

## AUDIT: AN INDEPENDENT REPORT

## Cardiac interventional procedures in the United Kingdom during 1988

Peter J B Hubner

The British Cardiovascular Intervention Society asked the cardiac units in the United Kingdom that performed adult and paediatric interventional procedures for information on the procedures that had been performed between 1 January and 31 December 1988. Information for adult procedures was obtained from 44 cardiac units, 18 of which supplied incomplete data. Information on paediatric procedures was provided by 11 units; there was no information from two units. Some units included their private patients with their National Health Service figures.

**Percutaneous transluminal coronary angioplasty**

Information on percutaneous transluminal coronary angioplasty was obtained from 44 cardiac units, including three private hospitals.

**TOTAL NUMBER OF PROCEDURES**

All units supplied this information and the final figure was 5047 (equivalent to 89 per million) for the United Kingdom. Edgar Sowton also derived a figure of 5750 for the numbers of percutaneous transluminal coronary angioplasties in the United Kingdom for 1988 (personal communication). His figures included all cases in the record books kept by the nurses of the catheter rooms in the cardiac units. This number may be an overestimate because they may include percutaneous transluminal coronary angioplasties that were

not performed after control angiography. Some peripheral vessel angioplasties may have been included as coronary angioplasties. The figure from the British Cardiovascular Intervention Society may be an underestimate because the experience of medical staff in recording details for audit varies. Also it was difficult to obtain information on procedures performed in private hospitals

**PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY: WORKLOAD OF THE CARDIAC UNITS**

Table 1 shows the number of cases per annum per unit. Only 29% of the units were performing  $\geq 150$  percutaneous transluminal coronary angioplasties in 1988.

**OVERALL RESULTS OF PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY**

Table 2 shows the overall results of percutaneous transluminal coronary angioplasty. The figure in the left hand column refers to the total number of procedures for which information was available. For example, out of 5047 percutaneous transluminal coronary angioplasty procedures, information on mortality was available on 4817 (95%). Mortality in these 4817 patients was 0.77% with figures for units ranging from 0% to 4.8%. Death and myocardial infarction refer to these complications occurring at or after percutaneous transluminal coronary angioplasty, during the hospital admission for the percutaneous transluminal coronary angioplasty, with or without emergency coronary artery bypass grafting. For this survey we defined success at percutaneous transluminal coronary angioplasty as the immediate angiographic result assessed visually where the stenosis was reduced to  $\leq 50\%$  of the lumen of the adjacent artery. This success was achieved without complication during the admission—that is, death, myocardial infarction, or emergency coronary artery bypass grafting. Unfortunately, information on myocardial infarction and the success of the procedure was less often available from the centres. Despite the reduced information, the survey does provide an overall view of the results and complications in patients who underwent percutaneous transluminal coronary angioplasty in the United Kingdom during 1988.

Table 1 Percutaneous transluminal coronary angioplasty United Kingdom 1988 (number of cases per annum in 44 cardiac units)

Cases	Units
0-50	10
51-100	11
101-150	10
151-200	8
201-251	1
251-300	4

Table 2 Percutaneous transluminal coronary angioplasty 1988

Variable	Data from	Mean (%)	(range)
Cardiac units	44		
Total	5047		
Mortality	4817	0.77	(0-4.8)
Emergency coronary artery bypass grafting	4721	2.71	(0-6)
Myocardial infarction	3346	2.36	(0-5)
Success	4074	86.6	(56-93)

**Honorary Secretary,  
British  
Cardiovascular  
Intervention Society**  
P J B Hubner

Correspondence to  
Dr Peter J B Hubner,  
Department of Cardiology,  
Groby Road Hospital, Groby  
Road, Leicester LE3 9QE.

**SINGLE VESSEL PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY (TABLE 3)**

The mortality for the procedure was low,

Table 3 Percutaneous transluminal coronary angioplasty in the United Kingdom in 1988: single vessel dilatation

	Data from	%	Range (%)
Total*	3666		
Cases of single vessel dilatation out of total percutaneous transluminal coronary angioplasties		83	63-100
Mortality	2655	0.37	0-1.9
Emergency coronary artery bypass grafting	2560	2.3	0-7
Myocardial infarction	2155	2.4	0-5.1
Success	2691	87	75-100

\*There were more than 3666 cases of single vessel disease but separate information was available only on these.

0.37% for 2655 patients. The immediate success rate was 87%.

#### MULTIVESSEL PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY (TABLE 4)

Information was available on 506 cases. The mortality and emergency coronary artery bypass graft rates were higher than for single vessel dilatation. The results reflect the increased risks for patients with more advanced coronary artery disease who were undergoing a more complicated procedure than single vessel dilatation.

#### Balloon dilatation of valves in adults (table 5)

Many units performed small numbers of balloon dilatations of the aortic valve. Balloon dilatation of the mitral valve was virtually confined to two units, which performed 47 out of the 60 procedures. Complications refer to significant local or general complications.

#### Paediatric interventional procedures (table 6)

No information was available from two units. Balloon dilatation of the pulmonary valve was the commonest procedure and it was associated with a low mortality.

Table 4 Percutaneous transluminal coronary angioplasty in the United Kingdom in 1988: multivessel dilatation

	Data from	% (range)
Cardiac units	24	
Total number of cases*	506	
Average number per unit	21	
Mortality	(506)	1.6 (0-5.7)
Emergency coronary artery bypass grafting	(506)	4.7 (0-16)
Myocardial infarction	(506)	3.0 (0-13)
Success (all vessels dilated)	(401)	81 (47-100)

\*There were more than 506 cases of multivessel dilatation but information was available only on these.

Table 5 Balloon dilatation of valves in adults in the United Kingdom in 1988

	Death	Complication
Cardiac units	24	
Pulmonary valve	32	0
Aortic valve	136	6 (4.4%)
Mitral valve	60	2 (3.3%)
Miscellaneous:		
Coarctation of aorta	7	0
Closure of ductus arteriosus	1	0

Table 6 Paediatric interventional procedures in the United Kingdom in 1988

	Death	Complication
Cardiac units	11	
Pulmonary valve dilatation	141	1
Aortic valve dilatation	56	4* (7.1%)
Coarctation of aorta	47	0
Closure of ductus arteriosus	32	0
Miscellaneous	61	0

\*All neonates.

Table 7 Percutaneous transluminal coronary angioplasty in 1988

Country	No/million population
Australia	256
Belgium	390
France	202
West Germany	233
United Kingdom	89*
United States	1000

\*Figure from the British Cardiovascular Intervention Society. Other figures from Intervention Limited, 1 Redman Court, Bell Street, Princes Risborough, Buckinghamshire.

#### Funding for percutaneous transluminal coronary angioplasty/interventional procedures

Units were asked to give details on how these procedures were funded. Very wide variation in funding was recorded. Twelve units had a separate budget, and 15 did not have a separate budget and the procedures were paid for out of the funds for cardiac catheterisation or the x ray department. No information on funding was available from 17 units. Of the units with a budget some had a reasonable allocation—for example £105 000 for 129 procedures. Others had a quite inadequate budget—£50 000 for 262 procedures.

#### Number of operators for percutaneous transluminal coronary angioplasty

Most units had two or more operators but the number of operators was not related to the number of procedures performed or the population area served.

#### Comments on the 1988 survey of procedures

This survey was the first attempt to audit the experience in the United Kingdom of percutaneous transluminal coronary angioplasty and other cardiac interventional procedures. It is hoped to improve the completeness of the survey in future years. The survey was made to assess the numbers and safety of the procedures. Percutaneous transluminal coronary angioplasty in 1988 in the United Kingdom was performed at relatively low risk—0.77% overall mortality and 0.37% mortality for single vessel disease. The number of percutaneous transluminal coronary angioplasties per million population in the United Kingdom in 1988 was well below the rates elsewhere in Europe and in the United States (table 7).