

Background

Epidemiology & Statistics

- Childhood cancer is rare, accounting for <1% cancer diagnosis²
- Survival rates are increasing to <84% survival rate for 5+ years²
 - Previous survival rate 58% in mid-1970's²
- Cancer is the *leading cause of death* by disease in children 1-14 years²
 - Most common diagnoses: leukemia (30%), CNS tumors (26%), and lymphomas (8%)*^{2,3}
- Childhood cancer *is different than adults* in diagnosis, treatment, & long term outcomes
- Limited data with high levels of evidence currently exist, thus resulting in a lack of standardized measures and/or practice guidelines for rehabilitation**
 - Psychosocial standard of care for pediatric cancer populations only standard available.

Methods

1) Defining PICO question

- What models for care are best practices for rehabilitative services in pediatric oncology populations?
- What late effects occur following cancer treatments for pediatric oncology populations?
- What assessment tools are reliable, valid, and feasible in identifying impairments for pediatric oncology populations?
- What interventions increase quality of life and functional health in pediatric oncology populations?

2) Needs assessment/comprehensive literature search

- Search terms**
 - Population
 - “childhood cancer,” “pediatric oncology,” “children with cancer,” “childhood cancer survivor,” and specific-cancer diagnosis terms
 - Intervention and Outcome search terms tailored to unique needs of each PICO question
- Databases:**
 - ASCO Publications, CINAHL Complete, Cochrane Library, EBSCO Host, Embase, OTSeeker (otseeker.com/resources), Physiotherapy Evidence Database (Pedro.org), PubMed, SAGEpub Journals
- Inclusion criteria**
 - Publications 2015-2020, unless a reference was frequently cited across multiple articles, children aged 21 or less, including childhood cancer survivorship studies
- Articles reviewed:** 111 articles

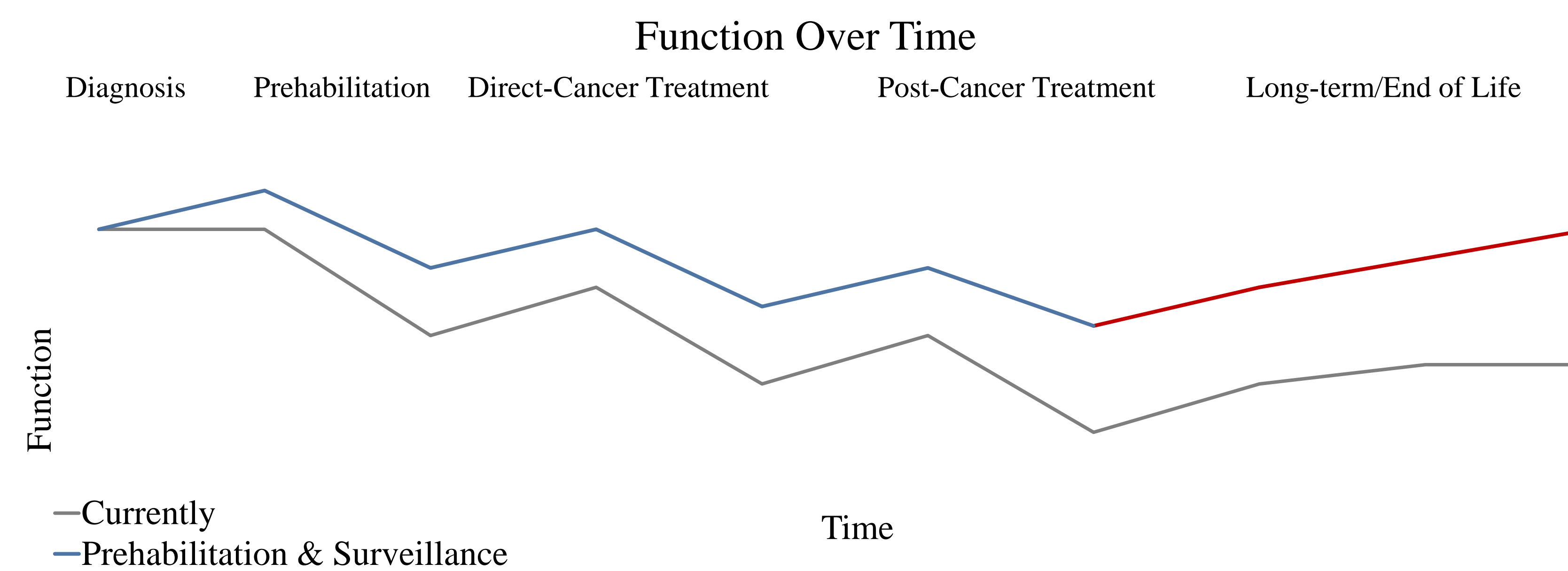
3) Application of literature to describe a delivery care model, delineate roles of rehabilitation, and identify recommendations for clinical practice for evidence based practices

Surveillance Model

Principles of Surveillance:

- Theoretical underpinnings in the Prospective Surveillance Model & Impairment-Driven Model
 - Prospective Surveillance Model = standard of care for populations with breast-cancer
 - Feasible and cost effective service delivery model
- Goal:** minimize morbidity and appearance of cancer sequelae, optimize the quality of life, and maximizing function, independence, and participation in activities of daily living and instrumental activities, such as school, play, and leisure exploration.
- Ongoing monitoring or surveilling of *physical function over time* across continuum of cancer care continuum

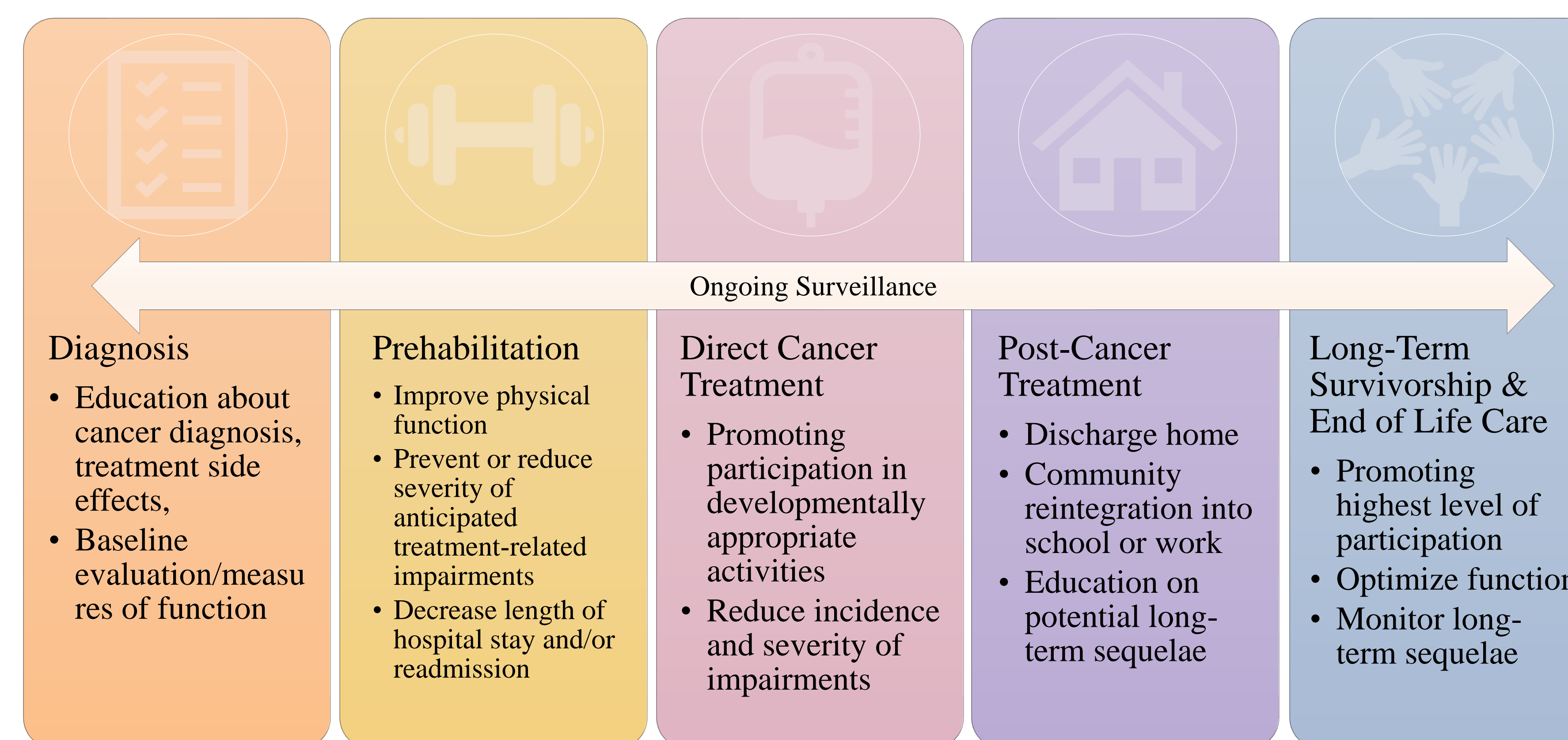
Figure 2. Function Over Time.^{2, 6, 11, 13, 16, 20, 22, 24, 25}



Current circumstances illustrate how function plateaus over time, resulting in activity limitations and participation restrictions during survivorship. Implementation of prehabilitation and ongoing surveillance of secondary cancer sequelae promotes resiliency and positive relationships to occur, leading to a gradual increase in performance, function, and quality of life during survivorship seen in red.

Role of Rehabilitation

Figure 2. Role of Rehabilitation Across Cancer Care Continuum



References

Case Example

Application of Prehabilitation to Stem Cell Transplant Process

A young adult, aged 22 years, with a diagnosis acute lymphoblastic leukemia (ALL) was admitted to inpatient services. Upon admission, patient entered the conditioning phase of transplantation, roughly 2 weeks prior to day 0 of his transplant. During this time, he was receiving prehabilitative services through occupational and physical therapy in aim to strengthen his musculoskeletal system to decrease overall deconditioning effects of the transplant process. Visits were scheduled at least 2-3x/week. Sessions included 30-45mins of strengthening, such as completing various planes of movement with 2-3# dumbbells, and physical mobility, such as dynamic movements (i.e., alternating squats) and ambulating long distances resembling community mobility throughout the hallway. Following transplantation, day 0, the patient was able to experience less negative effects, resulting in a positive relationship with physical function and mobility.

Evidence Based Recommendations for OT

Use of GRADE Scale^{9, 10} for intervention recommendations.

Strong recommendations with strong quality of evidence

- Periodic psychosocial screening is a standard of care for pediatric oncology team members, including rehabilitation^{14, 15, 26}

Strong recommendations with moderate quality of evidence

- Physical activity is effective for decreasing cancer-related fatigue and pain^{4, 18}
- Fatigue can be managed via relaxation, mindfulness, or energy conservation strategies¹⁸
- Cognitive interventions are beneficial for remediating cancer-related fatigue¹

Strong recommendation with weak quality of evidence

- Caregiver involvement significantly improves quality of life for pediatric oncology populations²¹
- Constraint-induced movement therapy is effective at improving hemiplegia in affected upper extremity involvement as a result of a brain tumor in pediatric populations²³
- Mirror therapy is effective for decreasing phantom limb pain in pediatric oncology populations³
- Physical activity is appropriate, safe, and feasible for patients with abnormally low or chronically low lab values^{7, 8, 19}
- Play-based interventions are safe and appropriate interventions¹²

Weak recommendation with weak quality of evidence

- Play-based interventions are effective at reducing fatigue, pain, and anxiety in children with acute lymphoblastic leukemia¹⁷

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