A Pediatric Cardiology-Oncology Program

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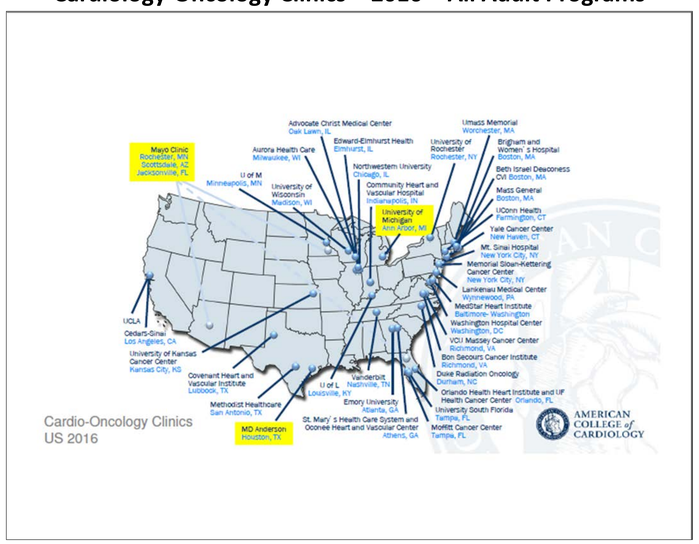
Background

- Significant improvement in childhood cancer survival in the last 40 years:
  - -- 5-year survival increased (58% to 82%)
  - -- In US: >325,000 survivors of childhood cancer
  - -- 24% of patients are now >30 years from diagnosis
- Cardiac mortality:
  - -- 10-fold higher among childhood cancer survivors
  - -- 3rd leading cause of death in this population
- Cardiotoxic effects:
  - -- Present at varying times during and after treatment
  - -- Vary from subclinical to clinical
- Identifying subclinical toxicity is important to prevent long term complications
- The 2013 AHA Scientific Statement:
  - -- Recommended more detailed monitoring, management and prevention
  - -- Develop evidence-based monitoring guidelines
  - -- Led to many adult centers initiating cardiology-oncology programs
  - -- Primary Goals:
    - -- Identify early signs of potentially reversible disease
    - -- Obtain baseline data for long-term follow-up studies
- Development of pediatric cardiology-oncology programs is limited

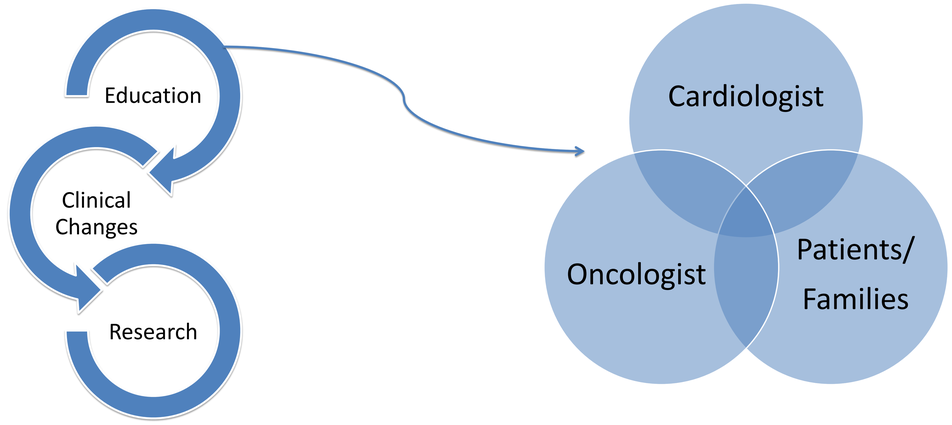
Cardiology-Oncology Clinics – 2016 - All Adult Programs

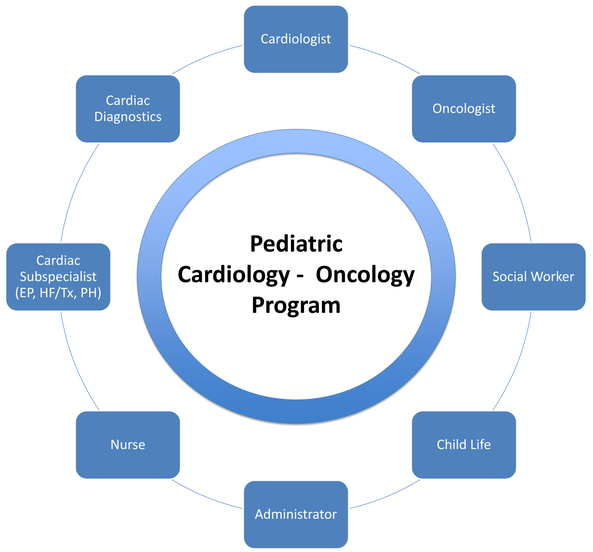


Objective

Develop a pediatric cardiology-oncology program that provides education, systematic monitoring and management of cardiac toxicity through early detection to improve outcomes in childhood cancer survivors

Methods





Clinical Changes

Echocardiogram Protocol	Multi-modality Screening Protocol	Cardiologist Staffed Clinics
- Image quality - Complete Study - Systolic function - Diastolic function - Strain Data (apical and parasternal) - IVC/SVC for clots and patency - Intra-cardiac shunts - Always compare/trend to prior	- EKG - Serum Biomarkers after completing treatment x1 - Holter monitor after 5 years of completion -MRI if any change/abnormality in above - Stress test with symptoms - Radiation (Evaluate Lipid Profile, CAD risk, Hypertension, high risk CVA)	-Cardiology specific clinics -Multi-Disciplinary clinics - Add into primary clinics - Overlap clinic days between specialties

Results

- Started Cardiology-Oncology Clinics (various types)
  - -- Cardiology visits - 10x/month
  - -- Multi-disciplinary – 5x/month
  - -- Imaging only visits for pre-treatment- daily
- Started Cardiology-Oncology Program
- Developed screening protocols
- Work with all oncology specialties (Solid tumor, Leukemia/Lymphomas, Neuro-oncology, Bone Marrow Transplant)
- Provide direct communication between oncology and one primary cardiology team
- Scheduling pathway for clinic visits vs echocardiogram visits
- At every clinic visit, patients meet a pediatric cardiologist
  - -- Direct necessary testing
  - -- Review results and plans
  - -- Educate about potential long term complications
- The majority of families are surprised of the potential long term complications and the need for life long follow up until told by the cardiologist
- **2012 – 2019**

2000 visits — 200 cardiac abnormalities

Anthracyclines 700 patients — 100 cardiac abnormalities

Conclusions

- We have built a dedicated team/program focused on cardiology-oncology, addressing an important gap in pediatrics.
- This has resulted in earlier detection of cardiac abnormalities, better communication between specialist and parents, and research alliances.
- Similar rate of detection as seen in adult studies
- Increased education of patients and families

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