Data Access Request Form

Please fax the completed form to 205.975.0085 or email it to Jennifer Gunther at jgunther@uab.edu

Requestor: __Kathleen L Grady, PhD, APN______________ Date requested: _3_/ _11_/ _2013_

Email: __________________ Other: __________________

Phone: __________________ Other: __________________

Institution or organization: __Northwestern University____________________________________

Current Conflict of Interest disclosure form:  [ ] included  [X ] on file at DCC

Relationship to INTERMACS:

[ ] Operations Committee member  [ ] Clinical site Local PI
[ ] Steering Committee member  [ ] Clinical site - other:
[ ] Subcommittee member  [ ] Outside investigator
[ ] Manufacturer representative company  [X ] Subcommittee Chair (QOL Committee) _____________

Type of request:
[ ] Raw data  [ ] INTERMACS Internal Report
[X ] Scientific study and/or analysis  [ ] INTERMACS slides for a presentation

Purpose of Request: (Check all that apply)

[ ] Abstract ISHLT _____________ 4_/ _9-12_/ _2014
[X ] Presentation ISHLT _____________ 4_/ _9-12_/ _2014
[X ] Publication JHLT _____________ _____/_____/
[ ] Internal Use _____________ _____/_____/
[ ] Other _____________ _____/_____/

Details of request: (A paragraph addressing the following is appropriate. May add up to 2 pages.)

- Specific Aims
- Analytic methods
- Background and significance
- Anticipated findings
- Study Design and Methods

Confidentiality Agreement:
I agree to only use the analyses and/or data that I receive based on this request for the purposes explicitly stated in this request. I also agree not to disclose, print, copy or distribute the analyses or data without appropriate permission.

_________________________ _________________ 3/11/13 ____________
Signature Date

DCC use only:

[ ] Conflict of Interest disclosure form on file or included?  [ ] Yes  [ ] No
[ ] Forwarded to DAAP Subcommittee - Date _____/_____/
[ ] Received back from DAAP Subcommittee - Date _____/_____/
[ ] OC reviewed - Date _____/_____/
[ ] Revisions requested  [ ] Approved  [ ] Disapproved
[ ] Project completed - Date _____/_____/

1
INTRODUCTION

DT MCS is being performed more frequently in older adults

In 2011, 38% (620/1620) of all MCS implants were DT, as reported to the Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS).¹ Importantly, more continuous flow DT MCS devices have been implanted in older patients than younger patients from 2006-2011 (<60 years: n=352, 60-69 years: n=416, and 70+ years: n=392).¹

Knowledge of HRQOL outcomes in older adults who undergo DT MCS is insufficient

The literature demonstrates improvement in health-related quality of life (HRQOL) outcomes from before to mid-term after mechanical circulatory support (MCS),²⁻⁵ including destination therapy (DT) MCS.⁴,⁶,⁷ However, there are important gaps in the MCS HRQOL literature regarding older age. We are not aware of any studies comparing HRQOL of older DT MCS patients with younger DT MCS patients. However, in a previous INTERMACS report, we demonstrated that older age is related to better HRQOL 6 months after continuous flow MCS.⁸ Furthermore, in a study of differences in HRQOL by age after heart transplantation, we reported that older transplant recipients were more satisfied with HRQOL and social support, had less transplant-related stress, negative affect, depression, better overall functioning, and less use of negative coping strategies than younger and middle-aged HT patients.⁹

Also, almost all of the DT MCS literature, using second generation continuous flow pumps, reported improvement in overall HRQOL,⁴⁻⁷ without discussion of HRQOL domains. Only Kirklin et al⁷ described improvement in HRQOL domains (e.g., mobility, self-care, usual activities, anxiety / depression, and pain / discomfort) from before to 1 year after DT implant. Thus, we have a limited understanding of change in domains of HRQOL from before to after DT MCS, in addition to limited data in older patients.

SPECIFIC AIMS

Primary Aim:

1. To determine whether older (> 70 years) advanced heart failure patients who undergo DT MCS, as compared to less old (60 – 69 years) and young/middle-aged (< 60 years) patients who undergo DT MCS, experience better self-reported overall HRQOL and HRQOL by domains from baseline through 2 years after surgery.

Hypothesis: Older advanced heart failure patients who undergo DT MCS will experience similar overall HRQOL to less old patients, but better overall HRQOL than young/middle-aged patients who undergo DT MCS through 2 years after surgery. Improvement in HRQOL domains will differ among the age groups, from baseline through 2 years after surgery.

Secondary Aim:

2. To identify factors related to overall HRQOL in older, less old, and young/middle-aged DT MCS patients at 1 year after surgery.

Hypothesis: Factors related to overall HRQOL after DT MCS will be generally similar among the three age groups and include pre-operative factors (e.g., demographic characteristics and co-morbidities) and post-operatives factors (e.g., adverse events).

STUDY DESIGN AND METHODS

Design

The proposed INTERMACS study will use a retrospective, longitudinal, comparative study design.

Sample

The source of data for this proposed study will be INTERMACS.

Inclusion criteria are: (1.) Advanced heart failure patients who are enrolled in INTERMACS with pre implant and post implant HRQOL data; (2.) Who have received a primary continuous flow left ventricular assist device
(LVAD) implant as DT between June 23, 2006 and March 31, 2011; and (3.) who are ≥ 19 years. **Exclusion criteria** are: (1.) Circulatory support with an isolated right (R)VAD, BiVAD, or total artificial heart and (2) patients from hospitals that did not collect post implant HRQOL data.

The follow-up date for this study will be March 31, 2013, allowing the opportunity for each patient to have 2 years of follow-up.

**HRQOL Instrument / Demographic / Clinical Data Sources**
The *EQ-5D-3L*[^1] will be used as the source of HRQOL data for this proposed INTERMACS study. This 6-item health status survey measures five dimensions of health (mobility, self-care, usual activities, pain / discomfort, and anxiety / depression) and overall perception of health. Each dimension has three levels of response (no problems, some/moderate problems, and extreme problems). Percent of respondents at each level of response can be determined for each dimension. A single item for rating current perception of health uses a vertical graduated (0-100) 20cm visual analog scale (VAS). Mean scores can be calculated for the VAS. Construct validity has been demonstrated for the *EQ-5D-3L* dimensions and total score[^1]. Demographic and clinical data will be collected from INTERMACS (see table 1).

**Analytic Methods**
Data will be analyzed by the INTERMACS DCC using SAS, version 9.1 (Carey, NC). Descriptive analyses will be conducted for all three age groups (including demographic and clinical variables [pre and post implant]), followed by comparisons among groups. The *EQ-5D-3L* VAS score will be reported as a mean ± standard deviation, and dimension scores will be reported as frequencies.

Data for the five dimensions will be clustered into two groups: (group 1) physical function / activities of daily living (which includes mobility, self-care, and usual activities) and (group 2) pain / emotions (which includes pain / discomfort and anxiety / depression). This grouping will be used as a response level of “Extreme problems” will be assigned to patients who are too sick to respond (as reported by the patient or research coordinator) for the physical function / activities of daily living group. This response level will be assigned prospectively to reduce the potential for overestimation of HRQOL in patients who are most severely ill. No assignment of responses will be made for the too sick patients for the pain / emotions group, as being too sick does not necessarily indicate extreme problems regarding pain or negative emotions. A VAS rating of 0 will be assigned to patients who also are too sick to respond.

**Primary Aim**
Statistical analyses will include chi square to compare proportions and t-tests to compare means among the three age groups, using all available data for each time period. Analyses for dimensions will be dichotomized (no problems vs. moderate or extreme problems). Paired t-tests will be used to test the robustness of our analyses for a subset of patients in each of the three age groups who complete pre and 24 month post implant HRQOL data. Level of significance will be $p \leq 0.05$ for longitudinal comparisons among groups across time.

**Secondary Aim**
Multiple regression analysis is proposed for the secondary aim with independent variables being entered in the following order (demographic, pre-operative, and post-operative). Separate regression analyses will be performed for each of the three age groups.

**Anticipated Findings**
We anticipate that older advanced heart failure patients who undergo DT MCS will experience similar overall HRQOL to less old patients, but better overall HRQOL than young/middle-aged patients who undergo DT MCS. Improvement in HRQOL domains will differ among the age groups, from baseline through 2 years after surgery. Specifically, we believe that middle aged/younger DT MCS patients will have more problems with pain/discomfort, anxiety/depression, self-care, and usual activities than the older and less old age groups. Factors that will be related to HRQOL will be generally similar among the three age groups.
REFERENCES


<table>
<thead>
<tr>
<th>DEMOGRAPHIC VARIABLES</th>
<th>PREOPERATIVE VARIABLES</th>
<th>POSTOPERATIVE VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (at time of implant)</td>
<td>Current Device Strategy</td>
<td>Discharge Location for implant hospitalization</td>
</tr>
<tr>
<td>Gender</td>
<td>Destination Therapy</td>
<td>Home</td>
</tr>
<tr>
<td>Race (white v nonwhite)</td>
<td>Cardiac Diagnosis Primary</td>
<td>Nursing Home/Assisted Care</td>
</tr>
<tr>
<td>Marital status (married v not married)</td>
<td>Previous Cardiac Operation</td>
<td>Hospice</td>
</tr>
<tr>
<td>Educational level (at time of implant)</td>
<td>Current ICD Device in Place (yes/no)</td>
<td>Another Hospital</td>
</tr>
<tr>
<td></td>
<td>IV Inotrope Therapy at Implant? (yes/no)</td>
<td>Rehabilitation Facility</td>
</tr>
<tr>
<td></td>
<td>Additional Support Interventions</td>
<td>Number of Days in ICU/CCU</td>
</tr>
<tr>
<td></td>
<td>Concerns/Contraindication</td>
<td>Adverse events</td>
</tr>
<tr>
<td></td>
<td>Advanced age</td>
<td>Cardiac Arrhythmia</td>
</tr>
<tr>
<td></td>
<td>Frailty</td>
<td>Major Bleeding</td>
</tr>
<tr>
<td></td>
<td>Severe Diabetes</td>
<td>Wound Dehiscence</td>
</tr>
<tr>
<td></td>
<td>Pulmonary disease</td>
<td>Hepatic Dysfunction</td>
</tr>
<tr>
<td></td>
<td>Pulmonary hypertension</td>
<td>Hypertension</td>
</tr>
<tr>
<td></td>
<td>Frequent ICD shocks</td>
<td>Major Infection</td>
</tr>
<tr>
<td></td>
<td>Large BMI</td>
<td>Pericardial Fluid Collection</td>
</tr>
<tr>
<td></td>
<td>Major stroke</td>
<td>Respiratory Failure</td>
</tr>
<tr>
<td></td>
<td>Peripheral vascular disease</td>
<td>Hemolysis</td>
</tr>
<tr>
<td></td>
<td>History of solid organ cancer</td>
<td>Arterial Non-CNS Thromboembolism</td>
</tr>
<tr>
<td></td>
<td>All psychosocial issues</td>
<td>Device Malfunction</td>
</tr>
<tr>
<td></td>
<td>Major infections</td>
<td>Myocardial Infarction</td>
</tr>
<tr>
<td></td>
<td>RVEF Severe dysfunction? (yes no)</td>
<td>Neurological Dysfunction</td>
</tr>
<tr>
<td></td>
<td>NYHA Class</td>
<td>Psychiatric Episode</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>Renal Dysfunction</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td></td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Right Heart Failure</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>Venous Thromboembolic Event</td>
</tr>
<tr>
<td></td>
<td>6 Minute Walk Test</td>
<td>Number of readmissions</td>
</tr>
<tr>
<td></td>
<td>V02 Max</td>
<td>Six minute walk test</td>
</tr>
<tr>
<td></td>
<td>Short term support (Yes/no) (e.g., IABP, ECMO)</td>
<td>NYHA</td>
</tr>
<tr>
<td></td>
<td>Dialysis at time of Implant? (Yes/no)</td>
<td>LVEF</td>
</tr>
<tr>
<td></td>
<td>Ventilator at time of Implant? (Yes/no)</td>
<td>EQ-5D-3L data (3, 6, 12, 18, 24 mos)</td>
</tr>
<tr>
<td></td>
<td>EQ-5D-3L data</td>
<td></td>
</tr>
</tbody>
</table>