amplification, ploidy, raised serum activities of ferritin and neurone specific enolase.¹⁵ Whether there is a progression from good to bad features remains controversial, although most of the evidence suggests that these features are constant within a given tumour.¹⁶

EFFECTIVENESS AND FEASIBILITY OF SCREENING

This study was set up to assess the feasibility of screening for neuroblastoma. Clearly this is possible and a high compliance rate can be achieved by using health visitors. By drying filter paper a low rate of taking repeat samples should be possible and there is a low false positive rate.

The authorities in Japan were convinced of the efficacy of screening so that since 1985 all babies in Japan have been offered screening.⁶ However, there is as yet no convincing evidence of a fall in the death rate from neuroblastoma in Japan.^{17,18} Because screening may detect silent cases of neuroblastoma, which might otherwise have spontaneously regressed, the only way to evaluate screening is a controlled trial comparing large screened and contemporaneously unscreened populations. Such a study is underway in Quebec¹³ and another has been proposed for the United Kingdom.¹⁹ Screening at 6 months of age has missed cases of neuroblastoma in this study, in Japan,²⁰ and in Quebec (W G Woods, personal communication). This, together with the undoubted increase in incidence of neuroblastoma in screened populations as a result of the identification of silent cases calls into question the age at which children should be screened or indeed whether they should be screened at all. The age related mortality characteristics of neuroblastoma suggest that screening at around 15-18 months of age may well reduce the incidence of both false negative cases and silent neuroblastomas but whether this would influence the course of fatal cases requires further investigation. A definitive study of neuroblastoma screening is essential and will probably require one million babies to be screened and a similar number of controls. The results of such studies are awaited with interest before neuroblastoma screening is implemented in many other countries.

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Are patient consent forms for research protocols easy to read?

Kim A Priestley, Claire Campbell, Christopher B Valentine, David M Denison, Nigel P Buller

Written informed consent is an integral part of any clinical research protocol. It is solicited with a written consent form after a brief oral explanation of the project. Informed consent demands that the written explanation of the research project is easy to read and understand. Reading difficulty can be measured with several scoring systems.¹ Using established measurements of readability, we compared the readability of consent forms with that of daily newspapers.

Methods and results

We examined the consent forms of 50 protocols for research on adults. These were all the approved protocols submitted to the ethics committee of the

Royal Brompton National Heart and Lung Hospitals between 22 July 1991 and 8 April 1992. The consent forms were analysed with Microsoft Word for Windows, a computer software package that provides statistics on readability. Several variables were counted: words, characters, paragraphs, sentences, sentences per paragraph, words per sentence, and characters per word. Readability was measured with the Gunning fog index, the Flesch-Kincaid index, and the Flesch reading ease. These indices are derived from the length of sentences and the number of syllables per word or per 100 words.

For comparison we analysed the editorial and comment sections of 10 national newspapers published on one particular day (*Daily Express*, *Daily Mail*, *Daily Mirror*, *Daily Star*, *Daily Telegraph*, *Guardian*, *Independent*, *Sun*, *Times*, and *Today*). The mean scores for the consent forms and the newspapers were then compared by Student's *t* test for unpaired data. Comparisons were also made with a mean score calculated for the three newspapers with the widest readership (*Sun*, *Daily Mirror*, and *Daily Mail*).²

The consent forms and newspaper editorials varied widely in length. This was reflected in the numbers of paragraphs, sentences, words, and characters used

Royal Brompton National Heart and Lung Hospital, London SW3 6NP

Kim A Priestley, research fellow
Claire Campbell, business administrator
Christopher B Valentine, research fellow
David M Denison, chairman, ethics committee
Nigel P Buller, senior lecturer

Correspondence to:
Dr K A Priestley,
Department of Invasive Cardiology, Royal Brompton National Heart and Lung Hospital, London SW3 6NP.

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	Newspapers			Consent forms			p Value
	Range	Mean	95% Confidence interval	Range	Mean	95% Confidence interval	
Words	128-928	447	311 to 638	163-1124	386	336 to 436	NS
Characters	592-4616	2288	1453 to 3123	719-5302	1796	1562 to 2029	NS
Paragraphs	4-21	12	8.5 to 16	2-19	6	5.1 to 7.02	0.004
Sentences	10-48	28	20 to 36	6-51	17	15.5 to 20	0.019
Sentences per paragraph	1.1-7.5	2.8	1.8 to 4.3	1.1-11	3.5	2.9 to 4.1	NS
Words per sentence	11.4-20.8	16.5	14.3 to 18.6	14-28	21.9	21 to 22	<0.0001
Characters per word	4.3-5.1	4.8	4.6 to 4.9	4.1-5.1	4.6	4.5 to 4.7	NS
Flesch reading ease*	39.6-71	57.5	51 to 64	30-72	52.2	49.6 to 54.8	NS
Flesch-Kincaid index†	6.5-11.8	9.27	8.2 to 10.4	8.1-15.3	11.21	10.7 to 11.7	0.003
Gunning fog index†	9.2-14.3	11.9	10.7 to 13.1	10-17.6	13.7	13.1 to 14.2	0.008

*Lower score indicates harder to read. †Higher score indicates harder to read.

(table). There was no significant difference in the numbers of words and characters between the consent forms and the newspaper editorials. Consent forms, however, had significantly fewer paragraphs and sentences. This was reflected in the readability scores. Consent forms were significantly more difficult to read than newspaper editorials when assessed by the Flesch-Kincaid and Gunning fog indices.

Compared with the mean values for the three most widely read newspapers, 46 consent forms had more sentences per paragraph and all the consent forms had longer sentences. The number of characters per word in the consent forms was similar to the mean for the three newspapers. Forty eight consent forms were

more difficult to read than the three newspapers (as shown by the mean value) according to the Flesch-Kincaid index, 45 according to the the Gunning fog index, and 37 according to the Flesch reading ease.

Comment

Good clinical practice requires that a patient's informed consent is obtained before that person is entered into a clinical trial.³ This demands clear oral and written communication between the doctor and patient. Consent forms in this study were more difficult to read than newspaper editorials. Poor readability was caused by the use of long paragraphs and long sentences, not by the excessive use of long words. This study supports the first of Gunning's 10 principles of clear writing—"Keep sentences short."¹ If we are to fulfil our obligations the readability of consent forms must be improved. These data suggest that shorter sentences would help make consent forms easier to read.

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Should general practitioners have access to paediatric cardiologists?

J A Rushforth, N Wilson

Department of Paediatrics,
General Infirmary at
Leeds, Leeds LS2 9NS
J A Rushforth, registrar

Killingbeck Hospital,
Leeds LS14 6UH
N Wilson, consultant
paediatric cardiologist

Correspondence to:
Dr Rushforth.

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Source of referrals to paediatric
cardiology clinic

Source	No
Community: General practitioner	129
Community medical officer	17
Paediatrician	38
Total	184

The prevalence of congenital heart disease in the population approaches 1%, but many children are found to have innocent heart murmurs.¹ We sought to establish the reasons for referral to a paediatric cardiology outpatient clinic and whether there was a case for general practitioners to continue to have direct access to the service.

Patients, methods, and results

The case notes of all new patients attending a paediatric cardiology outpatient clinic were reviewed. The clinic was not at a tertiary referral centre. General practitioners who referred patients worked mainly in inner city and suburban practices in Leeds. Chest radiography, electrocardiography, and echocardiography with Doppler studies were available in the clinic.

New patients made up 54% of all patients seen over the 13 months of the study. The table shows the source of these referrals. Of the 184 new patients, 167 were referred with an asymptomatic murmur, 15 were referred to exclude familial cardiac disease or cardiac manifestations of systemic disease, and only two were referred with symptoms (tachycardia). Altogether 142 patients were found to have either an innocent murmur or a normal heart on examination. Fourteen had a ventricular septal defect, nine pulmonary stenosis, four ductus arteriosus, two arrhythmia, and 13 more complex congenital heart disease.

Of the 129 referrals from general practitioners, 126

were made because of an asymptomatic murmur and the remainder because of an irregular heart rate. Fourteen patients (11%) were found to have a structural abnormality or an important arrhythmia. Seven had a ventricular septal defect: one aortic stenosis, one atrial septal defect, one ductus arteriosus, two mitral valve prolapse, and two supraventricular tachycardia. The general practitioners offered a diagnosis in 43 cases (33%) and were correct in 36 (84%). When the diagnosis was incorrect there were no serious implications. An innocent murmur had been diagnosed in three patients, who were found to have a ventricular septal defect, a mitral valve prolapse, and an aortic stenosis. Four patients referred with possible structural abnormalities were found to have innocent murmurs.

Referrals from paediatricians made up 21% of new patients seen. All these patients were referred with murmurs. Twenty (53%) had a structural cardiac abnormality. A diagnosis was offered in 27 (71%) of the 38 cases and was correct in 12 (44%). Again, incorrect diagnosis had no serious implications.

One third of all new patients attending the clinic had an investigation. Chest radiography and electrocardiography were performed in 55 patients and echocardiography in 72. For all new patients referred the median interval between referral and consultation was 27 (range 0-76) days. For referrals from general practitioners the median interval was 29 (7-64) days. This delay is acceptable for non-urgent referrals and compares favourably with waiting lists for medical and surgical paediatric outpatient clinics in this hospital during the study.

Comment

The pathological yield of 11% among referrals made by general practitioners seems to support the case for general practitioners having direct access to a paediatric cardiology service. Although the general practitioners made a tentative diagnosis for only one third of their referrals, it was correct in 84% of cases. These findings