occupational Therapy

Date

Abstract

The Indiana Hand to Shoulder Center is a leader in upper extremity rehabilitation and treatment and publishes the Diagnosis and Treatment Manual© that hand therapists use across the country. To join the trend towards evidence-based practice, the Editor, Director of Therapy, and Education Director desired to include evidence in the next edition of the Diagnosis and Treatment Manual©. My unique skills as a future OTR allowed me to complete a needs assessment with relevant stakeholders to establish criteria for appropriate articles. I then provided a skilled intervention by scouring databases and selecting 370 articles as appropriate for inclusion in the manual. I delivered a final product to my site, including a template of articles selected as best matching the site's needs. The therapists that use the Diagnosis and Treatment Manual© will be able to see and use the evidence that I provided when the next edition is published allowing for further integration of evidence-based practices.

Facilitating Evidence-Based Practice at the Indiana Hand to Shoulder Center

Literature Review

Evidence-based practice (EBP) has become an integral part of the occupational therapy educational experience. There are several benefits of EBP according to the literature: improved knowledge base, improved client outcomes, and improved practice overall (Myers & Lotz, 2017; Thomas & Law, 2013). Practice settings are not always able to continue this trend of EBP utilization due to various challenges (Myers & Lotz, 2017; Upton, Stephens, Williams, and Scurlock-Evans, 2014). One possible challenge may be the fundamental miscommunication regarding the definition of *evidence*, which could influence how companies and practitioners interact with current literature. This disparity could be explained by the Diffusion of Innovation model (Rogers, 1983), which is the theoretical basis for this Doctoral Capstone Experience (DCE) at the Indiana Hand to Shoulder Center (IHTSC). IHTSC will publish the 5th version of the Diagnosis and Treatment Manual© (DTM©) soon, with the notable addition of research articles and EBP to accompany therapy protocols. This inclusion promotes EBP in current treatment practice and bridges the gap between traditional definitions of evidence and the definition used by most practitioners.

Innovations in Practice

The disparity of definitions of evidence is likely due in part to the changing nature of innovations. According to the Diffusion of Innovation model, first proposed by Everett M. Rogers, “Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1983, p. 5). This process takes time. The fact that EBP is seen as desirable in most practice areas is a sign that the diffusion has moved past the Trial Use (Rogers, 1983) phase. Practitioners are now moving towards the Adoption and Institutionalization phases (Rogers, 1983). According to Rogers

(1983), institutionalization ends the innovation diffusion as it is no longer a new idea. The IHTSC is contributing towards this institutionalization by including literature, articles, and other evidence in the DTM© for the first time in this edition.

Support for EBP in Practice

Myers and Lotz (2017) found that institutional support can determine the success of EBP initiatives by providing leadership and incentives for change (Myers & Lotz, 2017). Upton et al. (2014) also found evidence that management and peer support increases use and competence with EBP. Therefore, in the diffusion of the innovation of EBP use, institutions must adopt the innovation along with individual practitioners. This could be done through creating journal clubs, facilitating a culture of research, and even facilitating collaboration between departments and disciplines. Thomas and Law (2013) found “six mechanisms that acted as catalysts for change: building confidence, finding flow, accumulating reward, conferring with others, constructing know-how, and channeling time” (e59). Institutions that allow practitioners time for research and evidence-review activities would be defined as earlier adopters using the Diffusion of Innovation (Rogers, 1983) model.

Thomas and Law (2013) reported the need for a social context in research and EBP. This could be anything as simple as consulting with a colleague, or as complex as a structured and expert-led journal club. One innovative way of furthering EBP using a social context is the hosting of students from local universities. Thomas and Law (2013) described that involvement in research, including hosting students, increased the use of EBP in the organizations. Szucs, Benson, and Haneman (2017) structured an academic class as a journal club. They found that “a journal club may easily be implemented into most practica [*sic*] settings” (Szucs et al., 2017, p. 147). Additionally, Thomas and Law (2013) reported that hosting students is a rewarding

experience despite the clinical and time demands. This social aspect of research and EBP is important to the successful diffusion of the innovation of integrating evidence into practice.

When institutions look to train practitioners in the use of EBP, there are important considerations to ensure the best outcomes. Myers and Lotz (2017) reported that journal clubs and collaborative continuing education increased clinicians' confidence and knowledge when using EBP. In addition, the resources that incorporated EBP also facilitated active participation (Myers & Lotz, 2017). This reinforces the importance of the social aspect of EBP, and by extension the nature of the diffusion of innovation. Thomas and Law (2013) found that practitioners preferred discussion groups and face-to-face interactions in continuing education. Therefore, when institutions look to support the diffusion of the innovation of evidence in practice, they should also consider the necessity of the social aspect of learning.

Challenges to EBP in Practice

Not all institutions are supportive of the diffusion of the innovation of evidence integrated into practice. These institutions would be classified as late adopters in the Diffusion of Innovation model (Rogers, 1983). Upton et al. (2014) found that there is a general lack of institutional support for EBP, which hinders practitioners' integration of evidence into practice. In addition, researchers claimed reimbursement agencies were not demanding or supporting EBP (Upton et al., 2014). The lack of support from reimbursement sources is concerning as many long-term changes in practice are currently driven by payer sources. The efforts of clinicians to implement EBP is also complicated. Despite some workshops and interventions causing a reported increase in skills, this does not translate into changes in practice (Myers & Lotz, 2017; Upton et al., 2014).

Individual stressors can also impact therapists' ability to adopt innovations. Researchers have identified workload and time pressures as well as decreased access and understanding of

EBP (Myers & Lotz, 2017; Upton et al., 2014). Additionally, researchers named time constraints, technical challenges, and lack of relevant content as barriers (Myers & Lotz, 2017). It is clear that to have successful diffusion of innovations, such as incorporating evidence into practice, therapists must aim to overcome individual and organizational barriers.

Occupational Therapy Scholarship

One way that occupational therapy programs have addressed these barriers is to educate new graduates on the importance of EBP. A consensus among many sources was that the recency of graduation, the higher a practitioner's education level, and postgraduate training were all associated with increases in EBP behaviors in practices (Szucs et al., 2017; Thomas & Law, 2013; Upton et al., 2014). This could be in part because of an increase in deliberate inclusion of EBP into the curricula of occupational therapy programs. Szucs et al. (2017) held a graduate course in order to examine the views of students related to EBP. Students reported increased confidence in understanding statistics, but a consistent barrier throughout the program was the time involved (Szucs et al., 2017). An interesting finding is that students were enthusiastically engaged in class discussions "in contrast to writing-intensive assignments... students were actively engaged in the EBP process through small and large group discussion. Discussions were lively and continued on beyond the minimal time requirements set for the assignment" (Szucs et al., 2017, p. 147). This enthusiasm of students is an encouraging glimpse of future practitioners.

Thomas and Law (2013) discussed the importance of a working relationship between practice settings and local universities. They emphasized that relationships could identify practice needs, prioritize research, and apply the results of research to clinical settings. They also reported that active, working relationships with universities considerably influence the use of EBP in clinics (Thomas and Law, 2013). The experience of hosting students is not only beneficial to the students and the university, but also to the hosting organization. Thomas and

Law (2013) stated “the more experience clinicians developed through clinical encounters, mentoring of students, and participation in continuing education and research, the greater their capacity to integrate research into practice” (e59). These findings support the importance of hosting students as their positive views towards EBP can help diffuse the innovation and move evidence into practice.

Clinical Definitions of Evidence

Clinicians appear to have a different definition of evidence though, and this gap is vital to address. Thomas and Law (2013) found that clinicians considered their experiences an important source of evidence, and experience influenced clinical decision-making. The longer that a clinician had been in practice, the less skilled they were in appraising research evidence despite increased clinical and personal experience (Thomas & Law, 2013). This belief that clinical experience and accumulation of setting-specific knowledge is also a form of evidence as innovation.

Dougherty, Toth-Cohen, and Tomlin (2016) found that therapists integrated research with their experiences before integrating the evidence into practice. They felt their background knowledge was a critical part of client-centered decision-making (Dougherty et al., 2016). This perspective would indicate that therapists were already using evidence to inform their practice, but not evidence as defined by academia and the traditional structure of research literature. The stock of knowledge and experience accumulated over a clinical career is augmented by research articles and other *evidence* as defined by academia (Dougherty et al., 2016). This combination increases efficacy and accuracy in client-centered clinical reasoning for practitioners (Dougherty et al., 2016). Clinical and personal experience is impacting client care more than published research literature but is no less valuable.

The role of influencing practice is traditionally left to research articles and *evidence* in the academic definition, but in this case, practice is influenced by the *evidence* of experience, knowledge, and intervention ideas. Practitioners' ability to synthesize information from multiple sources influenced their ability to grade or change interventions to be more client-centered, skills foundational to clinical reasoning (Dougherty et al., 2016). Clinical reasoning is initially developed in educational programs, but only experience can truly develop effective clinical reasoning. This reasoning allows clients to benefit from a therapist's accumulated knowledge, their past experiences, and their personal expertise, rather than the results of a research study or a published article.

Evidence from Thomas and Law (2013) also found professionals considered their experiences to be important evidence that influenced if and how they used research in clinical decisions. This supports the perspective that practitioners have a unique definition of *evidence*. Although studies have investigated therapists' perspectives on traditionally defined evidence and found research skills lacking, this perspective suggests that *evidence* should be redefined to include the therapists' accumulated knowledge and experiences. Thomas and Law (2013) found that instead of research evidence, clinicians used colleagues, clinical experience, and continuing education opportunities for clinical decision-making. Therefore, therapists are using the social aspect of evidence as described previously, but instead of research articles, therapists are exploring the experiences and knowledge of others through a social experience. Upton et al. (2014) also supported this perspective describing that practitioners often use peers for queries instead of researching in databases.

When they did use research, clinicians often preferred summaries of context-relevant information (Thomas & Law, 2013). In addition, "expert clinicians classified some information as 'foreground' (e.g. information about each client...) and other information as 'background'

(e.g. information from textbooks and journals, professional development activities) in making clinical decisions” (Thomas & Law, 2013, e59). Dougherty et al. (2016) also found that practitioners considered evidence from the client’s performance as critical for clinical decisions, rather than literature and research findings. Along with this practice-based evidence, background knowledge, and personal experience, Thomas and Law (2013) indicated that reflection is the formalized process of turning those everyday experiences into clinical evidence. Practitioners will not benefit from their experiences if they do not engage in reflection.

The therapists that treat their own clinical experience and expertise as evidence in equal or better standing to research-based literature evidence would be regarded as innovators according to the Diffusion of Innovation theory (Rogers, 1983). These innovators are working towards a more widespread view of personal experience as evidence, leading some early adopters to blend clinical evidence with research evidence in order to improve patient outcomes. The new edition of the DTM © however, will blend these two types of evidence. It currently contains the experience and knowledge of several therapists and surgeons who specialize in hand therapy. After this DCE project, the new edition also includes research articles that contribute to the treatments and protocols.

Evidence and the DTM©

This DTM© is used by many other hand clinics nationally and internationally. This allows for a widespread diffusion of innovation, blending the experience of specialists and therapists with the research evidence from recent literature. At this stage, the IHTSC is moving towards the Institutionalization stage of the Diffusion of Innovation model (Rogers, 1983). When the idea becomes fully institutionalized, it is no longer an innovation, as stated earlier (Rogers, 1983). Using the definition of “clinical reasoning” proposed by Dougherty et al. (2016), the DTM © is clinical reasoning at its finest. My research for the conditions in the DTM©

contributes to a broader definition of “evidence” in evidence-based practice, and ultimately leads towards institutionalization of a vital innovation: the integration of evidence into everyday practice.

Additionally, the IHTSC influences protocols and treatments in hand and upper extremity therapy with publication of the DTM©. Clinics across the United States, as well as internationally, use the DTM© to guide the overall treatment of their clients with upper extremity conditions. This influence allows the clinic to lead in innovative treatment solutions. According to the Diffusion of Innovation model (Rogers, 1983), the process of diffusion is the way an innovation is spread among a group. The Director of Therapy is an innovator in the clinic, the Education Director is an innovator in staff education and evidence-based practice (EBP), the Editor of the DTM© is an innovator in therapeutic protocols and EBP, and this DTM© is the ideal way to diffuse innovations to other practitioners.

Needs Assessment

Evidence for DTM©

I began my needs assessment with the Director of Therapy before arriving at the site, as I was creating my Memorandum of Understanding. My client’s major need was revising the DTM©. EBP is not integrated into the current, published edition of the manual, placing users at risk for suboptimal treatment outcomes and patient experiences. My client requested specifically that I find and collect evidence for inclusion in the manual. The intervention to address this performance problem involved my skills as an occupational therapy student to increase the occupational wellness and role competence of the practitioners using the DTM©.

During my needs assessment, I learned the specific search parameters that the Editor and Education Director required of me to locate appropriate EBP resources. Articles needed to be published in 2014 or later, in English, and be relevant to therapeutic practice instead of solely

surgical practice. Thomas and Law found in their 2013 study that “clinicians favored high quality, synthesized research summaries” (e58) which would be evidence at or near Level 3 (Burns, Rohrich, & Chung, 2012). However, the Editor and Education Director needed higher levels of evidence, where practitioners conducted research themselves and evaluated the efficacy of a protocol or treatment. According to Burns et al. (2012), this research would be Level 1 or Level 2. This demonstrated IHTSC’s commitment to innovation diffusion, as they sought higher levels of evidence and more recent articles to use as resources in the DTM©.

Annotated bibliography

While talking with the Director of Therapy, she made it clear that I would need to include clinical reasoning to justify the inclusion of certain articles in the DTM©. I planned to create an annotated bibliography as I found appropriate articles in my searches. This bibliography would allow me to track my reasoning for selecting an article. I would also pull out relevant measurements and figures from the articles as needed, for highlighting the importance of each article. I discussed this plan with the Director of Therapy and the Education Director and they expressed support. I also discussed my plan to consult with them once per week if I had any questions about the appropriateness of an article. They stated that once per week would be enough and that they did not feel we would need a more frequent schedule.

Article template

The Education Director had created a sample template for me to use as a base. She encouraged me to make changes to the layout as I felt appropriate and emphasized that it would be presented as my final product for inclusion into the manual. I asked if I should include my clinical reasoning from the annotated bibliography as well as the citation. The Education Director stated that it made sense to include the reasoning and that she was excited to see what I could produce.

Fellows' Talks research

The Education Director holds monthly meetings with the surgical fellows at IHTSC. In these meetings she reviews common upper extremity diagnoses, conservative therapeutic treatment options, and the therapeutic protocols after certain procedures. She encourages an active dialogue at the end between the fellows and the therapists in attendance. During the needs assessment, she stated that in addition to the research for the DTM©, she would need my help to find current evidence that she could integrate into the Fellows' Talks. She planned to contact me with the condition to be presented each month and would invite me to the talks so that I could see the direct results of my research. I appreciated her plan to integrate me into the talks and demonstrate the immediate results of my research, especially since the DTM© will not be finalized during my time at IHTSC.

Similarities to Traditional Practice

One similarity of the needs assessment to traditional practice was my client-centered, occupation-centered approach. My needs assessment was client-driven, and I addressed my client's occupation of work, specifically job performance. I let my client's values drive my search: ethical and high-quality practice using recent, relevant articles. Hand therapists have high-level cognitive client factors due to the specialty nature of the site, so introductory articles would not be appropriate. Hand therapy is a specialty area of occupational therapy, and so necessarily requires specialized knowledge and advanced cognitive client factors. My intervention affected my client's performance patterns, specifically their role as a treating therapist. To use the language of MOHO (Cole & Tufano, 2008), my intervention increased my client's occupational competence and performance capacity so that they could participate in the occupation of work.

My intervention and my client's occupational performance took place within a context that places an increasing value on EBP. Reimbursement agencies are placing a greater importance on interventions supported by evidence in order to justify payment. The American Occupational Therapy Association (AOTA) and their ethical standards, also influence treatment: the principle of Beneficence includes a standard of conduct that states therapists will use evaluation and treatment methods that are "evidence-based and current" (AOTA, 2015, p. 2). These external factors support the contextual need for practitioners to be competent in the integration of EBP into regular client care.

Differences to Traditional Practice

My needs assessment was different from traditional practice due to the non-traditional setting. I was unable to complete a standardized chart review as my client is the group of practitioners who use the DTM©. However, I was able to use skilled observations from a previous internship at the clinic to better understand my client's needs. The therapists worked in a highly collaborative manner and frequently consulted with one another throughout the day. The patients seen are also higher-complexity than the outpatient hand clinic where I completed my first Level II Fieldwork Experience. Therapists also consulted surgeons on a regular basis when there are questions about a therapy order or the direction of intervention. This was a more interdisciplinary approach to patient care than I have seen at my fieldwork sites. All of this informed my search for articles and my clinical reasoning about what articles would be appropriate: entry-level articles would not be appropriate, but articles from a journal regarding hand surgery or upper extremity surgery could still inform therapeutic practice.

Furthermore, I could not use a traditional assessment tool, since this intervention would affect my client's overall clinical practice. Instead, I planned to use regular meetings with the Director of Therapy and Education Director to ensure that my intervention was appropriate for

improving clinical practice of my client. These meetings and consultations would address my progress on the article search for the DTM© as well as my research for the Fellows' Talks that the Education Director presents every month.

Implementation Phase

During my DCE, I met regularly with my client to ensure client-centered care. My main task was combing databases to gather recent, relevant, high quality articles for inclusion into the DTM©. The client (Editor, Education Director, and Director of Therapy) had provided criteria for each article to meet: the article had to have been published within the last five years (2014-2019), include therapeutic outcome measures or tools (e.g. QuickDASH, Michigan Hand Questionnaire, goniometric measurements), and define client performance (change in function, change in outcomes, etc.). Overall, the intervention enhanced my client's occupational performance of EPB utilization, thereby improving clinical skills, through providing evidence for inclusion into the DTM©. I also provided EBP resources to the Education Director for integration into the Fellows' Talks. Both internal and external factors motivated my client for this increase in EPB including quality improvement, therapist interest, and payer sources. Lastly, the final product was a physical resource I delivered to my client fulfilling their request.

Evidence for DTM©

When searching the databases, I primarily used common terminology, MeSH terminology, and CINAHL terminology, with Boolean logic as necessary (see Appendix A for the complete search log). I utilized Academic Search Complete, Biomedical Reference Collection: Basic, CINAHL Plus with Full Text, SPORTDiscus with Full Text, and MEDLINE databases using the EBSCOhost search engine (© 2019, EBSCO Industries, Inc.). These databases were chosen for their relevance to healthcare and occupational therapy fields. As an example, for the condition of wrist arthrodesis, I searched:

- “therapy” AND “wrist fusion”
- “therapy” AND “wrist arthrodesis”
- “therapy” AND “total wrist arthrodesis”
- “therapy” AND “partial wrist arthrodesis”
- “therapy” AND “partial wrist fusion”

I found that replacing the word “wrist” with the word “carpal” in the searches produced zero results. When necessary, I consulted with my university’s reference librarian to analyze search terms and use appropriate language for searching all databases. The site’s librarian was also consulted when certain necessary articles were inaccessible without a clinic membership. The more general the terms that I used, the more articles would be returned. I set 150 articles as my cutoff point for narrowing the search based on the advice of the consulting reference librarian: if a query returned less than 150 articles, I would then begin screening articles. However, if a query returned more than 150 results, I would change the query to a more specific one and run the search again. Through the process, I followed the client’s standards and placed limiters for publication date (“January 2014–December 2019) and for language (“English”).

My unique skills as an occupational therapy student were necessary for an effective search process and desired results. I used an occupation-based perspective with the biomechanical frame of reference in order to guide my searches. I was able to use my clinical reasoning to determine which articles would be more relevant to clinical practice versus surgical practice, and which articles were more holistic in the treatment of the patients included. To remain client-centered throughout the process, I would meet once per week on average with the Director of Therapy and Education Director to discuss whether certain articles matched their criteria for inclusion; specifically, to verify if an article’s topic was of clinical or therapeutic importance/relevance. This allowed me to eliminate articles that would not serve my client and

meet the goal set in the needs assessment. I was also familiar with the standard therapeutic assessments used in the setting of outpatient hand therapy and was able to use this knowledge to further filter articles that did not include common, standard, or gold-standard assessments.

I used the biomechanical frame of reference (Cole & Tufano, 2008) to guide my searches since my clients will better treat patients with evidence that is relevant to the condition, the model, and the frame of reference used in practice. I knew which journals were commonly used and which journals would not be of use to my client; this made me more efficient when combing databases for relevant articles. I was consistently collaborating with the client to ensure that my intervention (searching, synthesizing, and providing evidence) was appropriate. Furthermore, I received positive feedback from my clients throughout the process. This interchange between client and therapist will make me a better practitioner, just as providing evidence in my intervention will help my clients in their occupational performance and role competence.

Annotated Bibliography

After collecting all appropriate articles for a condition, I independently created an annotated bibliography for each reference citation. This allowed me to detail the occupation-based clinical reasoning behind retrieving/including a particular article. To create these annotations, I examined the discussion sections of each article for clinical relevance of results, the methodology used to select participants, and the tools used to assess progress/change. This process was unique to my skills as an occupational therapy student as I am familiar with the statistical concepts used in research as well as the treatment standards of care. This thorough process allowed me to filter out articles that had an abstract that seemed relevant, but upon further reading was not appropriate for inclusion in the article; for example, a study with low statistical power, or poor methodology.

I collected more articles than the one to three requested by the client to ensure high rigor of my work. I compared the articles using the annotated bibliography in order to sort the most recent with the highest level of evidence, most relevance to hand therapy, and most therapeutically-focused content for final presentation to the client. The relevance was determined by consulting with my client to verify its appropriateness for inclusion. The therapeutic focus was assessed by clinical reasoning that I gained through my Occupational Therapy Doctoral program and my familiarity with the standards of hand therapy and with current practice.

Article Template

In order to present the final selection of articles to the client, I independently created a template organized by chapter in the DTM© (see Appendix B for sample template). Each chapter was broken down further by condition (e.g. shoulder: rotator cuff tear, rotator cuff repair...) or body part (e.g. fracture: digital, wrist, elbow...). This template provided the citations and summaries that will be included in the new edition of the DTM© alongside each condition as appropriate. To ensure that it was a client-centered tool, I initially presented a sample template to the Education Director and the Director of Therapy with the conditions “amputation”, “arthritis”, and “arthrodesis” completed. Both directors indicated that this template was satisfactory and that I had chosen appropriate articles that would fit well into the DTM©. Electronic versions of all articles, regardless of inclusion in the final template, were saved into a personal database on a site laptop. I organized them by chapter in the DTM© as well. This framework and personal database I created also allowed the client to access all articles saved during my research as needed.

Fellows’ Talks research

The Education Director was especially interested in my research and how it could support her Fellows’ Talk each month. This event educates the surgical fellows about therapy protocols

and different evidence-based treatment options. My research allowed her to increase the evidence in her education specifically about thumb carpometacarpal arthritis and elbow fractures. She is also the liaison with the physicians when they have questions about the current literature in treatment. For example, one of the surgeons at the clinic wanted to know if there was literature on using mirror therapy with orthopedic clients. The Education Director reached out to me and I provided current literature that was of high enough quality to merit sharing with the surgeon. The Education Director's clinical leadership and unique role at the clinic is an example of a workplace support for EBP (Myers & Lotz, 2017).

Societal need

My work on the DTM© met the societal need of deliberate EBP use in occupational therapy. I worked closely with the Director of Therapy and the Education Director to ensure that I was selecting relevant and appropriate articles to include in the DTM© which will improve the EBP of all the therapists who use the manual. Since many practitioners are unfamiliar with the research skills required to successfully perform a thorough search (Thomas & Law, 2013), my work on the DTM© will allow practitioners to use EBP without having to locate and synthesize articles themselves.

Quality Improvement Processes

Throughout the process of my DCE, I created several resources that IHTSC can use for continuous quality improvement of future editions of the DTM©. The annotated bibliography that I created provided justification for including certain articles as well as a brief summary of the articles found. This provided a clear outline of the method that I used to determine if articles were appropriate so that editors can follow the same method when determining which articles are appropriate for future editions.

The template that I created for selected articles also functions as a method of quality improvement. If I could not locate quality research on a specific condition, I left the area blank so that future authors and editors could contribute here with updated materials or if further information became available. Additionally, I wrote summaries of pertinent information included in the articles so that the editors can determine which are most appropriate to keep as well as prevent future editions of the DTM© from becoming overloaded with older or irrelevant information.

Leadership Skills

Throughout this experience, I developed leadership skills necessary for advanced practice. I advocated for my position as a resource for clinicians as well as a resource for the surgical fellows. I collaborated with the Education Director to provide appropriate articles for the monthly Fellows' Talk and advocated for the inclusion of certain articles in the presentations. I was able to direct therapists to certain journals or search terms when necessary and I led the inclusion of EBP with specific articles into my client's occupational performance. My intervention directly and positively influenced my client's role competence as treating therapists since I knew which articles and resources would be appropriate for a practicing therapist. I know and understand the unique frames of reference, therapy protocols, and the common tools used by occupational therapists in the field of hand therapy which made my searches and my overall intervention more client-centered and more efficient.

Staff Development

In addition to my contributions to the DTM©, I also facilitated increased staff knowledge of evidence-based practices. In the previously mentioned Fellows' Talks, I used my specialized knowledge as an occupational therapy student to discern which articles would be more appropriate for surgical fellows rather than practicing therapists or therapy students. This type of

code-switching, from medical professional to client, was a necessary skill for me to develop as an advanced practitioner. The surgical fellows expanded their knowledge base and occupational competence by observing the therapist perspective and conservative treatments. In addition to the Fellows' Talks, I received requests from various staff members on specific topics. These staff members were curious what the latest evidence was and wanted to ensure evidence-based treatment without sacrificing patient treatment time to investigate the literature. I was able to serve this need, find recent and relevant articles for each requested condition, and improve the therapists' occupational performance of patient treatment.

Discontinuation

Throughout my capstone, I improved the use of EBP at IHTSC. My research promoted the use of current evidence in the monthly surgical Fellows' Talks and the next edition of the DTM©. I created a template to allow easy inclusion of articles into the manual and the justification for their selection; this template can be used after I leave the site for any future editions. The Fellows' Talks given by the Education Director each month improved with the inclusion of current therapy protocols and outcomes. The surgical fellows can now better advise their patients on what to expect from a given procedure. The fellows were also interacting with the therapists present at the Talks, indicating an increased willingness to collaborate with treatment providers after the surgery. This interdisciplinary collaboration can help preserve continuity of care for patients, and each discipline can gain improved knowledge of procedures and outcomes.

I changed the layout and publication of the DTM© with the inclusion of articles I selected. This sets a precedent for future editions of the manual to include current evidence, changes in practice, and research where there is currently none. Hand therapists across the country use the DTM© to guide their interventions, so my changes can directly impact practice

nationwide. Some conditions did not have therapeutically relevant research available; for example, despite screening 179 articles related to flexor tendon reconstruction, none were appropriate for inclusion. This gap in research is an opening for further research by hand therapists and hand surgeons. As the research becomes available, I have created a template that is flexible enough to allow for consistent changes and updates to articles for future DTM© editions.

My work is important because of the need to deliberately include EBP into current therapy practice. Thomas and Law (2013) found that most practitioners consult with colleagues and other practitioners, instead of formally researching a question or topic. They also found that practitioners who had recently graduated and/or had a higher degree viewed EBP in a more positive light and were more comfortable integrating it into practice (Thomas & Law, 2013). Throughout my time at IHTSC, I found that only the Education Director was comfortable searching for evidence. Other therapists would occasionally consult me for a brief search into a rarer condition, such as post-polio syndrome, but several stated they were not comfortable using databases to search for evidence. I was able to step into the gap and provide high-quality research for inclusion into the DTM©.

There are several forces driving the deliberate inclusion of evidence into practice besides the initiatives within a practice. AOTA stated that the ethical concept of Beneficence included a standard of conduct that practitioners will use evaluations and treatments that are “evidence-based and current” (AOTA, 2015, p. 2). Medicare has changed its reimbursement system to a Merit-based Incentive Payment System (MIPS), which requires organizations to provide evidence of the quality of care, patient engagement, improvement of practice, and cost of care (Medicare, 2019). Therapy facilities can use EBP to show an increased quality of care for their patients, and facilities that can increase the use of EBP can show an improvement in practice. Either condition would meet the categories described in MIPS (Medicare, 2019). IHTSC placing

my articles in the Diagnosis and Treatment Manual is one of the ways that could satisfy MIPS requirements.

MOHO in Non-traditional Setting

According to the Model of Human Occupation (MOHO), first developed by Dr. Gary Kielhofner, a person's occupation is driven by volition (intrinsic motivation), habituation (patterns and routines), and performance capacity (physical and mental skills) (Cole & Tufano, 2008). This intrinsic driving force manifests outwardly as occupational competence and occupational adaptation (Cole & Tufano, 2008). To use the language of MOHO in this non-traditional treatment setting, I developed my client's performance capacity by providing evidence for inclusion into the DTM©. My client can now effectively use EBP because of enhanced performance capacity, specifically mental skills. Thomas and Law (2013) emphasized that university partnerships with clinicians diffuse EBP into practice settings. IHTSC and I both grew from my placement at this clinic. The clinic is more connected with EBP and current literature, the users of the DTM© are better able to practice in their role as hand therapists, and I enhanced my research skills.

I can also use the occupation-based language of MOHO to describe the impact of my interventions. My clients improved their occupational competence and mental skills as a result of my intervention. Like a traditional evaluation, I established my client's current and ideal occupational performance. Previously, there were no EBP resources in the DTM© and my client wanted at least one EBP resource for each condition in the manual. The motivation for change was present as the Director of Therapy had already prepared criteria for selecting appropriate articles. My needs assessment with the Director of Therapy and the Education Director clearly showed the motivation of IHTSC to incorporate EBP. However, the routine use of EBP by

clinicians was lacking, and therefore the mental skill and competence necessary to incorporate evidence into client treatment was not part of the current edition of the DTM©.

Overall Processes and Outcomes

Searching Databases

Communication with client. During my needs assessment, I worked with the Director of Therapy and the Education Director to find out what topics of research were needed, and how they would determine if an article was useful. The Director of Therapy provided me a list of terms that I would search, and the Education Director informed me that she would need me to do research intermittently for her monthly Fellows' Talks. I scheduled to meet with them once per week, on average, to ensure that I was finding appropriate content. During these meetings, I would discuss my findings and potential articles with the Director of Therapy and Education Director, and they would clarify which aspects of each article would make it appropriate for inclusion. This communication made my final selection of articles more useful to my client.

Communication with extra-disciplinary professionals. During my intervention, I scoured databases for articles from 2014 to 2019 that would be appropriate to include in the Diagnosis and Treatment Manual. In order to make my searches more efficient, I consulted with the Reference Librarian at my university and the Librarian at IHTSC. This consultation process took place in person, over e-mail communication, and by phone. Both librarians helped me discover the "trees" that are used in databases to categorize and interrelate conditions. I was then able to search a wider, more thorough area in order to exhaust all potential results for a given condition. By the end of my rote database searching, I screened 21,282 articles for inclusion into the DTM©.

Annotated Bibliography

As I collected articles, I kept their citations in an annotated bibliography. The Education Director had emphasized the importance of a rationale for including a certain article during the needs assessment. Since the citations also included an article summary, specific information from my opinion of the article, or a combination of all three, the annotated bibliography was not part of the formal project that was presented to stakeholders at the end. However, the annotations allowed me to screen for the best, most relevant therapeutic articles using my clinical reasoning. I consulted with the Education Director and the Director of Therapy when I had a question about including an article. This consultation took place approximately once per week, usually through e-mail correspondence. Finally, I selected 370 articles as appropriate to include in the manual.

Article Template

Once I had selected the articles, I created a template for presentation to the stakeholders. The Education Director had discussed a model template with me during the needs assessment and I used this model to create a template that followed the outline of the DTM© that also included article citations, a summary of the article, and my clinical reasoning to justify its inclusion. My personal library of 370 articles and the annotated bibliography that I had created throughout the process allowed me to fill in the template more efficiently. This digital resource allows for continuation of this intervention after I leave IHTSC, as future clinicians can use the framework I have built to add more articles as they become available and as the DTM© progresses through later editions. This framework and personal database I created also allowed the client to access all PDFs saved during my research if needed.

Leadership and Advocacy

I grew in leadership skills throughout this project by advocating for the inclusion of recent evidence in the Fellows' Talk, independently screening articles and creating template for evidence, and initiating consultations with outside experts as appropriate. I used the standards for

articles that my client had given me during the needs assessment as well as weekly consultations with the Education Director and Director of Therapy to ensure I met the client's needs and expectations. When I attended the Fellows' Talks given by the Education Director, I was impressed by the interaction that regularly took place between the fellows and the therapists. The different viewpoints provided a more holistic view of the continuum of care, patient outcomes, and clinical considerations.

During a presentation about various shoulder conditions, one of the therapists asked the surgical fellows about a biceps tenodesis versus a biceps tenotomy. The fellows explained that the type of procedure done is largely based on surgeon preference and that patients are sometimes bothered by the concept of cutting a tendon. It was interesting to hear the different fellows' opinions of a surgeon's decision, as well as various patient experiences. As therapists, we were able to explain the rehabilitation protocols, and how the surgeons' actions would affect weight limitations, early mobility options, and patient pain. There was a dialogue about patient responses to surgical and therapeutic intervention, potential complications, patient education, and interdisciplinary cooperation to ensure optimal treatment outcomes. This interdisciplinary contact was exciting to experience, and I hope to continue that at a future job. I felt that there was increased rapport between the surgical fellows and the therapy staff in attendance.

Conclusion

Overall, this capstone experience has allowed me to grow as a professional, develop advanced research skills, advocate for the inclusion of evidence, collaborate with inter-and extra-disciplinary professionals, and meet the needs of a non-traditional client in a traditional setting. I am proud of the value that I have added to the DTM© and the impact that my research will have on practicing therapists. As I look toward my future career, I can see myself using my passion for research to lead treatment initiatives and interdisciplinary learning opportunities that improve

patient outcomes. The extremely positive feedback that I received from therapists, the Director of Therapy, the Education Director, and the Editor of the DTM© reinforced the magnitude of the positive impact that I had at IHTSC.

References

- American Occupational Therapy Association. (2015). Occupational Therapy Code of Ethics. *American Journal of Occupational Therapy*, 69(Suppl. 3), p1-p8.
- Burns, P. B., Rohrich, R. J., & Chung, K. C. (2011). The levels of evidence and their role in evidence-based medicine. *Plastic and Reconstructive Surgery*, 128(1), 305-310.
- Cole, M. & Tufano, R. (2008). *Applied theories in occupational therapy: A practical approach*. Thorofare, NJ: SLACK Incorporated.
- Dougherty, D. A., Toth-Cohen, S. E., & Tomlin, G. S. (2016). Beyond research literature: Occupational therapists' perspectives on and uses of "evidence" in everyday practice. *Canadian Journal of Occupational Therapy*, 83(5), 288-296.
- EBSCOhost [Database]. Copyright 2019, EBSCO Industries, Inc.
- Medicare. (2019). Quality Payment Program, MIPS Overview. *Center for Medicare and Medicaid Services, Department of Health and Human Services*. Accessed from <https://qpp.cms.gov/mips/overview> on 3/29/19.
- Myers, C. T. & Lotz, J. (2017). Practitioner training for use of evidence-based practice in occupational therapy. *Occupational Therapy in Health Care*, 31(3), 214-237.
- Rogers, E. M. (1983). *Diffusion of Innovations*, (3rd ed.). New York, New York: The Free Press, A Division of MacMillian Publishing Co.
- Szucs, K. A., Benson, J. D., & Haneman, B. (2017). Using a guided journal club as a teaching strategy to enhance learning skills for evidence-based practice. *Occupational Therapy in Health Care*, 31(2), 143-149.
- Thomas, A. & Law, M. (2013). Research utilization and evidence-based practice in occupational therapy: A scoping study. *American Journal of Occupational Therapy*, 67, e55-e65.

Upton, D., Stephens, D., Williams, B., & Scurlock-Evans, L. (2014). Occupational therapists' attitudes, knowledge, and implementation of evidence-based practice: A systematic review of published research. *British Journal of Occupational Therapy*, 77(1), 24-38.

Appendix A

Search Log

Amputation: therapy, outcome, digital amputation, rehabilitation, transmetacarpal amputation, below elbow amputation, above elbow amputation

Arthritis: thumb, carpometacarpal joint, arthritis, “NOT surgery”, rheumatoid arthritis, therapy, gout, outcome, “NOT drug”, hand, occupational therapy, lupus, upper extremity, scleroderma

Arthrodesis: therapy, arthrodesis, finger, rehabilitation, digit, joint fusion, distal interphalangeal joint, proximal interphalangeal joint, wrist fusion, wrist arthrodesis, total wrist arthrodesis, partial wrist arthrodesis, partial wrist fusion

Arthroplasty: therapy, metacarpophalangeal arthroplasty, rheumatoid, trauma, proximal interphalangeal joint, arthroplasty, proximal interphalangeal arthroplasty, osteoarthritis, hemi-hamate, surgery, thumb, cmc, burton, thumb carpometacarpal joint, reconstruction, first metacarpal, wedge, osteotomy, tigh trope, wrist, schecker, DRUJ, total, elbow arthroplasty, radial head, outcome, coonrad, discovery, shoulder arthroplasty, “NOT reverse”, radial head arthroplasty, protocol

Biceps Rupture: distal biceps, rupture, outcome, therapy, conservative, “NOT surgical”, repair, therapy, proximal biceps, surgical

Bursitis: olecranon bursitis, outcome, therapy, aseptic, “NOT surgery”, surgery, shoulder bursitis, subacromial bursitis, occupational therapy

Burns: first degree, burns, upper extremity, therapy, burn, first degree burn, superficial burn, partial thickness burn, superficial thickness burn, deep thickness burn, full thickness burn, red burn, outcome, yellow burn, black burn, superficial thickness, rehabilitation, partial thickness, full thickness

Capsulectomy/Capsulotomy: dorsal, capsulectomy, metacarpophalangeal joint, capsulotomy, hand, dorsal capsulotomy, digit, proximal interphalangeal joint, DRUJ, distal radioulnar joint, elbow, global

Carpal Boss: carpal boss, conservative, therapy, outcome, carpometacarpal boss, metacarpal boss, surgery, recovery, operative

CRPS: complex regional pain syndrome, therapy, occupational therapy, hand

Compartment Syndrome: compartment syndrome, hand, therapy, upper extremity, outcome

Congenital Anomalies: camptodactyly, therapy, outcome, syndactyly, release

Crush Injuries: crush injury, hand, outcome, therapy, soft tissue, digit, crush

Cysts: mucous cyst, therapy, rehabilitation, outcome, inclusion cyst, hand, surgery, lipoma, giant cell tumor

Dislocations: proximal interphalangeal joint, dorsal dislocation, fracture, "NOT surgical" volar dislocation, volar plate repair, volar plate, outcome, dorsal, hinge, elbow, posterior dislocation, "NOT surgery", anterior dislocation, therapy, rehabilitation, shoulder, global dislocation

Dupuytren's: subtotal palmar fasciectomy, open technique, Dupuytren's fasciectomy, Dupuytren's, Dupuytren, open, splint, closed, xiaflex

Extensor Tendon Injuries: mallet finger, rehabilitation, "NOT surgery", therapy, surgery, central slip, outcome, delayed, repair, boutonniere, boutonniere deformity, manage, pseudo boutonniere, extensor tendon repair, delay, zone IV, hand, lateral band, injury, central slip repair, motion, early motion, extensor tendon, zone V, early, extensor, extensor tendon injury, dorsal hand, zone VI, zone VII, protocol, zone VIII, thumb, reconstruction, extensor tendon reconstruction, measure

Fibromyalgia: fibromyalgia, hand, therapy, protocol, outcome, upper extremity

Focal Dystonia: focal dystonia hand, rehabilitation, therapy, musician, athlete, arm, sports

Flexor Tendon Repairs: flexor tendon repair, thumb, postoperative, protocol, outcome, therapy, Indiana, flexor tendon, Louisville program, delayed, delayed motion, Louisville, Mayo clinic, mayo, flexor digitorum profundus, repair, reconstruction, therapy, flexor pollicis longus, thumb flexor, rehabilitation, injury, motion, flexor pollicis, restrictions, thenar muscle, zone V, flexor, active, passive, proximal forearm, flexor carpi ulnaris, flexor carpi radialis

Flexor Tendon Reconstruction: flexor tendon reconstruction, stage I, rod, first stage, therapy, rehabilitation, protocol, pronator slide, pronator, flexor pronator slide, reconstruction, flexor tendon, fractional lengthening, fractional, flexor, hand, lengthening

Fractures: metacarpal fracture, closed reduction, rehabilitation, therapy, outcome, protocol, percutaneous, pin, tension band, screw, plate, proximal phalanx, fracture, closed, middle phalanx, distal phalanx, shaft, tuft, bony mallet, wrist fracture, bennett, palmar beak, carpometacarpal fracture, dislocation, lunate fracture, Keinbock, Keinböck, scaphoid fracture,

conservative, surgical, ulnar styloid, distal radius fracture, cast, “NOT pediatric”, orthosis, splint, ORIF, spanning plate, external fixator, comorbid, comorbidity, coronoid fracture, functional outcome, ROM, terrible triad, lateral collateral ligament, lateral collateral ligament complex, repair, motion, medial collateral ligament complex, medial collateral ligament, elbow, elbow fracture, midshaft humerus fracture, midshaft humerus, humerus shaft fracture, proximal humerus fracture, postoperative, clavicle fracture

Ganglions: dorsal carpal ganglion, therapy, dorsal wrist ganglion, rehabilitation, volar wrist ganglion, volar retinaculum ganglion, volar carpal ganglion, volar ganglion

Hematomas: hematoma, upper extremity, hand, therapy, protocol, subungual hematoma

Infections: infection, risk factors, hand, hand injury, hand surgery, paronychia, cardinal signs, therapy, rehabilitation, motion, Kanavel, pyogenic tenosynovitis, flexor, pyogenic flexor tenosynovitis, splint, flexor tenosynovectomy

Intrinsic Contractures: intrinsic contracture, hand, splint, rehabilitation, motion, hand contracture, orthosis, “NOT Dupuytren”, occupational therapy, therapy, intrinsic release, lumbrical release, release, lumbrical OR interosseous, hand release, hand release rehabilitation, “NOT nerve”, “NOT artery”, hand release occupational therapy, “NOT foot”, muscle, hand muscle, interosseous OR lumbrical, muscle spasticity, contracture/RH/SU/TH, muscle spasticity/RH/SU/TH, contracture/RH/SU/TH, hand/SU, fingers

Ligament Injuries: collateral ligament, metacarpophalangeal joint, “NOT repair”, repair, rehabilitation, therapy, proximal interphalangeal joint, “NOT thumb”, wrist sprain, “NOT surgery”, carpal ligament, sprain-strain, scapho-lunate reconstruction, scapho-lunate ligament, reconstruction, scaphoid, lunate, ligament, scapholunate ligament, motion, outcome, Blatt

capsulodesis, triangular fibrocartilage complex, conservative, orthosis, lateral collateral ligament complex, elbow, medial collateral ligament, athlete, elbow medical collateral ligament, protocol

Nail Bed Injury: nail bed injury, conservative, nail injury, therapy, rehabilitation, fingernail injury, orthosis, finger nail injury, protocol

Nerve Compression Syndromes: anterior interosseous nerve, conservative, anterior interosseous nerve syndrome, therapy, rehabilitation, outcome, protocol, carpal tunnel syndrome, cubital tunnel syndrome, “NOT surgery”, radial tunnel syndrome, radial tunnel, thoracic outlet syndrome, occupational therapy, long thoracic nerve syndrome, long thoracic nerve, cervical radiculopathy, ulnar nerve, anterior transposition, anterior submuscular transposition, anterior subcutaneous, eaton, eaton sling, in situ, recovery, cubital tunnel release, carpal tunnel release, carpal tunnel, hypothenar fat pad flap, hypothenar fat, fat pad, adipose tissue, radial neuropathy/SU/RH/TH, posterior interosseous nerve, radial tunnel release, radial tunnel decompression, decompression, radial tunnel, surgery, medial epicondylectomy, ulnar nerve transposition, thoracic outlet surgery, neurogenic, nerve, long thoracic nerve

Nerve Repairs: digital nerve repair, digital nerve surgery, common digital nerve, palmar nerve, common palmar nerve, median nerve repair, digital nerve protocol, protocol, surgery, median nerve, forearm, repair, median nerve injury, ulnar nerve repair, ulnar nerve injury, outcome, ulnar nerve, radial nerve repair, “radial nerve NOT humeral fracture”, “radial nerve surgery NOT humeral fracture”, radial nerve injury, “surgery NOT humeral fractures”

Nerve Palsies: median nerve, orthosis, splint, “NOT carpal tunnel”, median nerve palsy, ulnar nerve, ulnar nerve palsy, therapy, rehabilitation, injury, “ulnar nerve”, “median nerve”, palsy, radial nerve palsy, radial nerve

Pulleys: pulley repair, hand, pulley rupture, pulley venting, pulley reconstruction, pulley rehabilitation

Ray Resection: ray resection, postoperative, ray amputation, hand, digital ray, “NOT radiography”, therapy, rehabilitation

Replantation: replantation guidelines, digital replantation, hand, thumb replantation, therapy, rehabilitation, hand replantation, outcome, arm replantation, arm reimplantation

Shoulder: acromioplasty, open, acromion/SU/PP/PH/IN, therapy, rehabilitation, acromion, arthroplasty, outcome, shoulder, anterior instability, shoulder anterior instability, “NOT surgery”, “NOT surgical”, arthroscopic debridement, debridement, Bankart repair, capsular shift, “joint instability surgery”, distal clavicle resection, frozen shoulder, occupational therapy, adhesive capsulitis, physical therapy, Hoffer transfer, latissimus dorsi, teres major, rotator cuff, surgery, transfer, impingement, conservative, labral debridement, labrum, repair, motion, levator scapulae syndrome, levator scapulae, levator scapula syndrome, injury, rotator cuff tear, rotator cuff repair, small, rotator cuff injuries/RH/SU/TH, “range of motion”, “goniometry”, “rotator cuff/SU”, “range of motion, articular”, proximal biceps tenodesis, proximal biceps tenodesis, proximal biceps, biceps brachii muscles/SU, “tenodesis”, “tenotomy”, scapulothoracic dyskinesis, “NOT athlete”, SLAP repair, postoperative, superior labrum anterior posterior repair

Spasticity: spasticity, arm, conservative, upper extremity, “NOT lower extremity”, superficialis, profundus, transfer, superficialis to profundus

Tendinitis: tendinitis, flexor carpi radialis, FCR, flexor carpi, inflammation, release, tendonitis, surgery, flexor carpi ulnaris, therapy, rehabilitation, tenosynovitis, (lateral

epicondylitis OR tennis elbow), conservative, percutaneous, lateral epicondylectomy, epicondylectomy, lateral epicondylitis, tennis elbow, extensor carpi radialis, tenotomy, extensor carpi radialis longus, extensor carpi radialis brevis, medial epicondylitis, nonoperative, outcome, protocol, medial epicondylectomy, epicondylitis, distal biceps tendinitis, biceps tendonitis, distal, triceps tendonitis, triceps tendinitis

Tenosynovitis: (flexor tenosynovitis OR trigger finger), conservative, tenosynovectomy, flexor tenosynovitis, (flexor tenosynovitis OR trigger thumb), trigger thumb, therapy, thumb, splint, flexor tenosynovectomy, dequervain tenosynovitis, dequervain's, first dorsal compartment, "NOT injection", tenosynovitis, de Quervain, release, wrist, extrinsic flexor tenosynovitis hand, arm muscle, extensor tenosynovectomy, intersection syndrome, proximal, distal, surgery, surgical

Tendon Transfers: palmaris longus, abductor pollicis brevis, flexor digitorum superficialis, thumb, adductor, transfer, "NOT hypoplastic", hand transfer, palsy, intrinsic, intrinsic palsy, claw, tendon transfer, bunnel, stiles, zancolli, lasso, metacarpophalangeal joint capsulodesis, metacarpal, hand, biceps, pectoralis major, elbow, latissimus dorsi, sternocleidomastoid, triceps, extensor digitorum communis, flexion transfer, extensor, extensor carpi radialis brevis, flexor digitorum profundus, extensor carpi radialis longus, flexor pollicis longus, extensor indicis proprius, extensor indicis, thumb, abductor pollicis brevis, tendon, abductor digiti quinti minimi, abductor digiti, huber, thumb opposition, opponensplasty, hoffer, shoulder, rotation

Tenolysis: tenolysis, extensor, hand, tenolysis surgery, extensor tendon, tendon, adhesion, capsulectomy, flexor tenolysis, flexor tendon, frayed, pseudotendon

TOS: thoracic outlet syndrome, therapy, "NOT surgery"

Triceps Repair: triceps repair, distal, distal triceps, therapy, rehabilitation, protocol, outcome, repair

Vascular Disorders: digital sympathectomy, sympathectomy, sclerosis, Raynaud, digit, “NOT drug”, therapy, hemangioma, hand, therapy, conservative, upper extremity, rehabilitation, outcome

Wounds: cellulitis, hand, therapy, “NOT drug”, upper extremity, rehabilitation

Wrist Procedures: wrist, darrach, ulnar head resection, ulnar head osteotomy, hit procedure, Lowenstein, sauve-kapandji, outcome, pisiform excision, proximal row carpectomy, therapy, rehabilitation, radius lengthening, radial lengthening, radial, longitudinal, lengthening, occupational therapy, shortening, osteotomy, radial osteotomy, scapho lunate dissociation, lunate dissociation, scaphoid dissociation, rotary subluxation, scaphoid, scapholunate interosseous ligament, injury, ulnar shortening, osteotomy, outcome, therapy, rehabilitation, motion

Misc- Toe to Thumb Transfer: toe, thumb, transfer, transplantation, toe transplantation, therapy, strength

Misc- Distal Radio-Ulnar Instability: radioulnar instability, sling, radius AND ulna, instability, flexor carpi ulnaris, carpi ulnaris, distal

Appendix B

Sample Template

Arthritis:

- Outcomes:
 - McQuillan, T. J., Kenney, D., Crisco, J. J., Weiss, A.-P., Ladd, A. L. (2016). Weaker functional pinch strength is associated with early thumb carpometacarpal osteoarthritis. *Clinical Orthopaedics and Related Research*, 474(2), pp. 557-561
 - “A 20% decrease in key pinch strength from the control subjects’ baseline was associated with a 10% increase in the OA diagnosis” (p. 557)
 - Key pinch was the most strongly associated with early CMC OA diagnosis, but there was also an effect on tip pinch and three-finger pinch
 - Authors describe that a decrease in joint strength may appear before radiographic deterioration of the joint

- Recommended Reading:
 - Ryan, S., Lillie, K., Thwaites, C., Adams, J. (2013). ‘What I want clinicians to know’ - experiences of people with arthritis. *British Journal of Nursing*, 22(14).
 - Pain is such a prominent part of life with arthritis, patients value addressing pain relief strategies and options throughout therapy
 - Patients want to be as independent as possible, and the focus group participants indicated a desire for adaptive equipment and strategies so they could feel more able to perform their ADLs
 - Patients value inclusion in the treatment planning process, and want to be seen as partners in their health care
 - Of note, participants with RA felt that their psychosocial needs were similar to a cancer survivor, as they have lasting deficits and chronic pain that hinders them in daily life and leads to depression and feeling inadequate