

# Surgery for valvular heart defects

From the National Hospital Morbidity Database it is estimated that there were 4,892 operations for acquired valvular heart defects in 1999. Details of 4,590 such operations are held in the National Cardiac Surgery Register and they are shown in this section.

Table 2 presents information about valve surgery performed from 1990 to 1999, and Table 4 gives more detailed figures for 1999 alone. Between 1990 and 1999, there has been an 85% increase in the number of operations for valve defects.

In 1999, most valve surgery was done on the aortic and mitral valves, 56% and 35% respectively. The vast majority of surgery was for replacement procedures (75%). For mitral valve surgery, repair of the valve was performed in 44% of cases. For aortic valve replacement, mechanical prostheses were used in 53%, bioprostheses in 44%, allografts in 2.5% and autografts in 1%. Of the bioprostheses 22% were stentless valves.

Between 1998 and 1999, repair and replacement procedures increased by 28% and 9% respectively. The increase in replacement procedures is due to increases in xenografts (heterograft) (29%). Replacement using prostheses remained steady over this period. The increase in repair procedures is mainly due to mitral valve repair (Table 4).

The reasons for valve reoperations are given in Table 3. In 1999 there were 69 reoperations for mechanical valve failures, with 2 deaths; 80 bioprosthetic tissue valve failures, with 4 deaths; and 24 reoperations for allograft tissue valve failures, with 3 deaths. These figures indicate there is a much higher valve failure rate for tissue valves, as over the last 10 years about 150 mechanical, 500 bioprosthetic and 150 allograft valves have been inserted each year.

Degeneration was the most frequent cause of reoperations to tissue valves, accounting for around 76% of all allograft replacements and bioprosthetic replacements. For mechanical valves, reoperations were performed for mechanical failure (54% of cases), endocarditis (32%) and paravalvular leak (14%) (Table 3).

**Table 2: Number of operations for acquired valve defects by type of valve and procedure, 1994–99**

	1994	1995	1996	1997	1998	1999
<b>Valve</b>						
Mitral	1,367	1,299	n.a.	n.a.	1,488	1,720
Aortic	2,153	2,183	n.a.	n.a.	2,405	2,716
Tricuspid	77	78	n.a.	n.a.	138	139
Pulmonary	3	3	n.a.	n.a.	7	15
Estimate from NHMD <sup>(a)</sup>	..	220	4,038	4,447	408	302
<b>Total</b>	<b>3,600</b>	<b>3,783</b>	<b>4,038</b>	<b>4,447</b>	<b>4,446</b>	<b>4,892</b>
<b>Type of surgery</b>						
Repair <sup>(b)</sup>	548	591	n.a.	n.a.	705	905
Replacement						
Mechanical prosthesis	2,338	2,127	n.a.	n.a.	2,153	2,206
Allograft <sup>(c)</sup>	129	113	n.a.	n.a.	124	113
Xenograft <sup>(d)</sup>	585	732	n.a.	n.a.	1,056	1,366
<i>Total replacement</i>	3052	2,972	n.a.	n.a.	3,334	3,685
Estimate from NHMD <sup>(a)</sup>	..	220	4,038	4,447	408	302
<b>Total</b>	<b>3,600</b>	<b>3,783</b>	<b>4,038</b>	<b>4,447</b>	<b>4446</b>	<b>4,892</b>
<b>Reoperations<sup>(e)</sup></b>						
Tissue valve						
Allograft	130	12	n.a.	n.a.	26	24
Bioprosthetic	..	136	n.a.	n.a.	65	80
Autograft valve	..	..	n.a.	n.a.	1	—
Not specified	..	..	n.a.	n.a.	..	..
Mechanical valve	59	39	n.a.	n.a.	59	69
<b>Total</b>	<b>189</b>	<b>187</b>	<b>n.a.</b>	<b>n.a.</b>	<b>151</b>	<b>173</b>

.. not applicable.

n.a. not available.

(a) From 1995, estimates were made from the National Hospital Morbidity Database (NHMD).

(b) Repair = valvotomy and reconstruction, as in Table 4.

(c) Allograft = homograft.

(d) Xenograft = heterograft.

(e) Not all units gave details on valve reoperations.

Source: AIHW/NHF National Cardiac Surgery Register.

**Table 3: Reasons for reoperations<sup>(a)</sup> for valve replacement, 1999**

Reason for reoperation	Mechanical valves	Tissue valves	
		Bioprosthetic	Allograft
		<b>Number (deaths)</b>	
Degeneration	..	63 (2)	16 (0)
Endocarditis	22 (2)	7 (1)	3 (1)
Mechanical failure	37 (0)	..	..
Paravalvular leak	10 (0)	10 (1)	5 (2)
<b>Total</b>	<b>69 (2)</b>	<b>80 (4)</b>	<b>24 (3)</b>

.. not applicable.

(a) Not all units gave details on valve reoperations.

Source: AIHW/NHF National Cardiac Surgery Register.

**Table 4: Operations for valve defects for acquired conditions by type of valve and procedure, 1999**

Valve	Procedure	Single	Double	Triple	Total
		<b>Number (deaths)</b>			
Mitral	Valvotomy	6 (0)	3 (0)	0	9 (0)
	Reconstruction				
	with support ring	559 (9)	51 (2)	2 (1)	612 (12)
	without ring	121 (3)	12 (2)	2 (0)	135 (5)
	repair paravalvular leak	1 (0)	0	0	1 (0)
	Replacement				
	xenograft	137 (8)	43 (5)	4 (0)	184 (13)
	mechanical prosthesis	574 (18)	180 (7)	17 (1)	771 (26)
	mitral allograft	0	8 (0)	0	8 (0)
Aortic	Reconstruction				
	valvotomy	0	1 (0)	1 (0)	2 (0)
	decalcification	6 (0)	2 (1)	0	8 (1)
	for regurgitation	5 (0)	5 (2)	0	10 (2)
	other/unstated	8 (0)	1 (0)	1 (0)	10 (0)
	repair paravalvular leak	4 (0)	0	0	4 (0)
	Replacement				
	classical allograft	23 (2)	2 (0)	1 (0)	26 (2)
	'mini root' allograft	32 (1)	2 (0)	0	34 (1)
	'total root' allograft	7 (1)	1 (0)	0	8 (1)
	'mini root' xenograft	0	1 (0)	0	1 (0)
	stent-mounted xenograft	865 (30)	43 (5)	5 (1)	913 (36)
	stentless xenograft	246 (12)	8 (0)	0	254 (12)
	xenograft not specified	0	1 (0)	0	1 (0)
	pulmonary autograft	31 (0)	0	0	31 (0)
	mechanical prosthesis	1,234 (44)	163 (6)	17 (1)	1,414 (51)
Tricuspid	Reconstruction				
	with support ring	16 (1)	41 (0)	11 (2)	68 (3)
	without ring	12 (2)	17 (2)	9 (0)	38 (4)
	Replacement				
	xenograft	8 (0)	2 (1)	2 (0)	12 (1)
	mechanical prosthesis	9 (1)	9 (1)	3 (0)	21 (2)
Pulmonary	Reconstruction	7 (0)	0	0	7 (0)
	Replacement				
	allograft	7 (0)	0	0	7 (0)
	xenograft	1 (0)	0	0	1 (0)
	Estimate from NHMD <sup>(a)</sup>	..	..	..	302
	<b>Total valves<sup>(b)</sup></b>	<b>3,919</b>	<b>596</b>	<b>75</b>	<b>4,892</b>
	<b>Total patients<sup>(c)</sup></b>	<b>3,919 (132)</b>	<b>298 (17)</b>	<b>25 (2)</b>	<b>4,242 (151)</b>

.. not applicable.

Allograft = homograft.

Xenograft = heterograft.

(a) For non-contributing units, estimates were made from the National Hospital Morbidity Database.

(b) Based on data from the AIHW/NHF National Cardiac Surgery Register and National Hospital Morbidity Database.

(c) Based on AIHW/NHF National Cardiac Surgery Register data only.

Sources: AIHW/NHF National Cardiac Surgery Register and National Hospital Morbidity Database.