Joint NVT - BACTS Meeting 2019

Report of the Database Committee
DBC Activities 2019

- Several meetings on:
  - Development of the “New BACTS Registry”
  - Update of the BACTS FileMaker Pro application
  - Power BI project 2019
  - Outcome project 2019
    - 12 participating centers
    - 6727 pt. (Jan-Dec 2018)

- Evening Symposium (Sept 10th, 2019)
  - New Registry & Power BI project
New BACTS Registry

http://new.bactsregistry.org
What is Power BI?

Power BI is a business analytics solution that lets you visualize your data and share insights across your organization, or embed them in your app or website. Connect to hundreds of data sources and bring your data to life with live dashboards and reports.

WATCH OVERVIEW  WATCH DEMO
BACTS Data flow

- Centra
- BACTS Registry
- FM Pro
- Quip
- Outcome
- Minimal data-set
- EACTS-QUIP
- Power BI

“Real Time”

Quarterly
BACTS Outcome Project 2019

• **12 participating centers**
  - AZ St.Jan, Brugge
  - CHU Tivoli, La Louvière
  - Imelda ZH, Bonheiden
  - Maria Middelares ZH, Gent
  - Middelheim ZH, Antwerpen
  - OLV-ZH, Aalst
  - Stedelijk ZH, Aalst
  - UCL
  - UZ Antwerpen
  - UZ Gent
  - UZ Leuven
  - ZOL, Genk

• **6727 patients** (operated on between January and December 2018)
1. Demographics

- **Age:** mean 67.7 ± 13.4 y (min 16 - max 95)

- **Gender:**
  - Male 68%
  - Female 32%

- **Preop. parameters:**
1. Demographics

- **Operative parameters:**
  - Type of procedure

<table>
<thead>
<tr>
<th>Type of Procedure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABG alone</td>
<td>42%</td>
</tr>
<tr>
<td>CABG &amp; valve</td>
<td>11%</td>
</tr>
<tr>
<td>CABG &amp; other</td>
<td>11%</td>
</tr>
<tr>
<td>Valve alone</td>
<td>2%</td>
</tr>
<tr>
<td>Valve &amp; other</td>
<td>1%</td>
</tr>
<tr>
<td>CABG &amp; valve &amp; Other</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>27%</td>
</tr>
</tbody>
</table>
1. Demographics

- **Operative parameters:**

  - **Other Cardiac**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left ventricular aneurysm repair</td>
<td>10</td>
</tr>
<tr>
<td>Ventricular septal defect</td>
<td>3</td>
</tr>
<tr>
<td>Atrial septal defect</td>
<td>54</td>
</tr>
<tr>
<td>Batista</td>
<td>0</td>
</tr>
<tr>
<td>Surgical Ventricular Restoration</td>
<td>1</td>
</tr>
<tr>
<td>Congenital</td>
<td>38</td>
</tr>
<tr>
<td>Transmyocardial laser revascularisation</td>
<td>0</td>
</tr>
<tr>
<td>Cardiac trauma</td>
<td>4</td>
</tr>
<tr>
<td>Cardiac transplant</td>
<td>32</td>
</tr>
<tr>
<td>Permanent pacemaker</td>
<td>160</td>
</tr>
<tr>
<td>AICD</td>
<td>2</td>
</tr>
<tr>
<td>Epicardial lead</td>
<td>31</td>
</tr>
<tr>
<td>AF Ablation surgery</td>
<td>264</td>
</tr>
<tr>
<td>Surgical Maze</td>
<td>28</td>
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<tr>
<td>Septal Myectomy</td>
<td>44</td>
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<tr>
<td>Cardiac tumor</td>
<td>29</td>
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<tr>
<td>Acute pulmonary embolectomy</td>
<td>5</td>
</tr>
<tr>
<td>Pulmonary endarterectomy</td>
<td>19</td>
</tr>
<tr>
<td>Pulmonary transplant</td>
<td>0</td>
</tr>
<tr>
<td>Ventricular septal rupture (post-infarction VSD)</td>
<td>5</td>
</tr>
<tr>
<td>Free wall rupture (post-infarction)</td>
<td>4</td>
</tr>
<tr>
<td>BIVAD</td>
<td>1</td>
</tr>
<tr>
<td>LVAD</td>
<td>21</td>
</tr>
<tr>
<td>RVAD</td>
<td>3</td>
</tr>
<tr>
<td>ECMM</td>
<td>33</td>
</tr>
<tr>
<td>ECMO</td>
<td>48</td>
</tr>
<tr>
<td>ECLS</td>
<td>19</td>
</tr>
<tr>
<td>Pericardiectomy</td>
<td></td>
</tr>
</tbody>
</table>
1. Demographics

- Operative parameters:
  - Other Cardiac
  - Other Non-Cardiac

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1. Demographics

- Operative parameters:
  - Other Cardiac
  - Other Non-Cardiac
  - Cardioprotection

- Cardioplegia: 92%
- Non-Cardioplegia: 8%
- Blood: 49%
- Crystalloid: 51%
1. Demographics

- **Operative parameters:**
  - Other Cardiac
  - Other Non-Cardiac
  - Cardioprotection
  - IABP
    - Pre-operatively 43 (0,9%)
    - Intra-operatively 38 (0,8%)
    - Post-operatively 16 (0,3%)
1. Demographics

• Postop. Parameters / Outcome:

  • Reoperation: **5.9%**
    - Reoperation for graft problems 0.3%
    - Reoperation for valve problems 0.1%
    - Reoperation for bleeding / tamponade **4.3%**
    - Sternal resuturing for any reason 0.3%
    - Reoperation for other cardiac problems 0.9%

  • Stroke:  - Transient 41 (0.6%)
              - Permanent 62 (1.0%)  **1.6%**

  • Dialysis: **2.5%**

  • Deep sternal wound infection/mediastinitis: **0.4%**
1. Demographics

**Postop. Parameters / Outcome:**

- **LOS:** mean 11.7 ± 17.7 days - median 8 days
- **In-hospital mortality:** 3.7%
- **EuroSCORE II:** mean 3.83 ± 7.03

Group ES II
- 0-4: 78.5%
- 4-10: 13.6%
- >10: 7.8%
2. Isolated CABG (n=2844/6727, 42%)

- Demographics

- Mean EuroSCORE 2.35 ± 5.02
2. Isolated CABG (n=2844)

- **Risk Factors**

- Hyperchol: 84%
- Hypertension: 76%
- Diabetes: 58%
- Ex Smoker: 30%
- Obesitas: 39%
- Active smoking: 27%

Comparison with all patients:

- Hyperchol: 59%
- Hypertension: 58%
- Diabetes: 30%
- Ex Smoker: 19%
- Obesitas: 30%
- Active smoking: 21%
2. Isolated CABG (n=2844)

- Risk Factors
- Operative Urgency

- Elective: 65.3%
- Urgent: 30.7%
- Emergency: 3.4%
- Salvage: 0.6%
2. Isolated CABG (n=2844)

- Risk Factors
- Operative Urgency
- Grafts used
  - Nº of anastomoses: 3.24 ± 1.19
    (60% arterial)
  - Total arterial revasc.: 
    - Overall: 29%
    - <66y: 41%

![Arterial grafts chart]

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2. Isolated CABG (n=2844)

- Risk Factors
- Operative Urgency
- Grafts used

- **CABG ⇔ OPCAB ⇔ MIDCAB**
  - Conversion: n=14 (0,5%)
2. Isolated CABG (n=2844)

- **Length of Stay:** median 7d

- **Morbidity:**
  - Stroke: 1,0 % (50% TIA)
  - Sternitis: 0,5% (BIMA in 7/10)
  - Dialysis: 1,2%
  - Reop.: ⇒ graft problems 0,3%
  - ⇒ Bleeding/tamponade 1,7%

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Table 2. Percentage and Number of Endpoint Events by Model Population in Development Sample

<table>
<thead>
<tr>
<th>Endpoint Events</th>
<th>All (n = 670,830)</th>
<th>CABG (n = 439,092)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative mortality</td>
<td>2.9%</td>
<td>2.4%</td>
</tr>
<tr>
<td></td>
<td>16,792/569,998</td>
<td>8,552/320,583</td>
</tr>
<tr>
<td>Stroke</td>
<td>1.5%</td>
<td>1.3%</td>
</tr>
<tr>
<td></td>
<td>9,866/669,561</td>
<td>5,023/420,385</td>
</tr>
<tr>
<td>Renal failure</td>
<td>2.7%</td>
<td>2.2%</td>
</tr>
<tr>
<td></td>
<td>17,202/648,808</td>
<td>9,881/424,888</td>
</tr>
<tr>
<td>Prolonged ventilation</td>
<td>10.9%</td>
<td>9.3%</td>
</tr>
<tr>
<td></td>
<td>72,984/670,830</td>
<td>40,974/439,092</td>
</tr>
<tr>
<td>Reoperation</td>
<td>3.1%</td>
<td>2.4%</td>
</tr>
<tr>
<td></td>
<td>20,872/670,778</td>
<td>10,327/439,060</td>
</tr>
<tr>
<td>Composite morbidity and mortality</td>
<td>17.4%</td>
<td>15.0%</td>
</tr>
<tr>
<td></td>
<td>101,180/581,976</td>
<td>56,984/380,491</td>
</tr>
<tr>
<td>Prolonged PLOS</td>
<td>6.6%</td>
<td>5.0%</td>
</tr>
<tr>
<td></td>
<td>44,533/670,428</td>
<td>22,091/438,867</td>
</tr>
<tr>
<td>Short PLOS</td>
<td>42.7%</td>
<td>48.3%</td>
</tr>
<tr>
<td></td>
<td>286,362/670,428</td>
<td>211,820/438,867</td>
</tr>
<tr>
<td>DSWI</td>
<td>0.3%</td>
<td>0.3%</td>
</tr>
<tr>
<td></td>
<td>1,875/669,392</td>
<td>1,346/438,270</td>
</tr>
</tbody>
</table>

CABG = coronary artery bypass grafting surgery; DSWI = mediastinitis/deep sternal wound infection; PLOS = postoperative length of stay.
2. Isolated CABG

- Hospital Mortality

\( \Rightarrow \text{All CABG: 1,23\%} \)

(EuroSCORE II: 2,3%)
2. Isolated CABG

- **Hospital Mortality**
  
  ➞ **All CABG**: 1.23 %  
  (EuroSCORE II: 2.3%)
  
  ➞ **Elective CABG**: 0.6 %  
  (EuroSCORE II: 1.5%)

![Graph showing observed and predicted mortality for Elective isolated CABG](image)
### 3. AV surgery (n=2341/6727, 35 %)

<table>
<thead>
<tr>
<th>All AV</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1017</td>
</tr>
<tr>
<td>A+M</td>
<td>116</td>
</tr>
<tr>
<td>A+T</td>
<td>13</td>
</tr>
<tr>
<td>A+M+T</td>
<td>51</td>
</tr>
<tr>
<td>A+cor</td>
<td>486</td>
</tr>
<tr>
<td>A+M+cor</td>
<td>48</td>
</tr>
<tr>
<td>A+T+cor</td>
<td>5</td>
</tr>
<tr>
<td>A+M+T+cor</td>
<td>13</td>
</tr>
<tr>
<td>A+other</td>
<td>592</td>
</tr>
</tbody>
</table>

- Isolated Av-Replacement : n= 879
- Isolated Av-Repair       : n= 21
- Redo’s Av                : n= 117
3a. Isolated Av Replacement (n=879/6727, 13%)

- **Demographics**

- **Type of prosthesis**

- **Approach**

(268/879 entries for access)
3a. Isolated Av Replacement (n=879/6727, 13%)

- **Morbidity**
  - 1 ECMO, no aortic dissections
  - Stroke: 1,5% (n=13). TIA (n=6)
  - Wound: 1 mediastinitis
  - Dialysis: 1% (n=9)
  - Reop.: ⇒ Bleeding/tamponade 2,5% (n=22)

- **Mortality**
  - In-hospital: **1,1%**
  - EuroSCORE II: **2,0%**
3a. Isolated Av Replacement

> 80 y (n=243, 28% of all isolated Av Replace)

- **Morbidity**
  - Stroke: 2.9% (n=7); 1 TIA
  - Dialysis: n=0
  - Reoperation for bleeding: n=2 (0.8%)

- **Mortality**
  - In-hospital **1.6%**
  - EuroSCORE II: **2.5%**
3a. Isolated Av Replace

In High Risk patients (ES II >4%, n=84)

- Mean EuroSCORE II $8.8\% \pm 6.08 (4.0\% - 29.3\%)

- Mortality
  - In-hospital $4.8\%$
  - Predicted (EuroSCORE II): $8.3\%$
3b. Av Repair (n=157, including all David/Yacoub procedures)

- **Demographics:**
  - Mean EuroSCORE: 4.11%

- **Type of repair:**
  - Repair with ring: 6%
  - Repair without ring: 74%
  - Unknown: 20%
  - Isolated valve repair (no aortic segment): 34%
  - Valve sparing root (with or without concomitant other aortic segment): 51%
  - Valve repair with Asc. Ao replacement (or more aortic segments): 15%
### 3b. Av Repair (n=157)

**Type of procedure**

<table>
<thead>
<tr>
<th>All AV-repair</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>AvP</td>
<td>21</td>
</tr>
<tr>
<td>AvP+M</td>
<td>6</td>
</tr>
<tr>
<td>AvP+T</td>
<td>1</td>
</tr>
<tr>
<td>AvP+M+T</td>
<td>3</td>
</tr>
<tr>
<td>AvP+cor</td>
<td>21</td>
</tr>
<tr>
<td>AvP+M+cor</td>
<td>5</td>
</tr>
<tr>
<td>AvP+T+cor</td>
<td>0</td>
</tr>
<tr>
<td>AvP+M+T+cor</td>
<td>3</td>
</tr>
<tr>
<td>AvP+other</td>
<td>97</td>
</tr>
</tbody>
</table>

- Redo surgery: 10/157 – 6.3%
- Acute dissection: 9/157 – 5.7%
- Acute endocarditis: 3/157 – 1.9%

+ Aorta : n=75
3b. Av Repair (n=157)

- **Outcome**
  
  - Discharge TTE

- **Isolated Av-repair + Isolated David/Yacoub (n=41)**
  
  - Morbidity:
    - Stroke: n=1
    - Dialysis: n=0
    - Reop f/ bleeding: n=2

  - Mortality: n=0
4. Aorta (n=554)

- **Demographics**

- **Pathology**

  - Aneurysm: 474 (86%)
  - Acute Dissection: 80 (14%)
4. Aorta (n=554)

- **Type of procedure**

  - Root + Ascendens + Arch n= 18 - 3%
  - Root + Ascendens n= 153 - 28%
  - Ascendens n= 226 - 41%
  - Root n= 88 - 16%
  - Ascendens + Arch n= 33 - 6%
  - Arch n= 16 - 3%
  - Descendens n= 6 - 1%
  - Abdominal Aorta
  - Asc + Arch + Desc n= 5 - 0,9%
  - Arch + Desc n= 1 - 0,2%
  - Arch + Desc + Abdom n= 1 - 0,2%
  - Descendens + Abdominal Ao n= 7 - 1,3%
  - Arch + Desc n= 1 - 0,2%

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4. Aorta (n=554)

- **Type of procedure**

- Root surgery (n=259):
  - Bentall/Freestyle 54%
  - David/Yacoub 33%
  - Ross 11%
  - Patch/sinus repair 2%
4. Aorta (n=554)

- **Outcome**
  - **Morbidity**
    - Stroke: n=17 - 3,1% (TIA 10, CVA 7)
    - Dialysis: n=16 - 2,9%
    - Reoperation for bleeding: n=42 - 7,6%
4. Aorta (n=554)

- **Outcome**
  - Morbidity
  - Mortality  • In-hospital **5.4%**
5. Mitral valve (n=1344, 20%)

- Repair vs replacement

- Type of prosthesis according to age

<table>
<thead>
<tr>
<th>Age</th>
<th>Mechanical</th>
<th>Biological</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>26%</td>
<td>74%</td>
</tr>
<tr>
<td>50-60</td>
<td>30%</td>
<td>70%</td>
</tr>
<tr>
<td>61-70</td>
<td>76%</td>
<td>24%</td>
</tr>
<tr>
<td>&gt;70</td>
<td>97%</td>
<td>3%</td>
</tr>
</tbody>
</table>

- Repair: 68%
- Replacement: 32%

- With ring: 96%
- Without ring: 4%
5. Mitral valve (n=1344, 20%)

- **Repair vs replacement (% of repair)**

![Bar chart showing repair vs replacement for different types of mitral valve conditions.](chart)

- Degenerative: Repair 71%
- Acute Endocarditis: Repair 28%
- Rheumatic: Repair 7%
- Ischaemic: Repair 91%
- Functional: Repair 93%
5. Mitral valve (n=1344, 20%)

- **Type of procedure**
  - Concom. Tri-rep: 26%
  - Concom. Ablation: 14.7%
  - Isolated MV (n=464)

- **Approach (n=154)**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>n</th>
<th>n + ablation</th>
</tr>
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<tbody>
<tr>
<td>M</td>
<td>464</td>
<td>89</td>
</tr>
<tr>
<td>M+T</td>
<td>152</td>
<td>63</td>
</tr>
<tr>
<td>M+A</td>
<td>120</td>
<td>8</td>
</tr>
<tr>
<td>M+T+A</td>
<td>56</td>
<td>6</td>
</tr>
<tr>
<td>M+cor</td>
<td>173</td>
<td>17</td>
</tr>
<tr>
<td>M+T+cor</td>
<td>38</td>
<td>10</td>
</tr>
<tr>
<td>M+A+cor</td>
<td>50</td>
<td>2</td>
</tr>
<tr>
<td>M+T+A+cor</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>M+other</td>
<td>76</td>
<td>1</td>
</tr>
</tbody>
</table>

M ± T ± ablation
n=768, 57%

Demographics

- Age: 66, 68, 52, 68
- % Male: 37, 63, 37, 63

\[= 14.7\%\]
5. Mitral valve (n=1344, 20%)

- **Outcome:** $M \pm T \pm ablation$ (n=768, 57%)
  - **Morbidity**
    - Stroke: **1.4%** (TIA n=2, CVA n=9)
    - Dialysis: **1.9%**
    - Reoperation for bleeding: **3.4%**
5. Mitral valve (n=1344, 20%)

- **Outcome:** Elective M ± T ± ablation (n=656, 49%)
  - Morbidity
  - Mortality
    - In-hospital: 2.0%
    - EuroSCORE II: 2.7%
5. Mitral valve (n=1344, 20%)

- **Outcome: ALL mitral repair**

- **Discharge TTE (148/918)**
6. Tricuspid valve (n=411)

- **Type of procedure**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single T</td>
<td>35</td>
</tr>
<tr>
<td>A + T</td>
<td>17</td>
</tr>
<tr>
<td>P + T</td>
<td>3</td>
</tr>
<tr>
<td>T + cor</td>
<td>6</td>
</tr>
<tr>
<td>A + T + cor</td>
<td>9</td>
</tr>
<tr>
<td>M + T</td>
<td>220</td>
</tr>
<tr>
<td>A + M + T</td>
<td>67</td>
</tr>
<tr>
<td>M + T + cor</td>
<td>36</td>
</tr>
<tr>
<td>A + M + T + cor</td>
<td>18</td>
</tr>
<tr>
<td><strong>Single T + other</strong></td>
<td></td>
</tr>
<tr>
<td>Cardiac tumor</td>
<td>1</td>
</tr>
<tr>
<td>VSD</td>
<td>0</td>
</tr>
<tr>
<td>ASD</td>
<td>2</td>
</tr>
<tr>
<td>Epicardial lead</td>
<td>4</td>
</tr>
<tr>
<td>PTEA</td>
<td>0</td>
</tr>
<tr>
<td>LVAD</td>
<td>1</td>
</tr>
<tr>
<td>Post-infarct VSD</td>
<td>0</td>
</tr>
<tr>
<td>pericardectomy</td>
<td>1</td>
</tr>
</tbody>
</table>

- Isolated (8.5%)

- In combination with mitral (n= 341, 83%)

- n= 8 - 2.6 %
6. Tricuspid valve (n=411)

- **Type of procedure**
  - Repair: 374 (91%)
  - Replacement: 37 (9%)
  - Bioprosthesis: n=37
  - Ring-annuloplasty: n=368
  - No ring: n=6
6. Tricuspid valve (n=411)

- **Outcome:**
  - Discharge TTE:
  - Mortality: • Isolated Tv surgery: 11,4% (n=35)
  - All group: 7,3%

  ![Discharge TTE of Tv Repair (158/411)](chart)

  Euroscore II deceased patients: 18,5 +/- 19,5%
7. Outcome overview

• Morbidity

- Stroke
- Dialysis
- Revision for bleeding

- Isol CABG
- Isol AvReplace
- Non-acute Ao Aneurysm
- M ± T ± abl
- All

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7. Outcome overview

- In-hospital mortality
DBC Active Members

• Koen Cathenis
• Erik de Worm
• Herbert Gutermann
• Steven Jacobs
• Steven Laga
• Bart Meuris

• Tine Philipsen
• Willem Ranschaert
• Bernard Stockman
• Yves Van Belleghem

• Dries Gaerdelen