

Cost-effectiveness of Hypothermic Machine Preservation versus Static Cold Storage in Renal Transplantation

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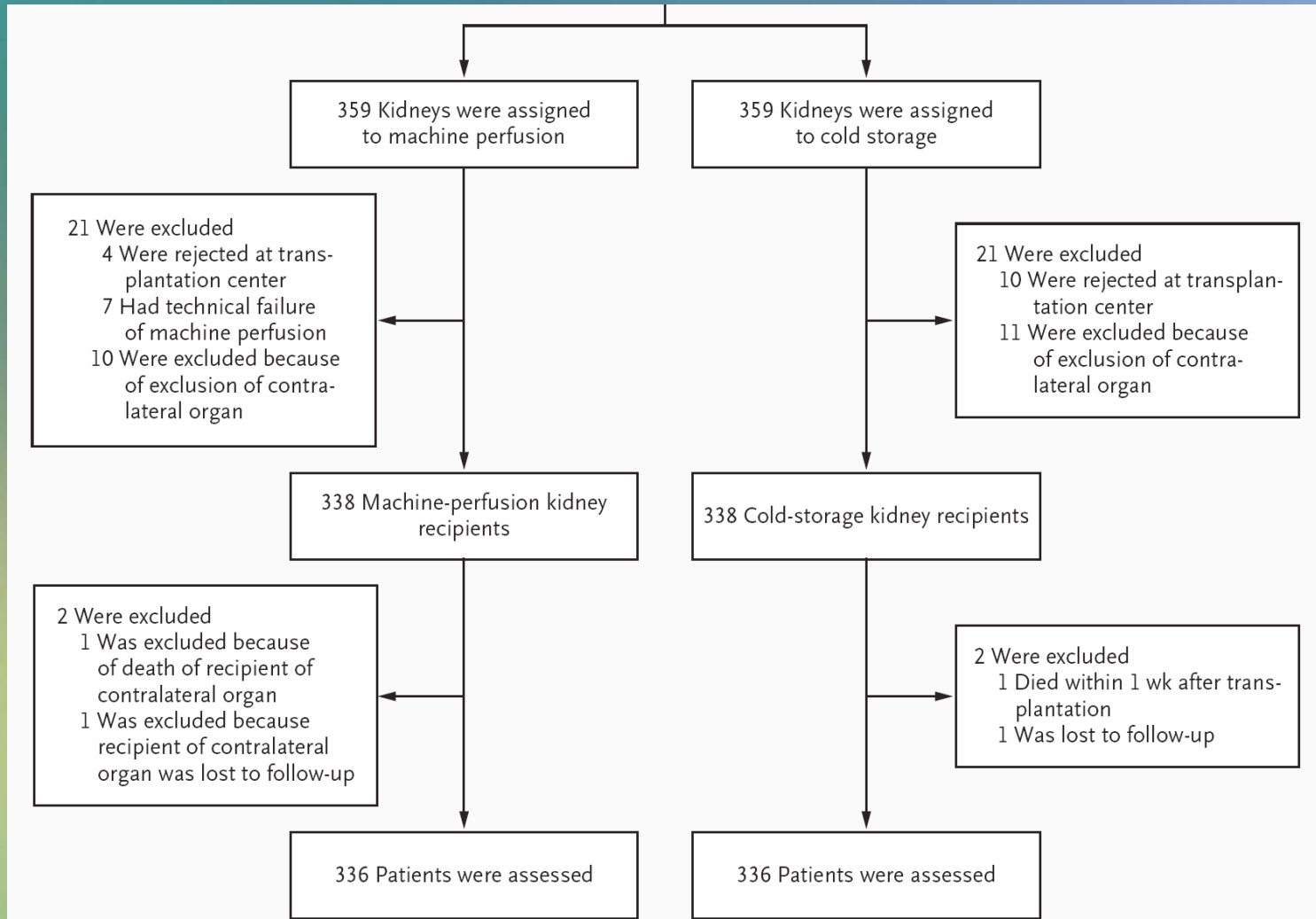
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Introduction

- Static cold storage (CS) most widely used preservation method for deceased donor kidneys
- Pulsatile Machine Perfusion (MP) shown to be superior in a recent multi-centre RCT (Moers et al., N Engl J Med, 2009)
- Economic evaluation of short-term and long-term cost-effectiveness
- Healthy grafts after one year and costs per life-year and QALY gained as outcomes

Patients and Methods



Patients and methods

LifePort® Kidney Transporter (Organ Recovery Systems, Inc.)



Patients and methods

Short-term economic evaluation

- Cost-effectiveness analysis with one year graft survival as primary outcome
- Hospital perspective
- Direct medical costs
- Time-horizon: 1 year
- RCT data supplemented with expert opinions
- Cost level: 2007

Patients and methods

Long-term economic evaluation

- Markov chain model with 1-year cycles
- Survival and quality of life as primary outcomes
- Time-horizon: 10 years
- Discounting of future costs and effects
- Data from RCT and literature

Patients and methods

Economic evaluation: unit costs

- Hemodialysis per day* € 465
- Peritoneal dialysis per day € 109
- Renogram € 218
- Renal ultrasound € 62
- Renal biopsy (Pathology excl) € 280
- Graft removal (nephrectomy) € 1,464
- Hospital admission per day € 505

*Merkus et al., NDT 1999, De Wit et al., HealthPolicy 1998

Patients and methods

Economic evaluation: preservation costs

- LifePort annual depreciation € 2,880
- Tx per year (2006, NL) 360
- Machine number (NL) 12
- Costs per Tx € 96
- Preservation fluids per kidney € 635
- Transport costs € 111
- Total costs per transplant € 842

Cold Storage

- CS preservation per kidney (1L) € 167
(50% UW and 50% THK)

Patients and methods

Economic evaluation: imputation

- Default regime: 3 times hemodialysis/week
- In case of PNF: replacement of missing values until 1 year or death of patient
- In case of non-PNF: replacement of missing values between graft survival and 1 year or death of patient
- Hospital readmission: missing values set to zero

Patients and methods

Model assumptions

Graft failure MP	0.071 / 0.065
Graft failure CS	0.076 / 0.077
Death from failure	0.15
Re-Tx after failure	0.30
Re-Tx failure (relative to initial)	1.85
QALY after (Re-)Tx*	0.90
QALY after failure*	0.66

* De Wit et al. 1998

Patients and methods

- Sensitivity analyses

Short-term model:

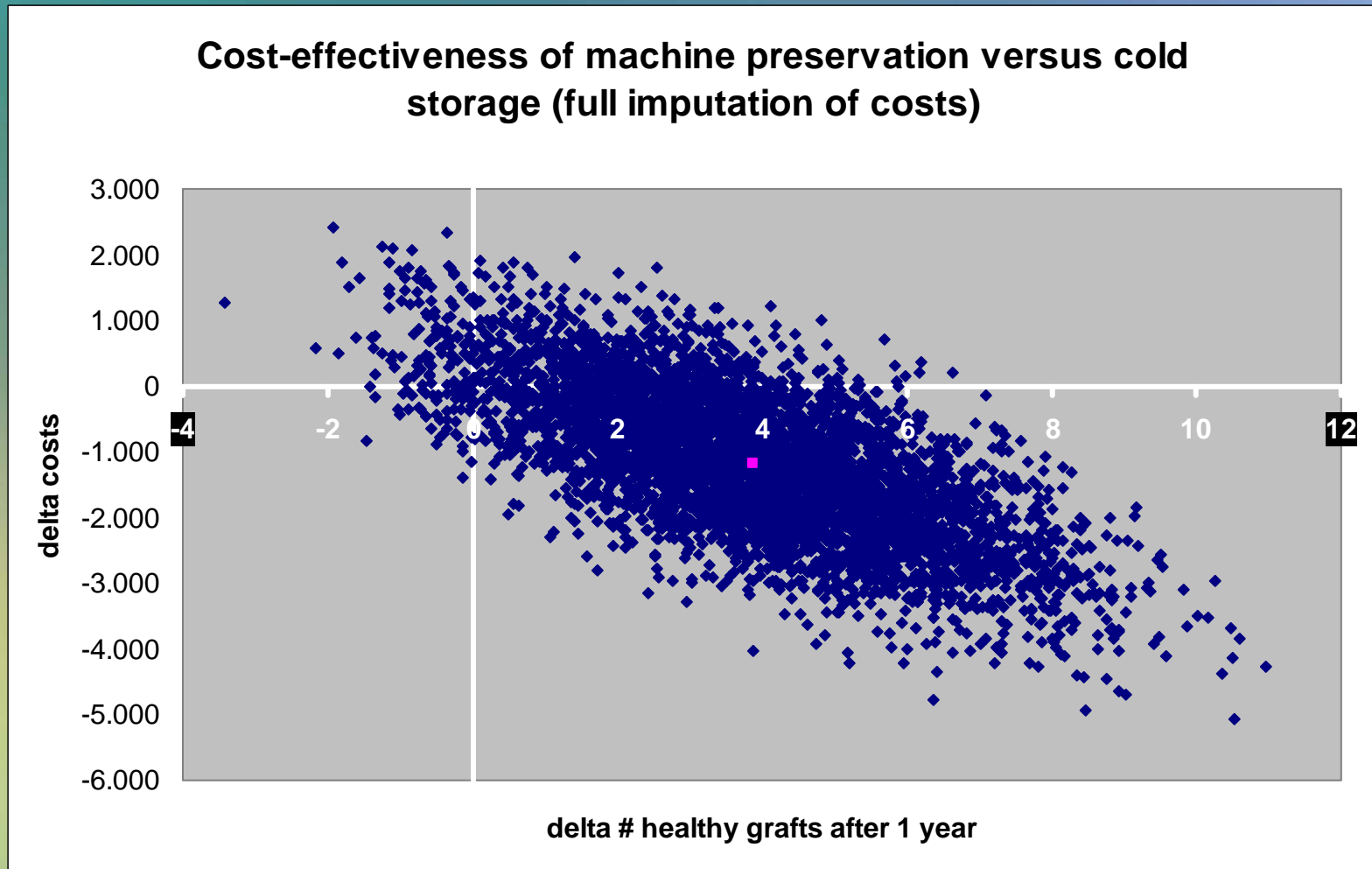
- bootstrap replication (n=5000)*

Long-term model:

- international cost data
- discount rates and time horizons
- equipment costs

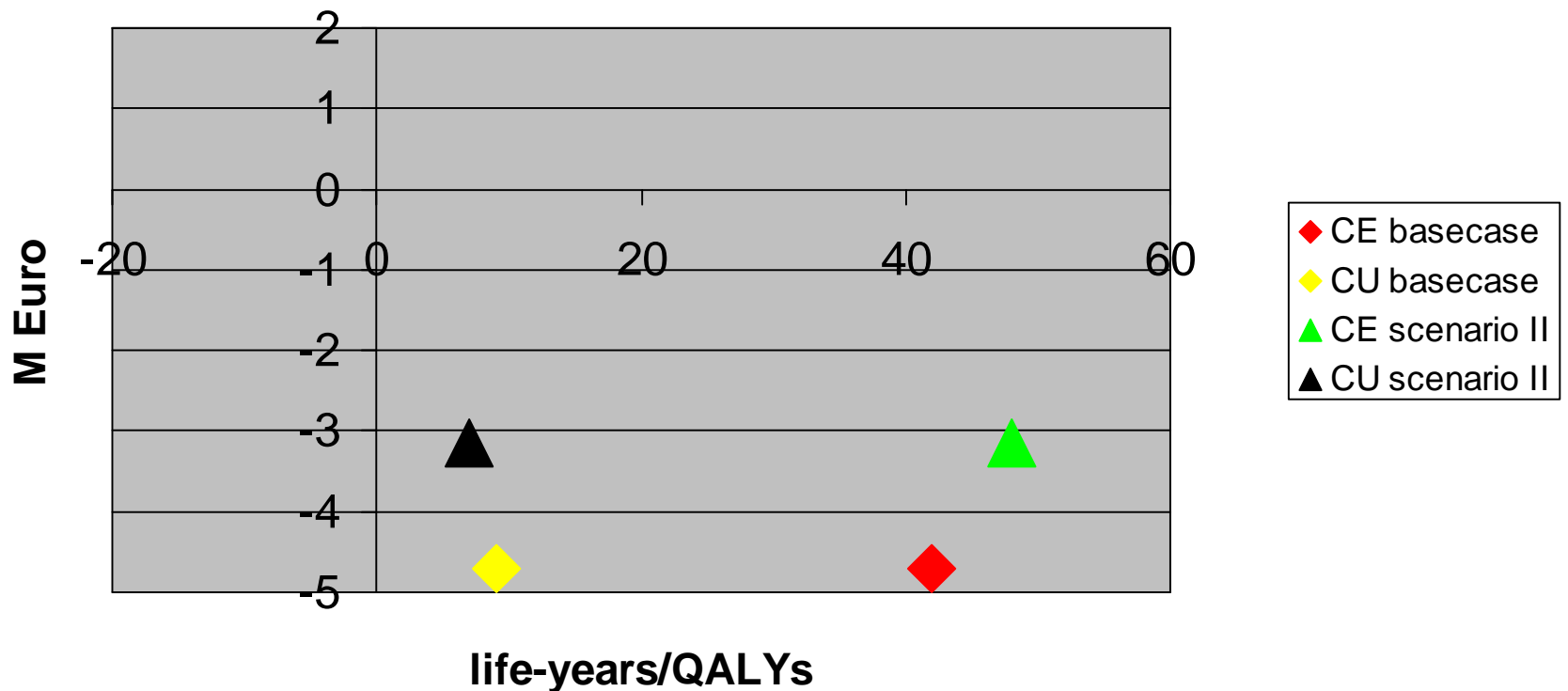
* Briggs et al. Health Econ 1997

Results – short term evaluation



Results – long-term evaluation

Model cost-effectiveness and cost-utility



Conclusion

- MP is cost-effective compared to CS
- Short and long term (10 years)
- Lower costs
- Better outcome
- Largely insensitive to national cost differences and discount rates

Machine Preservation Trial

MP vs. CS in Kidney Transplantation in collaboration with Eurotransplant

Scientific Steering Committee



Rutger J Ploeg - Coordinating PI

Cyril Moers - Secretary

Hugo Maathuis - RPC Liaison

Jaap Homan v/d Heide - Member

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UMCG – Dept. of Epidemiology



Erik Buskens – Head of Dept.

Henk Groen – Senior Epidemiologist

Trial Sponsor



David Kravitz - CEO



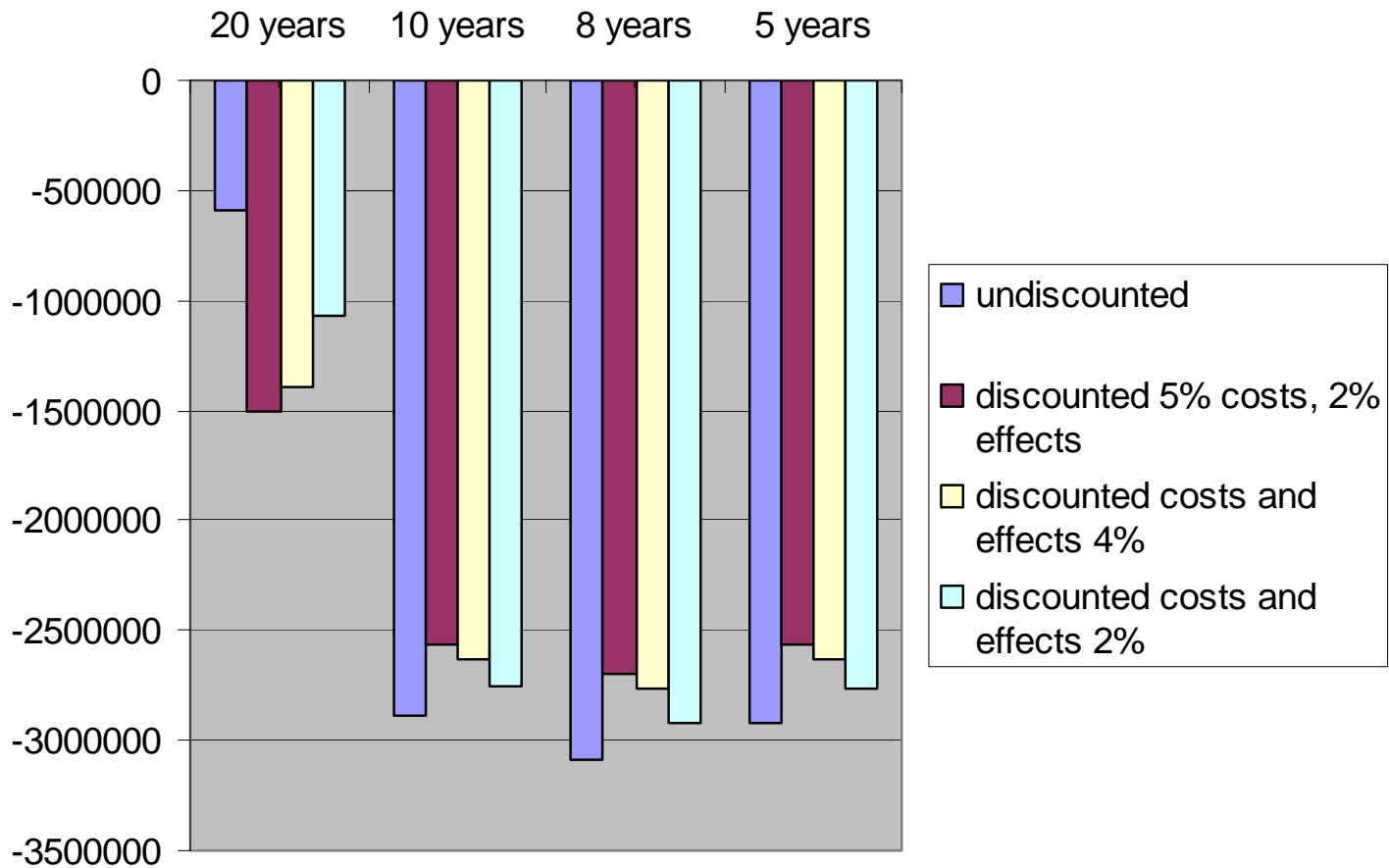
Luanne Rodgers - Director Marketing & Sales

Peter de Muylder - Director Perfusion Services

Machine Preservation Trial

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Incremental costs by time horizon and discount rate



Incremental lifeyears by time horizon and discount rate

