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# Effects of routine individual feedback over nine years on general practitioners' requests for tests

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Feedback to general practitioners about the diagnostic tests they request reduces the number of requests.<sup>1</sup> This effect disappears, however, soon after feedback is stopped.<sup>2</sup> Most studies have been short, so data on the long term effects of feedback are lacking.<sup>3</sup>

The Diagnostic Coordinating Centre Maastricht has provided feedback continuously since 1985, resulting in a more rational use of tests and fewer requests.<sup>4,5</sup> We report the effects of nine years of feedback. We also investigated its effects on requests for tests that were not advised but had a recommended alternative. We expected the effects to be greatest for such requests. We thought that if general practitioners had a choice of alternative tests they might be more willing to follow recommendations.

## Methods and results

The diagnostic coordinating centre coordinates all requests from the 85 general practitioners in the Maastricht region. Written feedback is given twice a year, with comments on inappropriate requests and suggestions for more rational testing. Rationality can be assessed because forms contain clinical data on patients.

We analysed annual data for each test and each doctor from 1983 to 1993. We assessed the effects of feedback by comparing trends in the number of requests for 44 common tests in our region and a control region. For these common tests in our region we also compared the trend for tests that were advised against but had a recommended alternative (measurement of urea, thyroxine, free thyroxine, and triiodothyronine concentrations; Rose-Waaler and latex fixation tests) with that for tests that were advised against but had no recommended alternative (haemoglobin concentration, packed cell volume, differential count, erythrocyte sedimentation rate, leucocyte count, erythrocyte count, lactate dehydrogenase, aspartate aminotransferase, alanine aminotransferase).

From 1984 to 1993 the mean annual decrease in the number of requests in the Maastricht region was 3.5%,

leading to a total decrease of 29% from 1984 values in 1993. A transient increase occurred in 1989 (table 1). Requests for individual tests decreased by up to 98%. The number of requests for the 44 common tests decreased by 45% between 1984 and 1993 (mean annual decrease 6%) in the Maastricht region, but it increased continuously in the control region (mean annual increase 3.2%) ( $P < 0.001$ , Mann-Whitney U test). If the trend in the Maastricht region had been the same as that in the control region the number of requests in 1993 would have been about double.

The number of requests for tests with a recommended alternative in the feedback information decreased dramatically (table). Such requests were reduced by 85% after nine years of feedback. For tests without a recommended alternative the decrease was 46% ( $P < 0.001$ , Wilcoxon signed ranks test).

## Comment

Feedback given twice a year over nine years led to a persistent reduction in the number of requests, especially when an alternative was recommended. The results suggest that the maximal effect had not been reached in 1993. It seems that the strongest effects are achieved when feedback is repeated, emphasising that feedback needs to be routine. Our feedback was continuous during the nine years from 1985 to 1993.

Requests for tests increased each year in the Netherlands, but in our region they decreased after 1985. Requests for all tests were affected, probably because of a general learning effect arising from the feedback.

Although we could not determine patient outcome, we would not expect it to be adversely affected. In the feedback information we recommend the use of tests for specific indications or appropriate tests with high validity. The general practitioners changed their practices accordingly, so negative effects on patient outcome seem unlikely.

Obviously, the smaller number of requests reduced the costs of diagnostic testing in the Maastricht region. Given that the national trend in expenditure on diagnostic testing increased each year by 7-8%, £1.8m would have been spent on testing in the region in 1993 if no feedback had been given. Instead £0.9m was spent. Once feedback is started the savings increase each year. Given that the annual costs of providing feedback are £60 000 at most, £3.8m was saved over the nine years from 1985 to 1993.

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**Table 1**—Numbers of requests for tests from 1983 to 1993 in Maastricht region unless stated otherwise

Year	All tests	44 Common tests		Unrecommended tests	
		Maastricht region	Control region*	With recommended alternative	Without recommended alternative
1983	136 474	101 933	182 283	5922	59 672
1984	147 212	114 747	191 698	6290	63 902
1985	131 168	102 859	195 982	4816	56 126
1986	114 828	88 493	198 316	2626	46 670
1987	111 970	76 905	203 721	1742	43 306
1988	115 420	77 041	214 586	1114	42 610
1989	120 681	84 168	222 357	881	44 719
1990	118 197	73 671	240 427	982	41 823
1991	106 161	63 241	246 154	890	35 332
1992	109 244	65 396	259 070	971	36 977
1993	105 003	63 062	276 401	913	34 608

\*Indexed to number of patients in Maastricht region.

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