

The Prince Charles Hospital Cardiac Catheterisation Laboratory Annual Report 2015-16



The Prince Charles Hospital

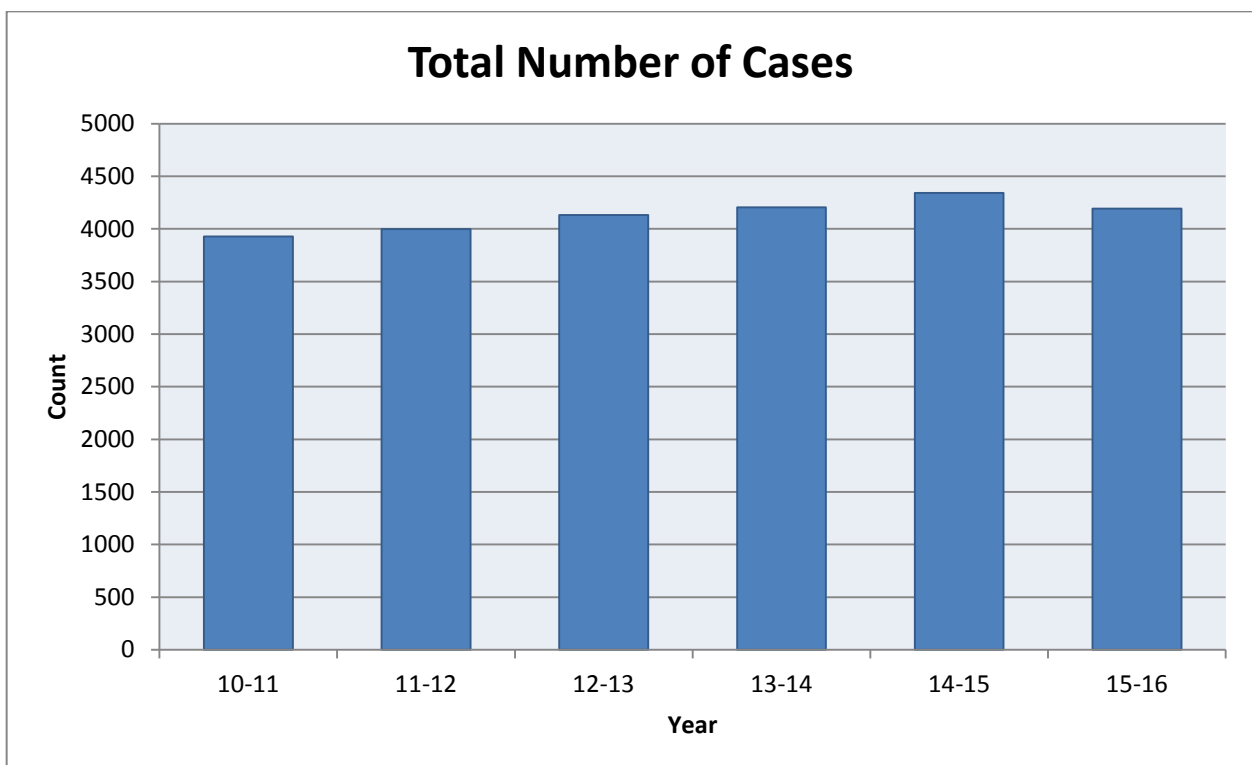
The Prince Charles Hospital
**Heart and Lung
Institute**

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Procedural Volumes

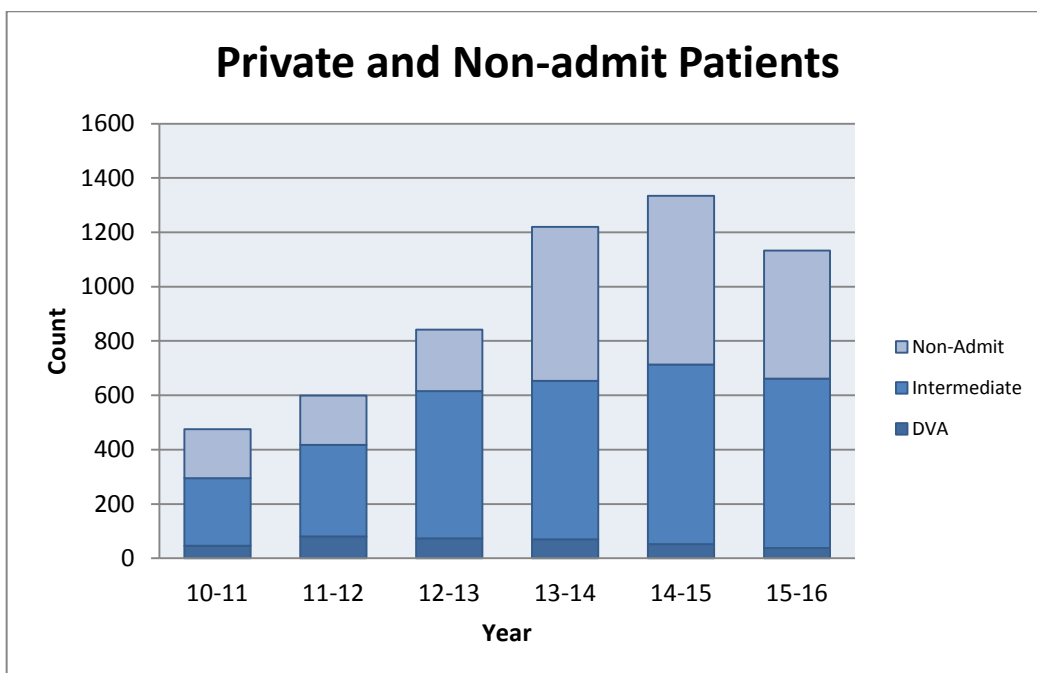
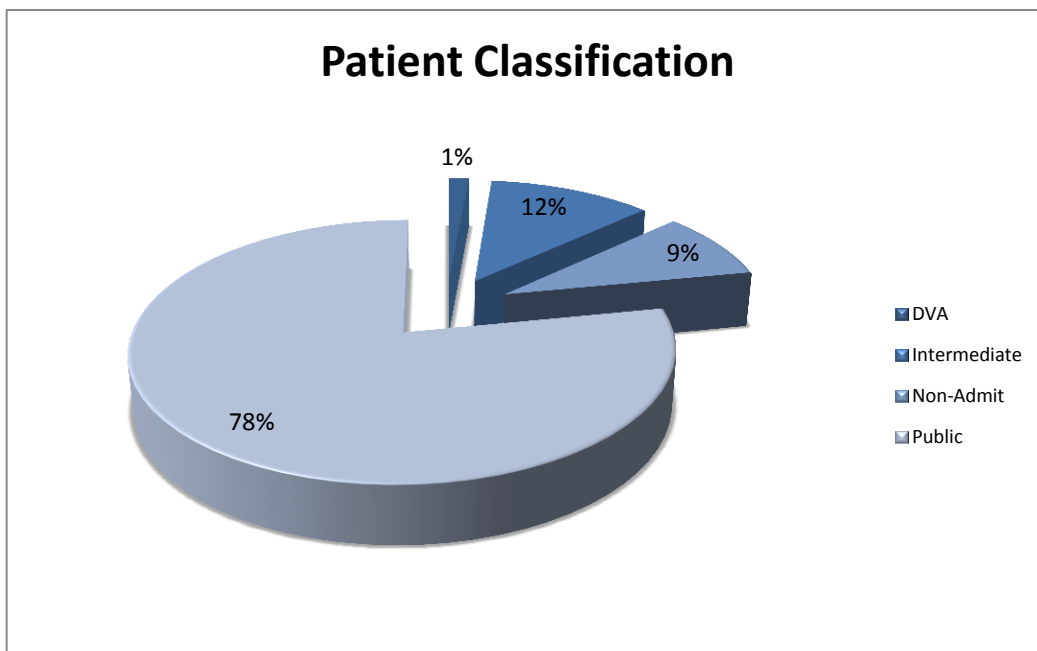
| Financial Year | Total of CCL Procedures |
|----------------|-------------------------|
| 2005 – 2006 | 3595 |
| 2006 – 2007 | 3585 |
| 2007 – 2008 | 4020 |
| 2008 – 2009 | 3747 |
| 2009 – 2010 | 3708 |
| 2010 – 2011 | 3929 |
| 2011 – 2012 | 3999 |
| 2012 – 2013 | 4133 |
| 2013 – 2014 | 4206 |
| 2014 – 2015 | 4343 |
| 2015 – 2016 | 4194 |



Patient Demographics

| | | | |
|---------|--------------|--------------|-------------------------|
| Female: | 1446 (34.5%) | Average Age: | 67.6 ± 14.5 |
| Male: | 2748 (65.5%) | Average Age: | 65.2 ± 13.1 |
| | | Average Age: | 65.8 ± 13.7 (mean ± SD) |

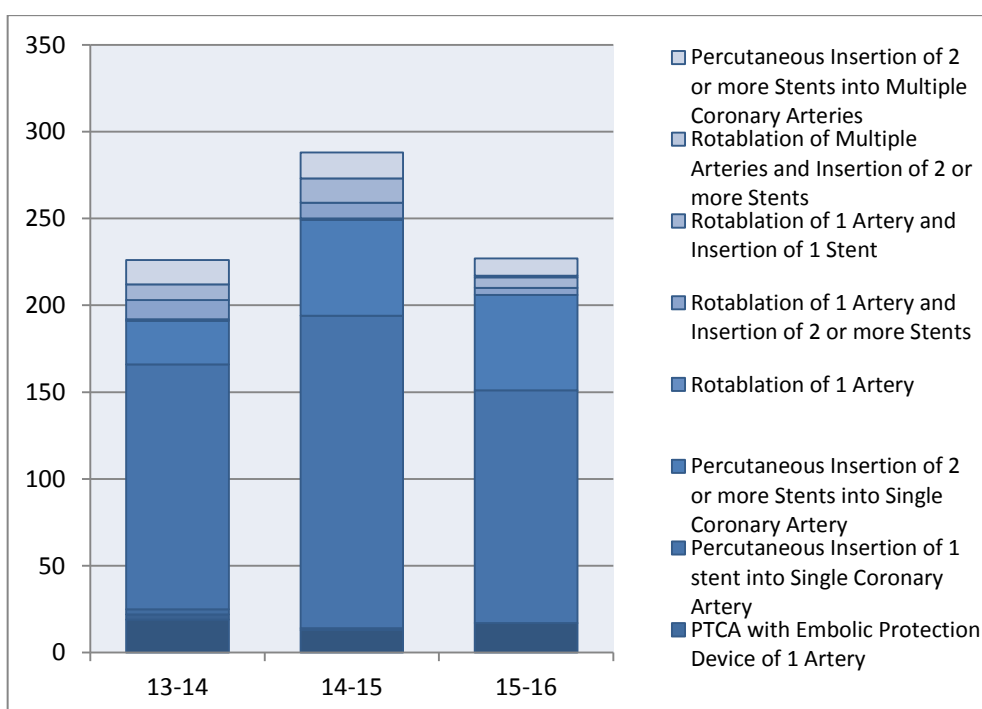
| Public | Private | DVA | Non-Admit | Total |
|--------|---------|-----|-----------|-------|
| 3061 | 624 | 38 | 471 | 4194 |



Coronary Procedures Performed

| Procedure | 2014-15 | | | 2015-16 | | |
|-----------------------------|------------|------------|-------------|------------|------------|-------------|
| | Public | Private | Total | Public | Private | Total |
| Coronary Angiography | 2587 | 1156 | 3743 | 2845 | 1050 | 3895 |
| Graft Study | 324 | 87 | 411 | 316 | 72 | 388 |
| IABP | 52 | 7 | 59 | 26 | 10 | 36 |
| IVC Filter | 3 | | 3 | | | |
| IVUS | 52 | 19 | 71 | 91 | 9 | 100 |
| FFR | 239 | 44 | 283 | 243 | 33 | 276 |
| OCT | 40 | 7 | 47 | 35 | 6 | 41 |
| PCI +/- Stents | | | | | | |
| No Stents | 58 | 8 | 66 | 41 | 10 | 51 |
| Single Vessel | 729 | 142 | 871 | 714 | 130 | 844 |
| Multi Vessels | 49 | 8 | 57 | 57 | 6 | 63 |
| Rotablation | 63 | 12 | 75 | 65 | 11 | 76 |
| Total PCI +/- Stents | 899 | 170 | 1069 | 877 | 157 | 1034 |
| Pericardiocentesis | 18 | 7 | 25 | 27 | 6 | 33 |
| Renal Denervation | 1 | 2 | 3 | 3 | | 3 |
| Right Heart Catheter | 265 | 166 | 431 | 366 | 172 | 538 |
| RV Biopsy | 16 | 21 | 37 | 42 | 21 | 63 |
| Septal Ablation (TASH) | 3 | | 3 | 1 | | 1 |
| Temporary Pacing | 197 | 95 | 292 | 190 | 63 | 253 |
| Valve / Lead Screening | 17 | 2 | 19 | 14 | 1 | 15 |

Percutaneous Coronary Intervention

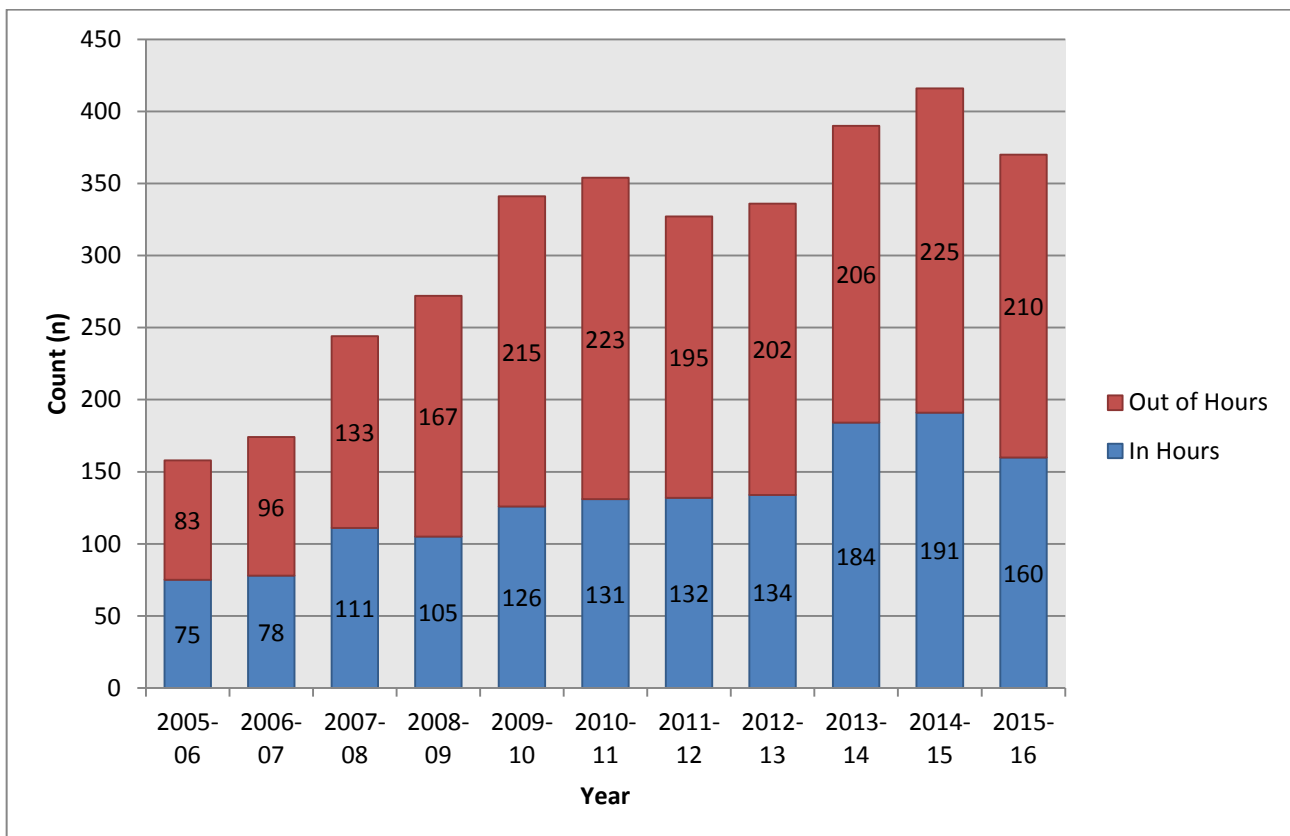


Structural Heart Procedures Performed

| Procedure | 2014-15 | | | 2015-16 | | |
|---------------------------------------|------------|------------|------------|------------|------------|------------|
| | Public | Private | Total | Public | Private | Total |
| Dilatation / Stenting | | | | | | |
| Aorta | 3 | 2 | 5 | 3 | 3 | 6 |
| Pulmonary | 3 | 1 | 4 | 2 | 2 | 4 |
| Renal | | | | 2 | | 2 |
| Subclavian | 2 | | 2 | 3 | | 3 |
| Vena Cava | | 2 | 2 | | 2 | 2 |
| Embolisation | | | | | | |
| Aorta / Coronary | | | | | | |
| Pulmonary | | 1 | 1 | | | |
| Renal | | | | | | |
| Subclavian | | | | | | |
| Valvuloplasty | | | | | | |
| Aortic | 133 | 82 | 215 | 133 | 48 | 181 |
| Mitral | 9 | 1 | 10 | 5 | | 5 |
| Pulmonary | 3 | | 3 | 1 | 2 | 3 |
| Tricuspid | | | | 1 | | 1 |
| Device Closures | | | | | | |
| ASD | 11 | 1 | 12 | 16 | 4 | 20 |
| LAA | 4 | 4 | 8 | 8 | 6 | 14 |
| PDA | 2 | | 2 | 1 | | 1 |
| PFO | 12 | 1 | 13 | 17 | 3 | 20 |
| VSD | 2 | | 2 | 1 | | 1 |
| Device Total | 31 | 6 | 37 | 43 | 13 | 56 |
| Valve Intervention | | | | | | |
| Paravalvular Leak Closure | 3 | | 3 | 6 | | 6 |
| Percutaneous Valve | 47 | 43 | 90 | 68 | 43 | 111 |
| Mitraclip | 8 | 11 | 19 | 9 | 11 | 20 |
| Valve Intervention Total | 58 | 54 | 112 | 83 | 54 | 137 |
| Total Structural Interventions | 331 | 209 | 540 | 402 | 191 | 593 |
| ICE | 21 | 4 | 25 | 26 | 5 | 31 |
| TOE | 70 | 49 | 119 | 95 | 53 | 148 |

Additional Cases

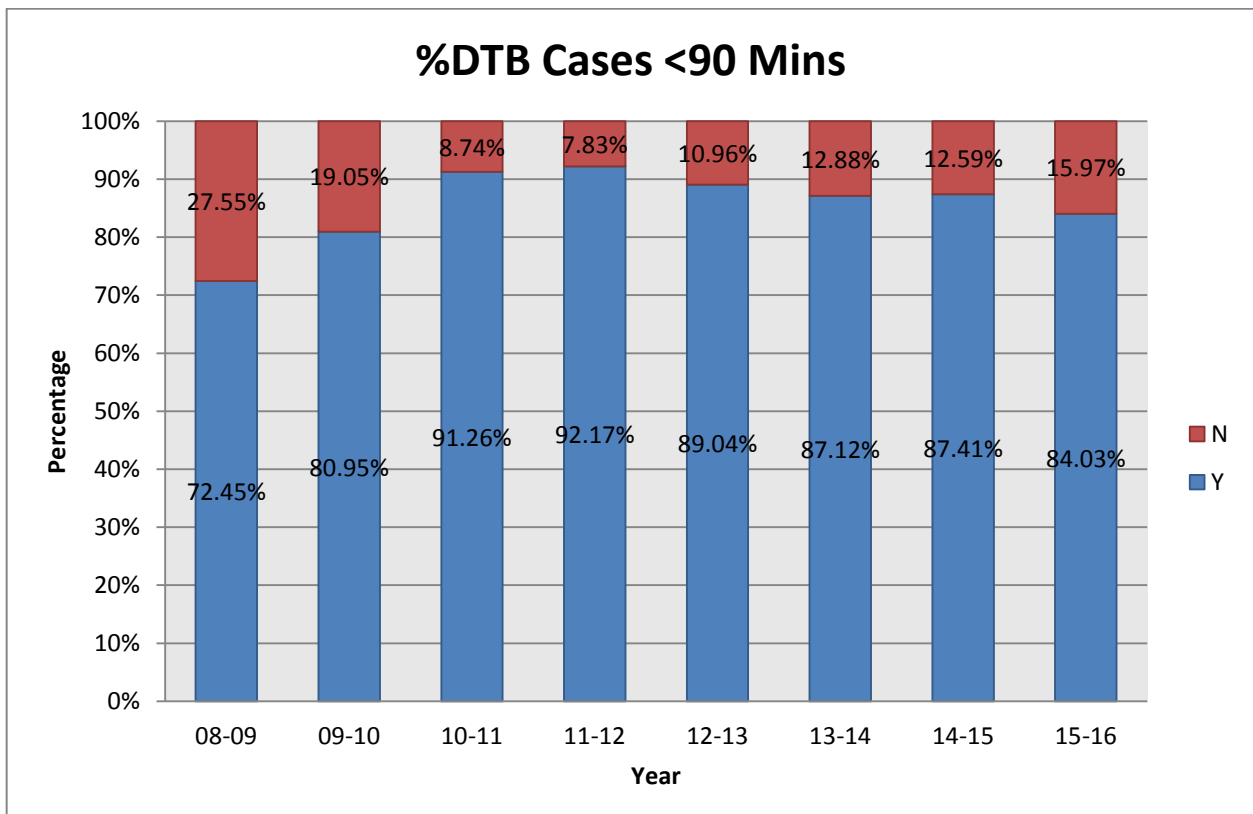
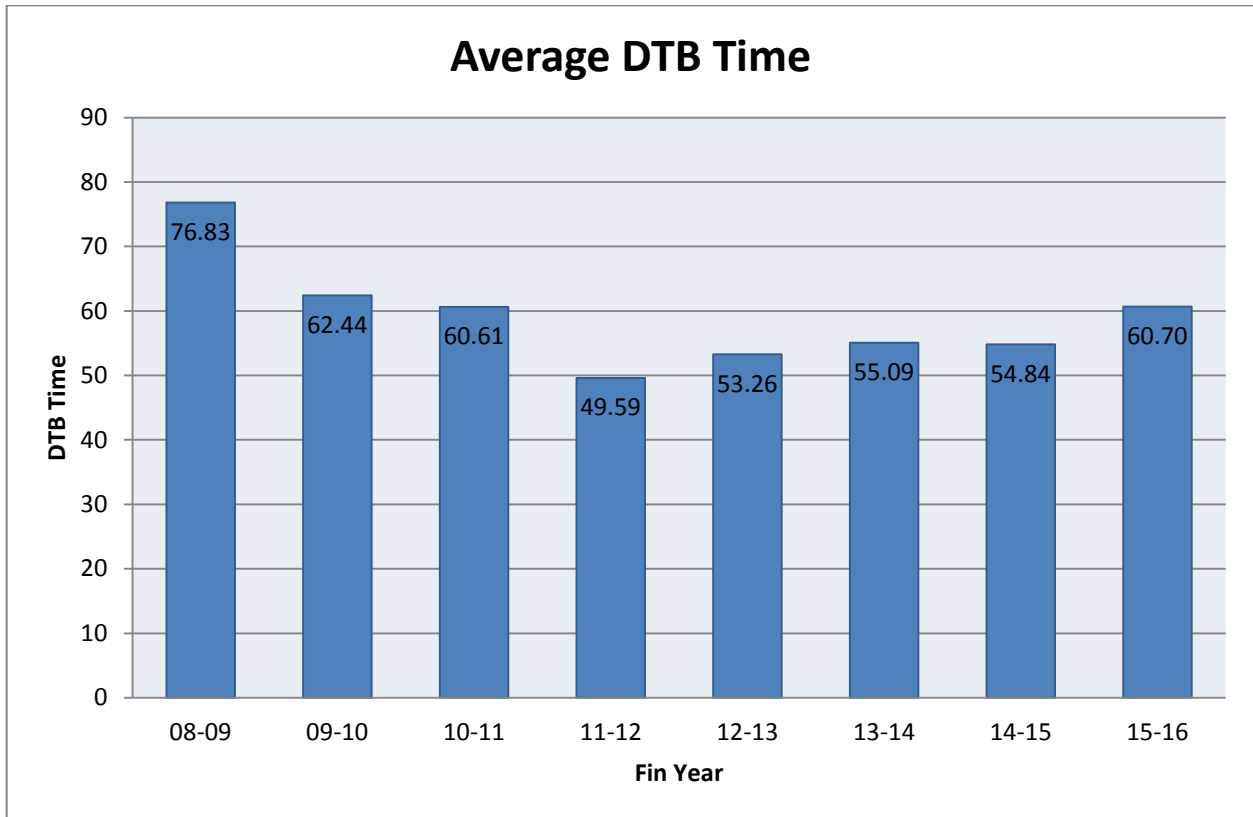
| | 2014-15 | 2015-16 |
|---|---------------------|---------------------|
| Add-ons | 1659 | 1723 |
| In Hours Emergency Add-ons (0800-1800) | 191 | 160 |
| Out of Hours Acute Call-ins (1800-0800) | 225 | 210 |
| Total | 2075 (47.8%) | 2460 (58.7%) |



Angioplasty Nursing Service

| | Total |
|----------------------|-------------|
| Occasions of PCI | 1033 |
| Outpatient Follow Up | |
| 7 Day | 664 |
| 1 month | 840 |
| Total | 1504 |

Primary PCI



Inter-hospital Transfers



Inter-Hospital Transfers Summary

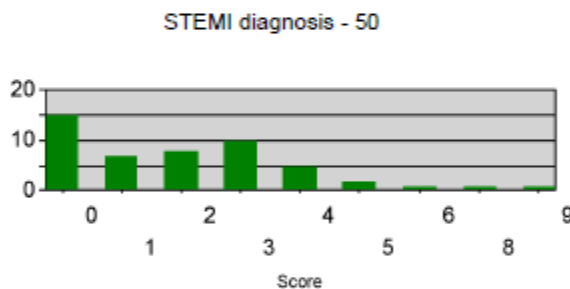
Start Date: Wednesday, 1 July 2015
 End Date: Thursday, 30 June 2016

Selection Criteria: Hospital: <All>; Treating Hospital: TPCH; Gender: <All>; Diagnosis:<All>

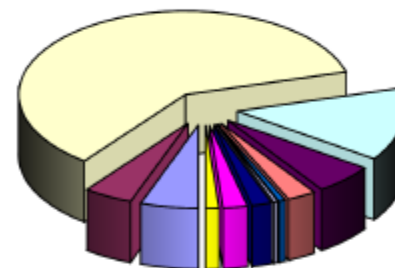
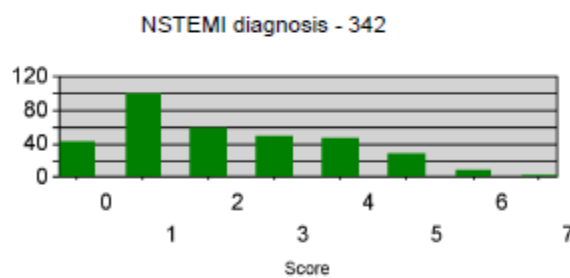
| | |
|-------------------------------------|-----|
| Total Transferred Referrals: | 638 |
| Interventions | 463 |
| Medically-Treated | 175 |

| | | | |
|----------------------------------|-----|---------------|--------------|
| Average Age of Referrals: | | Av 65.5 years | Dev +/- 14.2 |
| Male | 421 | 66% | 64.8 years |
| Female | 217 | 34% | 66.9 years |

Risk Calculations:



- STEMI with Fibrinolysis
- STEMI without Fibrinolysis
- NSTEMI with Troponin positive
- Unstable Angina
- Arrhythmia
- Cardiac Failure
- Endocarditis/Myocarditis/Pericarditis
- Pericardial Effusion
- Stable Angina
- Valvular Heart Disease
- Other

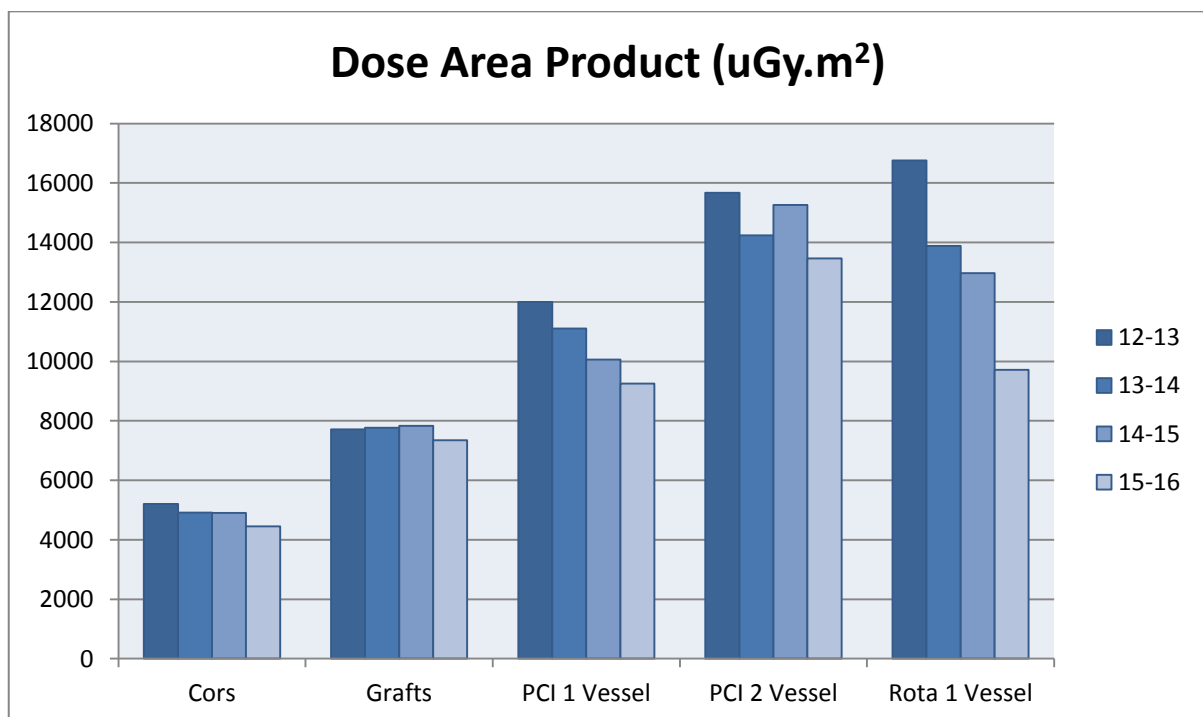
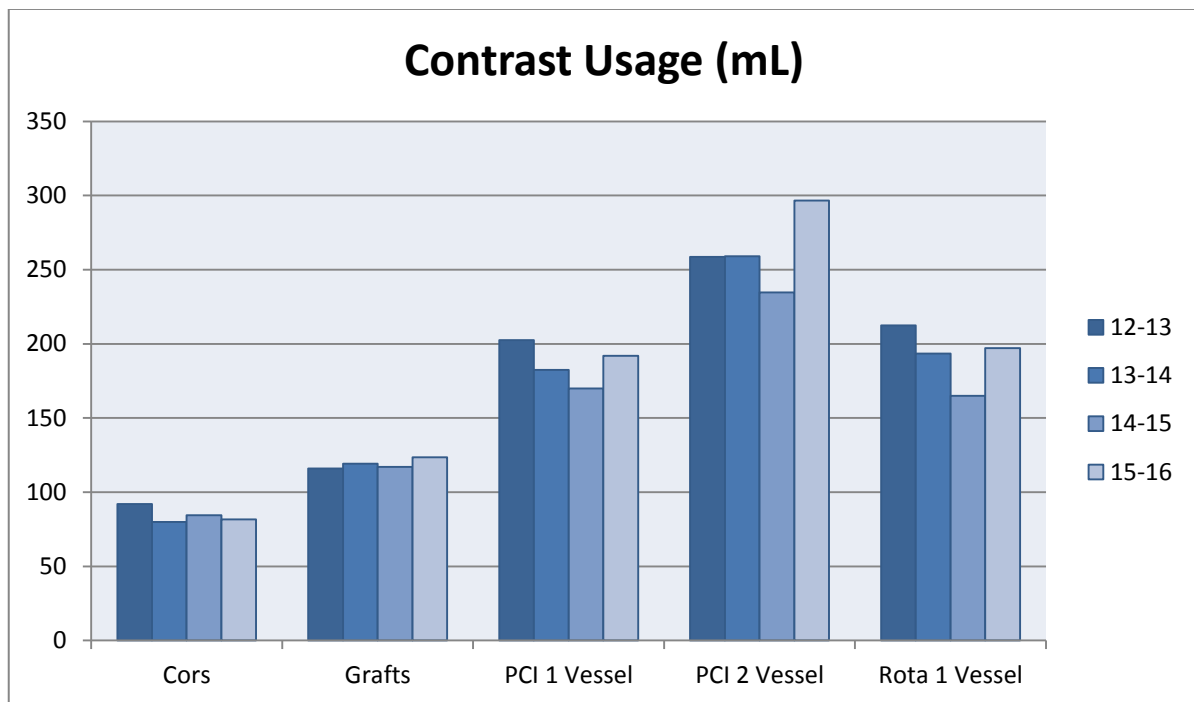


Days Waiting from Referral to Transfer:

| | | | | |
|---------------|-----|-------|----------------|--------------|
| Total: | 638 | 100% | Av 57:47 hours | Dev +/- 43.1 |
| Emergency | 52 | 8.2% | 15:3 | 14.6 |
| Urgent | 376 | 58.9% | 48:24 | 36 |
| Semi-Urgent | 205 | 32.1% | 85:6 | 44.2 |
| Semi-Elective | 5 | 0.8% | 86:34 | 31.1 |

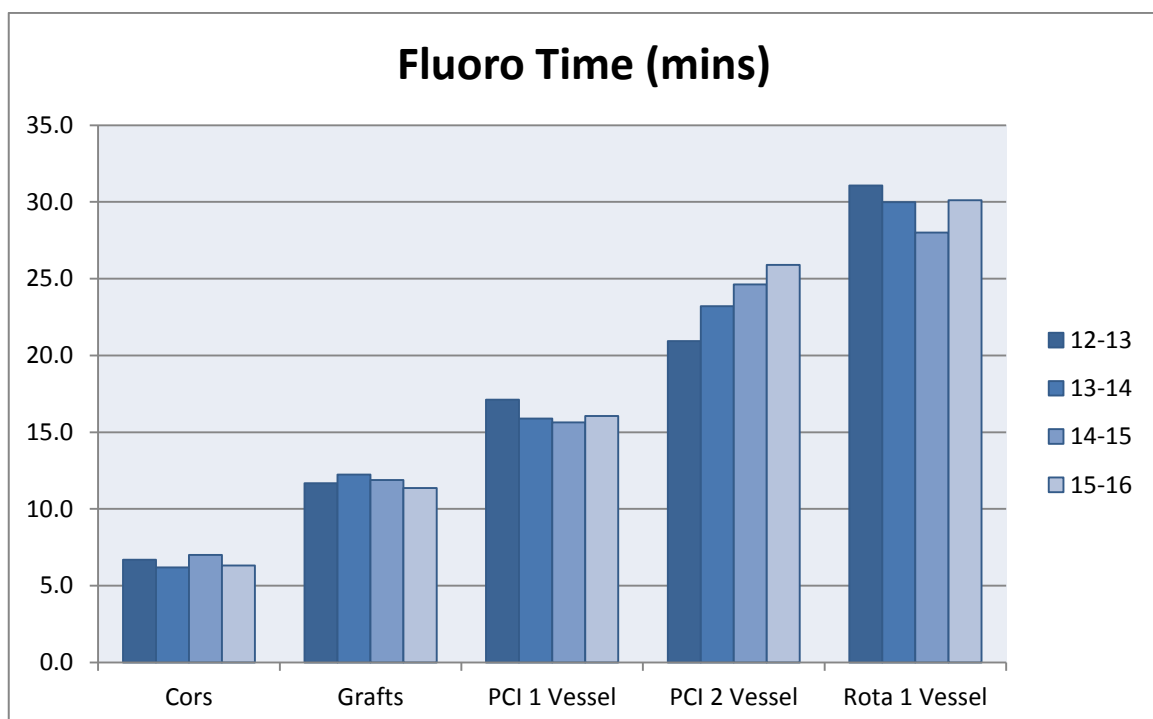
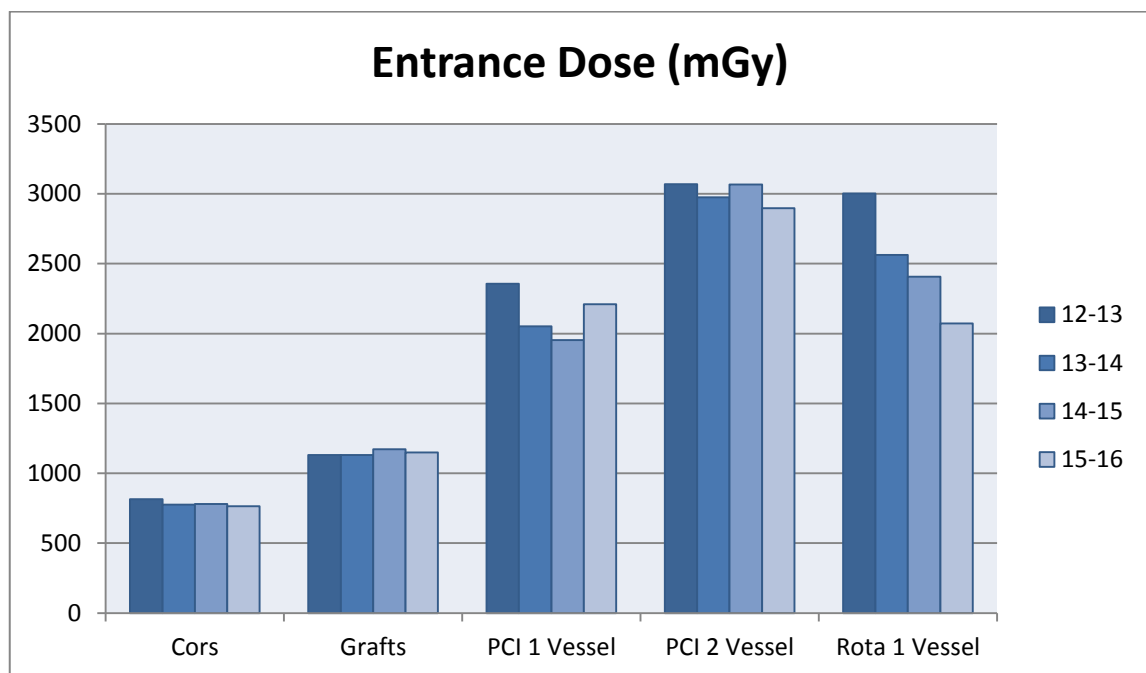
Patient Radiation Doses

| | CORS | GRAFTS | PCI 1 Vessel | PCI >2 Vessel | Rota 1 Vessel |
|--|-------------|---------------|---------------------|-------------------------|----------------------|
| | Mean | Mean | Mean | Mean | Mean |
| Contrast (ml) | 83.4 | 120.3 | 197.8 | 272.7 | 206.8 |
| Dose Area Product (cGy*cm ²) | 3948 | 6683 | 8618 | 11195 | 9536 |



Patient Radiation Doses

| | CORS | GRAFTS | PCI 1 Vessel | PCI >2 Vessel | Rota 1 Vessel |
|------------------------|-------------|---------------|---------------------|-------------------------|----------------------|
| | Mean | Mean | Mean | Mean | Mean |
| Entrance Dose (mGy) | 678 | 1031 | 1906 | 2549 | 2031 |
| Fluoroscopy Time (min) | 6.3 | 11.4 | 17.0 | 26.0 | 30.8 |

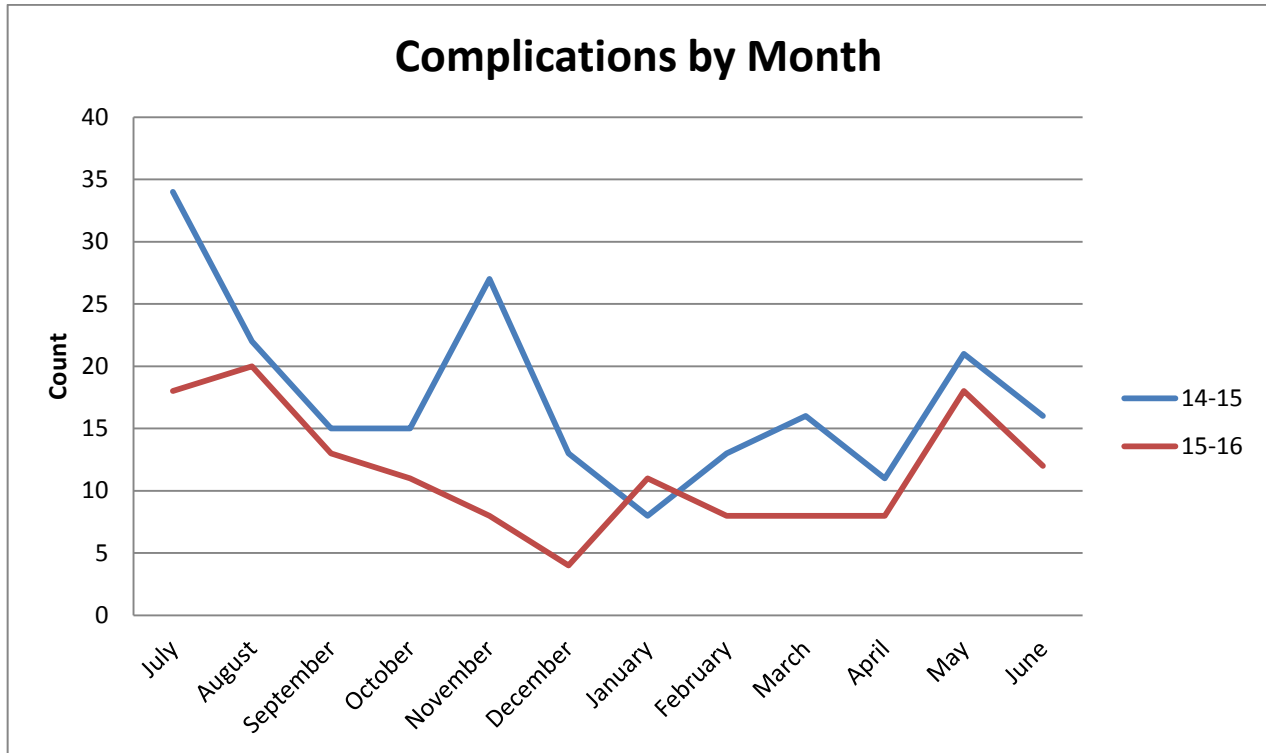


Complications

Total = **123 (0.29%)**

| Complications | 2014-15 | | 2015-16 | |
|-------------------------------|---------|--------|---------|--------|
| Access Site Occlusion | 2 | 0.95% | | 0.00% |
| Acute Respiratory Failure | 5 | 2.37% | 1 | 0.81% |
| Asystole | 9 | 4.27% | 1 | 0.81% |
| Atrial Fibrillation/Flutter | 6 | 2.84% | 5 | 4.07% |
| Bleeding - other cause | | 0.00% | 2 | 1.63% |
| Bleeding - Other/Unknown | 2 | 0.95% | | 0.00% |
| Bleeding at Percutaneous | 14 | 6.64% | 9 | 7.32% |
| Cardiogenic Shock | 2 | 0.95% | | 0.00% |
| Cardiogenic shock. | | 0.00% | 2 | 1.63% |
| Contrast reaction. | 7 | 3.32% | 5 | 4.07% |
| Coronary Dissection requiring | 17 | 8.06% | 6 | 4.88% |
| Coronary Embolisation / | 1 | 0.47% | 1 | 0.81% |
| CVA/stroke. | 1 | 0.47% | 3 | 2.44% |
| Dissection | 5 | 2.37% | | 0.00% |
| Emergency PCI | 1 | 0.47% | | 0.00% |
| Heart Block | 21 | 9.95% | 9 | 7.32% |
| Haematoma >5cm x 5cm | 22 | 10.43% | | 0.00% |
| Hematoma >10cm. | | 0.00% | 5 | 4.07% |
| Hematoma 5-10cm. | | 0.00% | 5 | 4.07% |
| Hypotension | 16 | 7.58% | 9 | 7.32% |
| Other vascular complication | 3 | 1.42% | 3 | 2.44% |
| Perforation of Artery | 2 | 0.95% | | 0.00% |
| Perforation of Coronary | | 0.00% | 3 | 2.44% |
| Peripheral Dissection | | 0.00% | 6 | 4.88% |
| Peri-procedural MI. | | 0.00% | 1 | 0.81% |
| Prolonged Angina | | 0.00% | 1 | 0.81% |
| Pseudoaneurysm | 1 | 0.47% | 1 | 0.81% |
| Pulmonary Oedema | 5 | 2.37% | 3 | 2.44% |
| Radiation Dose Exceeded | 10 | 4.74% | 9 | 7.32% |
| RBC/Whole blood | | 0.00% | 1 | 0.81% |
| Retroperitoneal Bleeding | 2 | 0.95% | | 0.00% |
| Supraventricular Tachycardia | 1 | 0.47% | 1 | 0.81% |
| Tamponade | 3 | 1.42% | | 0.00% |
| Transient Ischaemic Attack | 2 | 0.95% | | 0.00% |
| Unplanned Return to CCL | 1 | 0.47% | | 0.00% |
| Vaso-vagal Reaction | 13 | 6.16% | 14 | 11.38% |
| Ventricular Fibrillation | 17 | 8.06% | 7 | 5.69% |
| Ventricular Tachycardia | 14 | 6.64% | 8 | 6.50% |
| Vomiting | 6 | 2.84% | 2 | 1.63% |

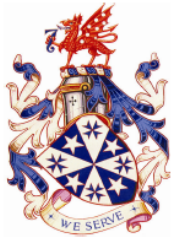
Complications



Prof Darren Walters
Clinical Director
Cardiac Catheterisation Laboratory
Date:

Michael Savage
Consultant Cardiac Scientist
Cardiac Catheterisation Laboratory
Date:

APPENDIX A



THE PRINCE CHARLES HOSPITAL CARDIAC CATHETER LABORATORY



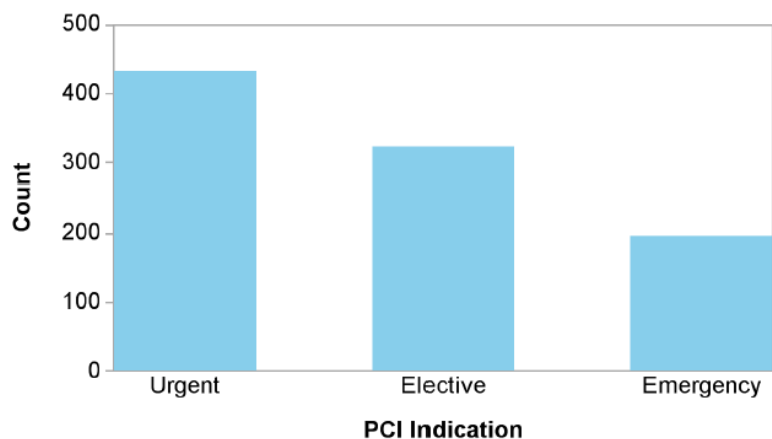
PCI Procedure Report - July 2014 Onwards

1/07/2015 - 30/06/2016

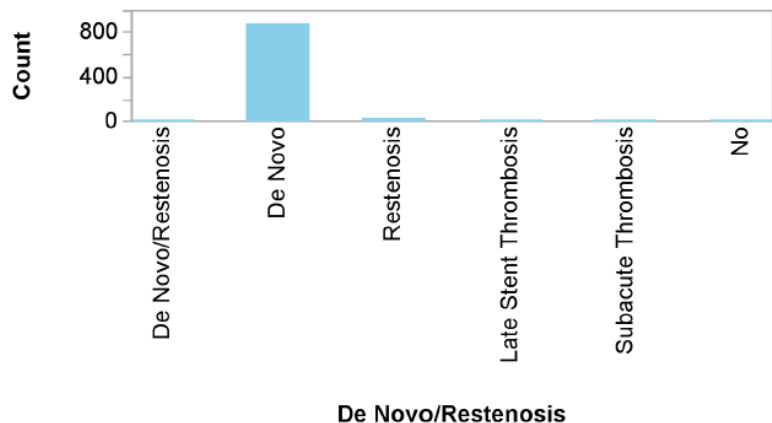
| Patient Age | | | |
|-------------|------------|-------------|---------------------|
| Male | 710 | 74.42 % | Av 64 +/- 12 |
| Female | 244 | 25.58 % | Av 68 +/- 12 |
| | 954 | 100% | Av 65 +/- 12 |

| PCI Status | Number of Cases | % |
|------------|-----------------|-------------|
| Elective | 324 | 33.96 % |
| Emergency | 196 | 20.55 % |
| Urgent | 434 | 45.49 % |
| | 954 | 100% |

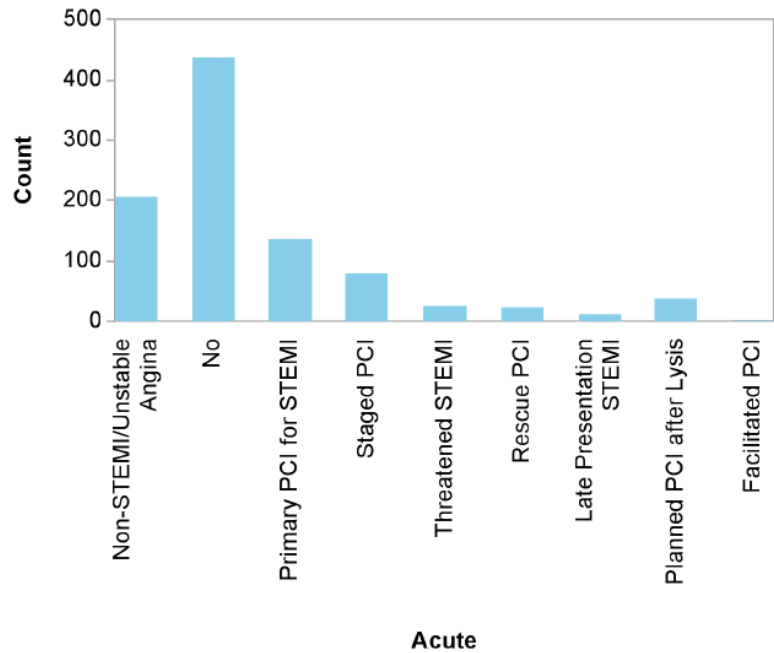
Indications



| De Novo/Restenosis | Number of Cases | % |
|-----------------------|-----------------|-------------|
| De Novo | 885 | 92.77 % |
| De Novo/Restenosis | 17 | 1.78 % |
| Late Stent Thrombosis | 6 | 0.63 % |
| No | 2 | 0.21 % |
| Restenosis | 37 | 3.88 % |
| Subacute Thrombosis | 7 | 0.73 % |
| | 954 | 100% |



| Acute | Number of Cases | % |
|---------------------------|-----------------|-------------|
| Facilitated PCI | 1 | 0.10 % |
| Late Presentation STEMI | 10 | 1.05 % |
| No | 438 | 45.91 % |
| Non-STEMI/Unstable Angina | 207 | 21.70 % |
| Planned PCI after Lysis | 36 | 3.77 % |
| Primary PCI for STEMI | 136 | 14.26 % |
| Rescue PCI | 23 | 2.41 % |
| Staged PCI | 78 | 8.18 % |
| Threatened STEMI | 25 | 2.62 % |
| | 954 | 100% |



| Lesions Risk | Number | % of total cases |
|----------------|-------------|------------------|
| Type A Lesion | 50 | 5.24 % |
| Type B1 Lesion | 315 | 33.02 % |
| Type B2 Lesion | 203 | 21.28 % |
| Type C Lesion | 573 | 60.06 % |
| | 1141 | |

| Approach | Number | % of total cases |
|----------|------------|------------------|
| Brachial | 4 | 0.42 % |
| Femoral | 336 | 35.22 % |
| Other | 1 | 0.10 % |
| Radial | 613 | 64.26 % |
| | 954 | 100% |

| Cardiac Indications | Number of Indications | % of total cases |
|---------------------------------|-----------------------|------------------|
| Angina. | 42 | 4.40 % |
| Cardiogenic Shock. | 5 | 0.52 % |
| Chest pain. | 536 | 56.18 % |
| Exertional dyspnoea. | 112 | 11.74 % |
| Known coronary artery disease. | 316 | 33.12 % |
| NSTEMI. | 241 | 25.26 % |
| Out of hospital arrest. | 20 | 2.10 % |
| Positive CT Coronary Angiogram. | 64 | 6.71 % |
| Positive EST. | 42 | 4.40 % |
| Positive stress echo. | 37 | 3.88 % |
| Post infarct angina. | 2 | 0.21 % |
| Previous MI | 59 | 6.18 % |
| STEMI. | 163 | 17.09 % |
| Thrombolysed STEMI. | 55 | 5.77 % |
| Unstable angina. | 18 | 1.89 % |
| | 1712 | |

| Risk Factors | Number of Factors | % of total cases |
|-------------------------|-------------------|------------------|
| Anxiety | 59 | 6.18 % |
| Cerebrovascular Disease | 62 | 6.50 % |
| CHF | 55 | 5.77 % |
| Chronic Lung Disease | 156 | 16.35 % |
| Current smoker | 202 | 21.17 % |
| Depression | 94 | 9.85 % |
| Diabetes | 256 | 26.83 % |
| Dyslipidemia | 618 | 64.78 % |
| Family History | 364 | 38.16 % |
| Hypertension | 632 | 66.25 % |
| Obesity | 368 | 38.57 % |
| Renal Failure | 72 | 7.55 % |
| | 2938 | |

| Complications | Number | % of total cases |
|-------------------------------------|--------|------------------|
| Acute Respiratory Failure | 1 | 0.10 % |
| Atrial Fibrillation/Flutter | 1 | 0.10 % |
| Bleeding at Percutaneous Entry Site | 1 | 0.10 % |
| Contrast Reaction | 4 | 0.42 % |
| Coronary Dissection | 6 | 0.63 % |
| CVA-Stroke | 1 | 0.10 % |
| Heart Block | 2 | 0.21 % |
| Hematoma at Access Site | 17 | 1.78 % |
| Hypotension | 2 | 0.21 % |
| Perforation of Artery | 3 | 0.31 % |
| Peripheral Dissection | 2 | 0.21 % |
| Periprocedural MI | 1 | 0.10 % |
| Prolonged Angina | 1 | 0.10 % |
| Pulmonary Oedema | 1 | 0.10 % |
| Radiation Dose Exceeded | 8 | 0.84 % |
| Vaso-vagal | 5 | 0.52 % |
| Ventricular Fibrillation | 4 | 0.42 % |
| Ventricular Tachycardia | 5 | 0.52 % |
| Vomiting | 1 | 0.10 % |
| 66 | | |

Previous Procedures

| Previous Procedures | Number | % of total cases |
|---------------------------|--------|------------------|
| Previous CABG | 113 | 11.84 % |
| Previous PCI | 233 | 24.42 % |
| Previous valvular surgery | 13 | 1.36 % |
| 359 | | |

Technical Data and Lesion Characteristics

| Stent Type | Number | % |
|--------------------|--------|-------------|
| Drug Eluting Stent | 1277 | 92.14 % |
| Bare Metal Stent | 106 | 7.65 % |
| Covered Stent | 3 | 0.22 % |
| 1386 | | 100% |

Technical Data and Lesion Characteristics

| Guide Size | Number | % | Balloon Size | Number | % |
|------------|-------------|-------------|--------------|-------------|-------------|
| Null | 4 | 0.29 % | Null | 10 | 0.31 % |
| 0.014 | 1 | 0.07 % | 1.00 | 12 | 0.37 % |
| 5 | 24 | 1.77 % | 1.10 | 23 | 0.71 % |
| 6 | 1091 | 80.34 % | 1.20 | 1 | 0.03 % |
| 6.5 | 11 | 0.81 % | 1.25 | 31 | 0.96 % |
| 7 | 186 | 13.70 % | 1.50 | 79 | 2.43 % |
| 7.5 | 3 | 0.22 % | 2.00 | 436 | 13.43 % |
| 8 | 38 | 2.80 % | 2.25 | 56 | 1.73 % |
| | 1358 | 100% | 2.50 | 943 | 29.05 % |
| | | | 2.75 | 148 | 4.56 % |
| | | | 3.00 | 598 | 18.42 % |
| | | | 3.25 | 168 | 5.18 % |
| | | | 3.50 | 393 | 12.11 % |
| | | | 3.75 | 95 | 2.93 % |
| | | | 4.00 | 164 | 5.05 % |
| | | | 4.50 | 64 | 1.97 % |
| | | | 5.00 | 21 | 0.65 % |
| | | | 5.50 | 3 | 0.09 % |
| | | | 6.00 | 1 | 0.03 % |
| | | | | 3246 | 100% |

Technical Data and Lesion Characteristics

| Stent Width | Number | % | Stent Length | Number | % |
|-------------|-------------|-------------|--------------|-------------|-------------|
| 2.00 | 4 | 0.29 % | 8 | 37 | 2.67 % |
| 2.25 | 113 | 8.16 % | 9 | 12 | 0.87 % |
| 2.50 | 311 | 22.45 % | 11 | 6 | 0.43 % |
| 2.75 | 122 | 8.81 % | 12 | 108 | 7.80 % |
| 2.80 | 2 | 0.14 % | 13 | 3 | 0.22 % |
| 3.00 | 417 | 30.11 % | 14 | 11 | 0.79 % |
| 3.25 | 7 | 0.51 % | 15 | 176 | 12.71 % |
| 3.50 | 296 | 21.37 % | 16 | 63 | 4.55 % |
| 4.00 | 105 | 7.58 % | 18 | 249 | 17.98 % |
| 4.50 | 4 | 0.29 % | 19 | 1 | 0.07 % |
| 5.00 | 4 | 0.29 % | 20 | 75 | 5.42 % |
| | 1385 | 100% | 22 | 26 | 1.88 % |
| | | | 23 | 124 | 8.95 % |
| | | | 24 | 80 | 5.78 % |
| | | | 26 | 24 | 1.73 % |
| | | | 28 | 146 | 10.54 % |
| | | | 30 | 22 | 1.59 % |
| | | | 32 | 29 | 2.09 % |
| | | | 33 | 71 | 5.13 % |
| | | | 34 | 6 | 0.43 % |
| | | | 36 | 4 | 0.29 % |
| | | | 38 | 104 | 7.51 % |
| | | | 48 | 8 | 0.58 % |
| | | | | 1385 | 100% |

30 Day Outcomes

| Quality of Life | Number | % |
|-----------------|-------------|-------------|
| Better | 1018 | 93.05 % |
| No Improvement | 52 | 4.75 % |
| Worse | 24 | 2.19 % |
| | 1094 | 100% |

| Cardiac Rehab Attended | Number | % |
|------------------------|------------|-------------|
| Attended | 428 | 44.40 % |
| Not Attended | 536 | 55.60 % |
| | 964 | 100% |

| Exercise Compliance | Number | % |
|---------------------|-------------|-------------|
| No | 200 | 19.88 % |
| Yes | 806 | 80.12 % |
| | 1006 | 100% |

| Angina | Number | % |
|--------------------------------|-------------|-------------|
| Class I (Strenuous Activity) | 72 | 6.41 % |
| Class II (Ordinary Activity) | 54 | 4.80 % |
| Class III (Marked Limitations) | 13 | 1.16 % |
| Class IV (At Rest) | 64 | 5.69 % |
| No Pain | 917 | 81.58 % |
| Unknown | 4 | 0.36 % |
| | 1124 | 100% |

| Access Site | Number | % |
|-----------------|-----------|-------------|
| Active Bleeding | 1 | 5.26 % |
| Bruising | 10 | 52.63 % |
| Haematoma | 1 | 5.26 % |
| Persistent Pain | 7 | 36.84 % |
| | 19 | 100% |

| Smoking | Number | % |
|---|-----------|-------------|
| Recommended Smoking at One Month Post Procedure | 46 | 88.46 % |
| Referred to Quit Programme | 6 | 11.54 % |
| | 52 | 100% |

| Medication Compliance | Number | % |
|-----------------------|------------|-------------|
| No | 3 | 0.32 % |
| Yes | 948 | 99.68 % |
| | 951 | 100% |

| Adverse Events | Number | % |
|----------------|----------|-------------|
| CVA | 3 | 37.50 % |
| MI | 5 | 62.50 % |
| | 8 | 100% |