

# The formation of a multidisciplinary, clinical exercise program for childhood, adolescent, and young adult cancer survivors in the United States

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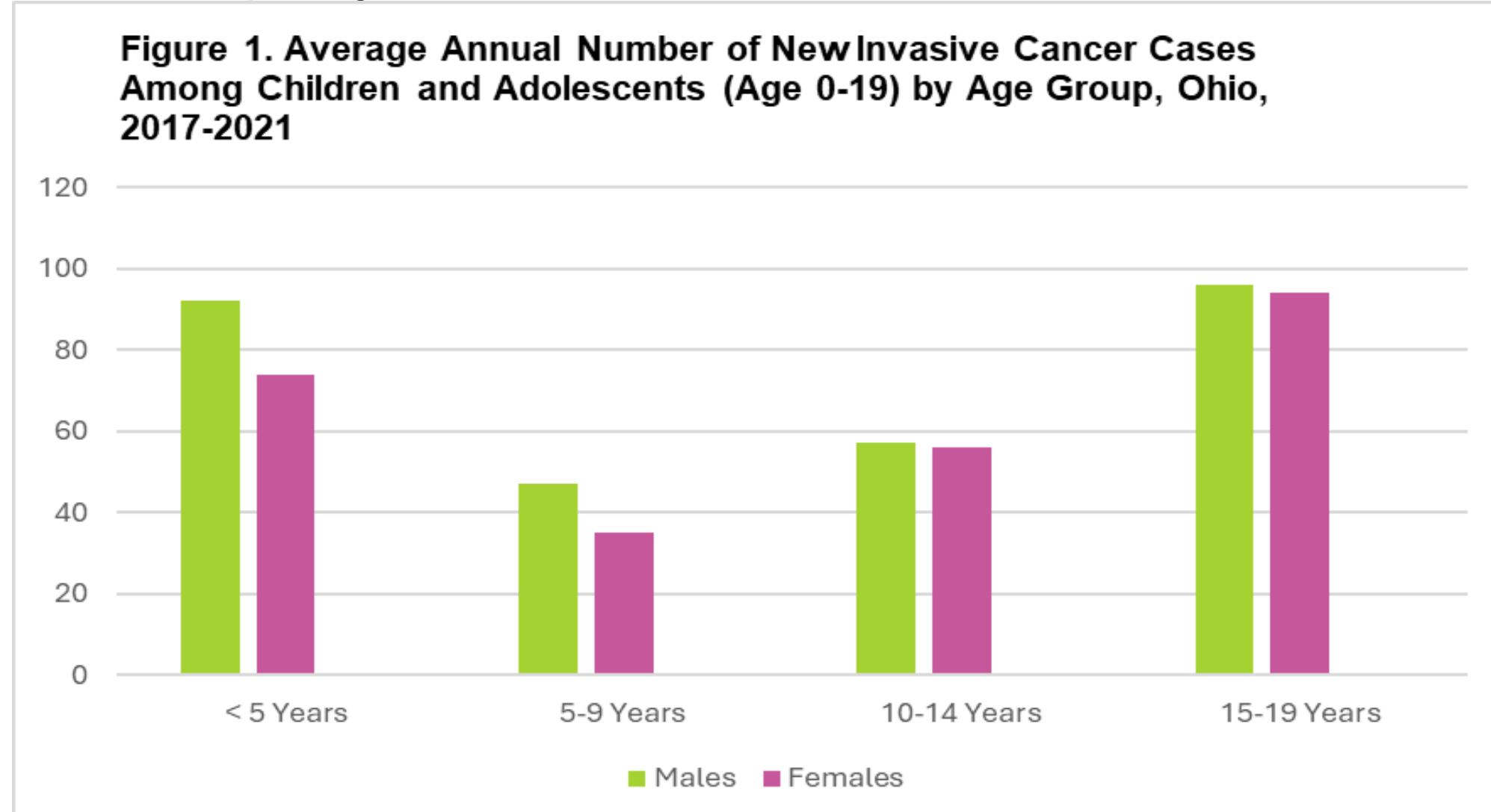
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## Background

- Exercise has been shown to mitigate short-and long-term toxicities of cancer therapies, improve functional capacity, decrease the risk of disease recurrence and prolong life in cancer survivors.
- Unfortunately, pediatric exercise therapy programs have largely been limited to research initiatives in the United States.
- This has resulted in a vast underutilization of these services, depriving this population of clinically impactful treatment.

## Methods

- This program was created as a collaboration between the Divisions of Oncology, Pulmonology, Occupational Therapy and Physical Therapy, Patient Services Research, Sports Medicine and The Heart Institute.
- The team is comprised of three physicians, three physical therapists, two exercise physiologists, a program manager, and a research assistant. We are also working on collaborations with integrative medicine, nutrition, and psychology.
- On average, this institution sees around 200 new cancer survivors per year.



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024

- We discuss the processes and general framework for a novel, clinically-based and funded exercise program for childhood, adolescent and young adult (CAYA) cancer survivors in the United States.

## Results

- The Cardiorespiratory Wellness Program at Cincinnati Children's Hospital Medical Center (CCHMC) is a comprehensive and individualized exercise program for CAYA cancer survivors, developed by a multidisciplinary team.
- The care delivery model for this program is based on our existing model for cardiac rehabilitation, which includes up to 36 in-person and virtual exercise therapy sessions with pre- and post-program standardized assessments.

Figure 2. Exercise Session Structure



## Results – cont.-

- Data from pre-program cardiopulmonary exercise testing and physical therapy evaluation guides the individualization of fitness programming, taking into consideration participants' goals and needs.

Figure 3. Outcome Measures

| Physical Outcome Measures | Cardiopulmonary Exercise Testing | Surveys                        | Blood Biomarkers        |
|---------------------------|----------------------------------|--------------------------------|-------------------------|
| Six Minute Walk Test      | Peak VO <sub>2</sub>             | Health-related Quality of Life | Inflammation/Exerkines  |
| Timed Up and Go           | Peak heart rate                  | Fatigue                        | Cellular Senescence     |
| Five-time Sit to Stand    | Blood pressure response          | Sleep                          | Epigenetic Clock        |
| Handgrip Strength         | Ventilatory efficiency           | Mental Health                  | Clonal Hematopoiesis    |
| Body Composition (InBody) | Spirometry                       | Neurocognition                 | Telomere Length         |
|                           | Exercise-induced arrhythmias     | Pain                           | Cardiometabolic markers |
|                           | Echocardiogram*                  | Barriers/Acceptability         |                         |
|                           | Pulmonary Function Testing*      |                                |                         |

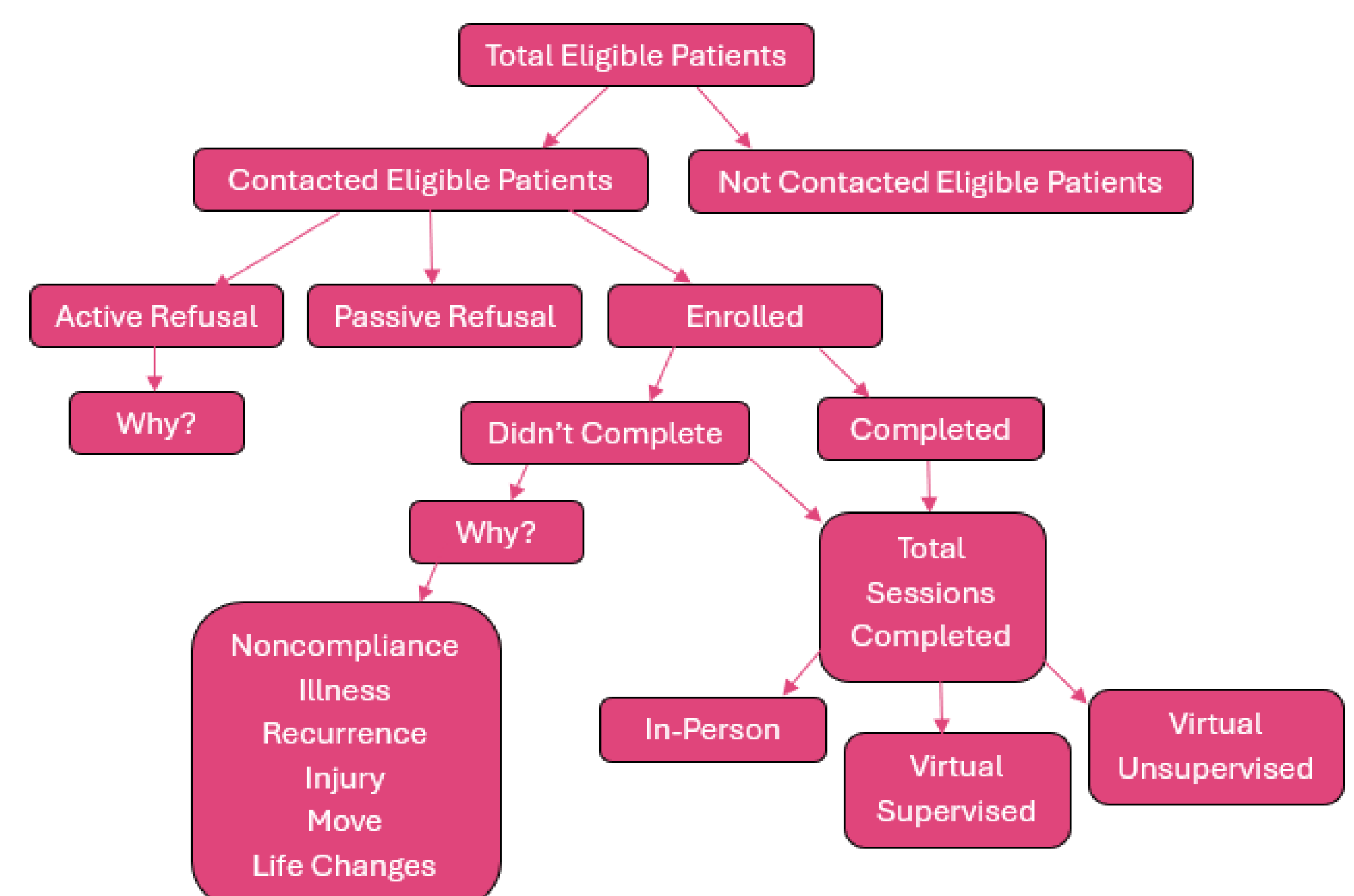
\* Based on treatment exposures and clinical history

- Longitudinal assessment of primary outcome measures include clinical and molecular markers of aging and cardiopulmonary dysfunction.
- Through utilization of clinical billing structures in existing therapy models, this program has demonstrated financial viability in its pilot phase, serving as a framework for further clinical growth.

## Conclusions

- Through integrated efforts led by a multidisciplinary team at CCHMC, the Cardiorespiratory Wellness Program was established to provide an unmatched level of expertise and services in the field of pediatric exercise medicine to impact the lives of CAYA survivors.
- Future goals of this program are to provide an infrastructure of this financially sustainable model for expansion to other pediatric populations with chronic diseases and provide reproducibility for other institutions nationally.

Figure 4. Flow Chart for Sustainable model



## Contact Us

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