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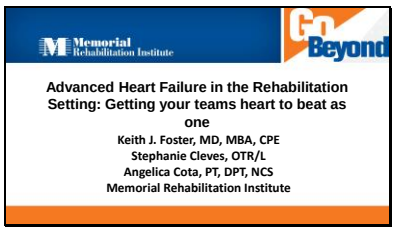

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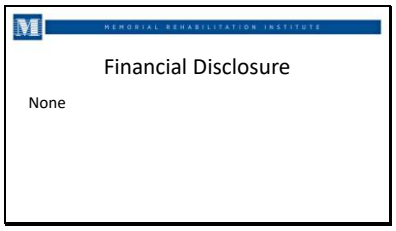

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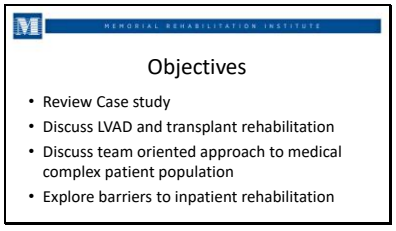

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MEMORIAL REHABILITATION INSTITUTE

Memorial Rehabilitation Institute

- 89 designated Inpatient Rehabilitation beds
- Inside an acute care hospital
- Over 2000 Rehab admissions a year
- Availability of acute care services 24/7ER, Radiology, Operative Room, Acute care
- All private rooms
- 18 Certified Rehab Nurses
- Open visiting hours, PFCC
- CARF accredited:
  - Comprehensive Rehab
  - Stroke Program
  - Brain Injury Program
  - Pediatrics
  - Cancer Rehabilitation

– 11 hospital employed physiatrists

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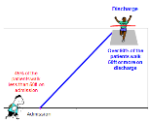
MEMORIAL REHABILITATION INSTITUTE

MEMORIAL REHAB OUTCOMES



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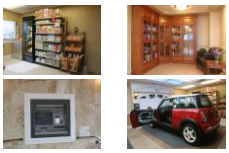
DETERMINATION DRIVE



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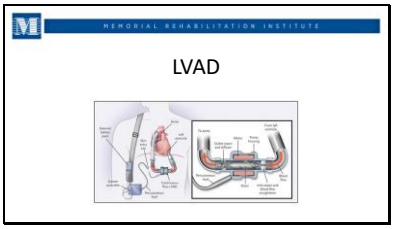

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MEMORIAL REHABILITATION INSTITUTE

LVAD

- Left ventricular assist device
  - Serves as destination or bridge therapy for advanced heart failure
    - Destination
      - Improve quality of life, not a candidate for transplant
    - Bridge
      - Allow patient to survive until transplant available

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MEMORIAL REHABILITATION INSTITUTE

Indications for LVAD

- most patients receiving durable LVADs have stage D and class IV heart failure
  - Typically already have difficulty completing ADL's, community ambulation

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Medically Complex Rehabilitation

- With the increase in procedures to improve quality of life for heart disease patients, comes an increasing need for rehabilitation services throughout the continuum of care
- LVAD and transplant patients create a unique challenge for rehabilitation professionals as they are at higher risk for multiple complications including
  - rejection of transplanted organs
  - increased rate of infections
  - depression and anxiety
  - as well as embolic events and require significant coordination of care and services
  - Return to the acute care hospital
- As rehabilitation professionals we are the ideal medical team to care for complex patients
  - Team oriented, patient focused quality of life approach

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Medically Complex Rehabilitation

- Rehabilitation care for medically complex patients
  - Creates challenges for the entire team
    - PT/OT/Speech, nursing, pharmacy, nutrition, psychology, social work, physician and consultant staff, Administrative burden
      - Decreased quality metrics
        - » RTACH, FIM gains, LOS issues

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MEMORIAL REHABILITATION INSTITUTE

Case Study

- 56 year old male presented to Memorial Regional Hospital with advanced heart failure requiring left ventricular assist device implantation and was discharged home
- Patient returned to the hospital 14 days later with right posterior putamen stroke and subsequently admitted to inpatient rehabilitation

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Medical and Nursing Challenges

- Things to address prior to acceptance (Physiatry consult or in person evaluation is preferred)
  - Disposition
    - Can patient care for LVAD? (ideally addressed prior to surgery however post operatively patient can significant deficits)
    - Code Status
  - Insurance authorization
    - Peer to peer will likely be needed for higher or lower level patients
    - Build on medical complexity in consult note/acute care notes to avoid SNF placement and RTACH
  - Managing LVAD team
    - Do you have the medical consultants available
      - Who will follow LVAD, cardiac needs
        - » Inside admission, outside admission
  - Nursing ratio/needs (medication knowledge, MAP management, wound care)
  - Education of staff

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Inpatient Role of the Occupational Therapist

- Increase independence with ADL's
- Train in safe and efficient functional mobility
- Energy conservation with self-care and home management tasks
- Edema management

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Occupational Therapy

Evaluate and Treat

Case Study

- Prior Level of Function (PLOF)
  - Independent with all ADL's and IADL's
- Current Level of Function s/p LVAD
  - Transfer FIM:
    - Toilet Transfer: Minimal assistance
    - Tub/Shower Transfer: Total assistance
  - ADL FIMs:
    - Grooming: Minimal assistance
    - Eating: Modified independence
    - Bathing: Moderate assistance
    - Upper body dressing: Minimal assistance
    - Lower body dressing: Maximal assistance

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Initial findings pertinent to the team

- ADL decline
- Decreased endurance and balance
- Poor safety
- Left upper extremity impairments
  - Decreased coordination
  - Impaired sensation
  - Bilateral hand integration

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Why does it matter?

- Difficulty with dressing
  - Managing buttons
  - Tying shoes
  - Opening containers
- Difficulty managing LVAD controllers and batteries
- Decreased participation in community re-entry and IADL's

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Team Approach: Nursing Communication

- MAP findings at time of evaluation
  - Medication
- Shower and ADL's
  - Sink side versus standing
  - Shower kit training
  - Wound care

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Initial LVAD Management

- Checking batteries for adequate charge
- Selecting battery harness for patient comfort
- Transitioning from power to batteries
- Discussion of alarms

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Showering an LVAD Patient

- Drive line stitches are in for 30 days
- Shower before going home
  - Goal is going home 2/3 weeks after implantation
- Shower bag must be present
- LVAD Driveline dressing change

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LVAD Driveline Dressing Change Instructions

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LVAD Driveline Dressing Change Instructions

- Dressing: change once a day
- PPE: cap, gown, mask, sterile gloves (2 pairs)

1. Patient wears cap, mask
2. Hold drive line to remove old dressing
3. Clean with CHG
4. Let dry 30 seconds
5. Apply dry sponge
6. Medipore tape

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Inpatient Role of the Physical Therapist

- Increase independence with functional mobility
  - Assistive device training
  - Maximize energy efficiency
- Determine appropriate components of exercise:
  - Intensity, duration, frequency, and mode
  - Assess response to activity via changes in baseline vitals
- Promote return home, community and social roles

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Physical Therapy

Evaluate and Treat

Case Study Results

- Prior Level of Function (PLOF)
  - Independent with all functional mobility and living in a 2nd floor apartment without an elevator
- Current Level of Function
  - Transfer FIM:
    - Bed, Chair/Wheelchair: Minimal assistance
  - Locomotion FIMs:
    - Walking: 15 meters with minimal assistance and a Rolling Walker
    - Wheelchair Mobility: Not Assessed
    - Stairs: Ascended/Descended 1 step with Moderate Assistance

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Why does it matter?

- Standing balance and lower extremity coordination impairments:
  - Increase fall risk
  - Minimal assist with stand-pivot transfers
  - Rolling walker and minimal assist required for stability during ambulation
- Poor endurance/activity tolerance
  - Decreases community re-integration
  - Limits participation or prolongs time spent on one task
  - Decreases quality of life

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Team approach: Nursing Communication

- End of therapy session status
  - Position, pain, and vitals
- Barriers:
  - Inaccurate blood pressure, heart rate and O2 saturation monitor readings
  - How do we communicate the patients response to therapy?

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What can we monitor?

- Mean Arterial Pressure (MAP)
- 65-85 mmHg
- Use a doppler and manual blood pressure cuff

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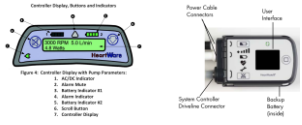
LVAD controller interface



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Controller Readings

- Pump Speed (RPM)
  - Usually set at the time of discharge and cannot be manually changed
  - 8600- 9000 RPM
  - Triangle indicates that pump is in pulse mode
- Flow (LPM)
  - Combination of power and speed
  - <4 L/min and >9 L/min contact LVAD team
- Pulsatility Index (PI)
  - Changes in a patients blood pressure can affect flow, with a higher BP causing a decrease in flow
- Power in watts (W)
  - The voltage and current of the pump motor
  - Usually around 6 no more than 9

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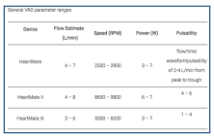
General VAD Parameters



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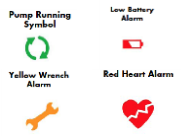
Types of alarms

- Advisory
  - Wrench
- Hazard
  - Broken heart
  - Low batteries



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Reasons for alarms

- GI bleed
- Pump thrombus
  - Insufficient anti-coagulation or pump speed preventing opening for aortic ventricle washout
- Arrhythmia
  - An adverse effect on pump function changing ventricle/pump filling
- Hypovolemia

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Essentials for home

- Check your drive line exit site
- Daily weights and MAP
- Medication compliance
- Signs and Symptoms for ED
- Alarms
- FPL, fire department, hospitals

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Discharge Home OT

- ADL's
  - Modified independence
- IADL's
  - Modified independence

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Discharge Home PT

- Transfers
  - Modified Independent
- Ambulation
  - Modified independent 50 m with single point cane
- Stairs
  - 21 steps Modified independent

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Case Study continued…

- The patient was discharged home and was doing well in the community when a heart became available for transplantation. Patient underwent heart transplant in October 9th, 2015.
- Initial physical therapy evaluation on October 18th, 2015 in the intensive care setting showed findings including acute decline in overall function and ability to mobilize self. (essentially max/total assist)

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Transplant Rehabilitation

- Knowledge of acute and chronic rejection in all types of transplantation
  - Important for all members of the rehabilitation team
- Include Precautions in plan and home care (surgical, immunosuppression)
- Discuss roles and follow up needs with transplant surgical team and medical team
  - *may be different for each organ or each center
    - Daily updates, daily lab work, want to get on staff to round together
- Teamwork is the only way to succeed

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Occupational Therapy

Case Study

- Prior Level of Function (PLOF)
  - Independent with all ADL's and IADL's
- Current Level of Function s/p LVAD
  - Transfer FIM:
    - Toilet Transfer: Maximal assistance
    - Tub/Shower Transfer: Total assistance
  - ADL FIMs:
    - Grooming: Minimal assistance
    - Eating: Supervision
    - Bathing: Moderate assistance
    - Upper body dressing: Supervision
    - Lower body dressing: Maximal assistance

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Initial findings pertinent to the team

- Bilateral upper extremity weakness and edema
  - Left weaker than right
- Lethargic
- Difficult to arouse
- Tremors

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Team Approach

- Communicate patient status to the RN and physical therapist
- Cardiac Rehabilitation literature/education
- Decrease fall risk
  - Alarm management

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Physical Therapy

Case Study
- Prior Level of Function (PLOF)
  - Modified independent with all functional mobility using a single point cane
- Current Level of Function s/p LVAD
  - Transfer FIM:
    - Bed, Chair/Wheelchair: Minimal assistance
  - Locomotion FIMs:
    - Walking: 30 meters with Contact guard assistance and a Rolling Walker
    - Wheelchair: Not Assessed
    - Stairs: Unable to complete due to fatigue

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Initial findings pertinent to the team

- Generalized weakness/deconditioning
  - Fall risk
- Poor activity tolerance
  - Increased need for rest breaks

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Team Approach

- Coordination of IV medications
- Communication board
  - Sternal precautions
- Communicate significant changes in vitals
- Communicate significant changes in response to activity

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Physiologic response to exercise

- The denervated heart

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Discharge Home After Transplant

- ADL's
  - Modified independence
- IADL's
  - Supervision
- Transfers
  - Modified independence
- Ambulation
  - Modified independent 120m with a single point cane
- Stairs
  - 12 with supervision

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When to call for help!

- Each institution will have different rules
  - Transplant surgeon vs. medical physician managing immunosuppression, monitoring for rejection
- Important to discuss and document before admission
- Very low threshold to call for help
- Consider having surgery/medicine following on consult basis while on inpatient rehabilitation unit

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Case study continued…

- Patient was discharged home with outpatient physical and occupational therapy
- By using a team-orientated approach with physical, occupational and speech therapy as well as rehabilitation nursing, neuropsychology, recreational therapy including adaptive sports and music therapy with daily supervision from a Physiatrist, the patient had significant improvement in independence and quality of life.

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Therapy: What did we learn?

- LVAD
  - Medication to manage MAP
  - Scheduled vs. PRN
- Heart Transplant
  - Coordinate IV medications with therapy schedule
  - Promoting out of bed tolerance

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Occupational Therapy Cardiac Guidelines

LVAD

Day 1
OT Evaluation
- Assessment, POC, goals, Discharge disposition, DME recommendations
- Evaluation of patient: ADL's, IADL's, prior level of function, current level of function
  - Bathing, dressing, toilet transfers, cognitive status
- Educate patient and/or family of rehab processes
  - 3-hour compliance, available group therapy, POC
- Determine knowledge of device (patient/caregiver)
  - PWC, or sequencing deficits
- Provide patient with written education material
- Review FAST acronym (increase chance of stroke post LVAD)

Heart Transplant

Day 1
OT Evaluation
- Patient history
- Evaluation of patient: ADL's, IADL's, prior and current level of function
  - Bathing, dressing, toilet transfers, cognitive status
- Determine patients level of knowledge of nurse to be aide, or new device
- Educate patient and/or family of rehab processes
  - 3-hour compliance, available group therapy, POC
- Assess vitals pre, during (if symptomatic), and post session.
- Reinforce education
  - Taking weight, cardiac diet, monitoring BP and HR, medication management
- Paced by breathing and chair yoga hand-outs, incentive spirometer, monitoring SPO2.
  - Energy conservation, task analysis, endurance training
- Edema management and positioning

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Physical Therapy Cardiac Guidelines

LVAD

Day 1

PT evaluation

- Patient History
- Assessment, POC, goals, Discharge disposition, DME recommendations
- Educate patient and/or family of rehab processes
  - 3 hour compliance, available groups, POC
- Determine if appropriate for group(s) or if requires 1:1
- Review precautions as applicable
- Determine knowledge of device (patient/caregiver)
  - Main screen
  - Drive line (dressing changes/procedure)
  - Battery usage (removal and application, time remaining)
  - Review all components provided from LVAD team
  - *Get docs from LVAD team if available*
- MAP pre and post session (during if patient becomes symptomatic)
- Explanation of rate of perceived exertion (RPE- Borg scale)
- 6 minute walk test as soon as appropriate to attain baseline
  - Re-assess throughout LOS or within 24 hours of discharge
- Determine necessity for neuropsychologist consult (if not already ordered) to teach patients skills for making lifestyle changes, coping, pain, ect
- Coordinate with interdisciplinary team to determine intensity and scheduling
  - Example: Severe deconditioning warranting 90 minutes for ADLs therefore patient would benefit from an AM session with OT and PT in PM *(communicate with scheduler as needed)*

Heart Transplant

Day 1

PT Evaluation

- Patient History
- Assessment, POC, goals, Discharge disposition, DME recommendations
- Educate patient and/or family of rehab processes
  - 3 hour compliance, available groups, POC
- Determine if appropriate for group(s) or if requires 1:1
- Determine patients level of knowledge of move in the tube or new device
- Review precautions as applicable
  - Request orders if appropriate (i.e.: pacemaker precautions)
- Assess vitals pre, during (if symptomatic), and post session.
- Explanation of rate of perceived exertion (RPE- Borg scale)
- 6 minute walk test as soon as appropriate to attain baseline
  - Re-assess throughout LOS or within 24 hours of discharge
- Determine necessity for neuropsychologist consult (if not already ordered) to teach patients skills for making lifestyle changes, coping, pain, ect
- Coordinate with interdisciplinary team to determine intensity and scheduling
  - Example: Severe deconditioning warranting 90 minutes for ADLs therefore patient would benefit from an AM session with OT and PT in PM (communicate with scheduler as needed)

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Case Study continued…

- Our rehabilitation team had a unique opportunity to see this patient improve from an LVAD s/p CVA patient requiring assistance for gait and all activities of daily living with severe deconditioning to a cardiac transplant patient leaving our rehabilitation center at modified independent level and ready to take advantage of a second chance at life.

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What did we learn?

- Nursing ratio
  - 1:4 for high acuity patients
  - 1:5 for standard "medically complex" patients
- Staff education
  - LVAD/transplant team
  - Pharmacy

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What did we learn?

- Use the EMR

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What did we learn?

- Social Work
- Dialysis
  - Education of dialysis nurses, placement issues

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What did we learn?

- Required changes to the pharmacy formulary
  - Changes to telemetry needs/location of service
    - Milrinone
    - Dobutamine

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What did we learn?

- Preadmission team sets the groundwork for the organization and success of the entire admission

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