

# **A Report from the NNECDSG Relational Database**

**Revascularization-Free Survival  
1997-2001**

***Update***

# Background

- **ARTS, which compared multi-vessel stenting to CABG, recently reported 5-year revascularization rates of 8.8% for CABG and 30.3% for PCI with stenting.**
- **Long-term revascularization rates for a large, representative, non-trial cohort have not been reported.**

# Cohort

- **“BARI” like**
  - 1997-2001
  - 2VD or 3VD
  - Left main <50%
  - 1<sup>st</sup> revascularization
  - <80
  - Not emergent
  - >24 hours from an MI

# Disposition of Records

|                        |                |
|------------------------|----------------|
| Total Patients         | 120,684        |
| First Procedure: Valve | <u>-13,628</u> |
|                        | 107,056        |
| CABG and PCI           | <u>-1,126</u>  |
|                        | 105,930        |

| PCI            |                              | CABG           |
|----------------|------------------------------|----------------|
| 57,202         |                              | 48,728         |
| <u>-16,775</u> | Pre - 1997                   | <u>-25,098</u> |
| <u>-19,652</u> | Post - 2001                  | <u>-8,398</u>  |
| 20,775         |                              | 15,232         |
| <u>-2,091</u>  | Prior Procedure not in Db    | <u>-801</u>    |
| 18,684         |                              | 14,431         |
| <u>-130</u>    | LM Disease                   | <u>-3,067</u>  |
| 18,554         |                              | 11,364         |
| <u>-13,849</u> | # of Diseased Vessels < 2    | <u>-2,449</u>  |
| 4,705          |                              | 8,915          |
| <u>-636</u>    | Same Day MI                  | <u>-162</u>    |
| 4,069          |                              | 8,753          |
| <u>-299</u>    | Emergent or Missing Priority | <u>-298</u>    |
| 3,770          |                              | 8,455          |
| <u>-260</u>    | Can't be matched to NDI      | <u>-1</u>      |
| 3,510          |                              | 8,454          |
| <u>-471</u>    | 80+ year-olds                | <u>-695</u>    |
| 3,039          |                              | 7,759          |

# Patient Characteristics

| PCI   |       | N                 | CABG  |      | Value   | Pr           |
|-------|-------|-------------------|-------|------|---------|--------------|
| 3,039 |       |                   | 7,759 |      |         |              |
|       |       | <b>SEX</b>        |       |      | chi-sq  | 8.22 0.004   |
| 875   | 28.8% | Female            | 26.1% | 2023 |         |              |
|       |       | <b>AGE</b>        |       |      | chi-sq  | 115.59 0.000 |
| 1211  | 39.9% | <60yr             | 29.2% | 2264 |         |              |
| 911   | 30.0% | 60-69yr           | 34.3% | 2664 |         |              |
| 914   | 30.1% | 70-79yr           | 36.5% | 2830 |         |              |
|       | 62.18 | Mean              | 64.60 |      | t-value | 11.41 0.000  |
| 349   | 11.5% | <b>COPD</b>       |       |      | chi-sq  | 18.55 0.000  |
|       | 10.2% | <b>CHF</b>        |       |      | chi-sq  | 77.79 0.000  |
| 197   | 6.5%  | Current Admit     | 10.2% | 792  |         |              |
| 112   | 3.7%  | Before this Admit | 6.7%  | 520  |         |              |
|       |       | <b>EF</b>         |       |      | chi-sq  | 123.94 0.000 |
| 18    | 0.6%  | <20%              | 0.9%  | 68   |         |              |
| 56    | 1.8%  | 20-29%            | 4.4%  | 339  |         |              |
| 121   | 4.0%  | 30-39%            | 8.9%  | 691  |         |              |
| 1790  | 58.9% | >=40%             | 77.8% | 6036 |         |              |
| 1054  | 34.7% | Missing           | 8.1%  | 625  |         |              |
|       | 55.67 | Mean              | 52.95 |      | t-value | 7.82 0.000   |
| 807   | 26.6% | <b>Diabetes</b>   |       |      | chi-sq  | 81.35 0.000  |

# Patient Characteristics

|                  | PCI   |                      | CABG                 |      | Value  | Pr           |
|------------------|-------|----------------------|----------------------|------|--------|--------------|
|                  | 3,039 | N                    | 7,759                |      |        |              |
| 455              | 15.0% | Any VAD              | 21.1%                | 1641 | chi-sq | 53.27 0.000  |
| 4                | 0.1%  | Cancer               | 3.8%                 | 298  | chi-sq | 110.50 0.000 |
| 120              | 3.9%  | Renal Failure        | 3.0%                 | 233  | chi-sq | 6.18 0.013   |
| 99               | 3.3%  | On Dialysis          | 0.9%                 | 66   |        |              |
| 21               | 0.7%  | Creatinine > 2.0     | 2.2%                 | 167  |        |              |
| 1661             | 45.3% | Previous MI          | 42.8%                |      | chi-sq | 10.58 0.001  |
|                  |       | no                   |                      | 4339 |        |              |
| 647              | 21.3% | 1-7 days             | 13.9%                | 1052 |        |              |
| 470              | 15.5% | 8-365 days           | 15.0%                | 1142 |        |              |
| 261              | 8.6%  | >1 year              | 13.9%                | 1057 |        |              |
|                  |       | No. Diseased Vessels |                      |      | chi-sq | 1400 0.000   |
| 2664             | 87.7% | 2                    | 48.9%                | 3791 |        |              |
| 375              | 12.3% | 3                    | 51.1%                | 3968 |        |              |
| 1975             | 65.0% | LAD                  | 90.5%                | 7025 | chi-sq | 1000 0.000   |
| 766              | 25.9% | Proximal LAD         | 60.3%                | 4534 | chi-sq | 1000 0.000   |
| 44.6% ≥2 Vessels |       | Completeness Revas   | 87.0% ≥3 Anastamoses |      |        |              |

# Study Population by Period of Follow-Up

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| <b>Period (yr)</b> | <b>PCI</b>  | <b>CABG</b> |
|--------------------|-------------|-------------|
| <b>0-1</b>         | <b>2250</b> | <b>6294</b> |
| <b>0-2</b>         | <b>1535</b> | <b>4720</b> |
| <b>0-3</b>         | <b>945</b>  | <b>3220</b> |
| <b>0-4</b>         | <b>424</b>  | <b>1688</b> |

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# Revascularization Following PCI and CABG in NNE 1997-2001

| Event                      | PCI (%) | CABG (%) | RR   | 95%CI     | p     |
|----------------------------|---------|----------|------|-----------|-------|
| <b>PCI</b>                 |         |          |      |           |       |
| 0-1                        | 16.0    | 2.1      | 0.13 | 0.11 0.16 | <0.01 |
| 0-2                        | 19.0    | 3.1      | 0.16 | 0.14 0.20 | <0.01 |
| 0-3                        | 20.5    | 3.8      | 0.18 | 0.15 0.23 | <0.01 |
| 0-4                        | 22.9    | 4.4      | 0.19 | 0.14 0.25 | <0.01 |
| <b>CABG</b>                |         |          |      |           |       |
| 0-1                        | 5.2     | 0.2      | 0.04 | 0.02 0.07 | <0.01 |
| 0-2                        | 6.8     | 0.3      | 0.04 | 0.02 0.07 | <0.01 |
| 0-3                        | 8.8     | 0.3      | 0.04 | 0.02 0.07 | <0.01 |
| 0-4                        | 10.4    | 0.3      | 0.02 | 0.01 0.06 | <0.01 |
| <b>Any Revasc</b>          |         |          |      |           |       |
| 0-1                        | 21.1    | 2.2      | 0.11 | 0.09 0.13 | <0.01 |
| 0-2                        | 25.6    | 3.4      | 0.13 | 0.11 0.16 | <0.01 |
| 0-3                        | 29.0    | 4.0      | 0.14 | 0.11 0.17 | <0.01 |
| 0-4                        | 32.3    | 4.6      | 0.14 | 0.11 0.18 | <0.01 |
| <b>Death</b>               |         |          |      |           |       |
| 0-1                        | 4.0     | 4.3      | 1.07 | 0.85 1.35 | 0.58  |
| 0-2                        | 5.8     | 6.2      | 1.07 | 0.85 1.35 | 0.54  |
| 0-3                        | 8.0     | 8.6      | 1.07 | 0.84 1.36 | 0.61  |
| 0-4                        | 11.1    | 10.2     | 0.92 | 0.68 1.25 | 0.59  |
| <b>Death or Any Revasc</b> |         |          |      |           |       |
| 0-1                        | 24.3    | 6.3      | 0.26 | 0.23 0.29 | <0.01 |
| 0-2                        | 30.4    | 9.4      | 0.31 | 0.28 0.35 | <0.01 |
| 0-3                        | 35.8    | 12.4     | 0.35 | 0.30 0.39 | <0.01 |
| 0-4                        | 40.8    | 14.3     | 0.35 | 0.30 0.41 | <0.01 |

# ARTS 5 Year Outcomes

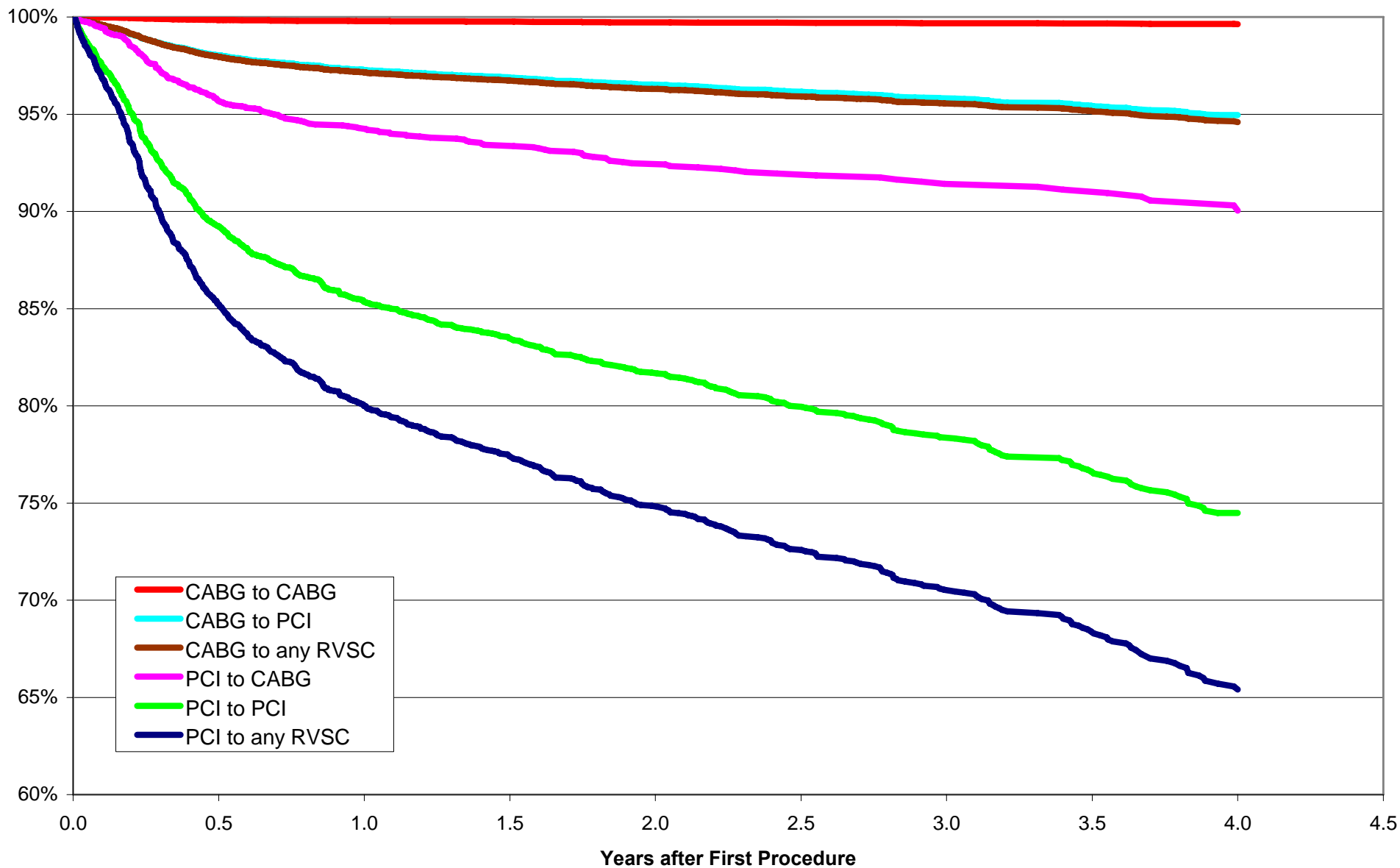
**Table 2.** Total Number of Patients With Major Clinical Events Within Interval of Time (Randomization to 1, 3, and 5 Years)

| Event                 | Stent |                  | CABG           |                | Relative Risk<br>(95% CI)   | p Value† |
|-----------------------|-------|------------------|----------------|----------------|-----------------------------|----------|
|                       | n*    | %*               | n*             | %*             |                             |          |
| Death                 |       |                  |                |                |                             |          |
| 0–1 yr                | 15    | 2.5              | 17             | 2.8            | 0.89 (0.45–1.77)            | 0.86     |
| 0–3 yrs               | 22    | 3.7              | 28             | 4.6            | 0.79 (0.46–1.37)            | 0.47     |
| 0–5 yrs               | 48    | 8.0              | 46             | 7.6            | 1.05 (0.71–1.55)            | 0.83     |
| CABG                  |       |                  |                |                |                             |          |
| 0–1 yr                | 40    | <b>NNE</b> 6.7   | <b>NYS</b> 4   | <b>NNE</b> 0.7 | <b>NYS</b> 10.0 (3.63–28.0) | < 0.001  |
| 0–3 yrs               | 55    | <b>8.8</b> 9.2   | <b>7.8</b> 7   | <b>0.3</b> 1.2 | <b>0.3</b> 7.92 (3.64–17.3) | < 0.001  |
| 0–5 yrs               | 63    | 10.5             | 7              | 1.2            | 9.08 (4.19–19.7)            | < 0.001  |
| Repeat PCI            |       |                  |                |                |                             |          |
| 0–1 yr                | 94    | 15.7             | 20             | 3.3            | 4.74 (2.96–7.58)            | < 0.001  |
| 0–3 yrs               | 120   | <b>20.8</b> 20.0 | <b>27.3</b> 37 | <b>3.8</b> 6.1 | <b>4.6</b> 3.27 (2.30–4.65) | < 0.001  |
| 0–5 yrs               | 139   | 23.2             | 50             | 8.3            | 2.80 (2.07–3.80)            | < 0.001  |
| Any revascularization |       |                  |                |                |                             |          |
| 0–1 yr                | 126   | 21.0             | 23             | 3.8            | 5.52 (3.59–8.49)            | < 0.001  |
| 0–3 yrs               | 160   | 26.7             | 40             | 6.6            | 4.03 (2.91–5.60)            | < 0.001  |
| 0–5 yrs               | 182   | 30.3             | 53             | 8.8            | 3.46 (2.61–4.60)            | < 0.001  |

# Adjust for...

- Age
- Sex
- DM, PVD, COPD, cancer, renal dysfunction
- MI, CHF
- Priority
- EF
- 3 vessel disease

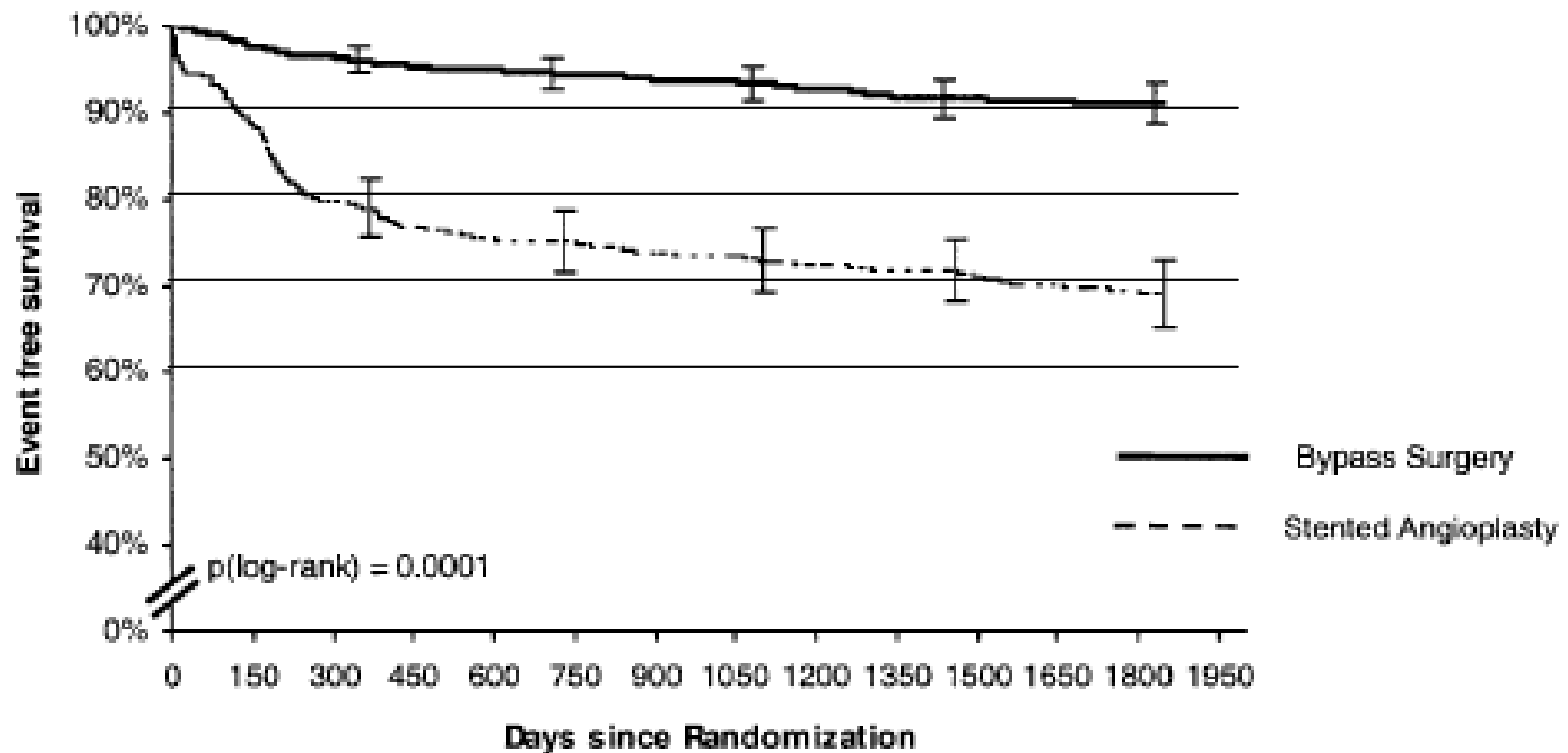
# Revascularization-Free Adjusted Survival Following PCI or CABG In Multivessel Disease Patients NNE 1997-2001



# ARTS 5 Year Outcomes

**D**

Revascularization-Free Survival



|              |        |         |         |         |         |
|--------------|--------|---------|---------|---------|---------|
| Pat. At risk | 1 year | 2 years | 3 years | 4 years | 5 years |
| CABG         | 566    | 552     | 541     | 523     | 511     |
| Stent        | 464    | 441     | 422     | 408     | 382     |

# Summary

- **In patients with multivessel CAD who may be candidates for CABG or PCI**
  - CABG is associated with a much smaller risk of repeat revascularization (HR 0.27)
  - At 4 years, the risk of repeat revascularization is...
    - 5% for CABG patients
    - 35% for PCI patients
- **Our regional experience is consistent with results from ARTS**

# Conclusions

- **A growing percentage of patients with multivessel CAD are choosing PCI over CABG.**
- **Given the survival advantage associated with CABG, but particularly given the high likelihood of subsequent revascularization associated with PCI, we believe there is a special need for patients considering PCI to be fully informed of the tradeoffs inherent in that decision.**

**Comments?**