

# Improving Problem Oriented Medical Records Through Self-Audit

Gordon L. Dickie, MB, and Martin J. Bass, MD  
London, Ontario

In a teaching family medical center a strategy was sought to improve the quality of medical record keeping. A study was undertaken to determine the usefulness of a standardized form for self-audit. Validity and reliability of the form were established and it was shown that there was a significant improvement in the study group three weeks after the exposure period, as compared to a control group. Improvements occurred particularly in the recording of drugs prescribed and in the linkage of progress notes to the problem list. Despite this improvement, linkage to the problem list was seen to occur in only half of the studied charts. With modification the self-audit form appears to be a useful stimulus to good record keeping.

One of the areas of interest which is being increasingly studied since the renaissance of family medicine is the clinical record. The advent of residency training programs and the reality of medical audit have focused attention on the record, which is the only lasting interpretation of the physician-patient interaction. In many academic settings the problem oriented medical record has received considerable attention, probably because it can demonstrate some aspects of the process, as well as the content of primary health care delivery.<sup>1-3</sup>

In the Department of Family Medicine at the University of Western Ontario, problem oriented medical records have been used since 1972. The problem oriented record was adopted as it provided a concise record of important problems over time, allowed the process of care to be monitored in the teaching setting, and provided a source of easily retrievable information to enhance continuity of patient care. Because entrants to the residency program had varying degrees of skill in

this type of record keeping, regular seminars, and other teaching sessions on this topic were conducted. Despite these measures many residents and staff physicians were writing records which were considered inadequate for the teaching setting. The Records and Research Committee of the department sought further strategies for improving the standard of record keeping.

It was postulated that if a physician were to examine his own records regularly, using a prescribed technique that drew attention to important areas of record keeping, improvement would result. A trial of self-audit was instituted using a standardized form which addressed the major areas of deficiency in record keeping.\* Specifically, the items were the completeness and accuracy of the problem list, linkage of progress notes to the problem list, and clarity of management plans, including drug prescribing and further investigations. A total of 14 items were to be judged as present, absent, or partly present. The form, which was based on one used by a colleague, Dr. Wayne Weston, was designed for either self-audit or external audit.

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From the Department of Family Medicine, University of Western Ontario, London, Ontario. Requests for reprints should be addressed to Dr. Gordon L. Dickie, St. Joseph's Family Medical Centre, 362 Oxford Street East, London, Ontario, N6A 1V8.

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\*Available on request by writing to Dr. G.L. Dickie, St. Joseph's Family Medical Centre, 362 Oxford Street East, London, Ontario, N6A 1V8.

Table 1. Self-Audit Group

Questions	Before Self-Audit (%)	After Self-Audit (%)	Follow-Up 3 Weeks After Self-Audit (%)
1. Problem List Use	90.0	100.0*	100.0*
2. Up-To-Date List	60.5	69.4*	73.8*
3. Dates on List	65.2	59.7	71.3*
4. Operations Listed	72.9	86.8*	78.8*
5. Medications List Current	78.8	65.1	73.5
6. SOAP Format Use	92.5	97.5*	100.0*
7. Linkage	19.6	51.9*	50.0*
8. Problem Outline	73.8	86.3*	83.8*
9. Consistent Problem Label	76.3	83.3*	84.2*
10. Clear Management	86.2	91.3*	96.3*
11. Clear Investigation	85.7	61.5	94.7*
12. Legible Writing	87.5	92.5*	97.5*
13. Clear Abbreviations	91.3	93.6	95.0
14. Drugs Specified	58.0	44.4	70.4*

\*Signifies > 5 percent improvement over baseline.

**Methods**

The validity and effectiveness of the form were tested in external audit. A random sample of five patient charts for each of four staff physicians was scrutinized individually by four observers who completed the audit form for each one. A scoring system was devised, which allowed a score to be calculated for each question on each chart. Items scored as "yes" received two points; "partly" one point; and "no" zero points. The score could then be calculated as a percentage of the maximum possible score. The ranking of the four staff physicians by quality of record keeping was the same when the scoring instrument was used by each of the four observers. This established the inter-observer reliability of the instrument. The validity of the record keeping score was established, in that the rank order of the physicians' scores was in agreement with the authors' general impression of the record keeping abilities of those physicians.

To assess the effect on medical record keeping of the use of the chart-audit form, four medical

teams were studied. Each team consisted of a staff physician and a senior resident. Two of the teams were randomly chosen to audit records using the chart audit form, each physician reviewing one of his own charts with the form daily for a three-week period. This was the "Self-Audit Group." The two other teams were simply informed that their records would be reviewed over a three-week period. This was the "Study-Exposed Control Group." They were told that of particular interest was the accuracy of the problem list, the use of SOAP format, and the linkage of progress notes to problem lists. This study exposed group was involved so that the effect of self-audit could be separated from the effect of involvement in the study. It was intended to use a second control group of two teams who would be unaware of the purpose of the study to test change with time alone, but one of these teams spontaneously changed their record keeping practices. They were, therefore, no longer useful as a control group.

This is a before and after study with a control group. Two physician investigators independently evaluated for each study physician a random

Table 2. Study Exposed Group

Questions	Before "Audit" Period (%)	After "Audit" Period (%)	Follow-Up 3 Weeks After Audit
1. Problem List Use	70.3	94.7*	100.0*
2. Up-To-Date List	38.2	63.2*	65.8*
3. Dates on List	21.4	25.0	27.6*
4. Operations Listed	47.7	66.1*	35.7
5. Medications List Current	52.2	78.0*	51.8
6. SOAP Format Use	96.3	97.5	98.8
7. Linkage	23.3	56.5*	58.3*
8. Problem Outline	87.5	86.3	80.0
9. Consistent Problem Label	78.8	82.5	91.3*
10. Clear Management	81.3	72.5	72.5
11. Clear Investigation	64.0	54.3	51.9
12. Legible Writing	77.5	72.5	78.8
13. Clear Abbreviations	83.8	82.5	81.3
14. Drugs Specified	56.3	71.2*	66.7*

\*Signifies > 5 percent improvement over baseline

sample of five charts of patients seen one week prior to the self-audit period, another sample of patients seen one week following the self-audit period, and a third sample of patients seen three weeks following the self-audit period. The follow-up assessment was to see whether any change was sustained. It took from five to ten minutes, with an average of seven minutes, for an external assessor to score a chart using the chart-audit form. In this study cumulative group scores were derived for each audit question before, immediately after, and in the follow-up period of the study. An improvement of five percent or more for the group as a whole was considered of operative significance.

## Results

Table 1 shows the scores for the self-audit group before, immediately after, and three weeks after the period of self-audit. It can be seen that immediately after the audit period, improvement was seen in 9 of the 14 items. After an additional three-week follow-up period, improvement was present in 12 of the 14 items.

Table 3. Chart Score Differences Before and After 3-Week Follow-Up

Group	Scores Same Or Lower	Scores 5% or More Improved
Self-Audit	2	12
Study-Exposed	8	6

P=0.021 (Fisher's Exact Test)

Table 2 shows that, for the study exposed group, improvement occurred in six areas after the self-audit period, and at follow-up three weeks later. There was no statistical significance between the improvements in the two groups immediately after the self-audit period. However, after a further three-weeks' follow-up, there was a statistically significant improvement in the self-audit group (Table 3).

## Discussion

The present study has demonstrated that record keeping can be improved in a teaching family medical center by involving the physicians concerned in a study. Improvement in the group not using the chart-audit form appears to be an example of the Hawthorne effect. This could have been clarified had the second control group remained uncontaminated. The effect on record keeping of using the chart-audit form may be delayed and the benefit prolonged. This improvement was related to increased attention being paid to linking the progress notes to the problem list, and in the recording of dosages and amounts of prescribed medication. The number of charts at each review for each physician was a compromise between the number of charts required to give exacting stability to the score and the time available to the investigators. This pilot study demonstrates the utility of a simple and easily administered stimulus to good record keeping. The form has been shortened by eliminating questions on clarity of handwriting and abbreviations, and on whether the problem list is being used, as these appear to be redundant. Consideration might also be given to including aspects of the patient data base, such as blood pressure, immunization status, or occupation.

The finding that only 50 percent of applicable progress notes were linked to the problem list, even with the stimulus of the study, is of particular interest since at every contact with the patient there is an opportunity to update the problem list, link progress notes to the problem list, and record the long-term management plans of problems dealt with. This low rate of linkage requires consideration. Is this requirement impractical in a situation where patients are seen with complex interacting problems? Little benefit and extensive writing may result from trying to separate each problem into its own discrete section, as one management strategy will frequently apply to several problems. It was found that linkage worked well where problems were distinct and defined, such as diabetes and hypertension. Linkage was less useful where there was strong interaction between problems, for example, anxiety, family dysfunction, and abdominal pain.

The demand for the specification of drugs as to dose, timing, and duration, is exacting. This detail is necessary if patient compliance and possible abuse of medication are to be monitored through

the record.

Particularly in the teaching situation, the medical record is an important source of continuity. The record enables the provider to review past management, whether it is his own or that of another physician, and to provide a continuous direction to the care the patient receives. This may well result in more effective, less expensive care.<sup>4</sup> With the current emphasis on audit, the form and content of the medical record also increases in importance for the physician.

Two questions remain to be answered: who should do the audit and how often? It seems valuable for a provider to have his charts reviewed by another member of the team, so that he may have the benefit of another opinion on his record keeping. Often it is another provider who must use the record. At the same time self-audit enables one to learn from one's experience, and this can be a powerful force effecting change in behavior.<sup>5</sup> The frequency of audit may well depend on how closely the provider's record resembles the ideal. Thus, daily audits would be useful for a resident working on improving his record keeping, while a weekly audit would probably maintain a very good level of recording. As wider experience is gained, it is anticipated that further modifications to the form and the techniques for its use will lead to greater effectiveness.

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