This reimbursement information is intended to provide the health care professional with information related to billing, coding and reimbursement requirements that may apply to Thoratec products. It is being provided for general informational and educational purposes only, and is not intended, and does not constitute, reimbursement or legal advice. Use of codes identified here does not guarantee coverage or payment at any specific level and is not intended to increase or maximize payment by any payer. Laws, regulations and coverage policies are complex and updated frequently. In addition, reimbursement policies vary widely from insurer to insurer and will reflect different patient conditions. You should check the current law and regulations and insurer’s policies to confirm the most current coverage, coding or billing requirements. Any questions should be directed to your attorneys or reimbursement specialist. The health care professional is responsible for all aspects of reimbursement, including using codes that accurately reflect the patient’s condition, procedures performed, and products used and ensuring the veracity of all claims submitted to third party payers.
Disclosures

- Consultant: Thoratec, HeartWare, SynCardia, St Jude

- Surgical Preceptor: HeartWare, SynCardia
UWMC VAD-Program Payor Mix

Percent

35 Medicaid
10 Other
13 Commercial
42 Medicare
Our Core MCS Team

- 3 Primary Surgeons
- 6 HF Cardiologists
- 5 ARNPs
- 6 VAD RNs
- 1 Admin Asst
- 1 Data Coordinator
- 1 Nurse Manager
Objectives

• Responsibly represent Professional Fees
• Understand how Facility Fees can be optimized
• Acknowledge the unmeasured Halo Effect of an MCS Program
• Clarify the role of Research
• Consider program metrics other than volume
What is *YOUR* Currency?
Paycheck...
Health of the System
Research and Publications
Program Metrics
Professional Fees
Professional Fees

• Although relatively small compared to facility fees, do NOT ignore these!

• There is no 90-day Global

• May be able to substantially support physician salaries

• Many opportunities…
VAD Interrogation

INTERROGATION
Different subject; different techniques

Nahush A. Mokadam MD, FACC, FACS–Presented at the Economic Summit on VADs on October 1, 2015
VAD Interrogation

• New CPT in 2010 (93750)
• Review of VAD settings, function and performance over last interval
• Requires an assessment (stable, dysfunctional, etc)
• Inpatient or outpatient
• 0.92 wRVU
Shared-Care

- E&M service delivered by an ACP and *shared* with a physician provider in a facilities-based area
- Physician must *ADD* something to the care (can’t just co-sign)
- Both providers must document their role
- Brings reimbursement up to 100%, and bills to physician provider
### Total wRVUs
First 90 Days

<table>
<thead>
<tr>
<th>HF Cardiologist</th>
<th>Cardiac Surgeon</th>
<th>Intensivist</th>
<th>Critical Care</th>
<th>ACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>62.5</td>
<td>93.32</td>
<td>11.68</td>
<td>6.75</td>
<td>8.23</td>
</tr>
<tr>
<td>x10</td>
<td>625</td>
<td>933.2</td>
<td>116.8</td>
<td>67.5</td>
</tr>
<tr>
<td>x20</td>
<td>1250</td>
<td>1866.4</td>
<td>233.6</td>
<td>135</td>
</tr>
<tr>
<td>x40</td>
<td>2500</td>
<td>3732.8</td>
<td>467.2</td>
<td>270</td>
</tr>
<tr>
<td>x80</td>
<td>5000</td>
<td>7465.6</td>
<td>934.4</td>
<td>540</td>
</tr>
</tbody>
</table>

Nahush A. Mokadam MD, FACC, FACS– Presented at the Economic Summit on VADs on October 1, 2015
Readmissions

• Estimated 70% of patients require readmission within 1 year

• 1.64 admissions PPY

J Am Coll Cardiol 2013;61:153-63
# Readmissions

<table>
<thead>
<tr>
<th></th>
<th>5 days/wk</th>
<th>50 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsq Hosp Visit,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lv 3</td>
<td>14.6</td>
<td>73</td>
</tr>
<tr>
<td>VAD Interrogation</td>
<td>29.2</td>
<td>146</td>
</tr>
<tr>
<td></td>
<td>58.4</td>
<td>292</td>
</tr>
</tbody>
</table>

Nahush A. Mokadam MD, FACC, FACS– Presented at the Economic Summit on VADs on October 1, 2015
## Developing Program
10 Implants, 5 Inpatients

<table>
<thead>
<tr>
<th></th>
<th>HF Cardiologist</th>
<th>Cardiac Surgeon</th>
<th>Intensivist</th>
<th>Critical Care</th>
<th>ACP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Implants</strong></td>
<td>625</td>
<td>933.2</td>
<td>116.8</td>
<td>67.5</td>
<td>82.28</td>
</tr>
<tr>
<td><strong>Inpatients</strong></td>
<td>3650</td>
<td>3650</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4275</td>
<td>4583.2</td>
<td>116.8</td>
<td>67.5</td>
<td>82.28</td>
</tr>
</tbody>
</table>

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Established Program

40 Implants, 10 Inpatients

<table>
<thead>
<tr>
<th></th>
<th>HF Cardiologist</th>
<th>Cardiac Surgeon</th>
<th>Intensivist</th>
<th>Critical Care</th>
<th>ACP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Implants</strong></td>
<td>2500</td>
<td>3732.8</td>
<td>467.2</td>
<td>270</td>
<td>329.12</td>
</tr>
<tr>
<td><strong>Inpatients</strong></td>
<td>7300</td>
<td>7300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9800</td>
<td>11032.8</td>
<td>467.2</td>
<td>270</td>
<td>329.12</td>
</tr>
</tbody>
</table>

Nahush A. Mokadam MD, FACC, FACS– Presented at the Economic Summit on VADs on October 1, 2015
# Large Program

80 Implants, 20 Inpatients

<table>
<thead>
<tr>
<th>HF Cardiologist</th>
<th>Cardiac Surgeon</th>
<th>Intensivist</th>
<th>Critical Care</th>
<th>ACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implants</td>
<td>5000</td>
<td>7465.6</td>
<td>934.4</td>
<td>540</td>
</tr>
<tr>
<td>Inpatients</td>
<td>14600</td>
<td>14600</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19600</strong></td>
<td><strong>22065.6</strong></td>
<td><strong>934.4</strong></td>
<td><strong>540</strong></td>
</tr>
</tbody>
</table>

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Know Thyself

- $65-$85 per wRVU
Really Do the Math

• Developing Program: ~10,000 wRVUs - $750,000

• Established Program: ~20,000 wRVUs - $1,500,000

• Large Program: ~44,000 wRVUs - $3,300,000
Remember...

- No account for outpatient visits beyond 90 days, or any other studies/procedures performed
- No account for any hospital based reimbursement for implant, readmission, or accessories
- No account for any non-VAD patient related care
Facility Fees
Facility Fees

• Based upon MS-DRG system
• Biggest contributor to financial viability or insolvency of an MCS program
• Build processes to ensure appropriate and responsible patient severity capture
MS-DRG 1

- Heart Transplant or Implant of Heart Assist System with Major Complications or Comorbidities (MCC)
  - 89% of intracorporeal VAD implants
  - All extracorporeal BiVADs
  - Multiplier of 25.3920 over Medicare Base Payment

$9,000 \times 25.3920 = \$228,528
MS-DRG 2

- Heart Transplant or Implant of Heart Assist System without Major Complications or Comorbidities (MCC)
  - 11% of intracorporeal VAD implants
  - Multiplier of 15.6820 over Medicare Base Payment

$9,000 \times 15.6820 = \$141,138
• Other Heart Assist Implant
  – All extracorporeal single ventricle VADs
  – Also includes percutaneous VADs
  – Multiplier of 15.4348 over Medicare Base Payment

$9,000 \times 15.4348 = $138,913
MS-DRG 3

• ECMO (or Tracheostomy with Mechanical Ventilation 96 hours+)
  – Includes both VV and VA ECMO
  – Multiplier of 17.6399 over Medicare Base Payment

$9,000 \times 17.6399 = $158,759

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Major Complications or Comorbidities

<table>
<thead>
<tr>
<th>Major Complications/Comorbid Conditions (MCC)</th>
<th>Complications/Comorbid Conditions</th>
<th>Complications/Comorbid Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular/Cerebrovascular</td>
<td>Gastrointestinal</td>
<td></td>
</tr>
<tr>
<td>• Congestive Heart Failure, Acute</td>
<td>• Acuteites</td>
<td></td>
</tr>
<tr>
<td>• Acute on Chronic</td>
<td>• Attention to Gastrostomy</td>
<td></td>
</tr>
<tr>
<td>• Systolic or Diastolic</td>
<td>• DC. Difficile Enteritis</td>
<td></td>
</tr>
<tr>
<td>• Cerebral Edema</td>
<td>• Cholelithiasis with Cholecystitis</td>
<td></td>
</tr>
<tr>
<td>• Coma</td>
<td>• Collitis, Enteritis or Gastroenteritis of Presumed Infectious Origin</td>
<td></td>
</tr>
<tr>
<td>• Endocarditis or Myocarditis, Acute</td>
<td>• Collitis, Ischemic or Ulcerative</td>
<td></td>
</tr>
<tr>
<td>• MI, Acute</td>
<td>• Colostomy or Enterostomy, Complications</td>
<td></td>
</tr>
<tr>
<td>• Pulmonary Embolism, Acute</td>
<td>• Crohn’s Disease</td>
<td></td>
</tr>
<tr>
<td>• Respiratory &amp; Infectious Disease</td>
<td>• Diverticulitis</td>
<td></td>
</tr>
<tr>
<td>• Aspiration Bronchitis, Aspiration Pneumonia</td>
<td>• Esophagitis, Acute</td>
<td></td>
</tr>
<tr>
<td>• CMV Disease</td>
<td>• Gastroenteritis, Toxic or due to Radiation</td>
<td></td>
</tr>
<tr>
<td>• Pneumonia, Including viral</td>
<td>• GI Bleed, Melena, Hematemesis, Hemoptysis</td>
<td></td>
</tr>
<tr>
<td>• Pulmonary Edema, Acute, Non-cardiogenic</td>
<td>• Hemia with Obstruction</td>
<td></td>
</tr>
<tr>
<td>• Respiratory Failure, Acute</td>
<td>• Pleuritits</td>
<td></td>
</tr>
<tr>
<td>• Respiratory Insufficiency</td>
<td>• Intestinal Infections, Viral or Bacterial</td>
<td></td>
</tr>
<tr>
<td>• Acute Post-Operative</td>
<td>• Intestinal Malabsorption</td>
<td></td>
</tr>
<tr>
<td>• Sepsis, Severe Sepsis, Septic Shock</td>
<td>• Jaundice</td>
<td></td>
</tr>
<tr>
<td>• Other MCCs</td>
<td>• Pancreatitis, Chronic</td>
<td></td>
</tr>
<tr>
<td>• Acute Renal Failure with</td>
<td>• Ulcer, Acute Gastric, Duodenal or Peptic</td>
<td></td>
</tr>
<tr>
<td>• Acute Tubular Necrosis (ATN)</td>
<td>• Nephrology &amp; Genitourinary</td>
<td></td>
</tr>
<tr>
<td>• Aplastic, Anemia due to</td>
<td>• Acute Renal Failure</td>
<td></td>
</tr>
<tr>
<td>• Drugs, Chemo, Infection, or Radiation</td>
<td>• Calcius of Urter or Kidney</td>
<td></td>
</tr>
<tr>
<td>• Diabetic Ketonacidosis or Diabetes with</td>
<td>• Chronic Kidney Disease, Stage IV or V</td>
<td></td>
</tr>
<tr>
<td>• Hyperosmolarity or Other Coma</td>
<td>• Hydromeleosis or Hydrouretner</td>
<td></td>
</tr>
<tr>
<td>• Encephalopathy</td>
<td>• Nephrotic Syndrome</td>
<td></td>
</tr>
<tr>
<td>• Metabolic or Toxic</td>
<td>• Polycystic Kidney</td>
<td></td>
</tr>
<tr>
<td>• Other or Unspecified</td>
<td>• Pyelonephritis, UTI</td>
<td></td>
</tr>
<tr>
<td>• End Stage Renal Disease</td>
<td>• Orthopedic &amp; Skin</td>
<td></td>
</tr>
<tr>
<td>• G1 Disorder With</td>
<td>• Cellulitis, EXCEPT Fingers or Toes</td>
<td></td>
</tr>
<tr>
<td>• Hemorrhage, Gastritis, Duodenitis or</td>
<td>• Compartment Syndrome, Non-Traumatic</td>
<td></td>
</tr>
<tr>
<td>• Other or Unspecified</td>
<td>• Complications of Prosthetic Joint</td>
<td></td>
</tr>
<tr>
<td>• G1 Ulcer With Perforation, Hemorrhage or</td>
<td>• Fractures, Pathologic</td>
<td></td>
</tr>
<tr>
<td>• Obstruction</td>
<td>• Fractures, Traumatic, Closed/Many Sites</td>
<td></td>
</tr>
<tr>
<td>• Ischemic Collitis, Acute</td>
<td>• Osteomyelitis, Acute, Chronic or Unspecified</td>
<td></td>
</tr>
<tr>
<td>• Major Injuries</td>
<td>• Stasis Ulcer, Inflamed or infected</td>
<td></td>
</tr>
<tr>
<td>• Malnutrition, Severe</td>
<td>• Ulcer of Skin, Lower Extremity</td>
<td></td>
</tr>
<tr>
<td>• Pancreatitis, Acute</td>
<td>• Respiratory</td>
<td></td>
</tr>
<tr>
<td>• Peritonitis</td>
<td>• Asthma Exacerbation</td>
<td></td>
</tr>
<tr>
<td>• Pressure Ulcer Stage III OR IV</td>
<td>• Atelectasis</td>
<td></td>
</tr>
<tr>
<td>• Quadriplegia or Functional Quadriplegia</td>
<td>• COPD with Acute Exacerbation</td>
<td></td>
</tr>
<tr>
<td>• SIRS due to Noninfectious Process with</td>
<td>• Empyema with Exacerbation of Chronic Bronchitis</td>
<td></td>
</tr>
<tr>
<td>• Acute Organ Dysfunction</td>
<td>• Hemoptysis</td>
<td></td>
</tr>
<tr>
<td>• Volvulus</td>
<td>• Pulmonary Edema, Non-Cardiogenic</td>
<td></td>
</tr>
<tr>
<td>• Other Shock without Trauma</td>
<td>• Respiratory Distress, Acute</td>
<td></td>
</tr>
<tr>
<td>• MCD IF Discharged Alive</td>
<td>• Respiratory Failure, Chronic</td>
<td></td>
</tr>
<tr>
<td>• Cardiac Arrest</td>
<td>• Respirator Weaning or Dependence</td>
<td></td>
</tr>
<tr>
<td>• Cardiogenic Shock</td>
<td>• Other</td>
<td></td>
</tr>
<tr>
<td>• Respiratory Arrest</td>
<td>• Bacteremia</td>
<td></td>
</tr>
<tr>
<td>• Ventricular Fibrillation</td>
<td>• Complications of Device, Implant or Graft</td>
<td></td>
</tr>
<tr>
<td>• Other Shock without Trauma</td>
<td>• SIRS due to Non-Infected Process</td>
<td></td>
</tr>
<tr>
<td>• TIA</td>
<td>• Thrush</td>
<td></td>
</tr>
<tr>
<td>• Vertebrobasilar Insufficiency</td>
<td>• Transplant Status, Most Organs</td>
<td></td>
</tr>
</tbody>
</table>

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Respiratory & Infectious Disease
- Aspiration Bronchitis, Aspiration Pneumonia
- HIV Disease
- Peritonitis
- Pneumonia, Including viral
- Pulmonary Edema, Acute, Non-cardiogenic
- Respiratory Failure, Acute
- Respiratory Insufficiency
  - Acute Post-Operative
- Sepsis, Severe Sepsis, Septic Shock

Other MCCs
- Acute Renal Failure with
  - Acute Tubular Necrosis (ATN)
- Aplastic, Anemia due to
  - Drugs, Chemo, Infection, or Radiation
- Diabetic Ketoacidosis or Diabetes with
  - Hyperosmolarity or Other Coma
- Encephalopathy
  - Metabolic or Toxic
  - Other or Unspecified
- End Stage Renal Disease
- GI Disorder With
  - Hemorrhage, Gastritis, Duodenitis Or Diverticular Disease
- GI Ulcer With Perforation, Hemorrhage or Obstruction
- Ischemic Colitis, Acute
- Major Injuries
- Malnutrition, Severe
- Pancreatitis, Acute
- Peritonitis
- Pressure Ulcer Stage III OR IV
- Quadriplegia or Functional Quadriplegia
- SIRS due to Noninfectious Process with
  - Acute Organ Dysfunction
- Volvulus

MCC IF Discharged Alive
- Cardiac Arrest
- Cardiogenic Shock
- Respiratory Arrest
- Ventricular Fibrillation
- Other Shock without Trauma
document everything.
Mr. X is 66 year old male with NICM and s/p placement of LVAD on 4/14. Past medical history also includes lap band placement and MS. Nutrition notes on 5/31 states that the pt meets criteria for severe protein calorie malnutrition. He meets criteria due to loss of muscle mass and poor po intake (>= 1 month with <= 75% EER intake. (EER=Estimated energy requirements). RD also notes “consistently <50% PO intake during previous hospitalizations. Volume overload likely masking additional underlying wt loss”. Treatment includes general diet with no restrictions and RD to continue to follow up.
Based on your response, I will update the problem list and prepare the clarification note for your review and electronic signature. It will appear for signature in your ORCA message inbox. Please continue to document your clinical opinion and the definitive and/or presumptive diagnosis related to the above clinical findings in the progress notes and discharge summary. Please include clinical findings supporting your diagnosis.
In your clinical opinion, is this patient also being managed for:

( ) severe protein calorie malnutrition, present on admission

( ) OTHER diagnosis to explain clinical findings ________________________________

( ) Unable to determine (no explanation for clinical findings)

( ) Disagree
Mr. X is 66 year old male with NICM and s/p placement of LVAD on 4/14. Past medical history also includes lap band placement and MS. Nutrition notes on 5/31 states that the pt meets criteria for severe protein calorie malnutrition. He meets criteria due to loss of muscle mass and poor po intake (>= 1 month with <= 75% EER intake. (EER=Estimated energy requirements). RD also notes “consistently <50% PO intake during previous hospitalizations. Volume overload likely masking additional underlying wt loss”. Treatment includes general diet with no restrictions and RD to continue to follow up.

Mr. X is also being managed for severe protein calorie malnutrition, present on admission.
Halo Effect
Halo Effect

- Indirect increase in professional and facility services

- Increase in referral base
  - Inpatient
    - Stable and unstable transfers
  - Outpatient
    - “Our surgeons said no since they don’t have a VAD”
Diagnostics

- Echo (~$450)
- PFTs (~$100)
- CPETs (~$175)
- RHC (~$700)
Cardiovascular Procedures

- IABP
- BiV ICD
- VT Ablations
- PCI/ High risk PCI
- High risk cardiac surgery
Other Services

- Infectious Disease
- Gastroenterology
- Psychiatry / Psychology
- Palliative Care
- Pulmonary Medicine

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Intangibles

- New referral sources and relationships
- Feeder to transplant program
- Multidisciplinary collaboration
Measuring the Halo Effect

• You can’t measure directly

• You may get feedback (not all good)
  – Too many echos
  – Too many GI consults
  – Not enough cath labs
  – Not enough clinic capacity

• (This is actually good feedback...)
Research and Publications
Clinical Trials

- Access to newest technology
- Independent and “free” marketing
- Outreach opportunity
Clinical Trials

- REMATCH
- STICH
- HeartMate II
- ENDURANCE
- ENDURANCE-II
- Lateral
- MOMENTUM 3

- Stem Cell Trials
- Tricuspid Valve
- Computational Fluid Dynamics
- UNOS and INTERMACS Database analysis

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Academic Currency

• Necessary for Academic Promotion
• Not restricted to Academia – Non-University Based Programs also participate!
• Can enhance National/International Profile
• Opportunity to establish “Best Practices”
• Can lead to beneficial partnerships
Program Metrics and Quality Improvement
Pathway

- ICU LOS from 6 to 4 days (NS)
- Total LOS from 16 to 13.5 days (p=0.03)
- No change in readmission rate
- No change in any adverse events or mortality
- Cost Savings ~$10,000 per implant
Understand Your Metrics

- Joint Commission Measures
- INTERMACS Reports
- Financial Viability
- OR and ICU Utilization
- “Whatever needs fixing”
Conclusions
KNOWLEDGE IS POWER.
POWER CORRUPTS.
STUDY HARD.
BE EVIL.
Conclusions

• Professional fees can be considerable even in our current environment

• Facility fees represent the largest bucket; collaboration between administration and providers is essential

• The Halo Effect of an MCS Program may be larger than you realize; it is difficult to measure, and may manifest itself by complaints
Conclusions

• Research may include Clinical Trials, Papers and Presentations – all elevate the profile of your program

• Volume isn’t everything unless it is supported by quality

• Your program’s *Currency* is likely to be varied among your team members – pay attention to all of it!

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“It's not about money. It's about the people you have, how you're led, and how much you get it.”

*Steve Jobs*
4 May 2014 8:27 am
Thank you!