

Programmatic Review and Optimization with a Patient Centered Perspective for an Expertise Model:

Are Specialty Call Teams Beneficial?

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Abstract

Preparation and Planning: Cardiac transplantation requires specific programmatic goals and expected near perfect outcomes with respect to one year mortality. Heart allocation policy historically has been a 3-tier system, based on wait-list mortality rather than post-transplant outcomes. The current heart allocation policy is now a 6-tier allocation system with more specific guidelines for each tier. The new system prioritizes patients based on severity of illness and medical urgency while still attempting to address geographic disparities in access to donors. The desire to balance the needs of critically ill patients with long-term post-transplant outcomes remains the priority given that donor hearts are a precious and limited resource. Assessment: Our team at Atrium Health Carolinas Medical Center did a programmatic reassessment in 2019 asking the question: How much specialization of our cardiac transplant team is appropriate to ensure our patients receive the best possible outcomes following cardiac transplantation? It was agreed that all patients deserve an expertise care model. Traditionally cardiac transplant surgeons and HF/transplant cardiologists have been a subset of the overall cardiac surgical and cardiology teams; why not a similar model for other teammates? Description of the team and implementation of new specialty call team: The hypothesis was that perioperative outcomes could be augmented with specialized components of the entire team. Administrative approval was obtained for the following: Cardiac transplant anesthesiologists – 4 – rather than 16, Cardiac transplant CRNA's – 9 – rather than 33, Cardiac transplant perfusionists – 4 – rather than 8, Cardiac transplant scrub nurses – 4 – rather than 32, Cardiac transplant circulators – 2 – rather than 32. Outcomes: Cardiac transplantation outcomes were analyzed 7.1.2019 to present. Surgical volume remained steady, while the acuity of patients increased with more patients going for transplantation on mechanical circulatory support from the ICU setting. Post-transplant graft dysfunction, need for ventricular assist device support (N= 10 vs 1), unplanned return to the OR (N = 12 vs 1), and 1 year survival (84% vs 98%) statistics were significantly improved during this time. Implications for perioperative nursing: Our data supports the conclusion that cardiac transplant patients are benefited with a specialized care model including OR nursing. We talked with the team for interest for the transplant team, the call requirements would significantly increase from six overnight call nights in six weeks to 26 weeks of 24-hour call. We removed six people from the regular call, and they were placed on adult heart transplant call, which caused a short-term burden for weekend teams for call. As new people were oriented, they filled the openings for the weekend call slots. The transplant team stayed on the regular holiday teams. The transplant team was given a higher call pay due to the increased call volume. The same call pay was later given to all members of the Cardiac OR team due to their specialized skills.

Who we are

Atrium Health's overarching goal is to provide seamless access to coordinated, high-quality healthcare.

- 40 hospitals and 1400+ care locations
- The region's only Level 1 Trauma Center
- Largest research center in the region
- Cardiovascular care at Atrium Health at Carolinas Medical Center - Sanger Heart and Vascular Institute has provided world-class heart care for over 50 years
- The Region's only heart transplant center
- Highly specialized multidisciplinary structural heart team
- The Region's busiest advanced cardiac mechanical support center

1/6/86 - 1st Heart Transplant

2/2/89 - 1st Pediatric Heart Transplant

10/18/95 - 1st VAD Implant

12/15/08 - 1st HM2 Implant

8/9/12 - 500th Heart Transplant

1/13/14 - 1st Syncardia TAH

2015 Momentum 3 Trial, 1st Implant

6/2019 - 700th Heart Transplant

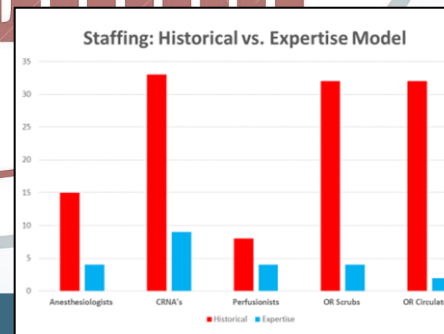
Program Beginnings

- Cardiac transplantation program that began in 1986
- Active participants in transplant cases historically included:
 - All cardiac surgeons – adult and pediatric.
 - Evolved to expertise model with fewer surgeons in 2000's
 - All surgical APP's.
 - All cardiac anesthesiologists – 16 +
 - All cardiac CRNA's – 33 +
 - All perfusionists – 8 +
 - All cardiac OR nurses and tech's – 32 +
- Cardiac transplant cases became increasingly more complex during the 2000's with most cases involving mechanical circulatory support device explantation
- Outcome expectations required near perfections with one year mortality > 92%
- Outcomes at the time were those desired
- New heart allocation policy, transitioning from the previous 3 tier system to a 6-tier system, prioritizing sicker patients
- Expertise team is readily accepted for the surgeon-component; thus, why not apply the same methodology to the other teammates?



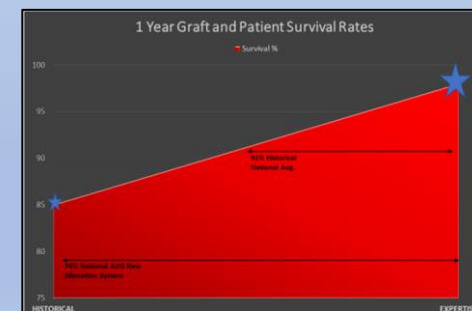
Present Day

- Current Expertise Team: July 1, 2019 to present.
- Active participants in transplant cases include:
 - 3 adult cardiac transplant surgeons
 - 4 transplant surgical APP's actively involved in procurement and implantation
 - 4 cardiac transplant anesthesiologists
 - 9 primary cardiac transplant CRNA's with a second CRNA in the room
 - 4 primary transplant perfusionists with a second perfusionist in the room
 - 4 cardiac transplant scrub nurses – 2 per case
 - 2 cardiac transplant circulating nurses – 1 per case



Impact of Expertise Model: New Era vs. Historical State

- Stable surgical transplant volumes
- Increased patient acuity with more patients going to OR on mechanical circulatory support from the ICU
- Post-transplant graft dysfunction with need for mechanical circulator support decreased by 90%
- Need for return to the OR for secondary procedure, excluding delayed chest closure decreased by 92%
- One year patient survival increased by 14%
- In an era, which includes the new organ allocation system, when programs easily saw a drop in one year survival, we feel that the above data supports the development of expertise teams for cardiac transplantation that extend beyond just that of the surgeon-component
- 6-month post transplant survival of all UNOS data following the new allocation system were shown to be 77.9% (vs. 93.4% historical value) (Estep et al., 2020)



CMC Advanced Heart Failure Surgical Timeline

