

## ORIGINAL ARTICLES

## Paediatric outpatient utilisation in a district general hospital

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### Abstract

Paediatric outpatient utilisation in a district general hospital was studied for 20 general practices that covered a population of 26 433 children. The actions taken by paediatric staff were analysed for 487 new referrals and 2784 review attendances (the latter in 1630 children) over an eight month period.

New referral rates from different general practices varied between 3.7 per thousand children 0 to 15 years and 29.6 with a mean of 13.7, equivalent to 19 per thousand per year. (The national mean based on health district populations is 21.2 per year.) A total of 63% of new referrals and 49% of review patients were aged under 5 years. Over the study period 2.2% of children under 5 years in the population were referred as a new patient, equivalent to 3.1% per year, and 1.3% of children aged 0 to 15 years were referred, equivalent to 1.8% per year. Review attendances on one or more occasion occurred in 6.5% of children under 5 years over the study period, equivalent to 9.2% per year, and for age 0 to 15 years, 4.8% attended once or more times over the study period, equivalent to 6.7% per year. The review attendance rate per thousand child population per practice varied between 59 and 160 with a mean of 81.9. New patients formed 14.8% of the total attendances (the national mean is 18.3%).

Review attendance rates were significantly lower when the general practice was large. Socioeconomic factors suggested by a high proportion of children in the general practice list were associated with a high review attendance rate. Altogether 27.0% of new referrals were seen once only and 32.8% had no tests done. The most common reason for attendance was asthma (11% of new and 19% of review patients). The second commonest was for fits (8.4% of new referrals and 4.7% of review patient attendances).

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There is very little information available upon the utilisation of paediatric outpatient services in the NHS and mostly this is numerical data for health service indicators (HSIs) based on district health authority populations. Information has been published on new referral of children to hospital outpatient clinics for all specialties—rather than just paediatric outpatient clinics—and has been documented at a rate of 100 referrals per thousand children aged 0 to 4 years and 64.3 per thousand children aged 5 to 14 years.<sup>1</sup> In a review of 1093 children

aged 3.5 years forming part of the British births study, 4% had attended a paediatric outpatient clinic one or more times in their lives (excluding neonatal follow up clinic attendance).<sup>2</sup> Variations between districts may partly be related to measures of socioeconomic deprivation.<sup>3</sup> Considerably more information is available upon the use of inpatient hospital services and also of child health clinics.<sup>4-6</sup>

### Methods

This study was based on a larger paediatric outpatient audit project. In this project, a form was prepared for each patient by an audit clerk that was completed by the doctor seeing the child. Diagnoses were coded using Read coding and actions taken in the clinic such as further appointment, referral to imaging, pharmacy, pathology, therapists, etc were recorded and analysed in respect of grade of staff and related to the case mix. The details of the referring general practice and the postcode of residence of the patient provided the data reported in this paper.

Over the period of the study between 4 September 1989 and 10 May 1990 (0.71 of a year), 487 new patients were seen and 2784 review attendances occurred in 1630 children.

Review attendances followed a previous outpatient attendance or were for follow up after an inpatient admission, the latter amounting to 9.5% of the review attendances. Excluded from the study were ward attenders and newborn babies reviewed in the maternity hospital.

The majority of the patients, 69%, came from Wakefield and 31% came from the Leeds, Pontefract, Dewsbury, or Barnsley district health authority populations.

Detailed analysis was made of new referral and review attendance from the Wakefield general practices as the population data available showed that these 20 general practices represented 97% of the Wakefield district health authority population (93% for 0 to 15 years) and child population data were available for these practices. The analysis therefore is based on 69% of the outpatient attendances (see tables 1 and 2 and results section (C)).

### Results

#### (A) NEW REFERRALS

Although the majority (87%) of new referrals were from the general practitioner (GP), there were 26, with prior agreement of the GP, from doctors working in the community child health service and a further eight referrals were made

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Table 1 Population summary

	Total No	0 to 15 years
Wakefield DHA*	145 820	28 520
Wakefield DHA practices†	141 048	26 433
Catchment population:*		
All acute specialties	209 000	
Paediatrics		46 460

Source: \*HSIs; †Family Health Services Authority. DHA=district health authority.

Table 2 Outpatient attendances

	New referrals	Review attendances
Total in outpatient study	487	2784
Wakefield DHA practices (%)	336 (69)	1922 (69)

DHA=district health authority.

Table 3 New patient referrals: the most common reasons/diagnoses by Read code groups representing 290 (59.5%) of the total 487 new referrals

Diagnosis	Read code	No (%)
Asthma/wheezing	H33 R060	57 (11.7)
Fits? (epilepsy in 17)	F25+ R002 and 3	41 (8.4)
Headaches (migraine in 18)	F26 R040	29 (5.9)
Cardiac murmur (significant in four)	G54Z P code R052+	28 (5.7)
Behaviour disorder (excluding enuresis/soiling)	E272 E274 E2C and D ECZ+	19 (3.9)
Urinary tract infection	K190	19 (3.9)
Chronic diarrhoea	A08ZZ R0772 J525	16 (3.3)
Short stature	R0345	16 (3.3)
Abdominal pain	R090+ J521	15 (3.1)
Constipation/soiling	PB2 J520 E277	15 (3.1)
Failure to thrive	R0341 R0342 R0343	13 (2.7)
Recurrent upper respiratory infections	H00 H05Z	12 (2.5)
Vomiting? reflux	J1011 R0701 and 2	10 (2.1)
Other		197 (40.5)
Total		487 (100.1)

Table 4 Outpatients seen related to practice and to practice size aged 0 to 15 years (20 practices)

No (%) in practice population aged 0-15 years	New referrals		Review attendances	
	No	No/1000 aged 0-15 years	No	No/1000 aged 0-15 years
2419 (20.6)	34	14.1	145	59.9
2414 (21.4)	18	7.5	134	55.5
2150 (18.5)	19	8.8	110	51.2
2038 (17.1)	44	21.6	195	95.7
2030 (18.3)	26	12.8	142	70
1906 (20.2)	23	12.1	117	61.4
1901 (17.5)	19	10	113	59
1526 (16.6)	7	4.5	164	105.1
1478 (19.9)	14	9.5	109	73.7
1439 (17.2)	26	18.1	124	86.2
1298 (22.5)	14	10.8	87	67
1124 (19.3)	10	8.9	38	33.8
1082 (15.9)	32	29.6	105	97
809 (15.8)	3	3.7	46	56.9
753 (18.8)	8	10.6	64	85
570 (22.5)	11	19.3	51	89
509 (15.4)	7	13.7	41	80
430 (21.9)	9	21	69	160
357 (14.9)	8	18.7	33	77.3
200 (49)	4	20	35	175
Total 26 433	336		1922	
Mean	20.2	13.7		81.9

at the instigation of the community doctors. Thus 7% of all new referrals arose from community child health doctors.

#### (B) MOST COMMON DIAGNOSES IN NEW REFERRALS

These are given in table 3 and the variable diagnostic coding for similar disorders used in the study are illustrated. There is a need to use groups of Read codes when searching for similar disorders.

#### (C) REFERRAL PATTERNS FOR GENERAL PRACTICES

The pattern of new referral and review attendances based upon each of the Wakefield district health authority practices is shown in table 4. Detailed analysis was made of new referral rates and review attendance rates per thousand children aged 0 to 15 years according to general practice characteristics: (a) size of general practice child population and (b) the proportion of the general practice list who were in this age band.

##### (i) GP new referral rates

The number of new outpatient referrals related closely to the size of the practice and the new referral rate per thousand child population 0 to 15 years from each general practice had a mean (SD) of 13.7 (6.5) per thousand over 0.71 of a year (equivalent to 19 per thousand over a year). The referral rate of new outpatients per thousand was not significantly related to general practice size or proportion of practice list who were children.

##### (ii) Review attendances by general practice

Predictably, the greater the size of the practice, the greater the number of review patients seen. The review attendance rate per thousand child population aged 0 to 15 years, however, varied between 33.8 and 175 with a mean (SD) of 81.9 (34.2), equivalent to 115.3 per year. The review attendance rate per thousand practice child population was greater when there was a higher than average proportion of the total practice list who were children ( $r=0.6153$ ,  $p=0.004$ ) but the review attendance rate per thousand was smaller the larger the size of the general practice population ( $r=-0.5$ ,  $p=0.013$ ). The observation that larger general practices had lower review attendance rates may imply that bigger general practices are more able to undertake review of complex or serious disorders, perhaps by having a partner with a particular interest in paediatrics. The higher review attendance from the practices with a high proportion of children on their list may be a reflection of socioeconomic disadvantages in the population served.

These observations were also reflected in attendance patterns for asthma, but not for failure to thrive, which may be more closely linked to socioeconomic deprivation.

#### (D) DIAGNOSTIC CASE MIX

(i) The diagnostic coding made on new referrals

Table 5 HSI 1989 paediatrics group ranking: selected paediatric outpatient indicators

Indicator	National mean	Wakefield value	Centile rank	In top 20%?
CL67 (outpatient referral attendances 1000 catchment population)	21.2	28.4	88	Yes
CL65 (outpatient average referral attendances/clinic)	2.02	3.17	94	Yes
CL63 (% of all attendances that are referral attendances)	18.34	22.29	82	Yes
MS21 (consultants/10 000 referrals seen)	32.6	22.7	22	No

Source: Department of Health; HSI 1989.

and review attendances has allowed further detailed analysis which will be reported separately (R MacFaul, R Long, in preparation). It has also been possible to demonstrate the range of conditions seen by each consultant and by other grades of staff.

(ii) A HSI (CL-63, see table 5) gives the ratio of new outpatients in comparison to the total number seen for each health district, the national mean being 18.34% for paediatrics and for Wakefield is shown as 22.29%. However, for this study the ratio was 14.8% and furthermore, data from this study enables the ratio to be

Table 6 Frequent review attenders: more than five attendances over the eight month period

Diagnosis	No of attendances
Asthma	40
Epilepsy	35
Mental handicap with/without epilepsy or cerebral palsy	31
Arthritis	17
Cystic fibrosis	16
Failure to thrive	16
Idiopathic thrombocytopenic purpura	12
Diabetes	10
Constipation/soiling	9
Brucellosis (one child)	8

Table 7 Action taken by consultant

Consultant	% New patients seen once only
A	18
B	36
C	20
Total	28

Table 8 % Follow up or discharge by staff grade

	Further appointment	Discharge
Consultant	77.5	20.1
Clinical assistant	83.3	15.5
Experienced senior house officer	84.0	15.1
Senior house officer GPVTS*	81.5	17.5

\*General practice vocational trainee.

Table 9 % Paediatric outpatient utilisation arising from 20 general practices with a child population of 26 433 children

Age	New referrals		Review attendances	
	Over period of study (0.71 year)	Per year	Over period of study (0.71 year)	Per year
0-5 years	2.2	3.1	6.5	9.2
0-15 years	1.3	1.8	4.8	6.7

calculated separately for groups of children with differing diagnoses.

(iii) The most common reason for attending for review was asthma but the highest review attendance as a proportion of the total attendance for any specific condition was for diabetes as there were few new referrals for this disorder. A high proportion of review attendances (compared with new referrals) occurred when the review was for a condition that led the child to attend initially after an inpatient admission—for example, for febrile convulsion, meningitis or acute arthritis, and the child has not been referred as a new outpatient. Other conditions for which there was a high proportion of review attendances in relation to new referrals were mental handicap, cerebral palsy, and epilepsy.

These latter conditions also formed the largest number of review attendances, second only to asthma. Reviews after an inpatient admission were expected largely to have been seen by senior house officers, but were also seen by other grades of staff: consultants saw a third of these attendances.

(iv) Frequent review attendances—over the period of the study, 229 attendances were in children attending five times or more. The diagnoses for these children are summarised in table 6.

#### (E) ACTIONS TAKEN IN CLINIC

Actions taken by the consultant after a child was seen as a new patient were noted: 32.8% had no investigations requested. Altogether 28% out of 487 new patients required no further follow up and the proportion varied between consultants (see table 7); 24% of new patients seen required neither investigation nor follow up.

Follow up appointments are initiated by the paediatric department rather than by the GP and consultants tended to discharge a higher percentage of the patients seen, although the difference between the consultant and the other grades of staff was minimal (see table 8); one explanation for this is that consultants were more likely to see children with chronic disorders who were less likely to be discharged.

#### (F) PAEDIATRIC OUTPATIENT UTILISATION

(i) Using the Wakefield district health authority general practice population the following figures were calculated: (a) of the new referrals, 63% were under 5 years of age and (b) of the review attendances, 49% were under 5 years of age.

(ii) Over the period of the study (0.71 year) 2.2% of 9070 children under 5 years of age from the Wakefield district health authority practice population of 141 048 children of all ages were referred as new paediatric outpatients (equivalent to 3.1% per year) and 6.5% of all those under 5 years attended once or more as review patients (equivalent to 9.2% per year). For those aged 0 to 15 years these figures would be 1.8% and 6.7% per year respectively (based upon 1268 children who attended 1922 appoint-

ments over 0.71 of a year); see table 9. The HSIs for Wakefield are given in table 5 and allow comparison with the activities of other districts. The new patient referral rate per thousand on HSI-CL 67 appears high and exceptional. However, when analysis is based only on the Wakefield district health authority general practice population, the new referral rate is 13.7 per thousand 0 to 15 years over 0.71 of a year, equivalent to 19 per year and just below the national mean of 21.2. The remaining new referrals appearing on the HSIs are from cross boundary flow from other district health authorities where the population data are less clear. A small number of referrals for paediatric opinions may have been made from Wakefield general practices to other hospitals outside the district. Subsequent estimates, based on the contracting process, suggest that number is small and such referrals would lead to the rates in this report forming an underestimate of the demand for paediatric services.

The observed rate of referral in this study was therefore unlikely to have been unusually excessive and the paediatric outpatient utilisation figures are probably representative of national utilisation. This is the first study in the UK that provides such a population based measure of paediatric outpatient utilisation.

### Discussion

This study has analysed GP new referrals and review attendance patterns based upon a known population size, providing some insight into utilisation of paediatric services. Of note is the high attendance of children under the age of 5 years (63% of new attendances and 49% of review attendances) and the proportion seen at least once in a paediatric outpatient department in any given year: 8.5% of children in the age band 0 to 15 years and 12.3% of children under 5 years. These figures are from an extrapolation of the attendance over the 0.71 of a year represented in the Wakefield study period (see table 9). Analysis of monthly attendance shows that there was random variation over the year,

more dependent on doctors' leave periods than other factors except for an increase in attendance for asthma in November and December.

Previous studies have examined new referrals to paediatricians as part of analysis of multiple specialty outpatient referrals from the general practice perspective.<sup>7,8</sup> In East Anglia, an average GP was likely to refer 6.4 children in a year with a 95% confidence interval of 1 to 12, representing 0.5 to 6 referrals per thousand per year with a mean of 3.2. This contrasts with the Wakefield study new referral rate per general practice of between 3.7 and 29.6 (mean 13.7) over 0.71 year, equivalent to a mean annual rate of 19.3 per thousand per year. This large difference may be related to the proximity of the population to hospital services.<sup>4</sup> The Wakefield population is fairly dense urban and semirural in contrast to East Anglia. A large part of the variation in referral rates between individual GPs has not been accounted for and there is a large random effect which is compounded by problems of analysis of small numbers.<sup>4,8</sup> Average practice list size is felt to be a better denominator for studies and partially compensates for the small number effect.<sup>9</sup> A further study based on an east Birmingham practice of 11 500 people with a new paediatric outpatient referral rate of 4 per thousand children attempted to examine whether the GPs' particular areas of interest may have led to a higher rate of referral and confirmed this to be the case in two of the specialties studied,<sup>10</sup> although not in paediatrics where no partner has a special interest. These studies have been on new referrals and there appear to be no such data reported elsewhere on review attendance rates in paediatric practice related to population size.

There are very few data available on diagnostic case mix for children attending paediatric outpatient departments. An unpublished study reported in 1989 at the British Paediatric Association annual scientific meeting (CMN Bholchain, PW Wilkinson), showed that over a four month period in the Wirral, 374 children were referred as new patients, equivalent to a referral rate of 15.5 per thousand per year; 90% were from GPs and 12% from the child health service. Of the patients referred, 30% were discharged after one consultation (28% in the Wakefield study). Asthma was the commonest reason for referral: 12.8% (11.7% in the Wakefield study see table 3) where it was also the commonest reason for attendance as a review patient (see table 10).

This study has shown the scale of paediatric outpatient utilisation in Wakefield. Comparison with HSIs shows that this utilisation was not unusual compared with figures from health authorities in England and Wales. There is a particularly high workload in paediatric outpatients arising from children with asthma. Reduction in hospital attendance may be possible by joint working with GPs especially as a substantial number of the new referrals did not have any test performed. Fewer review attendances for all conditions including asthma, took place from the larger general practices, raising implications for further joint collaboration between consultant paediatricians and GPs.

Table 10 Paediatric outpatient study: review attendances by diagnosis based on 2784 attendances in 1630 children

Diagnosis	No of attendances	No of children
Asthma	539	324
Epilepsy	237	120
Fits*	130	99
Failure to thrive	120	79
Cerebral palsy/mental handicap	115	84
Urinary tract infection	99	73
Soiling/wetting	88	49
Headaches	79	54
Cardiac murmur:		
Organic	33	31
Functional	35	33
Short stature	68	53
Recurrent coughs—not asthma	65	58
Constipation	60	38
Arthritis	54	28
Vomiting	42	34
Chronic diarrhoea	33	27
Delayed development	29	20
Child abuse	26	21
Abdominal pain	25	20
Behaviour disorder	13	9
Recurrent infections	12	9
Total (%) of all outpatients	1902 (68)	1263 (77)

\*Includes febrile convulsion, apnoea attacks, fits.

Consultant paediatricians saw 44% of review attendances in this study and had a tendency to see more chronically ill and disabled children. This study has shown the value of diagnostic information in evaluating the use of resources in outpatient clinics.

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### Smart from the start

Babies weren't born yesterday, y'know. Well, let me rephrase that. There is a steadily increasing amount of information showing that quite young babies can take in much more than we used to think they could. There is evidence, for instance, that babies only 2 days old will look at their mother's face in preference to that of a woman unknown to them. A recent article in *Nature* (P E Bryant, 1991;354:19) reviews some new findings by experimental psychologists. Apparently most babies will look at a checkerboard pattern rather than anything else, even a schematic face. They do, however, prefer a face to most other things but their reactions change as they grow older. Babies under 1 month of age will follow a moving face-like pattern in preference to a 'scrambled' face in which the components are in disarray. If, however, the same experiment is done with the realistic and scrambled faces presented to the baby statically then young babies show no preference but by the age of 2 months they do. In a recent experiment M H Johnson and colleagues had an arrangement whereby the babies moved around the patterns. They found that babies up to 1 month preferred to follow a realistic face pattern but older babies had no such preference. P E Bryant suggests that perhaps the older babies just become too smart to continue to be tricked by a pattern which they knew was not a real face. Why very young babies follow a moving face rather than a moving non-face and yet show no preference when the patterns are static is not known. It is suggested that the underlying neurological mechanism involves immaturity of the cortical visual pathways, the preference for a moving face occurring at a time when 'subcortical mechanisms' are important. It is not known, either, whether the preference for moving faces applies to real faces as well as to schematic ones. Whichever way you look at it babies are amazingly perceptive very soon after birth.

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