**Supplemental material**

**Supplementary Table A.** CCAM Codes.

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| --- | --- | --- |
| **Category of Device** | **CCAM Code** | **English Title** |
| **SCP** | DELF007 | Permanent pacemaker implantation, with implantation of an atrial or a right ventricular lead by transcutaneous venous route |
| DELA003 | Permanent pacemaker implantation, with implantation of a ventricular epicardial electrode, by direct route |
| **DCP** | DELF010 | Permanent pacemaker implantation, with implantation of an atrial and a unique right ventricular lead by transcutaneous venous route |
| DELF005 | Permanent pacemaker implantation, with implantation of an atrial and a unique right ventricular lead by transcutaneous venous route |
| DELF903 | Permanent pacemaker implantation, with implantation of 2 atrial leads and a right ventricular lead by transcutaneous venous route |
| DELA001 | Permanent pacemaker implantation, with implantation of atrial and ventricular epicardial electrodes, by direct route |
| **CRT-P** | DELF001 | Permanent pacemaker implantation, with implantation of a right atrial or ventricular lead, and a lead in a left cardiac vein by transcutaneous venous route |
| DELF904 | Permanent pacemaker implantation, with implantation of a right atrial or ventricular lead, a lead in coronary sinus, and a lead in a left cardiac vein by transcutaneous venous route |
| DELF902 | Permanent pacemaker implantation, with implantation of a right atrial lead and a right ventricular lead, and a lead in coronary sinus by transcutaneous venous route |
| DELF015 | Permanent pacemaker implantation, with implantation of a right atrial lead and a right ventricular lead, and a lead in a left cardiac vein by transcutaneous venous route |
| DELF905 | Permanent pacemaker implantation, with implantation of a right atrial lead and a right ventricular lead, a lead in coronary sinus, and a lead in a left cardiac vein by transcutaneous venous route |
| DELF901 | Permanent pacemaker implantation, with implantation of a lead in coronary sinus and a lead in a left cardiac vein by transcutaneous venous route |
| DELF012 | Permanent pacemaker implantation, with implantation of a lead in a left cardiac vein by transcutaneous venous route |
| **Undefined Pacemakers** | DELA006 | Implantation of a cardiac pacing generator |

**Supplementary Table B.** Results for the Subgroup of Patients Implanted with a Single-Chamber Pacemaker at Three-Years of Follow-Up.

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| --- | --- | --- |
|  | **Complications (%)** | **Mean Complication Costs Per-Patient with a Complication** |
| Complications likely avoidable by leadless pacemakers (mechanical complications, pneumothorax, pocket bleedings) | 417 (4.7%) | €6,420 ± 2,998 |
| Deep venous thrombosis | 8 (0.1%) | €3,304 ± 4,011 |
| Cardiac injuries | 14 (0.2%) | €9,481 ± 6,691 |
| Total | 439 (5%) | €6,461 ± 3,134 |

**Supplementary Table C.** Survival Analysis for Complications Avoidable by Leadless Pacemakers.

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| --- | --- | --- |
|  |  | **Cox models** |
|  |  | **Univariate analysis (threshold = 10%)** | **Multivariate analysis (threshold = 5%)** |
|  |  | **HR** | **95% IC** | **p-value** | **HR** | **95% IC** | **p-value** |
| **Age** |  | 1.01 | 1.00 | 1.02 | 0.14 | 1.01 | 1.00 | 1.02 | 0.06 |
| **Gender** |  |  |  |  | NS |  |  |  | NS |
|  | Men | 1.00 | - | - |  |  |  |  |  |
| Women | 0.98 | 0.83 | 1.16 |  |  |  |  |  |
| **Type of pacemaker** |  |  |  |  | NS |  |  |  | NS |
|  | SCP | 1.00 | - | - |  |  |  |  |  |
| DCP + CRT-P | 1.11 | 0.91 | 1.36 |  |  |  |  |  |
| **Chronic respiratory failure, pneumothorax** |  |  |  |  | 0.0211 |  |  |  | NS |
|  | No | 1.00 | - | - |  |  |  |  |  |
| Yes | 1.23 | 1.03 | 1.48 |  |  |  |  |  |
| **Malnutrition/BMI < 20** |  |  |  |  | 0.0023 |  |  |  | **0.01** |
|  | No | 1.00 | - | - |  | 1.00 | - | - |  |
| Yes | 1.43 | 1.14 | 1.80 |  | 1.35 | 1.07 | 1.71 |  |
| **Acute coronary syndrome** |  |  |  |  | 0.0159 |  |  |  | **0.04** |
|  | No | 1.00 | - | - |  | 1.00 | - | - |  |
| Yes | 1.48 | 1.08 | 2.05 |  | 1.42 | 1.02 | 1.98 |  |
| **Centers with low volume of activity** |  |  |  |  | 0.0589 |  |  |  | NS |
|  | No | 1.00 | - | - |  |  |  |  |  |
| Yes | 1.48 | 0.99 | 2.21 |  |  |  |  |  |
| **Oral anticoagulants** |  |  |  |  | NS |  |  |  | Not included |
|  | No | 1.00 | - | - |  |  |  |  |  |
| Yes | 1.03 | 0.84 | 1.28 |  |  |  |  |  |
| **Early reintervention (60 days before/after)** |  |  |  |  | 0.0228 |  |  |  | **0.00** |
|  | No | 1.00 | - | - |  | 1.00 | - | - |  |
| Yes | 1.30 | 1.04 | 1.65 |  | 1.43 | 1.13 | 1.81 |  |
| **Temporary pacing wire** |  |  |  |  | 0.0585 |  |  |  | 0.09 |
|  | No | 1.00 | - | - |  | 1.00 | - | - |  |
| Yes | 1.45 | 0.99 | 2.12 |  | 1.40 | 0.95 | 2.06 |  |
| **Dialysis, renal failure/insufficiency** |  |  |  |  | NS |  |  |  | Not included |
|  | No | 1.00 | - | - |  |  |  |  |  |
| Yes | 1.16 | 0.95 | 1.43 |  |  |  |  |  |
| **Diabetes** |  |  |  |  | NS |  |  |  | Not included |
|  | No | 1.00 | - | - |  |  |  |  |  |
| Yes | 1.11 | 0.92 | 1.34 |  |  |  |  |  |
| **Congestive heart failure** |  |  |  |  | 0.0094 |  |  |  | 0.08 |
|  | No | 1.00 | - | - |  | 1.00 | - | - |  |
| Yes | 1.27 | 1.06 | 1.53 |  | 1.18 | 0.98 | 1.43 |  |
| **Cirrhosis, liver failure** |  |  |  |  | NS |  |  |  | Not included |
|  | No | 1.00 | - | - |  |  |  |  |  |
| Yes | 1.11 | 0.71 | 1.74 |  |  |  |  |  |
| **Infection during the previous year** |  |  |  |  | 0.0026 |  |  |  | **0.01** |
|  | No | 1.00 | - | - |  | 1.00 | - | - |  |
| Yes | 1.70 | 1.20 | 2.41 |  | 1.60 | 1.12 | 2.29 |  |

Cox models were used to express the instantaneous hazard of occurrence of complications avoidable by Micra according to the factors of interest. Factors significantly associated with the studied outcome in the univariate analysis (threshold = 10%) were included in the multivariate analysis. Stepwise selection with backward elimination was applied, with a threshold of 5% and according to proportional risks hypothesis.

NS: non-significant; HR: hazard ratio; 95% CI: 95% confidence interval; Not included: non-significant variable in the univariate analysis (threshold = 10%), therefore not included in the multivariate analysis; NS: non-significant variable (threshold 5%) in the multivariate analysis, therefore removed from the model.