Caseload of NHS plastic surgeons in Scotland, 2005–2006: analysis of Scottish hospital activity data

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DECLARATIONS

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CTB obtained the data and prepared a draft manuscript. TS provided specialist advice and commented on the manuscript. Both authors read and approved the final version of the manuscript

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Summary

Objective To assess the contemporary caseload of NHS plastic surgeons.

Design Descriptive study.

Setting Scotland.

Methods Analysis of routinely collected NHS hospital activity data relating to the financial year 2005–2006.

Main outcome measures Number of inpatient/day-case episodes and bed-days by principal diagnosis and main operative procedure.

Results During the study period, 12,844 inpatient and 9439 day-case episodes were recorded in 19,166 patients, accounting for 36,300 bed-days. There were more female patients, especially among middle-age groups. Socioeconomic deprivation was more common than expected ($P < 0.0001$), especially among younger age groups and male patients. In terms of episodes, the most common categories of diagnosis were neoplasms (28.4%) and injuries, including burns (22.4%). However, injuries accounted for a higher proportion of bed-days (37.3%) than neoplasms (23.8%). Only approximately half of all surgical procedures were assigned to the skin chapter of the OPCS-4 classification.

Conclusions Despite some limitations, this study provides an insight into the current caseload of NHS plastic surgeons working in Scotland. The data suggest that cosmetic surgery for purely aesthetic reasons represents a relatively small part of NHS plastic surgery activity in Scotland, and that the majority of caseload is in reconstructive plastic surgery.

Introduction

In January 2007, the *BMJ* published a personal view entitled 'We don't need another 400 plastic surgeons'.¹ Perhaps stung by the suggestion that plastic surgery trainees might all simply want to be cosmetic surgeons, the article provoked 72 rapid responses within less than three months, mainly

from the plastic surgery community.² Many correspondents expressed their frustration about the public image of plastic surgeons, based on misconceptions of their role, although this is by no means a new phenomenon.^{3–6} With notable exceptions, very few correspondents supported their arguments with data.

Although aesthetic surgery forms an important part of the workload of a plastic surgeon, the other subspecialty branches include craniofacial surgery, hand surgery, burns surgery, microsurgery and paediatric plastic surgery. Apart from normalization and improvement of appearance, the main areas of work include trauma and burns, cancer (skin, head and neck, breast and sarcoma), congenital deformities and tissue degenerative conditions requiring reconstruction.⁷

By analysing routinely collected NHS hospital activity data, the aim of the present study was to provide information about the contemporary caseload of NHS plastic surgeons in one part of the UK.

Methods

Anonymized inpatient and day-case hospital episode data for the plastic surgery specialty and the financial year April 2005–March 2006 were obtained from the Information Services Division of NHS National Services Scotland. There are four main plastic surgery units in Scotland. The data were analysed by principal diagnosis and main operative procedure. Although essentially administrative data, re-abstraction exercises have shown that the coding of the principal diagnosis and main operative procedure are approximately 90% reliable at the level of three digit ICD-10⁸ and OPCS-4⁹ categories.¹⁰ The impact of socioeconomic position

Figure 1
Age and sex distribution of inpatients and day-cases, 2005–2006

Figure 2a
Plastic surgery inpatient and day-case episodes by main diagnostic category, Scotland, financial year 2005–2006

Figure 2b
Plastic surgery inpatient bed-days by main diagnostic category, Scotland, financial year 2005–2006

was assessed using the Scottish Index of Multiple Deprivation (SIMD). This has seven domains (income, employment, education, housing, health, crime and geographical access) at 'data zone' level, which have been combined into an overall index to identify small area concentrations of multiple deprivation.¹¹ The statistical significance of differences in proportions was tested using the Chi-squared test.

Results

During the financial year April 2005–March 2006, 12,844 inpatient and 9439 day-case episodes were

Table 1
Plastic surgery inpatient and day-case episodes by principal diagnosis, Scotland, financial year 2005–2006*

Diagnosis	ICD-10 code	Episodes		% of total		% Day-cases		Bed-days	
		n	% of total	n	% of total	n	% of total	n	% of total
<i>Neoplasms</i>	<i>C00-D48</i>	6332	28.4	62.5	8645	23.8			
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	81	0.4	3.7	974	2.7			
Malignant melanoma of skin	C43	500	2.2	41.0	987	2.7			
Other malignant neoplasms of skin	C44	3073	13.8	61.6	3195	8.8			
Malignant neoplasm of other connective and soft tissue	C49	55	0.3	7.3	370	1.0			
Malignant neoplasm of breast	C50	186	0.8	1.6	1252	3.4			
Secondary and unspecified malignant neoplasm of lymph nodes	C77	59	0.3	5.1	505	1.4			
Melanoma in situ	D03	123	0.6	67.5	64	0.2			
Carcinoma in situ of skin	D04	119	0.5	58.8	115	0.3			
Benign lipomatous neoplasm	D17	177	0.8	61.0	112	0.3			
Haemangioma and lymphangioma, any site	D18	189	0.9	75.1	91	0.3			
Other benign neoplasms of connective and other soft tissue	D21	33	0.2	78.8	10	0.0			
Melanocytic naevi	D22	1104	5.0	91.1	85	0.2			
Other benign neoplasms of skin	D23	394	1.8	83.5	73	0.2			
<i>Diseases of the nervous system</i>	<i>G00-G99</i>	694	3.1	73.1	259	0.7			
Facial nerve disorders (including Bell's palsy)	G51	26	0.1	19.2	38	0.1			
Mononeuropathies of upper limb (including carpal tunnel syndrome)	G56	661	3.0	75.6	215	0.6			
<i>Diseases of the eye and adnexa</i>	<i>H00-H59</i>	260	1.2	61.5	146	0.4			
Other disorders of eyelid (including entropion, ectropion, ptosis)	H02	228	1.0	61.0	112	0.3			
<i>Diseases of the circulatory system</i>	<i>I00-I99</i>	678	3.0	96.3	134	0.4			
<i>Diseases of capillaries (including non-neoplastic naevi)</i>	<i>I78</i>	652	2.9	99.4	2	0.0			
<i>Diseases of skin and subcutaneous tissue</i>	<i>L00-L99</i>	3021	13.6	63.1	3524	9.7			
Infections of the skin and subcutaneous tissue	L00-L08	235	1.1	8.5	788	2.2			
Skin changes due to chronic exposure to non-ionizing radiation (including actinic keratosis)	L57	275	1.2	77.8	90	0.2			
Acne and rosacea	L70-L71	101	0.5	38.6	92	0.3			
Follicular cysts of skin and subcutaneous tissue	L72	592	2.7	89.7	66	0.2			
Other follicular disorders (including hidradenitis suppurativa)	L73	135	0.6	27.4	382	1.1			
Other disorders of pigmentation (including lentigo)	L81	125	0.6	90.4	26	0.1			
Seborrhoeic keratosis	L82	137	0.6	92.7	13	0.0			
Other epidermal thickening (including acquired ichthyosis)	L85	47	0.2	70.2	27	0.1			
Decubitus ulcer (including bedsore)	L89	23	0.1	0.0	582	1.6			

Diagnosis	ICD-10 code	Episodes		Bed-days		
		n	% of total	% Day-cases	n	% of total
Atrophic disorders of skin (including disfigurement due to scar)	L90	587	2.6	51.4	667	1.8
Hypertrophic disorders of skin (including keloid scar)	L91	260	1.2	75.4	69	0.2
Granulomatous disorders of the skin and subcutaneous tissue	L92	47	0.2	57.4	32	0.1
Ulcer of lower limb, not elsewhere classified	L97	41	0.2	7.3	345	1.0
Other disorders of the skin and subcutaneous tissue, not elsewhere classified	L98	322	1.5	61.5	292	0.8
(including pyogenic granuloma)						
<i>Diseases of musculoskeletal system and connective tissue</i>	<i>M00-M99</i>	<i>1021</i>	<i>4.6</i>	<i>36.3</i>	<i>1692</i>	<i>4.7</i>
Arthropathies	M00-M25	182	0.8	26.4	303	0.8
Disorders of synovium and tendon	M65-M68	201	0.9	57.7	115	0.3
Fibroblastic disorders (including Dupuytren's contracture)	M72	459	2.1	36.2	738	2.0
<i>Diseases of the genitourinary system</i>	<i>N00-N99</i>	<i>410</i>	<i>1.8</i>	<i>9.3</i>	<i>991</i>	<i>2.7</i>
Disorders of breast (including hypertrophy)	N60-N64	337	1.5	7.7	678	1.9
<i>Congenital malformations, deformations and chromosomal abnormalities</i>	<i>Q00-Q99</i>	<i>1542</i>	<i>6.9</i>	<i>49.4</i>	<i>1541</i>	<i>4.2</i>
Other congenital malformations of ear (including prominent ear)	Q17	527	2.4	51.2	254	0.7
Cleft lip and cleft palate	Q35-Q37	257	1.2	2.3	651	1.8
Hypospadias	Q54	64	0.3	10.9	234	0.6
Polydactyly	Q69	67	0.3	71.6	14	0.0
Syndactyly	Q70	27	0.1	22.2	30	0.1
Other congenital malformation of skin (including congenital non-neoplastic naevus)	Q82	291	1.3	94.8	19	0.1
Congenital malformation of breast	Q83	75	0.3	12.0	145	0.4
<i>Injury, poisoning and certain other consequences of external causes</i>	<i>S00-T98</i>	<i>5001</i>	<i>22.4</i>	<i>1.7</i>	<i>13528</i>	<i>37.3</i>
Injuries	S00-T14	3874	17.4	1.2	6008	16.6
Burns and corrosions	T20-T32	622	2.8	0.5	5239	14.4
<i>Factors influencing health status and contact with health services</i>	<i>Z00-Z99</i>	<i>2816</i>	<i>12.6</i>	<i>29.5</i>	<i>4676</i>	<i>12.9</i>
Procedures for purposes other than remedying health state (including cosmetic breast implant)	Z41	1267	5.7	19.5	2259	6.2
Follow-up care involving plastic surgery	Z42	960	4.3	31.0	2015	5.6
<i>Other diagnoses</i>		<i>508</i>	<i>2.3</i>	<i>33.1</i>	<i>1164</i>	<i>3.2</i>
<i>Total</i>		<i>22283</i>	<i>100</i>	<i>42.4</i>	<i>36300</i>	<i>100</i>

* Note that only selected subcategories of the main diagnostic categories (italics) are shown. Only the sums of the main diagnostic categories correspond to the column totals

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recorded in 19,166 patients, accounting for 36,300 bed-days. Overall, there were more female (10,098) than male (9068) patients, especially among the middle-age groups, although men predominated at the ages under 30 and 60–79 years (Figure 1). A higher than expected percentage of patients (25.3%) were assigned to the most deprived quintile of the Scottish Index of Multiple Deprivation based on their postcodes of residence (Chi-squared = 373.2, $P < 0.0001$). Socio-

economic deprivation was more commonly observed among younger age groups and male patients.

The distribution of inpatient or day-case episodes and bed-days by main category of principal diagnosis is shown in Figures 2a and 2b, and in Table 1 with selected, more specific diagnoses listed under each main category. In terms of episodes, the most common categories of diagnosis recorded were 'Neoplasms' (28.4%) and 'Injury, poisoning and certain other consequences of external causes' (22.4%). However, 'Injury, poisoning and certain other consequences of external causes' accounted for a higher proportion of bed-days (37.3%) than 'Neoplasms' (23.8%).

Only 1593 (7.1%) episodes had no operative procedure recorded. The distribution of inpatient or day-case episodes and bed-days by main category of main operative procedure is shown in Figures 3a and 3b, and in Table 2 with selected, more specific procedures listed under each main category. Almost half of all procedures were classified under the 'Skin' chapter of OPCS-4, either defined in terms of episodes (47.8%) or bed-days (45.4%).

Figure 3a
Plastic surgery inpatient and day-case episodes by main operation category, Scotland, financial year 2005–2006

Figure 3b
Plastic surgery inpatient bed-days by main operation category, Scotland, financial year 2005–2006

Discussion

We have used national data, collected routinely, to describe the caseload of NHS plastic surgeons in Scotland. It has been observed that case numbers alone may give a totally misleading impression of the amount and type of work carried out by plastic surgeons.¹² However, for the sake of simplicity, we chose to analyse only the principal diagnosis and the main operative procedure of inpatient or day-case episodes. Inevitably, this underestimates the complexity of the workload because many patients have multiple diagnoses and multiple procedures performed. Furthermore, we did not analyse outpatient data because these do not record all return visits, they do not usually record diagnosis, and the recording of operative procedures is believed to be incomplete. According to existing published statistics, 26,480 new plastic surgery outpatients were seen during the financial year April 2005–March 2006.¹³

Despite the limitations of our analysis, we believe that our results provide a reasonable insight into the current pattern of work of NHS consultant

Table 2
Plastic surgery inpatient and day-case episodes by main operation, Scotland, financial year 2005–2006*

Operation	OPCS-4 code	Episodes		% Day-cases		Bed-days	
		n	% of total	% of total	% of total	n	% of total
<i>Nervous system</i>							
Repair of peripheral nerve	A01-A84	1019	4.6	50.4		667	1.8
Carpal tunnel release	A62-A64	306	1.4	0.7		412	1.1
	A65.1	633	2.8	76.1		185	0.5
<i>Breast</i>	B27-B37	1850	8.3	8.9		5145	14.2
Excision of breast (total or partial)	B27-B28	194	0.9	8.2		948	2.6
Reconstruction of breast	B29	200	0.9	0.5		1326	3.7
Prosthesis for breast	B30	249	1.1	1.6		616	1.7
Reduction mammoplasty	B31.1	575	2.6	0.3		1307	3.6
Augmentation mammoplasty	B31.2	284	1.3	0.4		549	1.5
Mastopexy	B31.3	76	0.3	1.3		152	0.4
Operations on nipple (including eversion of nipple)	B35	191	0.9	69.1		65	0.2
<i>Eye</i>	C01-C86	950	4.3	64.1		499	1.4
Operations on eyebrow (including excision of lesion, suture of eyebrow)	C10	146	0.7	65.8		38	0.1
Operations on canthus (including excision of lesion)	C11	216	1.0	67.6		116	0.3
Operations on eyelid (including excision of lesion, excision of redundant skin)	C12-C22	577	2.6	63.3		334	0.9
<i>Ear</i>	D01-D28	1265	5.7	60.0		661	1.8
Excision of external ear (total or partial, including preauricular abnormality)	D01	161	0.7	75.8		51	0.1
Extirpation of lesion of external ear	D02	397	1.8	79.1		119	0.3
Plastic operations on external ear (including correction of prominent ear)	D03	542	2.4	42.6		377	1.0

Operation	OPCS-4 code	Episodes		Bed-days		
		n	% of total	% Day-cases	n	% of total
Respiratory tract	E01-E63	1077	4.8	60.4	775	2.1
Plastic operations on nose (including rhinoplasty)	E02	206	0.9	17.5	306	0.8
Operations on external nose (including excision of lesion)	E09	827	3.7	72.9	370	1.0
Mouth	F01-F58	833	3.7	35.8	1206	3.3
Excision of lesion of lip	F02.1	285	1.3	79.3	85	0.2
Correction of deformity of lip (including primary closure of cleft lip)	F03	59	0.3	6.8	174	0.5
Suture of lip	F05.3	147	0.7	2.0	73	0.2
Correction of deformity of palate (including primary repair of cleft palate)	F29	79	0.4	1.3	183	0.5
Urinary	M01-M83	86	0.4	12.8	363	1.0
Repair of hypospadias	M73.1	53	0.2	7.5	209	0.6
Skin	S01-S70	10655	47.8	52.0	16468	45.4
Plastic excision of skin of head or neck (including facelift)	S01	51	0.2	13.7	69	0.2
Plastic excision of skin of abdominal wall (including abdominoplasty)	S02	153	0.7	0.7	570	1.6
Excision of sweat gland bearing skin of axilla or groin	S04.1-S04.2	76	0.3	10.5	241	0.7
Excision of lesion on skin	S05-S06	4516	20.3	72.0	3275	9.0
Photodestruction of lesion on skin	S09	1392	6.2	94.4	100	0.3
Punch, shave or other biopsy of skin	S13-S15	162	0.7	77.2	114	0.3
Skin flap operations (including Z plasty)	S17-S31	444	2.0	26.4	1898	5.2
Skin graft	S33-S37	769	3.5	19.1	3229	8.9
Suture of skin	S41-S42	345	1.5	3.5	456	1.3
Removal of substance from skin (including repair material, metal, glass, dirt, etc.)	S43-S45	160	0.7	38.1	90	0.2
Opening of skin (including drainage of lesion of skin)	S47	128	0.6	3.1	364	1.0
Insertion of or attention to skin expander in subcutaneous tissue	S48-S49	71	0.3	1.4	217	0.6

Operation	OPCS-4 code	Episodes		Bed-days	
		<i>n</i>	% of total	% Day-cases	% of total
Introduction of destructive substance into subcutaneous tissue (including sclerosing substance)	S51	116	0.5	99.1	3
Exploration of burnt skin (including debridement, etc.)	S54-S55	163	0.7	0.0	2016
Exploration of other skin (including debridement, etc.)	S56-S57	1027	4.6	2.0	2864
Tattooing of skin	S60.3	101	0.5	92.1	6
Refashioning of scar, not elsewhere classified	S60.4	308	1.4	46.1	273
Liposuction	S62.1-S62.2	165	0.7	14.5	207
Repair of nailbed	S66.2	257	1.2	2.7	140
Soft tissue	T01-T96	1562	7.0	20.9	3030
Palmar fasciectomy	T52.1	267	1.2	24.7	340
Division of palmar fascia	T54.1	131	0.6	71.8	47
Excision of ganglion	T59	55	0.2	69.1	10
Operations on tendons (including repair of tendon)	T64-T74	794	3.6	9.9	968
Block dissection of lymph nodes or excision or biopsy of lymph node	T85, T87	123	0.6	6.5	893
Bones and joints of skull and spine	V01-V54	75	0.3	2.7	542
Other bones and joints	W01-W92	545	2.4	14.3	993
Miscellaneous operations	X01-X59	611	2.7	30.4	1528
Amputation of hand	X08	137	0.6	2.2	225
Correction of congenital deformity of hand	X21	74	0.3	60.8	28
Other operations		162	0.7	26.5	707
No operation recorded		1593	7.1	15.9	3716
Total		22283	100	42.4	36300

* Note that only selected subcategories of the main operation categories (*italics*) are shown. Only the sums of the main operation categories correspond to the column totals

plastic surgeons in Scotland who, according to national manpower census statistics, numbered 26 at 30 September 2005, approximately halfway through our study period.¹³ It is possible to classify many of the diagnoses and procedures listed in Tables 1 and 2 according to whether they relate primarily to reconstructive surgery or to aesthetic surgery. Based on this, the data suggest that the majority of caseload is in reconstructive plastic surgery, and that cosmetic surgery for purely aesthetic reasons represents a relatively small part of NHS plastic surgery activity in Scotland. Even for the latter cases, clinical coders may not have been aware of other factors underpinning the decision to operate, such as psychological morbidity. In future, the advent of clinical information systems may permit a more clinically meaningful classification and analysis of plastic surgery activity.

References

- 1 Zaman MJS. We don't need another 400 plastic surgeons. *BMJ* 2007;**334**:44
- 2 Rapid Responses to: Zaman MJS. See <http://www.bmj.com/cgi/eletters/334/7583/44>
- 3 Park AJ, Scerri GV, Benamore R, McDiarmid JGM, Lamberty BGH. What do plastic surgeons do? *J R Coll Surg Edinb* 1998;**43**:189–93
- 4 Johnson D, Whitworth IH. Recent developments in plastic surgery. *BMJ* 2002;**325**:319–22
- 5 Dunkin CSJ, Pleat JM, Jones SAM, Goodacre TEE. Perception and reality – a study of public and professional perceptions of plastic surgery. *Br J Plast Surg* 2003;**56**:437–43
- 6 Hopkins Tanne J. New US drama outrages plastic surgeons. *BMJ* 2003;**327**:295
- 7 British Association of Plastic Surgeons. *The Way Forward. The Future of Plastic Surgery*. London: BAPS; 2003. See <http://www.bapras.org.uk/UploadFiles/The%20Way%20Forward.pdf>
- 8 World Health Organization. *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10)*. Geneva: WHO; 1992
- 9 Office of Population Censuses and Surveys. *Tabular List of the Classification of Surgical Operations and Procedures, Fourth Revision (OPCS-4)*. London: The Stationery Office; 1990
- 10 Harley K, Jones C. Quality of Scottish Morbidity Record (SMR) data. *Health Bull (Edinb)* 1996;**54**:410–17
- 11 See <http://www.scotland.gov.uk/Topics/Statistics/SIMD/>
- 12 Heywood TJ, McGregor JC. An audit of case-load and work-load in a regional plastic surgery unit using intermediate equivalents: a one-year study. *J R Coll Surg Edinb* 1994;**39**:34–8
- 13 <http://www.isdscotland.org>