International Comparison of the Cost-effectiveness of VADs as Bridge to Transplant

Mark Schnitzler, MD*

Melissa Skeans, MS,

Ajay Israni, MD,

Monica Colvin, MD

SRTR
SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

*Presenter

Disclosures

Mark Schnitzler, PhD
Professor Internal Medicine
Director Research and Quality Abdominal Transplantation
Saint Louis University, St. Louis, Missouri

- I have no financial relationships to disclose within the past 12 months relevant to my presentation.
- My presentation does not include discussion of off-label or investigational use.
- I do not intend to reference unlabeled/unapproved uses of drugs or products in my presentation.

This work was supported wholly or in part by HRSA contract 250201000018C. The content is the responsibility of the authors alone and does not necessarily reflect the views or policies of the Department of HHS, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

SRTR SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

Cost-effectiveness of Ventricular Assist Device Use in the United Kingdom: Results From the Evaluation of Ventricular Assist Device Programme in the UK (EVAD-UK)

Linda D. Sharples, PhD, Matthew Dyer, MSc, Fay Cafferty, MMath, Nikolaos Demiris, PhD, Carol Freeman, MPhil, Nicholas R. Banner, FRCP, Stephen R. Large, FRCP, FRCS, Steven Tsui, MD, FRCS, Noreen Caine, BA, and Martin Buxton, BA.

Background: The UK Department of Health funds ventricular assist device (VAD) implantation as a bridge to transplantation (BTT) at three centers. The cost-effectiveness of this program has not been established.

Methods: All 70 VAD implants for BTT and a consecutive cohort of 71 inotrope-dependent transplant candidates, between April 2002 and December 2004, were prospectively monitored for survival, transplantation, quality of life and resource use. Costs and quality-adjusted life-years were estimated for these groups, and for a hypothetical scenario in which VAD patients would die within 30 days

J Heart Lung Transplant 2006;25:1336-43.

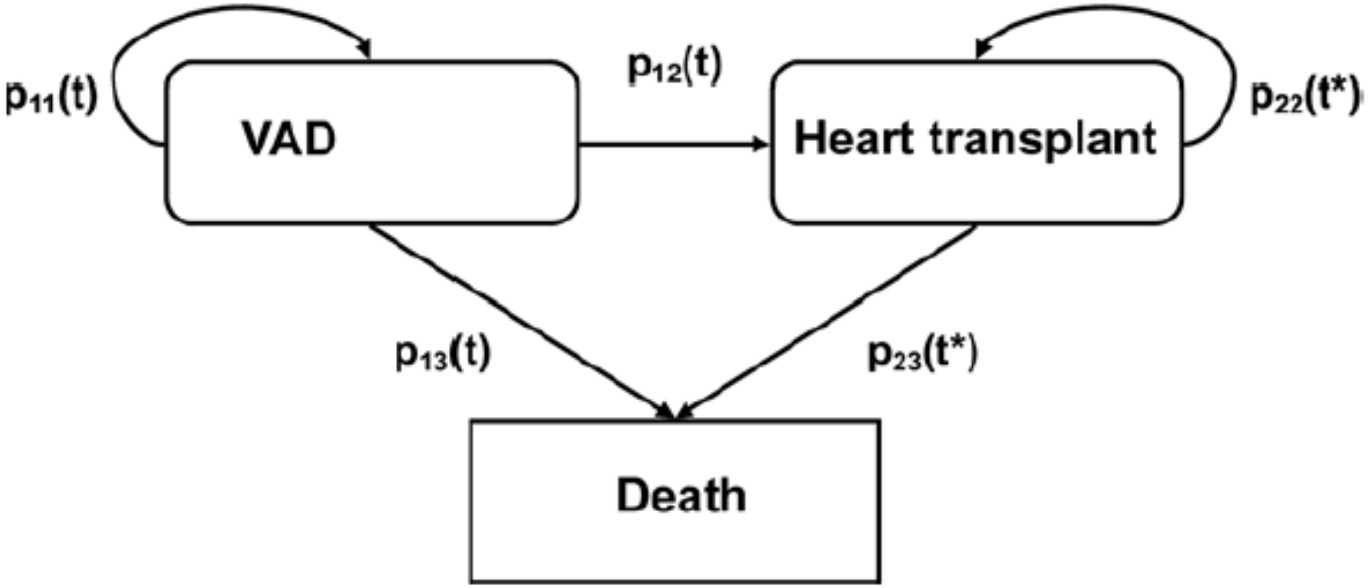


Figure 1. Discrete-time, semi-Markov, multi-state model for VAD patients. P_{11}, probability of a VAD patient surviving *t* months after VAD implant; P_{12}, probability of a VAD patient being transplanted t months after VAD implant; P_{13}, probability of a VAD patient dying *t* months after VAD implant, before transplant; P_{22}, probability of a transplant recipient surviving t^* months after heart transplant; P_{23}, probability of a transplant recipient dying t^* months after heart transplant.

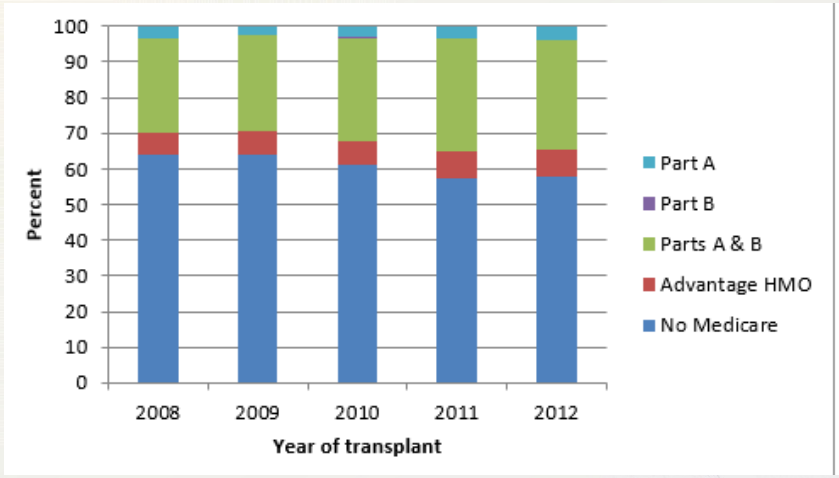
Sharples' Results

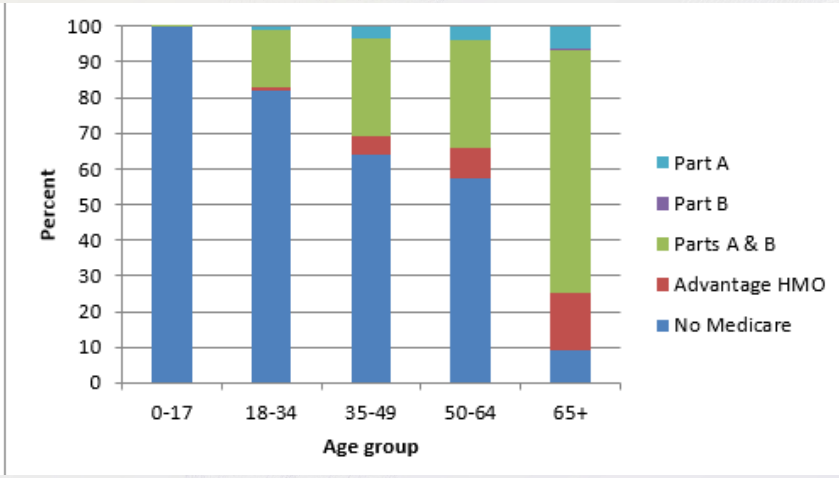
Costs		
VAD group	£173,841	(US$316,078)
Inotrope-dependent group	£130,905	(US$238,011)
Worst clinical scenario	£14,400	(US$26,182)
Life-years (mean survival)		
VAD group	5.63	
Inotrope-dependent group	8.62	
Worst-case scenario	0.04	
QALYs		
VAD group	3.27	
Inotrope-dependent group	4.99	
Worst-case scenario	0.02	

Methods

- US registry data (OPTN) linked to Medicare claims
- 2008 – 2012

Medicare Coverage of Heart Transplantation





SRTR
SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

US UK Cost Comparison

	UK Data	US Medicare	UK/US ratio
VAD Implantation and Associated Care	$139,429	$181,906	76%
TX with 1 Year of Care	$109,611	$391,102	28%
VAD/TX ratio	127%	46%	

US Based Markov Model

- Total Cost 1 year pre- through 1 year post-transplant
  - VAD $421,114
  - No VAD $342,714

- 1 year post-transplant survival
  - VAD 88.8%
  - No VAD 93.5%

- Note: Assumes VAD and no VAD patients are otherwise identical

Suppose VAD and no VAD Patients are Different

	Marginal Cost Effect	Death HR (SRTR PSR)
VAD	$76,518	1.5
ICU	$0	1.4
Dialysis	$53,144	1.9
ECMO	$3,202	1.9

Conclusions

- VAD increases the cost of heart transplantation
- Death rates following heart transplant are higher with VAD in otherwise identical patients
- VAD may improve life expectancy following transplant if it can improve the condition of the patient
- The organ supply is essentially fixed, therefore, BTT VAD may be cost-effective
- Only if BTT VAD stabilizes the patient and is not simply an allocation tool