

UCLA Integrated Advanced Heart Failure Program Development 2011-2015: Integrative Vision and Five Year Experience

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on Behalf of the Integrated Advanced Heart Failure/Mechanical Circulatory Support/Heart Transplant
Program

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Summary

During the five years 2011-2015 with the charge to develop “an academic program in advanced heart failure emphasizing clinical investigation and providing leading-edge therapies for advanced heart failure”, the following outcomes resulted (key accomplishments):

- The Cardiomyopathy Center (Director Dr. Gregg Fonarow) annual outpatient referral volume grew from 253/year (2011) to 317/year (2015) (+23%) (**extrapolated annual volume in 2020: 420/year**).
- The adult mechanical circulatory support device annual volume grew from 26/year (2011) to 39/year (2015) (+50%) (**extrapolated annual volume in 2020: 64/year**).
- The adult heart transplant annual volume grew from 35/year (2011) to 48/year (2015) (+37%) (**extrapolated annual volume in 2020: 73/year**).

Within the vision of creating a UCLA value-based patient care delivery program, key foundations fostered during the five year contract as Director of the Advanced Heart Failure Program include

- Nurturing a multidisciplinary team culture of patient care.
- Empowering patients to make informed personal choices in a framework that integrates science, technology, and humanism.
- Integrate quality-of-life emphasizing options during the entire course of illness in the Advance Care Planning Initiative.
- Connecting primary care practitioners, cardiologists, hospitals, longterm facilities and the tertiary care centers in a care continuum.

In addition, we have been

- Enhancing NIH-funded translational research infrastructure linking outcome research and basic science research.
- Creating the foundations by integrating Medicine (South Campus) and Education/Humanities (North Campus) .

Testimony is available from team members listed in Appendix 1 representing the Advanced Heart Failure (**AdHF**)-**Team**, Appendix 2 representing the UCLA Advance Care Planning (**ACP**)-**Team**, Appendix 3 representing **UCLA Health and David-Geffen School of Medicine Leadership**, Appendix 4 representing **Regional Collaborative Network Leadership**, Appendix 5 representing **National/International Professional Network Leadership**, Appendix 6 representing **UCLA patients**.

Background

Heart failure affects roughly 6 million patients in the US and is the most common diagnosis for acute hospitalization in Medicare patients over 65. Over 670,000 patients are newly diagnosed each year, Heart failure contributes to over 250,000 deaths a year. It results in 2.4-3.5 million hospitalizations a year and in 12-15 million outpatient office visits a year, with total costs estimated at 39.2 billion dollars a year. With total health care costs in the US (2007) at 2.6 trillion dollars, heart failure accounts for about 1.7% of total health care costs in the US. Hospitalization for heart failure accounts for 50% of total heart failure-related health care costs in U.S., implying that better management of heart failure to reduce hospitalization rates will have a major economic impact. Therefore, heart failure represents a historic opportunity for academic medical centers to integrate treatment advances into a comprehensive patient-centered heart failure management program. It has long been proposed that heart failure management needs to be organized in an integrated multidisciplinary format (**Deng 1995**).

This report describes the guiding vision & principles of the UCLA Integrated Advanced Heart Failure Program development 2011-2015, practical implementation experiences, 5-year outcomes, and perspectives for the next 5-year period. It is based on core concepts of contemporary value-conscious US-health reform (**Berwick 2011**), the changing role of academic medical centers (**Washington 2013**), and the foundations of humanism in modern medicine (**Raia/Deng 2014**).

History

In 1956 UCLA surgeons performed the first open-heart surgery in the western United States. In 1984, UCLA's Heart Transplant Program (now one of the largest in the world) was founded. In 1992, Dr. Hillel Laks pioneered the country's first Alternative Heart Transplant Program. He was also the first U.S. cardiac surgeon to perform bypass surgery on a donor heart prior to transplantation. During this time, Dr. Lynne Warner-Stevenson established critical algorithms for assessing the benefit of heart transplantation over continued medical management in advanced heart failure patient. In 1995, Dr. Jon Kobashigawa published a landmark study in the New England Journal of Medicine demonstrating an immuno-modulatory property of statins resulting in survival benefit in heart transplant recipients. In 2001, UCLA surgeons implanted the Abioco total artificial heart. The Ahmanson-UCLA Cardiomyopathy Center's Dr. Gregg Fonarow spearheaded the evidence-based "Get with the guidelines" initiative in heart failure. Over the years, the U.S. Department of Health and Human Resources recognized UCLA's heart transplant program as one of the nation's best. In 2011 Dr. Mario Deng implemented as UCLA protocol the first in history FDA-cleared genomic leukocyte test for non-invasive heart transplant rejection monitoring (**Deng 2006**). In 2015 UCLA's Dr. Abbas Ardehali led a multi-center phase 2 clinical study of an experimental organ-preservation system that allows donor hearts to continue functioning in a near-physiologic, "beating" state outside the body during transport (**Ardehali 2015**).

Integrated Value-Based Patient Care Delivery Vision

As part of a restructuring process of faculty practice towards an integrated UCLA Health system, per January 1, 2010, after the UCLA heart transplantation private practice group led by Dr. Jon Kobashigawa had transitioned to the neighboring Cedars-Sinai Medical Center, and after a search period of 12 months, UCLA had identified, with highest expectations as a world class healthcare system (2015 US-News & World Report #3, Best in the West since >25 years), the author as new UCLA Advanced Heart Failure (AdHF) Program leadership. Immersed into the UCLA Health System-wide vision to heal humankind by improving health, alleviating suffering and delivering acts of kindness, one patient at a time, the aim was to develop a comprehensive world class advanced heart failure care model in synchrony with this vision and the 2020 goal of the UCLA Academic Medical Center spearheaded by Dr. Alan Fogelman to develop an integrated health system, offering every service from primary to quaternary services to a population of 2-4 mill.

Based on this vision and the UCLA 2020 longterm strategic plan, we formulated the overarching goals for the 5-year plan 2011-2015 to:

1. Empower patients to make informed personal choices
2. Connect primary care practitioners, cardiologists, hospitals, longterm facilities and the tertiary care centers in a care continuum
3. Provide world class heart transplantation medicine
4. Expand state-of-the art lifetime assist heart pump therapy

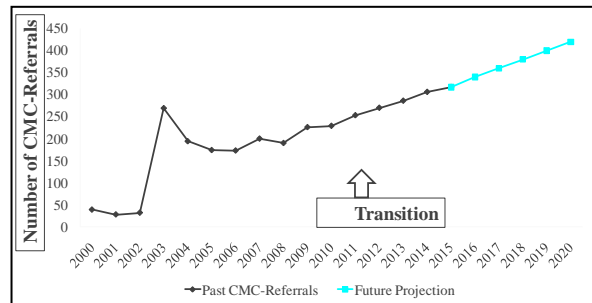
5. Integrate quality-of-life emphasizing options during the entire course of illness
6. Unites all of the region's providers to create an accountable health system
7. Act as a multidisciplinary team, specifically empowering the non-physician professionals incl. nurses, coordinators, social workers, pharmacologists, physical therapists, nutritionists, to just name some of the very important groups
8. Create a powerful translational research infrastructure linking outcome research and basic science research
9. Teach our young health profession students in Medical School and Nursing School a successful professional practice paradigm
10. Advance a concept of medicine that integrates science, technology, and humanism in one framework.

Patient Care Outcomes 2011-2015

From day 1 (April 1, 2011), the vision was presented to all team members. Feedback from all stakeholders was continuously incorporated. Consensually with the team members, stepwise implementation decisions consistent with the vision framework were made.

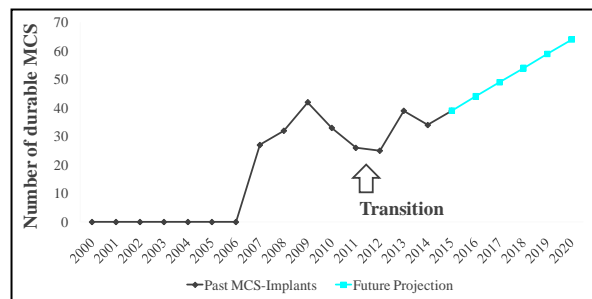
Cardiomyopathy The Cardiomyopathy Center annual outpatient referral volume grew from 253/year (2011) to 317/year (2015) (+23%) (Anticipated annual volume in 2020: 420/year) (Figure 1).

In 2012, an AdHF-office was opened in UCLA-Santa Monica. After the UCLA-VA-West Los Angeles merger, in 2015 an AdHF-office was jointly opened with the West-Los Angeles VA team to help build the infrastructure of a regional VA-AdHF-referral center allowing to serve the tristate VA-population with post heart transplantation care and destination MCS care.



Mechanical Circulatory Support The adult mechanical circulatory support device annual volume grew from 26/year (2011) to 39/year (2015) (+50%) (Anticipated annual volume in 2020: 64/year) (Figure 2).

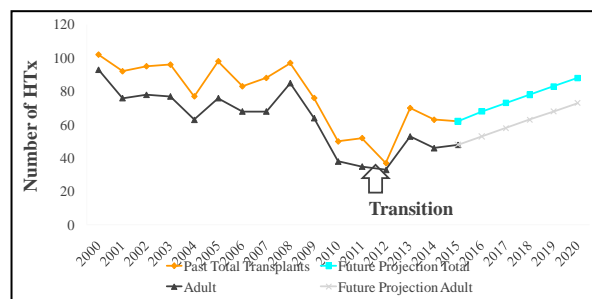
In 2013, the Total Artificial Heart Program was initiated at UCLA. In 2015, the world's first successful bridge to heart transplantation with the new small 50cc Total Artificial Heart was reported at UCLA (



<http://news.yahoo.com/one-size-fits-few-artificial-hearts-leave-many-180026893.html>).

On January 2, 2016, UCLA performed its first Heartware HVAD biventricular support as bridge to transplantation.

Adult Heart Transplantation The adult heart transplant annual volume grew from 35/year (2011) (Total combined adult and pediatric heart transplant volume 2011: 52, Total combined adult and pediatric heart transplant volume 2012: 37, Total combined adult and pediatric heart transplant volume 2013: 70, Total combined adult and pediatric heart transplant volume 2014: 63) to 48/year (2015) (+37%) (Total combined adult and pediatric heart transplant volume 2015: 62) (Anticipated annual volume in 2020: 73/year) (Total combined adult and pediatric heart transplant volume 2020: 88) (Figure 3).



The Scientific Registry for Transplant Recipients (SRTR) Report (most recently October 31, 2015), attests a Mortality Hazard Ratio for the UCLA Adult Heart Transplant that compares favorably to the US national outcomes 1-month post transplantation and 1-year post transplantation (Figures 4 and 5).

Value-Based Patient Care Initiatives 2011-2015
Advance Care Planning Initiative & Protocols

The AdHF-group has implemented *Advance Care Planning protocols* for our AdHF-patients and families. The overarching principle is that Advance Care Planning is a natural part of patient engagement in medical care, but just as patient engagement in decision making and care participation must be elicited, so too must advance care planning.

Outreach and Development/Regional Referral Trust-Building

Between 2011-2015, more than 20 outreach trust-building and shared-care sites were initiated/built by our team. One example is team of *HealthCare Partners Arcadia* 5/24/13, who decided to refer advanced heart failure patients to UCLA because of the integrated program concept. We have developed with this site a shared-care model for advanced heart failure patients, specifically after destination MCS-implantation. Another example is the fostering of the relationship between *KP SoCal* Transplant Services and Cardiology and UCLA Advanced Heart Failure Program. A third prominent example is the first destination MCS-implantation in a patient with a *shared-care model in Las Vegas* on 8/13/13.

Mechanical Circulatory Support-Consortium Southern California: With a focus on creating value-conscious offerings (Berwick 2011, Washington 2013), the AdHF group has initiated a Mechanical Circulatory Support-Consortium Southern California with the other regional Mechanical Support centers to create a shared-care infrastructure with regional cardiologists for the care of AdHF patients requiring lifetime mechanical support therapy. Consortium meeting dates were organized every 3-6 months.

Education/Training Initiatives 2011-2015

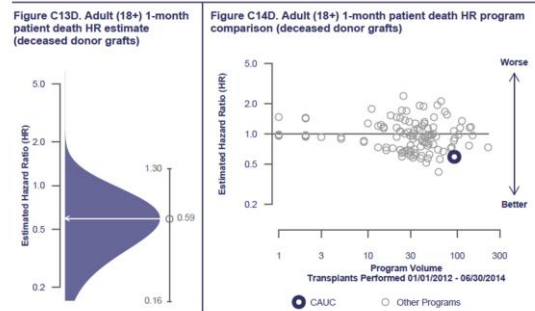
Annual UCLA Advanced Heart Failure Symposia On May 5, 2012, May 18 2013, May 17 2014, and May 23 2015, four annual symposia with 150-200 attendants bringing together cardiologists, internists, nursing and multidisciplinary team members as well as patients and families with excellent evaluations took place in the Hyatt Regency Century City.

Advanced Heart Failure Lecture Series Since 2014, we have implemented a regular AdHF lecture series with internal and external speakers. This series is well-received and is attended by the advanced heart failure team members but also by general cardiology fellows and members of the CCU/CTICU teams.

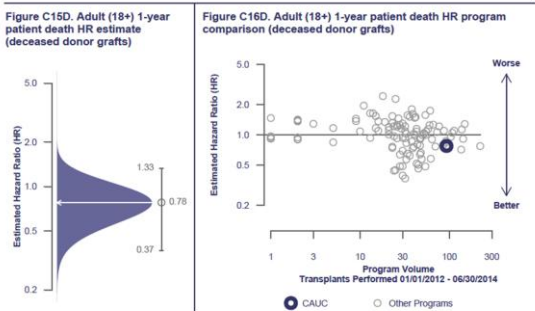
ACGME/ABIM-Milestones Project Since 2015, we have been video-recording (PI Professor Federica Raia) Endomyocardial Biopsy sessions which are essential part of the AdHF-fellow training program.

Translational Research Initiatives 2011-2015

Multidimensional Molecular Biomarkers In Advanced Heart Failure In close collaboration with Dr. Elaine Reed (UCLA Center for Immunogenetics) and Dr. PeiPei Ping (UCLA NHLBI Cardiovascular Proteomics Center), the project received NIH R21-funding. We hypothesize that Multidimensional Molecular Biomarkers (MMB), grounded in deep phenotyping of the Heart Failure-trajectory and



The data reported here were prepared by the Scientific Registry of Transplant Recipients (SRTR) under contract with the Health Resources and Services Administration (HRSA). Page: 21



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innovative computational modeling, improve prediction of outcomes at the time of evaluation for Optimal Medical Management, Mechanical Circulatory Support, Heart Transplantation, or Palliative Care in patients with AdHF (**Bondar 2014, Wisniewski 2015**).

Non-invasive Heart Transplant Rejection Monitoring: The gene expression profiling test (AlloMap), co-developed by our lab and clinically implemented US-wide offers a new rejection surveillance paradigm: the main clinical objective in the surveillance monitoring of stable heart-transplant recipients is the detection of the “presence of quiescence” (**Deng 2006**). The AlloMap test has been optimized in its clinical performance to display a high negative predictive value. Longitudinal test score stability allows to identify heart transplant patients at low risk for clinical events and reduction of immunosuppression (**Deng 2014**).

Encounter Research Initiative The AdHF-teams encounter research initiative as key element of the Relational Medicine Project examines the practice of modern medicine under the leadership of Professor Federica Raia Ph.D. (primary appointment GSEIS, secondary appointment DGSOM). The Relational Medicine Project hypothesizes that A) the higher the level of technological advances used in medical practice, the more relevant the value of human relations becomes, B) the imperative to care for this patient, this person, replaces the concept of mere compliance, i.e. unilateral adherence to a prescribed therapeutic plan and that C) if the relationship and communication between healthcare providers and patients could be improved, the reduction in medical errors and the subsequent human and monetary benefits could be staggering, 2) patient preferences would be taken more seriously and satisfaction with health care providers could be greatly enhanced, 3) higher quality care would be delivered to the entire patient population, and 4) cost-effectiveness would be enhanced (**www.relationalmedicinefoundation.org**). In this framework, the requirement for the doctor-patient relationship is not only to focus on taking care of the diseased organ system but on taking care of the whole patient with the diseased organ system condition, allowing the person to own her/his decision and thereby integrating personhood and body into a novel identity (see www.amazon.com: **Raia/Deng.Relational Medicine. Imperial College Press/WSPC 2014**).

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