Value of The Watch List From Hospital Perspective And How It Will Be Used?

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Dept of Epidemiology & Biostatistics
DISCLOSURE

LHSC (UH-VH) $1.1 Billion
ST Joseph’s London $480 M

No Industries
Conflict of Interests
## CNESH TOP 10 WATCH LIST

<table>
<thead>
<tr>
<th>Device/Drug</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antimicrobial copper surfaces</strong></td>
<td>to reduce hospital acquired infections in intensive care settings</td>
</tr>
<tr>
<td><strong>Ex-vivo lung perfusion device</strong></td>
<td>to preserve and assess donor lungs prior to transplant</td>
</tr>
<tr>
<td><strong>Ipilimumab</strong></td>
<td>for unresectable or metastatic melanoma</td>
</tr>
<tr>
<td><strong>Mitral valve clip</strong></td>
<td>for degenerative mitral regurgitation</td>
</tr>
<tr>
<td><strong>Obinutuzumab</strong> (plus chlorambucil)</td>
<td>for newly diagnosed chronic lymphocytic leukemia</td>
</tr>
<tr>
<td><strong>Remote ischemic conditioning (RIC) device</strong></td>
<td>to prevent cardiac ischemia and infarction in patients undergoing cardiac surgery</td>
</tr>
<tr>
<td><strong>Retinal Prosthesis implant</strong></td>
<td>to improve vision in patients with retinitis pigmentosa</td>
</tr>
<tr>
<td><strong>Self-expanding, drug coated, stent</strong></td>
<td>for the treatment of peripheral arterial disease</td>
</tr>
<tr>
<td><strong>Trastuzumab emtansine</strong></td>
<td>for HER2-positive metastatic breast cancer</td>
</tr>
<tr>
<td><strong>Tympanostomy tube insertion delivery system</strong></td>
<td>for children with chronic ear infections</td>
</tr>
</tbody>
</table>
"I don’t know what this is, but it’s new and improved, so it must be good!"
OBJECTIVES: VALUE - CNESH TOP 10 LIST

1. Clinical Implications (Outcomes)
2. Resource Implications (Costs)
3. SLEEPERs (social, legal, ethical, institutional, further research, etc.)
4. Is It a Game-Changer and Value (Outcomes and Costs) For Hospitals?
Antimicrobial Copper Surfaces To Reduce Hospital Acquired Infections ICU Settings
1. **Clinical Implications**

- HAIs major morbidity, mortality and costs in hospitals (e.g. ICU settings)
- RCT Copper alloy surfaces in ICUs lower incidence of HAI and/or colonization with MRSA or VRE
- But no difference in mortality rate
- QoL unknown but possible
Copper Surfaces Reduce the Rate of Healthcare-Acquired Infections in the Intensive Care Unit

Cassandra D. Salgado, MD; Kent A. Sepkowitz, MD; Joseph F. John, MD; J. Robert Cantey, MD

<table>
<thead>
<tr>
<th></th>
<th>Copper (n = 294)</th>
<th>Noncopper (n = 320)</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary outcome: new HAI or colonization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No HAI or colonization</td>
<td>273 (92.86)</td>
<td>279 (87.19)</td>
<td>552 (89.90)</td>
<td>.020</td>
</tr>
<tr>
<td>HAI and/or colonization</td>
<td>21 (7.14)</td>
<td>41 (12.81)</td>
<td>62 (10.10)</td>
<td></td>
</tr>
<tr>
<td><strong>Secondary outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HAI only</td>
<td>10 (3.40)</td>
<td>26 (8.12)</td>
<td>36 (5.86)</td>
<td>.013</td>
</tr>
<tr>
<td>Colonization only</td>
<td>4 (1.36)</td>
<td>12 (3.75)</td>
<td>16 (2.61)</td>
<td>.063</td>
</tr>
<tr>
<td><strong>ICU length of stay</strong></td>
<td></td>
<td></td>
<td></td>
<td>.96</td>
</tr>
<tr>
<td>0–2 days</td>
<td>72 (24.49)</td>
<td>73 (22.81)</td>
<td>145 (23.62)</td>
<td></td>
</tr>
<tr>
<td>3–4 days</td>
<td>95 (32.31)</td>
<td>108 (33.75)</td>
<td>203 (33.06)</td>
<td></td>
</tr>
<tr>
<td>5–7 days</td>
<td>63 (21.43)</td>
<td>69 (21.56)</td>
<td>132 (21.50)</td>
<td></td>
</tr>
<tr>
<td>&gt;7 days</td>
<td>64 (21.77)</td>
<td>70 (21.88)</td>
<td>134 (21.82)</td>
<td></td>
</tr>
<tr>
<td>Died in ICU</td>
<td>42 (14.29)</td>
<td>50 (15.63)</td>
<td>92 (14.98)</td>
<td>.64</td>
</tr>
</tbody>
</table>
Antimicrobial Copper Surfaces

2. Resource Implications

– Copper objects effective in reducing microbial burden (bedrails, call buttons, IV poles, Chair arms) but not on tray tables or monitors.

– Significant upfront capital costs (implementing into new equipment purchased will be lesser cost than retrofitting existing surfaces.

– No evidence/study on cost-benefits
Antimicrobial Copper Surfaces

3. **SLEEPERs**
   - Social, legal, ethical, institutional: Likely favourable

4. **Game-Changer and Value For Hospitals?**
   - Likely Not, Maybe, **Likely Yes**
   - All in-patients
Ex-vivo Lung Perfusion Device
1. **Clinical Implications**

   - Lung Tx major morbidity/mortality: primary graft dysfunction grade 3 (PGD3) – ischemia and reperfusion injury
   - Blood-based perfusate and replenishing O2, nutrients and hormones with continuous monitoring of organ versus standard cold storage preservation
   - Preliminary INSPIRE RCT trial Organ Care System (OCS): lower PGD3 post Tx but not 6 m survival yet
   - XVIVO (TGH) with Steen solution: 2 studies
2. Resource Implications

– Great resource saving potential if early and chronic graft dysfunction is lowered
– Capital costs of device and solutions
Ex-vivo Lung Perfusion Device

3. SLEEPERs
   – Social, legal, ethical, institutional: Likely favourable

4. Game-Changer and Value For Hospitals?
   – Likely Not, Maybe, Likely Yes
   – Lung Tx population only
Mitral Valve Clip For Degenerative Mitral Regurgitation
Mitral Valve Clip

1. **Clinical Implications**

   – Transcatheter mitral valve repair than open repair
   – Non-inferiority of the MitraClip as a treatment option for severe, symptomatic MR in comparison to conventional valvular surgery
   – Evidence suggests safety but less effective at reducing FMR than conventional surgery
   – 30d procedure related mortality 7.7% in MitraClip and 8.3% in Control
   – QoL unknown
MitraClip® Device: EVEREST II High Risk Study (HRS)
A meta-analysis of MitraClip system versus surgery for treatment of severe mitral regurgitation

Benjamin Wan¹, Mohammad Rahnavardi¹, David H. Tian¹, Kevin Phan¹,², Stine Munkholm-Larsen¹,³, Paul G. Bannon¹,², Tristan D. Yan¹,²

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>MitraClip Events</th>
<th>Total</th>
<th>Surgery Events</th>
<th>Total</th>
<th>Weight</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conradi</td>
<td>14</td>
<td>95</td>
<td>1</td>
<td>76</td>
<td>49.2%</td>
<td>12.96 [1.66, 100.99]</td>
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</tr>
<tr>
<td>Feldman</td>
<td>41</td>
<td>178</td>
<td>0</td>
<td>80</td>
<td>26.4%</td>
<td>48.59 [2.95, 800.68]</td>
<td></td>
</tr>
<tr>
<td>Paranskaya</td>
<td>0</td>
<td>24</td>
<td>0</td>
<td>26</td>
<td></td>
<td>Not estimable</td>
<td></td>
</tr>
<tr>
<td>Taramasso</td>
<td>5</td>
<td>52</td>
<td>0</td>
<td>91</td>
<td>24.4%</td>
<td>21.19 [1.15, 391.39]</td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td></td>
<td>349</td>
<td>273</td>
<td>100.0%</td>
<td></td>
<td>20.72 [4.91, 87.44]</td>
<td></td>
</tr>
<tr>
<td>Total events</td>
<td>60</td>
<td></td>
<td>273</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity:</td>
<td>Tau² = 0.00;</td>
<td>Chi² = 0.62, df = 2 (P = 0.73); I² = 0%</td>
<td>Test for overall effect: Z = 4.13 (P &lt; 0.0001)</td>
<td></td>
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</tr>
</tbody>
</table>

Residual MR >2

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>MitraClip Events</th>
<th>Total</th>
<th>Surgery Events</th>
<th>Total</th>
<th>Weight</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
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</thead>
<tbody>
<tr>
<td>Feldman</td>
<td>11</td>
<td>181</td>
<td>5</td>
<td>89</td>
<td>46.5%</td>
<td>1.09 [0.37, 3.23]</td>
<td></td>
</tr>
<tr>
<td>Paranskaya</td>
<td>2</td>
<td>24</td>
<td>0</td>
<td>26</td>
<td>5.8%</td>
<td>5.89 [0.27, 129.15]</td>
<td></td>
</tr>
<tr>
<td>Taramasso</td>
<td>6</td>
<td>52</td>
<td>10</td>
<td>91</td>
<td>47.7%</td>
<td>1.06 [0.36, 3.10]</td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td></td>
<td>257</td>
<td>206</td>
<td>100.0%</td>
<td></td>
<td>1.18 [0.56, 2.48]</td>
<td></td>
</tr>
<tr>
<td>Total events</td>
<td>19</td>
<td></td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity:</td>
<td>Tau² = 0.00;</td>
<td>Chi² = 1.11, df = 2 (P = 0.57); I² = 0%</td>
<td>Test for overall effect: Z = 0.44 (P = 0.66)</td>
<td></td>
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</tr>
</tbody>
</table>

12-M Mortality
2. Resource Implications

– Transcatheter MICS (capital, realign infrastructure cost, learning curve)

– Not yet evidence to replace gold standard open MV Repair or Mini-Mitral repair

– Potentially increase cost to implant device in medically managed severe MR patients in hospital

– Need large RCT and long term follow up trials
3. **SLEEPERs**

   - ethical, institutional: Maybe (less effective, FMR treatment debatable)

4. **Game-Changer and Value For Hospitals?**

   - Likely Not, **Maybe**, Likely Yes
   - Subset of severe MR patients (not surgical candidate)
Remote Ischemic Conditioning (RIC) Device To Prevent Ischemia/Reperfusion Injury
Remote Ischemic Conditioning (RIC) Device To Prevent Ischemia/Reperfusion Injury

1. **Clinical Implications**

   – Ischemic preconditioning with repeated short occlusion of blood flow to limb induces endogenous humoral and neuronal mediators to prevent cell death.

   – Extensive studies in RCTs in CABG, PCI patients with positive clinical outcomes

   – QoL unknown but possible with lower MAACE
Cardioprotective and prognostic effects of remote ischaemic preconditioning in patients undergoing coronary artery bypass surgery: a single-centre randomised, double-blind, controlled trial

Matthias Thielmann, Eva Kottenberg, Petra Kleinbongard, Daniel Wendt, Nilgün Gedik, Susanne Pasa, Vivien Price, Konstantinos Tsagakis,

Lancet 2013; 382: 597-604

All Cause Mortality – Intent to Treat

All Cause Mortality – per protocol
Improved long-term clinical outcomes in patients with ST-elevation myocardial infarction undergoing remote ischaemic conditioning as an adjunct to primary percutaneous coronary intervention

Astrid D. Sloth, Michael R. Schmidt, Kim Munk, Rajesh K. Kharbanda

**Figure 2** Hazard ratio for the primary composite endpoint (major adverse cardiac and cerebrovascular events) and for the secondary endpoints (all-cause mortality, myocardial infarction, readmission for heart failure, and ischaemic stroke/transient ischaemic attack) in the follow-up period (per-protocol analysis).
Remote Ischemic Preconditioning Improves Outcome at 6 Years After Elective Percutaneous Coronary Intervention
The CRISP Stent Trial Long-term Follow-up

William R. Davies, PhD, MRCP; Adam J. Brown, MRCP; William Watson, MRCP;
Liam M. McCormick, MRCP; Nick E.J. West, MD, FRCP; David P. Dutka, MD, FRCP;
Stephen P. Hoole, MA, DM, MRCP

Clinical Trial Registration—URL: http://www.ukcrn.org.uk. Unique identifier: UKCRN 4074 (Circ Cardiovasc Interv 2013;6:246-251.)

All Cause Mortality
Remote Ischemic Conditioning (RIC) Device To Prevent Ischemia/Reperfusion Injury

2. Resource Implications

– Simple to perform before PCI or CABG
– Reduce MAACE likely reduce resource utilization
– Device low-priced
Remote Ischemic Conditioning (RIC) Device To Prevent Ischemia/Reperfusion Injury

3. **SLEEPERs**
   - Social, legal, ethical, institutional: Likely favorable

4. **Game-Changer and Value For Hospitals?**
   - Likely Not, Maybe, **Likely Yes**
   - Large population of CVS disease
Retinal Prosthesis Implant To Improve Vision In Patients With Retinitis Pigmentosa
1. **Clinical Implications**

- RP patients with genetic disorders characterized by progressive vision loss (peripheral, night, central)
- Improved vision in Motion detection, guidance of fine hand movement, ID letters and words, and spatial motor tasks and a door-finding test.
- 70% no serious adverse event. Most common SAE: conjunctival erosion, dehiscence over the extraocular implant.
- QoL improved (FLORA), independence
Retinal Prosthesis Implant

2. Resource Implications

– Capital costs of device and surgical implant (US$115,000, UK£75,000)
– A surgical program needs to be developed in hospital, i.e. institution costs
– Cost-savings in community (social and support care)
3. **SLEEPERs**

   – Social, legal, ethical, institutional: Likely favorable (specialty program)

4. **Game-Changer and Value For Hospitals?**

   – Likely Not, Maybe, **Likely Yes**
   – Limited to Retinitis Pigmentosa patients
Self-Expanding, Drug Coated, Stent For Treatment Of Peripheral Arterial Disease

Zilver® PTX®
DRUG-ELUTING PERIPHERAL STENT

NOW FDA APPROVED
1. **Clinical Implications**

- Zilver PTX stent for PVD (femoro-popliteal artery)
- No difference in all-cause death but significant higher Event-Free Survival (EFS) rate compared with BMS or angioplasty
- Reduce in-stent restenosis by 50% BMS and reduce surgical re-interventional rates
- EFS rate (Zilver PTX, PTA): 12m 90.4%, 82.6%; 24m 86.6%, 77.9%
- Patency similar to bypass graft surgery
Paclitaxel-Coated Versus Uncoated Balloon Angioplasty Reduces Target Lesion Revascularization in Patients With Femoropopliteal Arterial Disease: A Meta-Analysis of Randomized Trials
Salvatore Cassese, Robert A. Byrne, Ilka Ott, Gjin Ndrepepa, Mateja Nerad, Adnan Kastrati and Massimiliano Fusaro

_Circ Cardiovasc Interv._ 2012;5:582-589; originally published online July 31, 2012;

### Binary restenosis

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>PCB Events</th>
<th>PCB Total</th>
<th>UCB Events</th>
<th>UCB Total</th>
<th>Weight</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>THUNDER</td>
<td>7</td>
<td>41</td>
<td>21</td>
<td>48</td>
<td>38.8%</td>
<td>0.26 [0.10, 0.71]</td>
</tr>
<tr>
<td>FemPac</td>
<td>10</td>
<td>31</td>
<td>22</td>
<td>34</td>
<td>36.1%</td>
<td>0.26 [0.09, 0.73]</td>
</tr>
<tr>
<td>PACIFIER</td>
<td>4</td>
<td>40</td>
<td>12</td>
<td>39</td>
<td>25.1%</td>
<td>0.25 [0.07, 0.86]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>112</td>
<td>55</td>
<td>121</td>
<td>100.0%</td>
<td></td>
<td>0.26 [0.14, 0.48]</td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 0.00$; $\chi^2 = 0.01$, df = 2 (P = 1.00); $I^2 = 0\%$

Test for overall effect: $Z = 4.27$ (P < 0.00001)

Heterogeneity$_{(exact)}$: $\chi^2 = 0.004$, df = 2 (P = 0.99)

Test for overall effect$_{(exact)}$: P < 0.000001
2. **Resource Implications**

- Capital costs of drug stent (than BMS), incremental cost increase for percutaneous stent implant than transluminal angioplasty (similar infrastructure)
- Reduce costs for readmission care and intervention for in-stent restenosis
3. **SLEEPERs**
   - Social, legal, ethical, institutional: Likely favorable

4. **Game-Changer and Value For Hospitals?**
   - Likely Not, Maybe, **Likely Yes**
   - Most major above knee PVD patients
Ear Tympanostomy Tube Insertion Delivery System
1. **Clinical Implications**

- Anesthetic Solution: Lidocaine, epinephrine, Na Bicarbonate
- Average pain score for children after iontophoresis was 1.07 vs 1.19 (surgical anesthesia) on a 0-5 scale. The ear treatment was successful in 70 of 78 ears (89.7%).
2. Resource Implications

– Capital costs of delivery system
– Shifting hospital surgery to clinics procedure
3. **SLEEPERs**
   
   – Social, legal, ethical, institutional: Likely favorable

4. **Game-Changer and Value For Hospitals?**
   
   – Likely Not, Maybe, **Likely Yes**
   
   – Shifting high cost hospital procedure (pediatric) to out-patient or clinics
<table>
<thead>
<tr>
<th>TOP 10 WATCH LIST (DEVICES)</th>
<th>VALUE</th>
<th>CLIN IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimicrobial Copper Surface</td>
<td>Likely Yes</td>
<td>Hospital ICU, in-patients</td>
</tr>
<tr>
<td>Ex-Vivo Lung Perfusion-Ventilation Device</td>
<td>Likely Yes</td>
<td>Limited Lung Tx</td>
</tr>
<tr>
<td>Mitral Valve Clip</td>
<td>Maybe</td>
<td>Subset FMR pt</td>
</tr>
<tr>
<td>Remote Ischemic Conditioning Device</td>
<td>Likely Yes</td>
<td>CVS pts</td>
</tr>
<tr>
<td>Retinal Prosthesis Implant</td>
<td>Likely Yes</td>
<td>Retinitis Pigmentosa</td>
</tr>
<tr>
<td>Self-Expanding, Drug Coated PVD Stent</td>
<td>Likely Yes</td>
<td>PVD pts</td>
</tr>
<tr>
<td>Tympanostomy Tube Insertion and Anesthetic Delivery System</td>
<td>Likely Yes</td>
<td>Ped ENT Procedure</td>
</tr>
</tbody>
</table>