



Significance of Pediatric Oncology in Childhood Cancer Survival

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Description

Pediatric oncology, the specific field of medicine determined to diagnosing and treating cancer in children, plays an essential role in improving survival rates and quality of life for young patients. Childhood cancers, though relatively rare compared to adult cancers, require specialised methods due to the unique biological, developmental and emotional needs of children. Over the past few decades, advancements in pediatric oncology have significantly enhanced outcomes, showing its vital role in the fight against childhood cancer. It shows the importance of pediatric oncology in improving survival rates, the unique challenges it treats and its global significance. Childhood cancers differ significantly from adult cancers in terms of their types, causes and progression. The most common pediatric cancers include leukemia, brain and central nervous system tumors, neuroblastoma and Wilms tumor.

Unlike adult cancers, which are often linked to environmental and lifestyle factors, childhood cancers typically arise from random genetic mutations during early development. Pediatric oncology involves a specific method, include specialists in oncology, hematology, surgery, radiology and supportive care. This comprehensive framework ensures that every aspect of a child's health is addressed during their cancer journey, from diagnosis to survivorship. Modern treatment protocols have been pivotal in improving survival rates for childhood cancers. Pediatric oncologists have developed specific chemotherapy regimens, precision radiation therapies and innovative surgical techniques that minimize long-term

side effects. For instance, Acute Lymphoblastic Leukemia (ALL), once considered a fatal disease, now boasts a survival rate exceeding 90% in developed countries due to refined treatment protocols.

Targeted therapies and immunotherapy represent new advancements in pediatric oncology. Targeted therapies, such as tyrosine kinase inhibitors, focus on specific genetic mutations promoting cancer growth, providing highly effective and less toxic alternatives to traditional treatments. Immunotherapy, including Chimeric Antigen Receptor (CAR-T) cell therapy, utilizes the body's immune system to combat cancer cells, providing new belief for children with refractory or relapsed cancers. Early diagnosis is important to improving outcomes in pediatric cancer. Pediatric oncologists, equipped with specialized knowledge and diagnostic tools, can identify cancers at earlier stages, providing timely and effective treatment. Centralized care at pediatric oncology centers further enhances outcomes by providing access to technological advances, clinical trials and knowledge from various fields. While survival rates have improved significantly, many childhood cancer survivors face long-term health complications, including secondary cancers, cardiac issues and cognitive impairments.

Pediatric oncology focus on survivorship care plans that monitor and manage these late effects, permitting survivors to lead healthier lives. Despite advancements, significant disparities exist in childhood cancer survival rates between high-income and Low and Middle-Income Countries (LMICs). Limited access to diagnostic tools, trained specialists and essential medications contributes to poorer outcomes in LMICs. Pediatric oncology facilitates improvement by focusing on the unique biology of childhood cancers. Studies into genetic mutations, developmental biology and novel treatment modalities not only improves pediatric outcomes but also informs cancer therapies for adults. For example, studies on pediatric sarcomas have advanced the understanding of tumor biology across age groups.

Conclusion

Pediatric oncology has changed the way that childhood cancer care is provided, transforming once-fatal diagnoses into treatable conditions with potential survival rates. By managing the unique needs of young patients, advancing treatment modalities and promoting for appropriate access to care, pediatric oncology continues to save lives. As one can work for a future where no child dies of cancer, the significance of pediatric oncology remains important in the global fight against this dreadful disease.

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