31 GIORNATE CARDIOLOGICHE TORINESI

TURIN
October
24th-26th
2019

AOU Città della Salute e della Scienza di Torino

Maria Pia Hospital

Follow-up and quality of life after VAD implantation

Dott. Andrea Baronetto

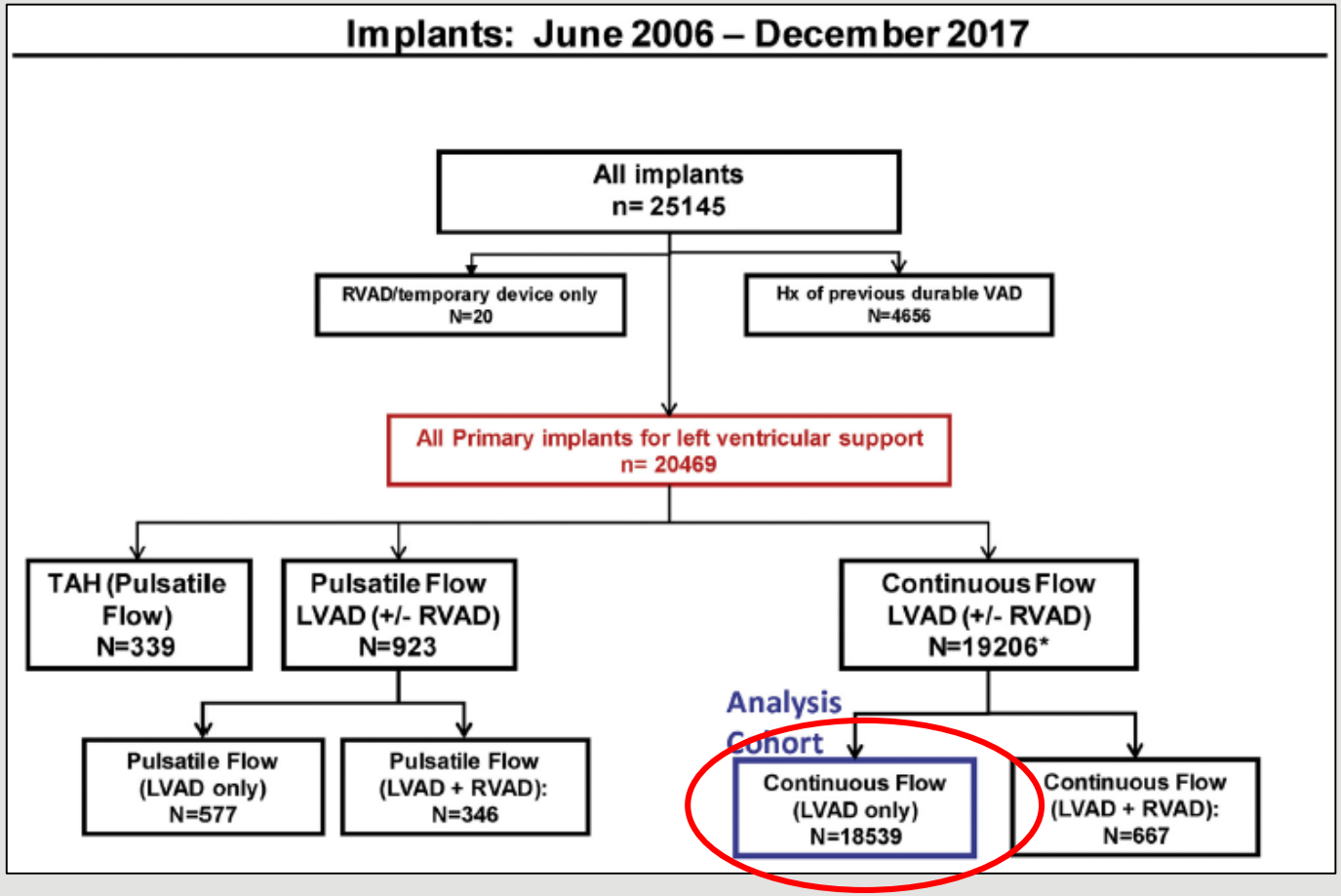
UNIVERSITÀ DEGLI STUDI DI TORINO

GVM CARE & RESEARCH

AZIENDA OSPEDALIERO UNIVERSITARIA Città della Salute e della Scienza di Torino

Long Term VAD

- Organ function recovery
- Patient resident at home
- Increased survival
- Improving the quality of life



J Heart Lung Transplant. 2019 Feb;38(2):114-126. doi: 10.1016/j.healun.2018.11.013.

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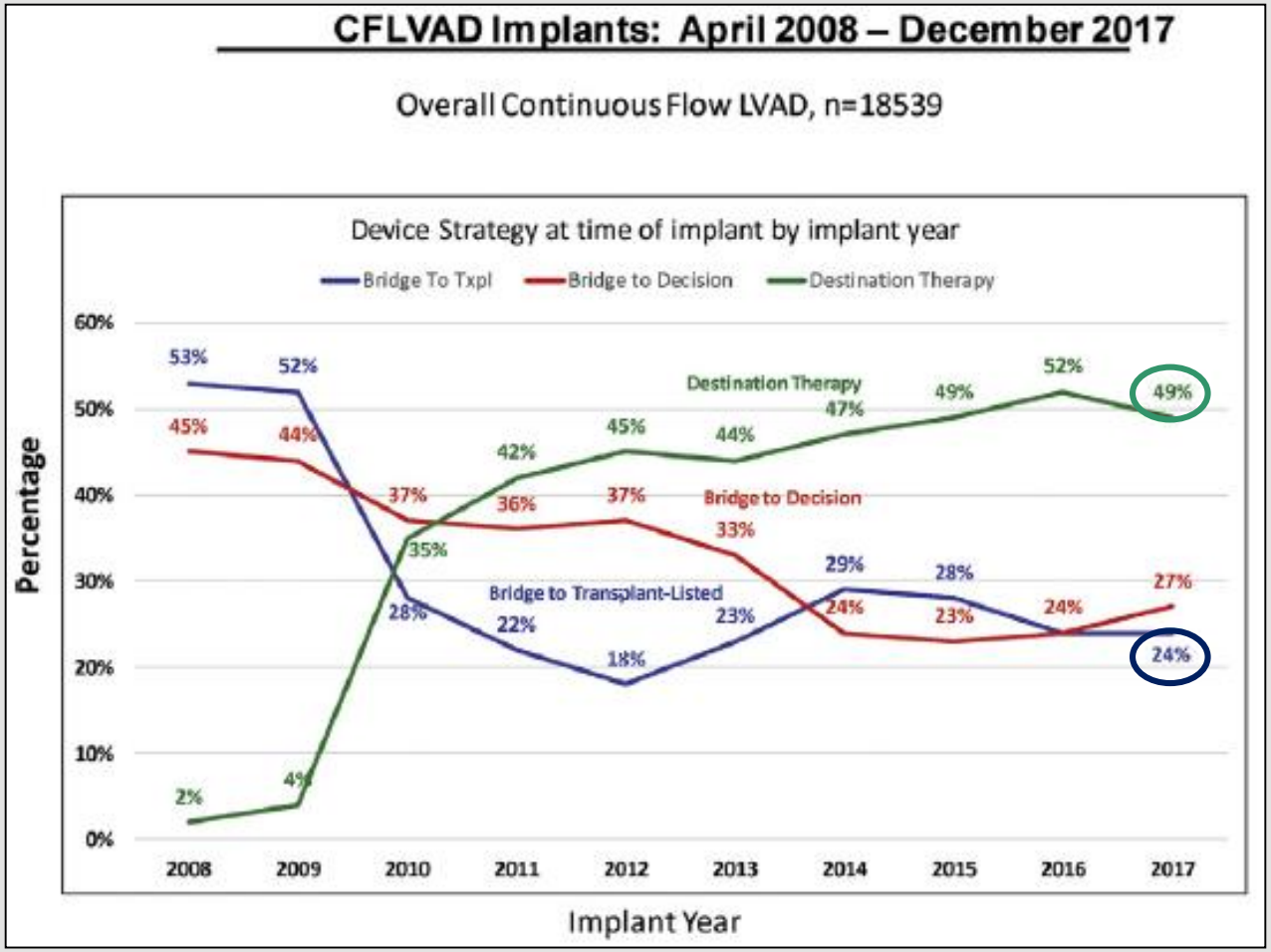

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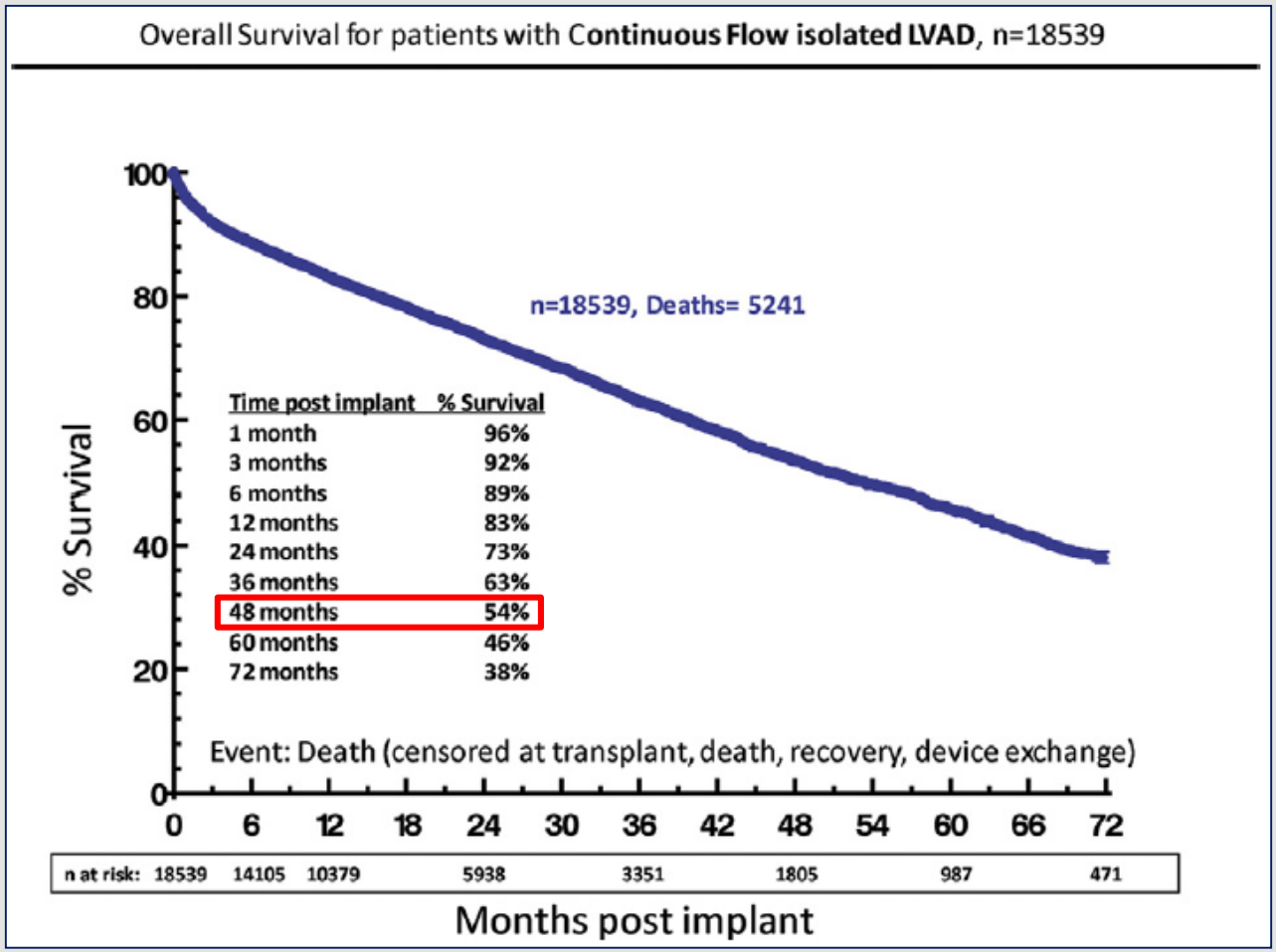

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Table 2 Proportion of Patients Reflecting Specific Causes of Death

Primary Cause of Death	No. (%)
Nervous system: neurologic dysfunction	1,019 (19)
Multisystem organ failure/hepatic or renal failure	763 (15)
Cardiac disease, including progressive congestive heart failure	635 (12)
Other causes	600 (11)
Withdrawal of support	591 (11)
Major infection	411 (8)
Circulatory	341 (7)
Respiratory failure	331 (6)
Right heart failure	197 (4)
Device malfunction or hemolysis	186 (4)
Major bleeding	109 (2)
Trauma/accident	58 (1)
Total deaths	5,241 (100)

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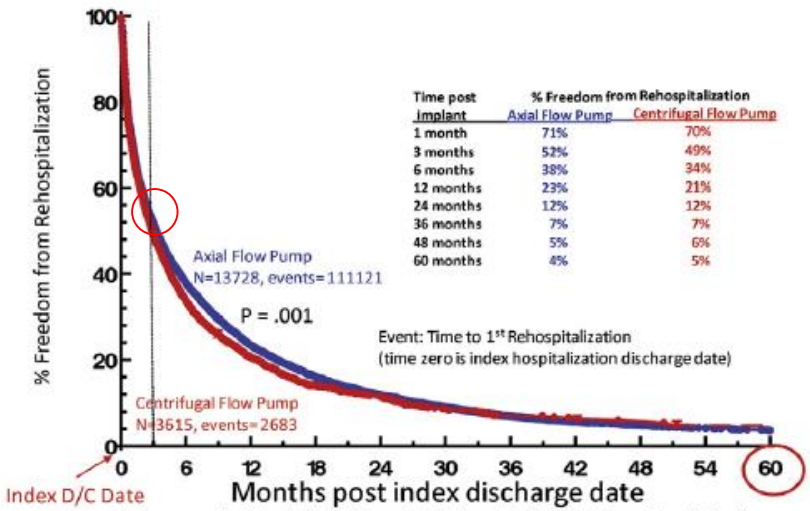
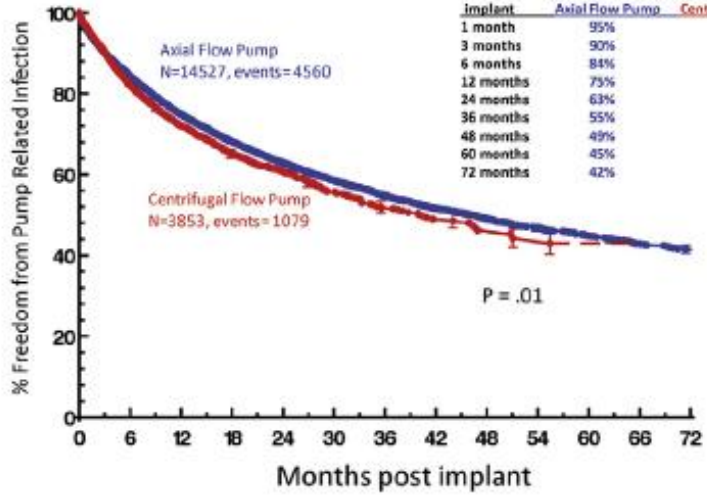
Time to 1st Rehospitalization* by Pump Flow Type



Time post Implant	% Freedom from Rehospitalization: Axial Flow Pump	Centrifugal Flow Pump
1 month	71%	70%
3 months	52%	49%
6 months	38%	34%
12 months	23%	21%
24 months	12%	12%
36 months	7%	7%
48 months	5%	6%
60 months	4%	5%

*primary reason for Rehospitalization is transplantation is excluded in this depiction. Only patients with a valid index hospitalization discharge date is included in this depiction.

A Time to 1st Pump Related Infection by Pump Flow Type



Time post Implant	% Freedom from Pump Related Infection: Axial Flow Pump	Centrifugal Flow Pump
1 month	95%	96%
3 months	90%	90%
6 months	84%	82%
12 months	75%	72%
24 months	63%	61%
36 months	55%	52%
48 months	49%	46%
60 months	45%	43%
72 months	42%	----

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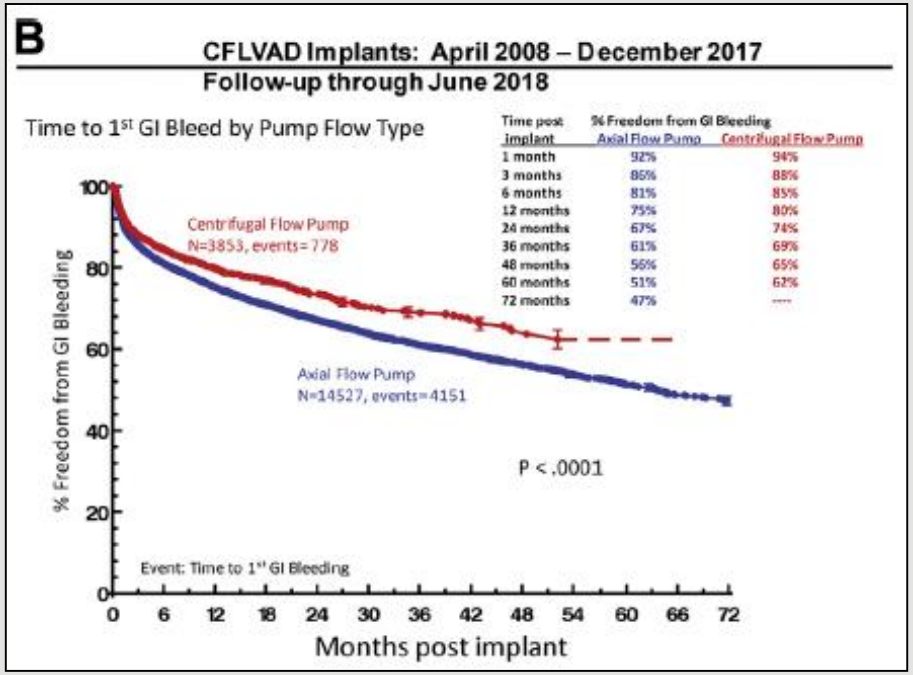

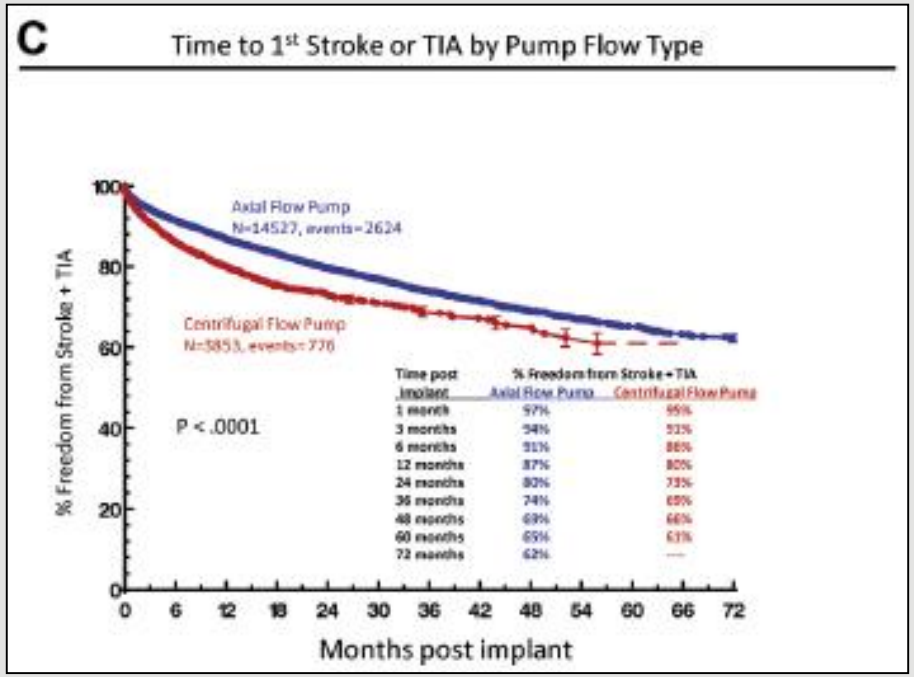

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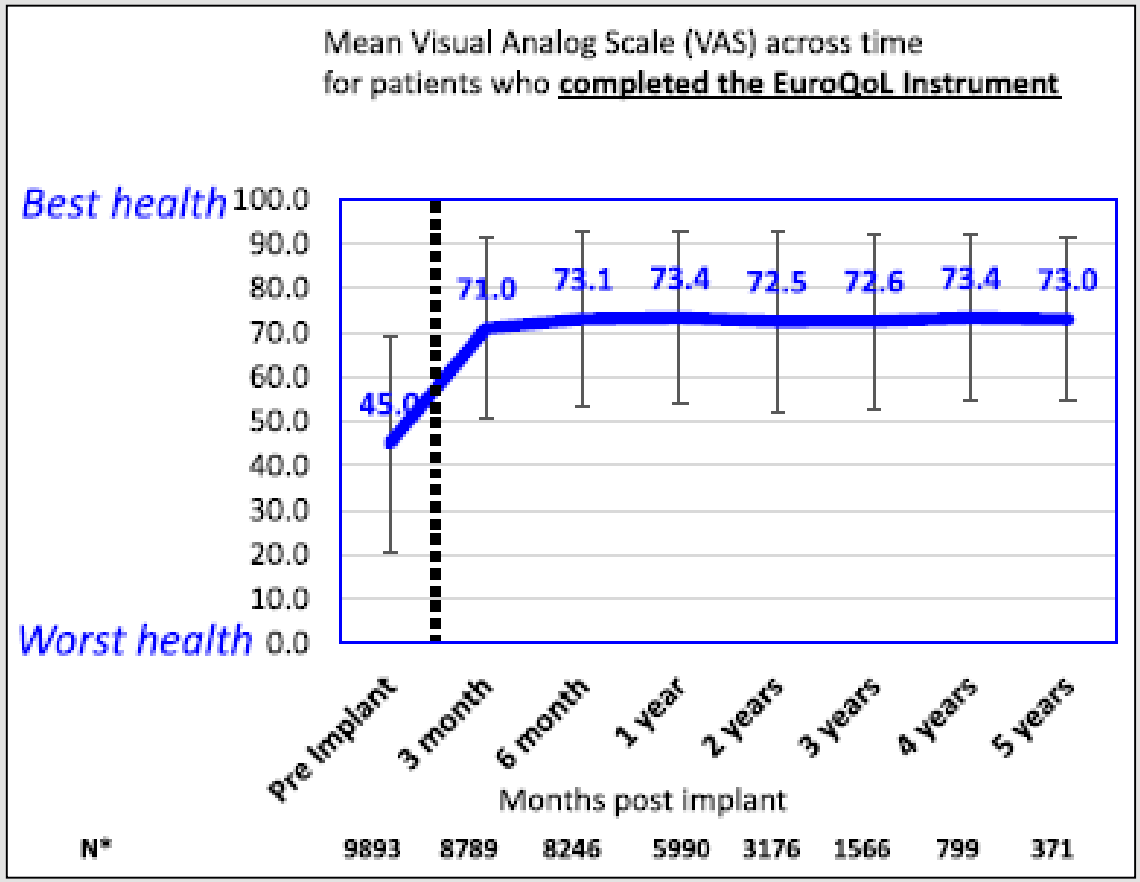
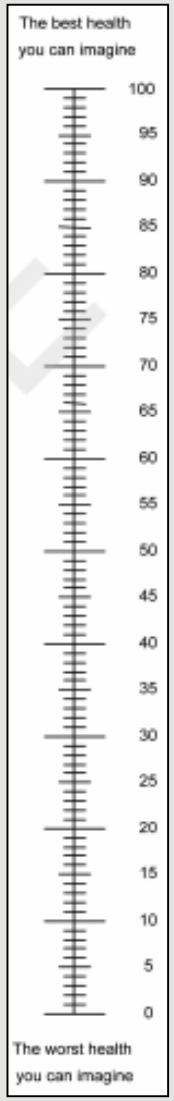


Il suo stato di salute oggi



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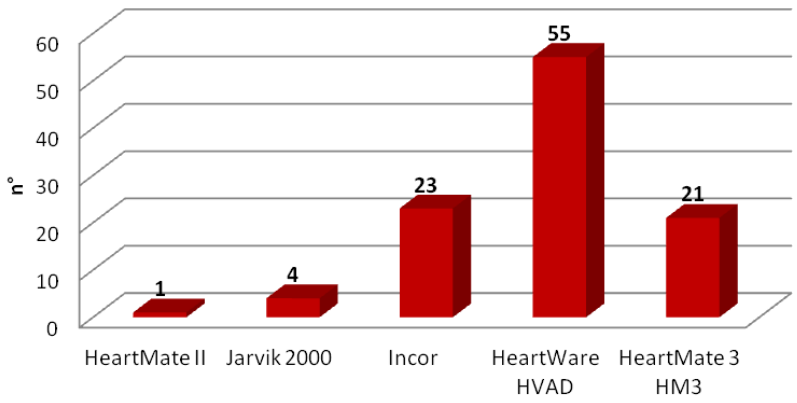
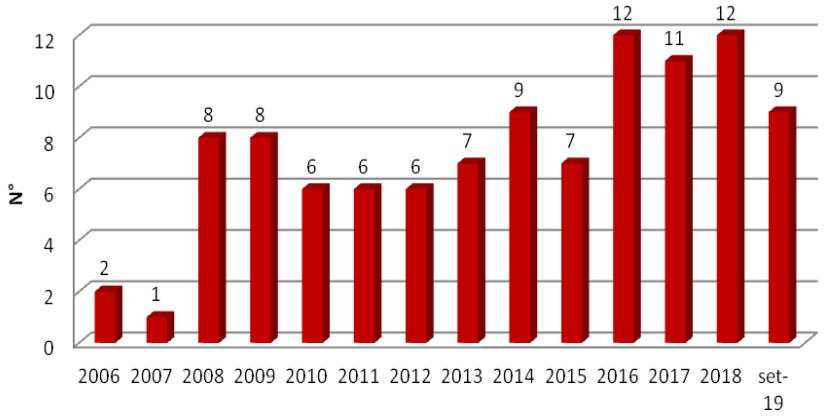
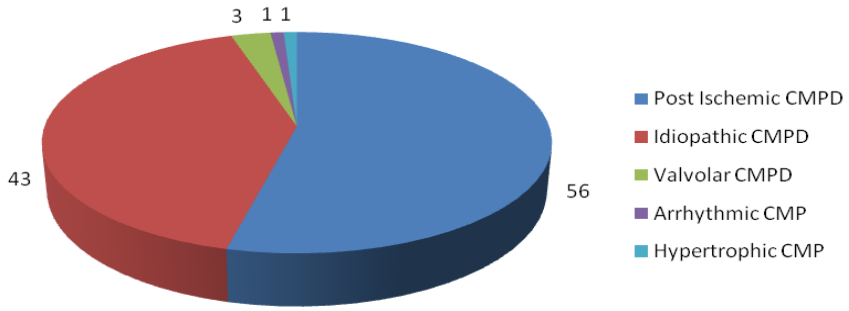
Devices (104 patients)



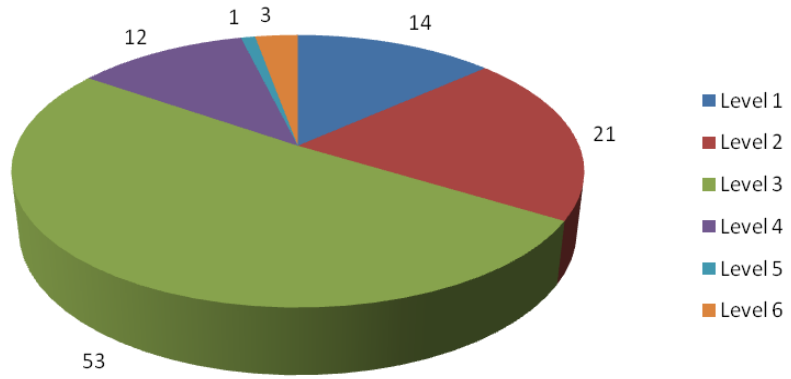
Implants (104 patients)



Etiology (104 patients)



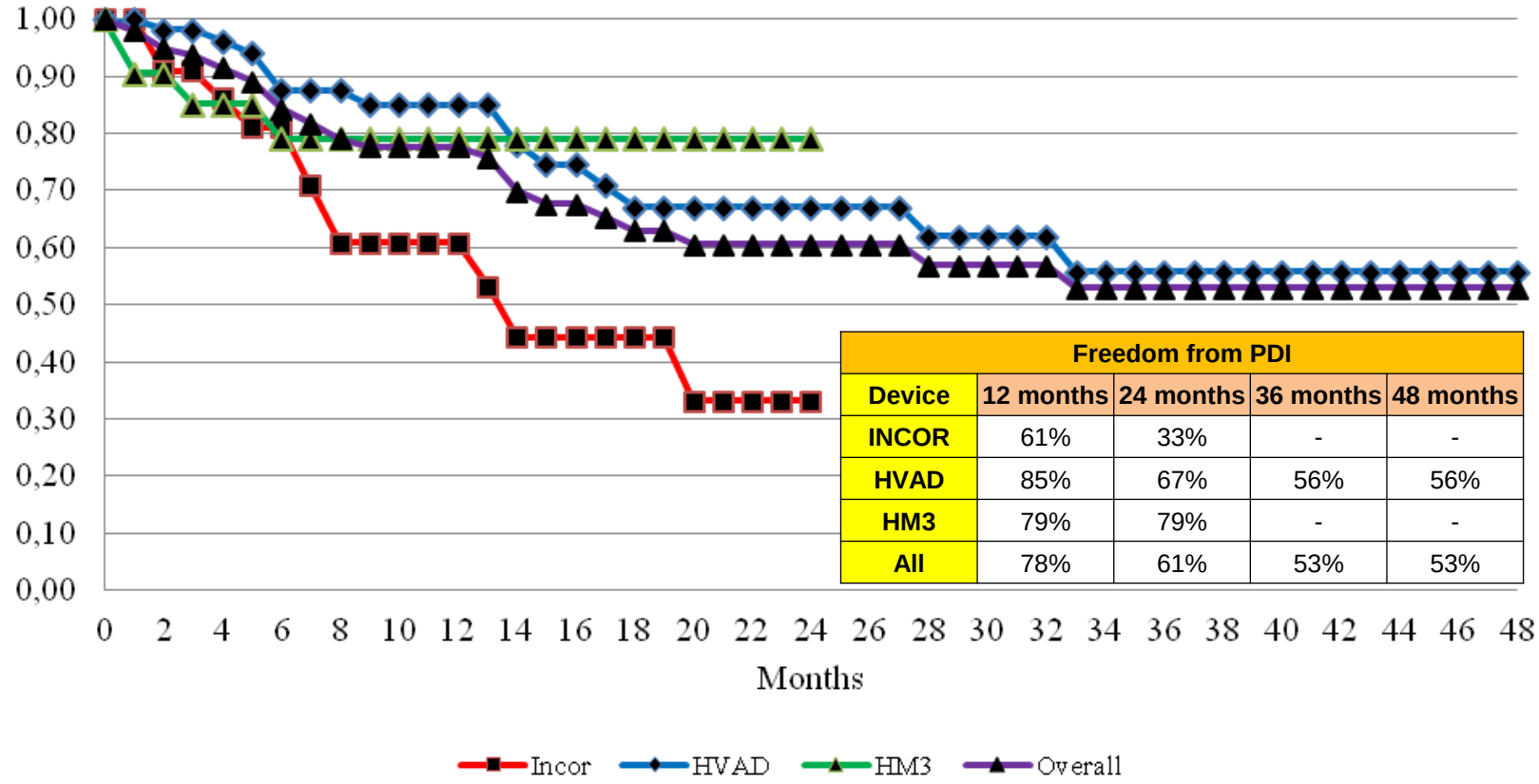
INTERMACS (104 patients)



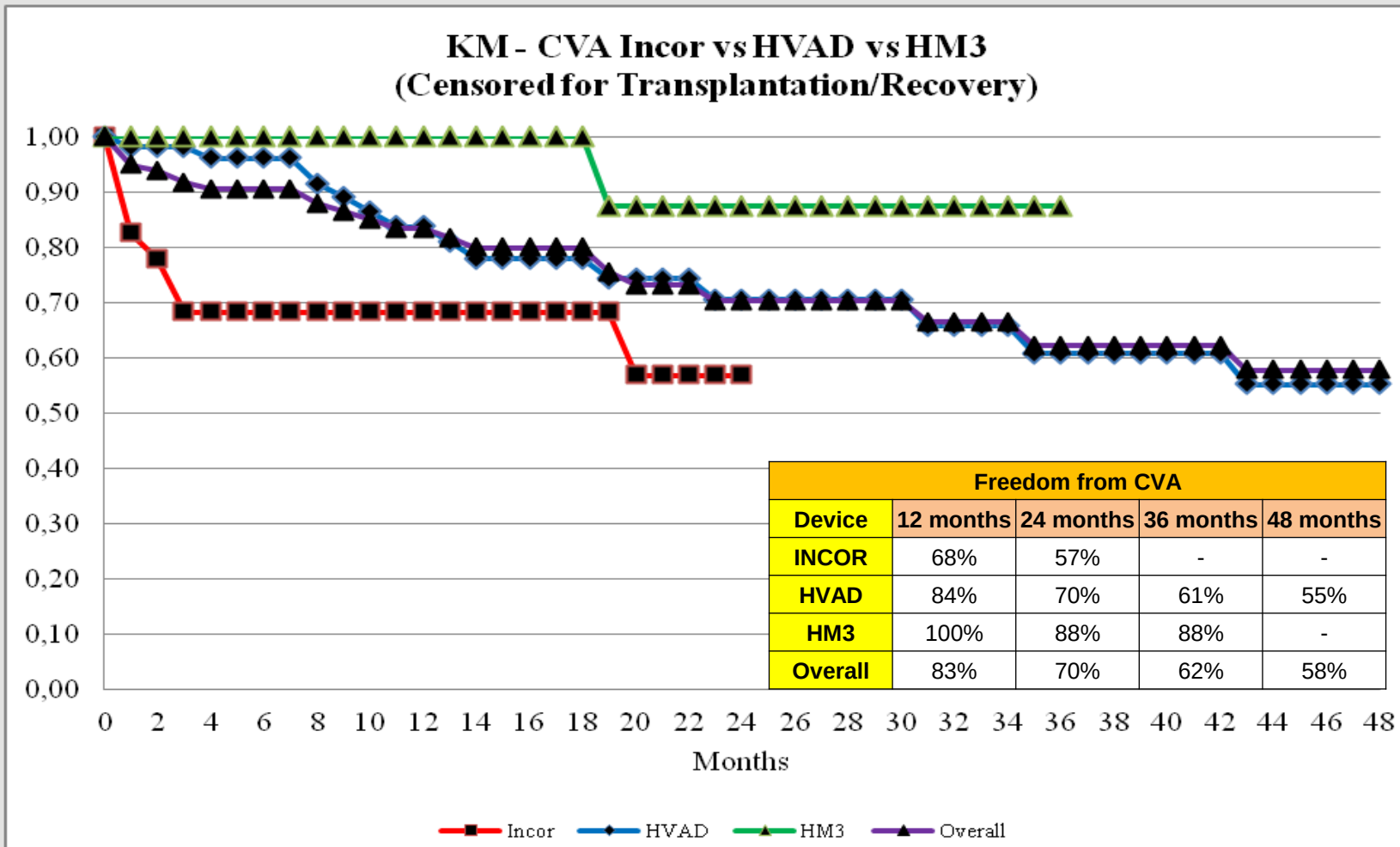
		Media + DS (months)
Follow up LVAD	**Years/Patient**	**Censored for Transplant**
INCOR	25,68	13,40 +/- 11,86
HVAD	105,68	23,49 +/- 19,26
HM3	24,02	14,41 +/- 10,49

29 LVAD ongoing as of 30/09/2019

KM - PDI Incor vs HVAD vs HM3
(Censored for Transplantation/Recovery)

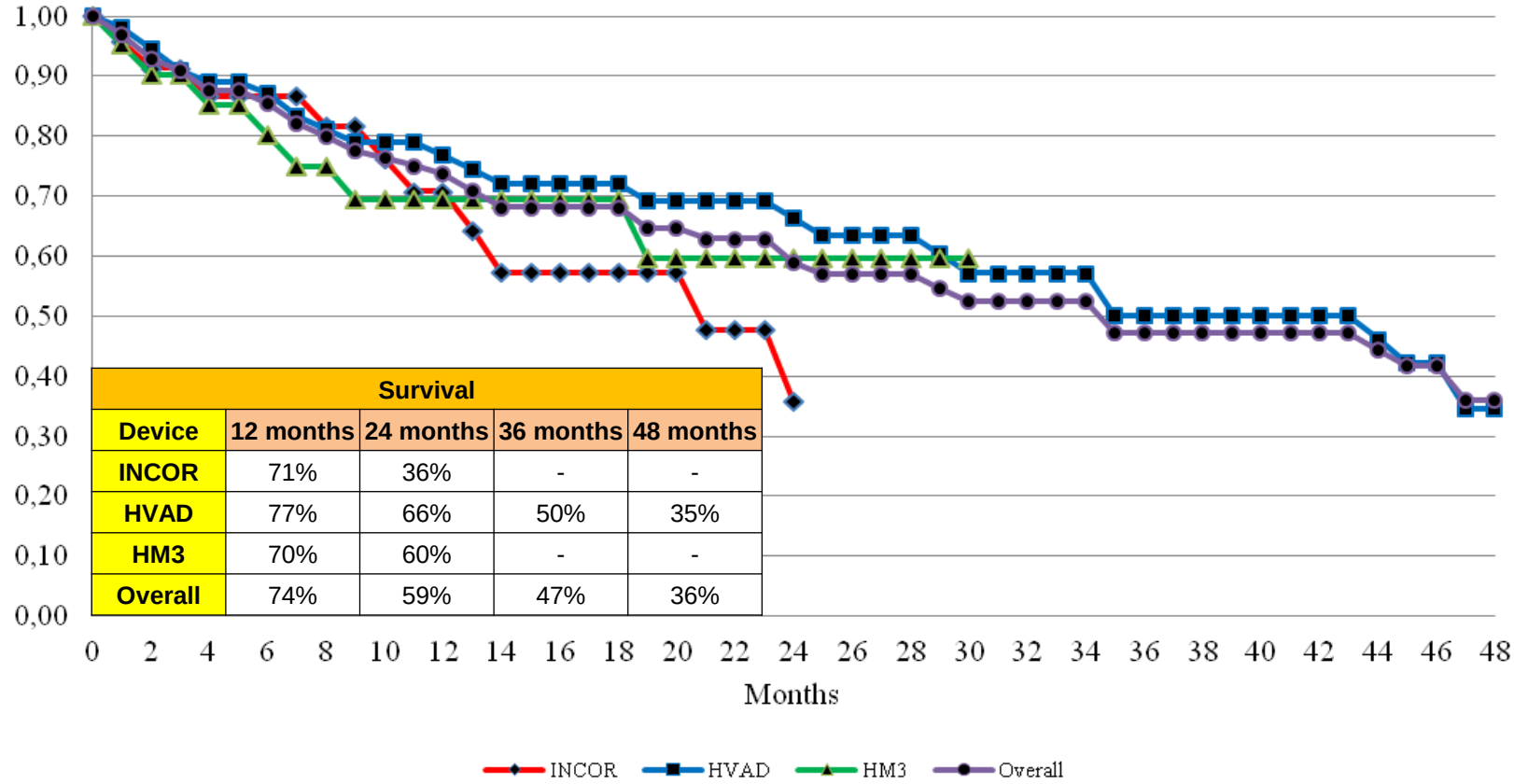


Freedom from PDI				
Device	12 months	24 months	36 months	48 months
INCOR	61%	33%	-	-
HVAD	85%	67%	56%	56%
HM3	79%	79%	-	-
All	78%	61%	53%	53%

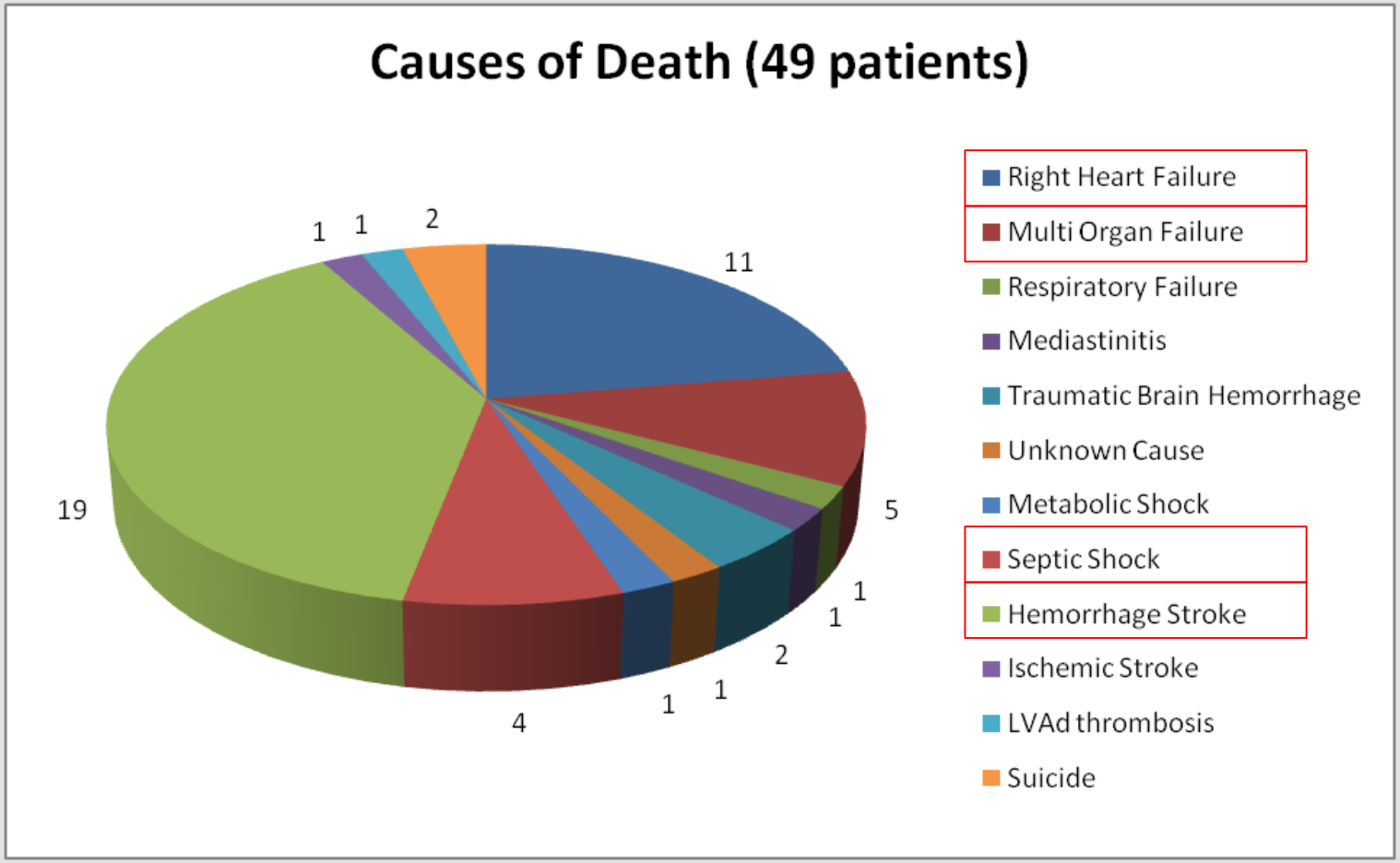


Freedom from CVA				
Device	12 months	24 months	36 months	48 months
INCOR	68%	57%	-	-
HVAD	84%	70%	61%	55%
HM3	100%	88%	88%	-
Overall	83%	70%	62%	58%

KM - Survival INCOR vs HVAD vs HM3 (Censored for Transplantation/Recovery)



Survival				
Device	12 months	24 months	36 months	48 months
INCOR	71%	36%	-	-
HVAD	77%	66%	50%	35%
HM3	70%	60%	-	-
Overall	74%	59%	47%	36%


Causes of Death (49 patients)
11
5
1
1
2
1
1
4
19
1
1
2
Right Heart Failure
Multi Organ Failure
Respiratory Failure
Mediastinitis
Traumatic Brain Hemorrhage
Unknown Cause
Metabolic Shock
Septic Shock
Hemorrhage Stroke
Ischemic Stroke
LVAd thrombosis
Suicide

Objectives of cardiac rehabilitation:

- Increase functional capacity
- Reduce symptoms
- Promote reintegration in one's psycho-social context
- Facilitate return to work

Start mobilization as soon as possible!

↓

TARGETS:

- Preventing complications related to lodging
- Minimize the loss of mobility
- Maximizing independence
- Facilitate the ventilator weaning

Main discriminating factor:

LVAD pre-implant clinical conditions

Evaluation steps after LVAD installation

Evaluation of starting conditions

Individual treatment planning

Table 1. - Physical therapy pre-evaluation

Detailed review of recent and past medical history.

Review of prior level of function.

Mental status, and cognitive ability.

Vital signs, screening for cardiovascular instability.

Medications, i.e. need for continuous or intermittent infusions (inotropic drugs).

Ventilator settings or oxygen requirements.

Surgical wound, and skin integrity.

Range of motion, coordination, balance, strength, endurance.

Functional assessment:
1. Bed mobility.
2. Transfers.
3. Gait.
4. Activities of daily living.

Table 2. - Individualised physical therapy interventions for early mobilization

Positioning

Exercises
- Muscle strengthening.
- Breathing.

Bed mobility activities
- Sitting on edge of bed, in association with exercises, trunk control.
- Turning side to side.

Transfers from bed to
- Stretcher-chair.
- Chair.
- Commode.

Gait
- Pre-gait activities: weight shifting, stepping in place and sideways.
- Gait training with rolling walker.

Evaluation steps after LVAD installation

Evaluations during physical exercise

↓

Table 3. - Criteria for termination of physical therapy session

Significant drop in LVAD flow or suction alarm.
Hypotension associated with fainting, dizziness, or diaphoresis.
Supine resting heart rate >100 beats per minute.
Severe, intolerable dyspnea.
Saturation less than 90% on supplemental oxygen.
Significant chest pain or discomfort.
Extreme fatigue or claudicatio.
Request of patient to stop.
> 1.8 Kg increase in body mass over previous 1 to 3 days.
Complex ventricular arrhythmia at rest or appearing with exertion.

→ Resumption of exercise only at stabilized clinical conditions / normal operation of the device

Tailored on the individual patient, do not generalize!

- Hypertension
- Volemia and hydration
- Arrhythmias
- Left ventricular function
- Right ventricular function
- LVAD related
  - ✓Infections
  - ✓Thrombosis
  - ✓Bleeding
- Home discharge and psycho-social reintegration

J Artif Organs. 2006;9(4):203-8. Epub 2006 Dec 21.

Psychiatric problems of heart transplant candidates with left ventricular assist devices.

Baba A[1], Hirata G, Yokoyama F, Kenmoku K, Tsuchiya M, Kyo S, Toyoshima R.

- 14 patients undergoing paracorporeal LVAD implantation
- Close correlation between physical conditions and psychological state
- Post-implantation disorders:

→ 50% adaptation disorders

→ 21% delirium

→ 7% depression

→ 7% acute psychosis

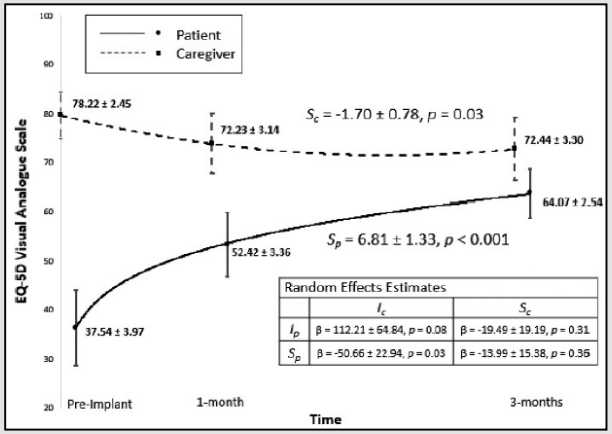
- Need for pharmacological intervention (antidepressants, anxiolytics, antipsychotics) in 9 patients (64%)

J Cardiovasc Nurs. 2017 Sep/Oct;32(5):455-463. doi: 10.1097/JCN.0000000000000378.

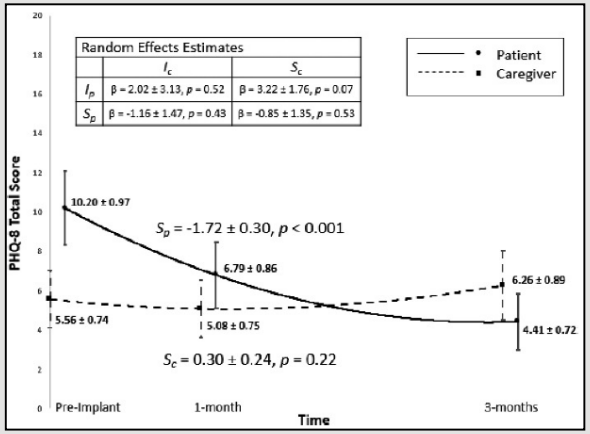
Quality of Life, Depression, and Anxiety in Ventricular Assist Device Therapy: Longitudinal Outcomes for Patients and Family Caregivers.

Bidwell JT[1], Lyons KS, Mudd JO, Gelow JM, Chien CV, Hiatt SO, Grady KL, Lee CS.

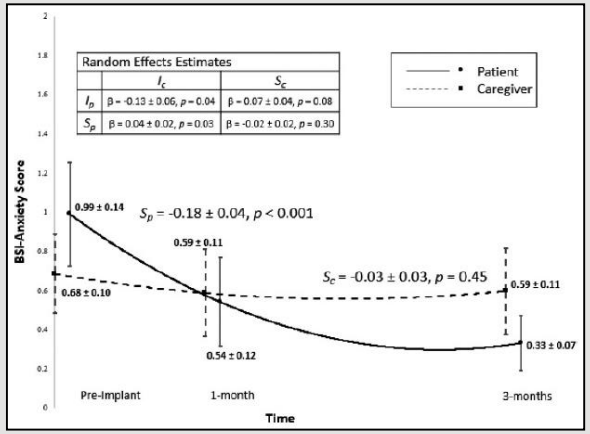
- Quantitative study, 41 VAD patients and caregivers
- Data collected at 3 time points (prior to implantation and at 1 and 3 months post-implantation)



QoL



Depression

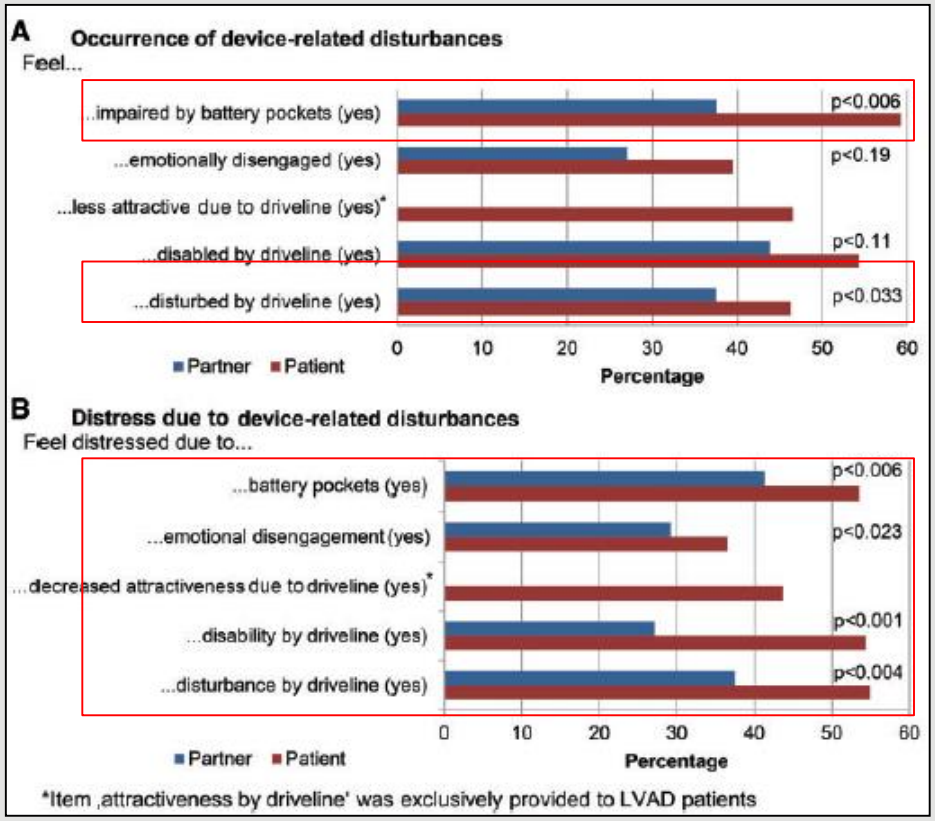


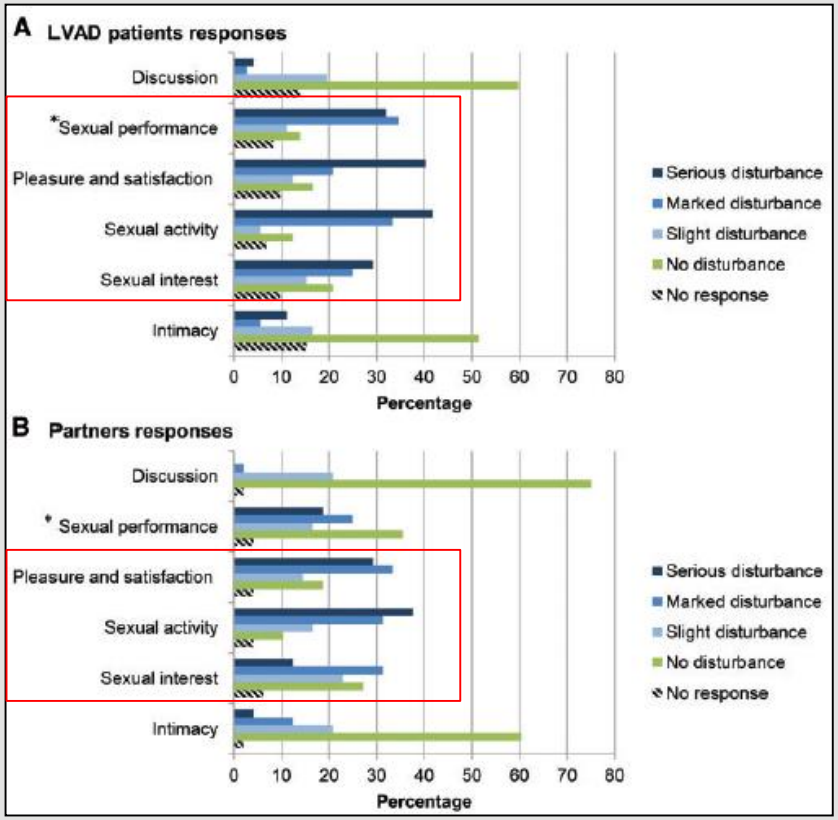
Anxiety

Eur J Cardiothorac Surg. 2018 Apr 1;53(4):799-806. doi: 10.1093/ejcts/ezx426.

Sexual activity in patients with left ventricular assist devices and their partners: impact of the device on quality of life, anxiety and depression.

Kugler C[1], Meng M[1], Rehn E[2], Morshuis M[2], Gummert JF[2], Tigges-Limmer K[2].



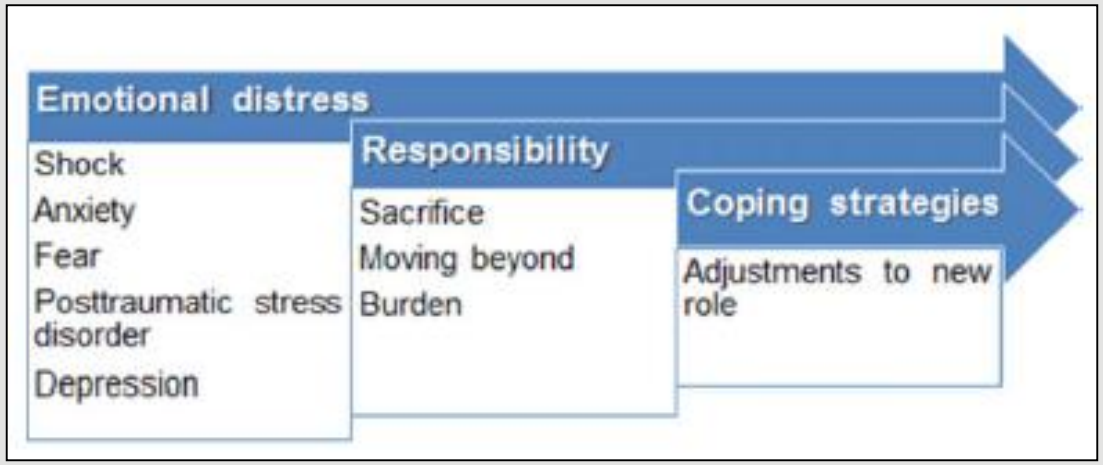


Prog Transplant. 2016 Jun;26(2):135-48. doi: 10.1177/1526924816640648. Epub 2016 Apr 4.

The Experience of Family Caregivers of Patients With a Left Ventricular Assist Device: An Integrative Review.

Cicolini G[1], Cerratti F[2], Della Pelle C[3], Simonetti V[3].

- 15 studies → 5 studies considering patients and caregivers
  → 10 studies considering only caregivers
- Three major themes are identified:
  1. Emotional distress
  2. Responsibility
  3. Coping strategies



1. **Emotional Distress**

- Preventing more than 20% of caregivers from returning to their normal daily life activities or previous employment.

2. **Responsibility**

- Biggest challenges: “doing dressing changes” and “moving forward.”
- Sacrifices are necessary in terms of family, friends
- Caregivers feel the burden of the day-to-day surveillance care and maintenance of the mechanical device

3. **Coping strategy**

- Caregivers new roles become easier over time with the use of coping strategies

CONCLUSION: Caregivers are at higher risk for post-traumatic stress disorder

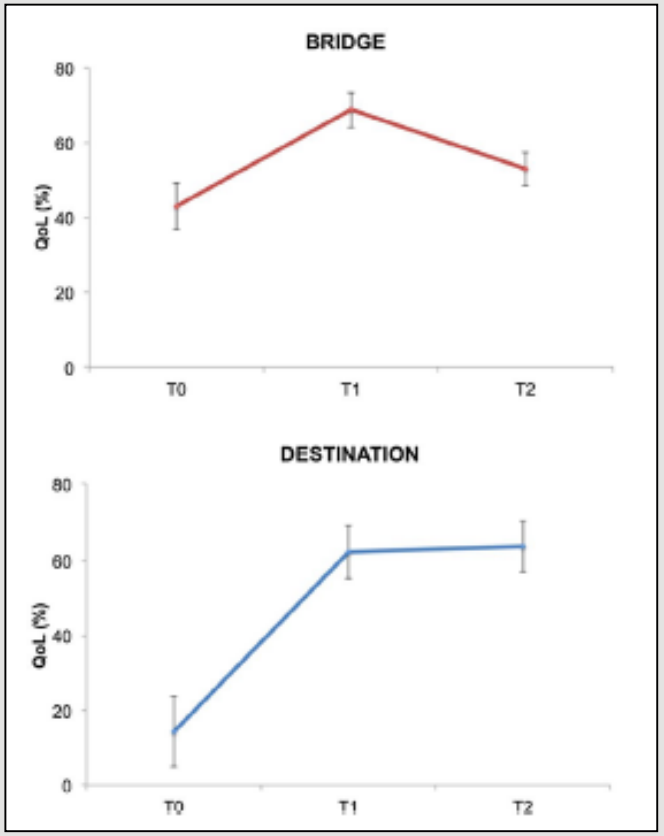
Artif Organs. 2019 Jul 3. doi: 10.1111/aor.13531. [Epub ahead of print]

Psychological outcomes of left ventricular assist device long-term treatment: A 2-year follow-up study.

Voltolini A[1], Salvato G[1,2,3,4], Frigerio M[5], Cipriani M[5], Perna E[5], Pisu M[5], Mazza U[1].

	Months				
Subscale	*0* (T0)	*12* (T1)	*24* (T2)	Adj *P* T1 vs. T0	Adj *P* T2 vs. T0
Mobility	2.72	1.52	1.75	0.001	0.006
Self-care	2.35	1.80	1.85	n.s.	n.s.
Usual activities	2.68	1.55	1.78	<0.001	0.001
Pain/Discomfort	2	2	2	n.s.	n.s.
Anxiety/Depression	2.52	1.80	1.68	0.066	0.022
Quality of life (mean)	33	66.5	56.7	<0.001	0.229
(SD)	21.3	15.4	16.2		

- Analysis of 20 patients (2013-2018) with a 2-year follow-up
- Pre-implant assessment (T0), at 1 year (T1), at 2 years (T2)
- Stratified by ITT



- Psychological interventions on LVAD patients since February 2017
- Patients' family members are also invited to the group
- Somatopsychic manifestation
- Main distress found in patients:
  - ✓ Non-acceptance of the disease
  - ✓ Difficulty in perceiving one's body and relating to VAD support
  - ✓ Refusal and non-recognition of the gravity of the situation
  - ✓ Sense of guilt towards their family members
  - ✓ Anxious-depressive states
  - ✓ Sense of helplessness and frustration
  - ✓ Fear of death

- Main distress found in caregivers:
  - ✓ Difficulty accepting change in lifestyle
  - ✓ Anxiety for the fear of not managing the situation in the best way
  - ✓ Sense of helplessness towards the sick and suffering of the patient
  - ✓ Conflicts with the patient
  - ✓ Anger
  - ✓ Fear
  - ✓ Patient loss experience

- Positive return:
  - ✓ Establish relationships with other patients in the same situation thus sharing paths and suggestions (they are not the only ones in difficulty)
  - ✓ Exchanging information, accepting the suffering of others, but also proposals and alternative solutions
  - ✓ Possibility of establishing relationships and comparisons between family members
  - ✓ Occasion for some patients / family members to undertake psychological support or psychotherapy programs
  - ✓ Improvements from a psychological point of view both for some patients and their families

THE TAKE-HOME MESSAGE

- Need for adequate patient information regarding his future living with VAD
- Pre-implant psychological assessment of the patient and caregiver
- Follow the patient and caregiver during the mechanical support period
- Need for a reference figure (VAD Coordinator)
- Best results → intensive program with multidisciplinary approach for patient and caregiver (CCH, cardiologists, physiotherapists, nurses, physiatrists, psychologists, social workers)

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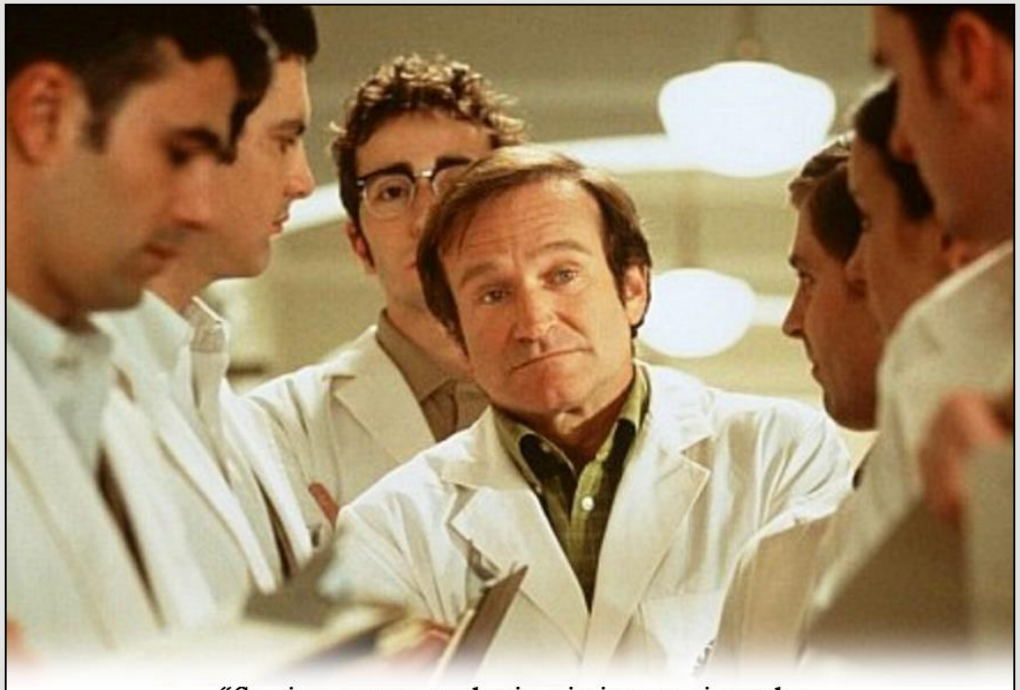

"Se si cura una malattia, si vince o si perde;
se si cura una persona, vi garantisco che in quel caso si vince,
qualunque esito abbia la terapia"

PATCH ADAMS
(1998, diretto da Tom Shadyac)

Thank You