Oncology: The Future of Physical Therapy Education

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Abstract

The American Board of Physical Therapy Specialties and American Physical Therapy Association have acknowledged oncology (the study of cancer causation, development, and treatment) as a certified specialization of physical therapy beginning in fall 2019. The domain of physical therapy may experience several changes due to this acknowledgment. Using the works of Laura Gilchrist (PT, PhD) and colleague Mary Galantino (PT, PhD), this paper demonstrates the need for modification of physical therapy programs in the United States to include instruction and training on oncological studies. This paper explores ways in which oncology could be effectively implemented into physical therapy programs, specifically through the modification of curriculum, research projects, and internship opportunities.

Keywords: physical therapy, oncology, education, physical therapy specializations

Introduction

During 2018, it was estimated 1,735,350 United States citizens would be newly diagnosed with cancer, and 609,640 would die due to the disease; while this number of estimated deaths was large, the average death rate among cancer patients has consistently trended downward since the 1990s (American Cancer Society, 2018, p. 2). *Figure 1* and *Figure 2* illustrate that the number of new cancer cases and cancer deaths is expected to rise (Centers for Disease Control and Prevention, 2016). Conversely, *Figure 1* and *Figure 2* show the incidence rate is projected to stay relatively constant, while the death rate is expected to decline (Centers for Disease Control and Prevention, 2016). The increasing longevity of survival among oncology patients, along with the potential addition of millions of oncology patients each year, has caused a substantial increase in the number of patients requiring cancer-related medical care.

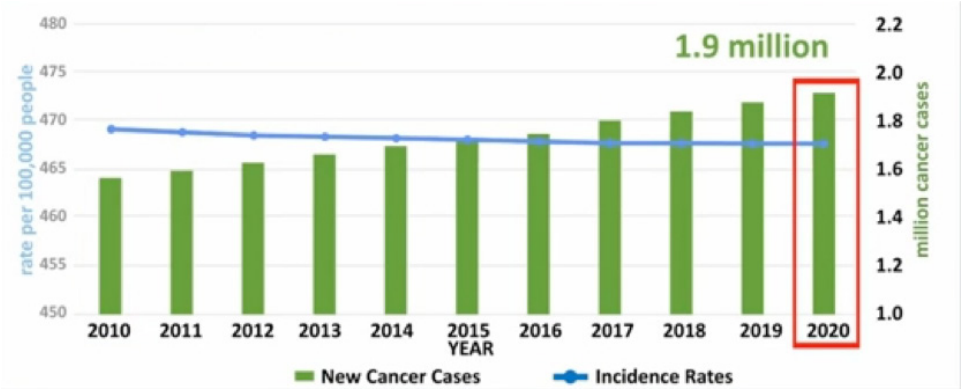

***Figure 1**:* Projected New Cancer Cases. Image courtesy of the Centers for Disease Control and Prevention. https://www.cdc.gov/cancer/dcpc/research/articles/cancer_2020.htm

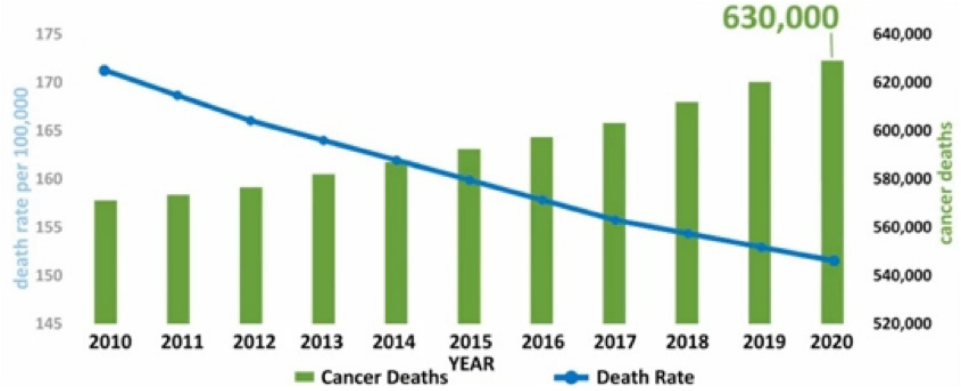

***Figure 2**:* Projected Number of Cancer Deaths. Image courtesy of the Centers for Disease Control and Prevention. https://www.cdc.gov/cancer/dcpc/research/articles/cancer_2020.htm

Due to the increasing number of oncology patients requiring medical care and research promoting the use of exercise-related rehabilitation for cancer patients, interaction between oncology patients and physical therapists is greatly increasing (Gilchrist et al., 2009). Furthermore, the American Board of Physical Therapy Specialties (ABPTS) and the American Physical Therapy Association (APTA) have decided to add oncology to the list of certified specializations within physical therapy starting in fall 2019.

The ABPTS and APTA recognizing oncology as a certified specialization will cause significant change in both the practical and research settings of physical therapy. Physical therapists being able to receive an accredited designation for their expertise in oncology could positively impact funding and approval rates for oncological research related to physical therapy. Additionally, both the

ABPTS and APTA are highly influential associations, and their acknowledgment of physical therapy as an effective treatment for oncology patients could further increase interactions between oncology patients and physical therapists as physical therapists begin working within hospitals and outpatient clinics. The prospective increase in oncology patient and physical therapist interaction will require physical therapists to have an increased knowledge of oncological treatment and cancer rehabilitation. Physical therapy programs in the United States must adapt, specifically in curriculum, research, and internship opportunities, to the changes occurring within the field of physical therapy due to the addition of oncology to board-certified specializations in 2019.

Current Treatments Applied in Oncology

Physical therapy within oncology exists as a single intervention within a larger multimodal approach to cancer treatment. Physical therapy is most effectively used in oncological treatment to alleviate or prevent symptoms either directly arising from cancer or as side effects from other modes of cancer treatment (Gilchrist et al., 2009). Consequently, for oncological physical therapy treatment to be successful, it is essential that physical therapists involved in the treatment plan of a cancer patient understand all aspects of his or her treatment.

There are presently several types of treatments oncologists use to treat patients: surgical therapy, radiation therapy, and various types of systemic therapies, such as chemotherapy, hormonal therapy, and targeted therapy (American Cancer Society, 2016, p. 2). These types of treatments have side effects, which can present themselves physically, physiologically, and psychologically, and can range in severity (Newton, Hickey, & Marrs, 2009, p. 139).

The main role of physical therapists working within oncology is to provide comfort to patients through the management of various cancer symptoms and cancer-treatment side effects. Physical therapy, through various modalities, techniques, and exercise prescription, can be used to treat several common side effects associated with surgical therapy, radiation therapy, and systemic therapies. The side effects, which physical therapists can effectively treat among oncological patients, range from decreasing the probability of postoperative infection to mitigating fatigue and bone density loss (Benedetti, Furlini, Zati, & Mauro, 2018, p. 8; Mock et al., 1997, p. 991; Thakral et al., 2013).

Surgical Therapy

Surgery is a therapeutic approach often used within oncology. Around 60% of cancer patients are treated with surgery, either as a singular treatment or as part of a multimodal treatment plan. Surgical procedures are used by oncologists for cancer prevention, diagnosis, staging, and treatment. Surgery is most effectively used to treat oncology patients during the early stages of cancer; if cancer is diagnosed at an early stage, surgeons can sometimes remove entire tumors from the affected areas. Cancer that has progressed to advanced stages or exists in a functional area of the body may only permit the surgeon to resect a portion of the tumor. This means the oncology patient must undergo other types of treatment to either meet the goal of cure, reduce symptoms, or in palliative cases, extend and/or increase the quality of survival (Newton et al., 2009, p. 139).

Oncological surgery, like all types of surgery, may cause the presentation of certain side effects in the patient. *Table 1* shows the various side effects associated with surgical therapy in oncology cases; none of these side effects are expected to be life-threatening (American Cancer Society, 2016, p. 3). Additionally, pain, along with pain medications commonly prescribed after surgery, may cause fatigue (Mayo Clinic Staff, 2014).

Several techniques within physical therapy can help mitigate side effects often associated with surgery. Electrical stimulation is a modality typically used to produce muscle contractions through the application of an electrical current via electrodes placed on the skin (Allen, 2014, p. 2). Patients may receive electrical stimulation as part of their post-operative rehabilitation to facilitate muscular contraction in muscles suffering from atrophy. In addition to producing muscular contractions, electrical stimulation has been shown to reduce infection, pain, and tissue damage, all of which are concerns after oncological surgery (Thakral et al., 2013). Furthermore, physical therapists can aid oncological patients in increasing the functionality of body structures affected by surgery through exercise prescription and manual therapy.

Radiation Therapy

Radiation therapy uses high-energy particles, or x-rays, which generate ionizing radiation by expelling electrons from their orbit. This type of therapy is commonly used for localized cancer treatment, with an estimated 60% of cancer patients receiving some type of radiation therapy. Several physical, chemical, and biochemical factors occur to produce the effects of radiation, the most notable being double-strand breaks in DNA. Radiation therapy can be delivered in several ways, including brachytherapy, radioisotope therapy, ste-

reotactic radiosurgery, and, most commonly, external beam therapy. Although radiation treatment can be used as a single source of therapy for oncology patients, it is often combined with surgery or chemotherapy. Most side effects of radiation therapy are site-specific, such as alopecia (absence or loss of hair); late cognitive changes when used on the brain; or nausea and vomiting when used in the abdominal region. Two common side effects of radiation therapy that lack site-specificity are pain and fatigue (See *Table 1*) (Newton et al., 2009, p. 141; Stedman, 2012, p. 63).

Fatigue induced by radiation therapy, and even general cancer-related fatigue, has been shown to decrease in response to exercise programs (Mock et al., 1997, p. 991; Scott & Posmontier, 2017, p. 66). Through the prescription of mild exercise programs, physical therapists can potentially reduce fatigue in oncology patients receiving radiation therapy and increase their overall quality of life.

Systemic Therapies

Systemic therapies involve drugs, which are transported via the bloodstream. Because systemic therapy relies on the bloodstream, it has the potential to affect all parts of the body. While the transportation mechanisms of different types of systemic therapies are identical, the mechanisms by which they function deviate (American Cancer Society, 2016, p. 3). Chemotherapy, for instance, targets cells that grow rapidly within the body; cancer cells are characterized by their irrepressible and abnormal growth, making them a target for chemotherapeutic drugs. Chemotherapy can inhibit cancer cell multiplication, invasion, and metastasis. Another form of systemic therapy, hormonal therapy, involves using drugs that block specific receptors and various feedback loops to suppress or inhibit the circulation of certain natural hormones within the body (Newton et al., 2009, p. 184, 314). Targeted therapy is a newer form of systemic therapy that uses drugs to attack specific molecules on or around cancer cells that foster cancer growth. *Table 1* shows the various side effects associated with systemic therapies (American Cancer Society, 2016, p. 3-4).

Fatigue and bone density loss are two common side effects of systemic therapies that physical therapists can successfully reduce in oncological patients. Physical therapists can effectively reduce fatigue related to chemotherapy through the prescription of an exercise program (Mock et al., 1997, p. 991; Scott & Posmontier, 2017, p. 66). In addition to decreasing fatigue, the implementation of exercise programs into oncological treatment could lead to decreases in bone loss and even increases in bone mineral density of treated patients (Benedetti et al., 2018, p. 8).

***Table 1**:* Associated Side Effects of Common Cancer Treatments
Note: *Table 1* is adapted from information found at the American Cancer Society and Mosby's Oncology Nursing Advisor: A Comprehensive Guide to Clinical Practice.

Treatment Type		**Side Effects**
Surgical Therapy		Bleeding, blood clotting, damage to nearby tissue, damage to nearby organs, pain, infection, functional impairment to certain parts of the body
Systemic Therapies		Thrombocytopenia, blood clotting, bone density loss, bowel dysfunction, fatigue, hair changes, heart damage, immune suppression, infertility, cognitive deficits, nausea, taste change, weight changes, numbness, and pain
Radiation Therapy	**Site of Therapy:**	
	Brain	Alopecia, late cognitive change
	Head and Neck	Xerostomia, mucositis, dental caries, dysphagia
	Chest	Cough, pneumonitis, late fibrosis
	Abdomen	Nausea and vomiting
	Pelvis	Diarrhea, cystitis, infertility
	Skin	Erythema, dry and moist desquamation

Physical Therapy Education: The Addition of Oncological Studies

Typically, physical therapy program curricula include nine semesters of courses, which focus on medical/clinical sciences, healthcare management, and research structure. Additionally, physical therapy programs require students to complete several clinical rotations in order to obtain their doctoral degree in physical therapy. While physical therapy programs already include the study of various modalities, techniques, and exercise prescriptions in their general curricula, they do not incorporate how these skills can be utilized within oncological treatment. Additionally, physical therapy programs do not integrate specific protocols for treating oncology patients within their current coursework. The most effective way to ensure physical therapists understand cancer treatment and are prepared to work with oncology patients would be to modify

physical therapy education to incorporate oncological studies. The revision of physical therapy programs should occur in curriculum, as well as internship and research opportunities.

Revision of Curriculum

It is indisputable that the practice of oncological physical therapy is growing, and consequently, the requirement for physical therapists to be knowledgeable in oncology should expand proportionally. Despite this, individuals may argue against revisions to the curricula of physical therapy programs to include oncological study. Opponents to the modification of physical therapy programs might say the time physical therapy programs have to educate their students is too limited to accommodate classes that focus on specific areas of physical therapy, like oncology. While it is true that time is limited in physical therapy programs, there is one way in which the implementation of area-specific curriculum could occur with ease: physical therapy programs should begin including oncology-specific elective courses within curriculum.

Most institutions have already allotted specific requirements into their programs to allow students to enroll in elective courses. Additionally, these institutions offer a number of area-specific elective courses, such as women's health, pediatrics, and sports physical therapy, within their physical therapy programs. While physical therapy programs have incorporated several courses focused on specializations currently board-certifiable by the ABPTS, only the University of Puget Sound offers an elective course on oncological studies within their physical therapy program (University of Puget Sound, 2018).

By implementing an elective course focusing on oncology, physical therapy programs could incorporate oncology into their program without disrupting the established core curriculum. Furthermore, offering oncology as an elective course would provide flexibility and diversity in physical therapy programs, allowing students to evaluate the necessity of oncological studies to their education based on their unique professional interests. While the addition of an oncology elective course may create additional expenses for physical therapy programs, these costs could be addressed through minute increases in tuition costs. Moreover, training established faculty members to instruct elective oncology courses could minimize additional expenses created by these courses. Adding oncology to physical therapy programs as an elective course would provide students interested in practicing oncological physical therapy a fundamental knowledge of oncology they could build upon without accumulating significant financial or opportunity costs.

Creating Internship and Research Opportunities

In addition to the revision of graduate program curricula for physical therapy, institutions should also consider using internship and research opportunities to introduce oncology into their physical therapy programs. Using resources institutions already have available, such as established faculty involved in student internship placement, physical therapy programs could examine oncological internship opportunities within their surrounding local and regional areas and compile lists of available internship opportunities in which physical therapy students could gain experience in oncological physical therapy. Additionally, institutions could apply for federal and state grants, which could be used to create on-campus internship and research opportunities related to oncology for physical therapy students.

Internship and research positions related to oncology would help physical therapy students gain experience with oncological studies in a practical setting, allowing the students to obtain a central knowledge of oncology treatment, and providing the students an opportunity to practice their knowledge through applied training with an experienced professional. Additionally, clinical internships and research projects are already scheduled within the curriculum of the typical physical therapy graduate program. This means, as it does with the addition of oncological elective courses, expanding internship and research opportunities to include oncology would allow students to become familiar with oncology in their education without altering the core-curriculum traditionally found in physical therapy programs around the United States.

Conclusion

With the American Board of Physical Therapy Specialties' decision to allow physical therapists to become board-certified in oncology, the already growing field of oncological physical therapy will expand even further. Due to the role physical therapists occupy within the multi-dimensional treatment of cancer, students studying physical therapy require exposure to oncology in their education. Physical therapy schools should carefully consider addressing this need through revisions to curriculum, internship opportunities, and research projects to incorporate oncology into their programs cost-effectively.

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