

# Improving the Periodic Health Examination: Use of a Screening Flow Chart for Patients and Physicians

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*An attempt was made to improve periodic health examinations in a family practice department. Both physicians and patients were instructed in the use of a screening flow sheet that listed the clinic's minimum recommendations for the periodic health examination. Both groups were also educated about the evidence against ordering other tests routinely, such as x-ray examinations and blood tests. Audits were performed before and after physician and patient education on a total of 384 charts.*

*Compliance with all of the screening flow-sheet recommendations improved with education. Significant improvements occurred with the ordering of the tetanus-diphtheria booster and proctosigmoidoscopy examinations. Compliance for most procedures, however, remained well below the recommended level. Unnecessary testing was not decreased by the educational effort. The complete blood count was actually ordered significantly more often after patient education despite the lack of evidence of its value in screening. Although physician and patient education in the use of the screening flow sheet did result in some improvement in the ordering of recommended tests, the optimal method of improving periodic health examinations has yet to be found.*

In the last decade great progress has been made toward determining the appropriate components of the periodic health examination. Several influential organizations have critically reviewed evidence for and against routine screening for many disorders.<sup>1-6</sup> Although the recommendations of these groups are not unanimous, minimum standards for the periodic health examination can be derived from these reports.

Unfortunately it has been repeatedly demonstrated that physicians are not routinely doing even these minimum procedures on most of their patients.<sup>7</sup> Moreover, many physicians include tests in their routine examinations that most screening authorities agree are of no benefit for healthy patients. The literature on this topic has described

various methods to improve physician performance of health maintenance, including nurse-initiated and computer-generated physician reminders.<sup>8-10</sup> Few efforts have been made to decrease routine testing that is unnecessary according to strict screening criteria.

This study differs in two ways from prior efforts to improve performance of the periodic health examination. First, both patients and physicians were instructed in the suggested minimum clinic standards for routine examinations. Second, patients as well as physicians were informed of which tests are not recommended routinely by most screening authorities. Chart audits were performed before and after these educational efforts to determine whether more recommended tests and fewer unnecessary ones were performed.

## METHODS

The study was conducted at the Eisenhower Army Medical Center Family Practice Clinic during a five-month period in 1986. The clinic provides medical care free of

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TABLE 1. SCREENING FLOW-SHEET RECOMMENDATIONS WITH AUDIT CRITERIA

Test	Recommended Frequency	Criteria for Eligible Patients for Audit
Papanicolaou smear	Every 3rd year after 2 normal annual Papanicolaou smears, for women	All women
Physician breast examination	Every 3rd year until age 50 yr, then annually, for women	All women
Mammogram	Annually age $\geq$ 50 yr, for women	Women age $\geq$ 50 yr
Fecal occult blood test	Annually age $\geq$ 50 yr	Patients age $\geq$ 50 yr
Flexible proctosigmoidoscopy	Once at age 55 yr	Patients age $\geq$ 50 yr
Tetanus-diphtheria booster	Every 10 yr	All patients
Pneumococcal vaccine	Once at age 65 yr	Patients age $\geq$ 65 yr
Influenza vaccine	Annually age $\geq$ 65 yr	Not audited because of seasonal administration

charge for active duty and retired soldiers along with their dependent spouses and children.

The faculty of the Family Practice Department developed a screening flow sheet for use with clinic outpatient records similar in design to one described by Frame.<sup>6</sup> The faculty agreed to include eight different examinations and tests as the minimum recommendations for the periodic health examination of the Family Practice Clinic patients.

Three chart audits were performed to evaluate changes in health maintenance performance. The first audit took place during a one-month period before the introduction of the flow sheet. The flow sheet was then incorporated into the outpatient record. All department physicians received a letter explaining the use of the flow sheet. Physicians were reminded that the recommendations were the minimum suggested by the medical literature. They were advised to order other tests according to their own best judgment. A one-hour lecture at this time also reviewed the rationale and method of using the screening flow sheet. The evidence against ordering other tests routinely, such as the chest x-ray examination and complete blood count, was also presented. A second chart audit took place during a one-month period after the flow sheet was introduced and the physicians educated about its use.

Finally, the patients were also instructed about the new screening flow sheet. A patient handout was developed that included the flow sheet and instructions on how to read it. The handout also mentioned that such tests as x-

ray examinations and blood tests are rarely useful in a person who is feeling well and, therefore, were not included in the flow sheet. All patients scheduled for a routine physical examination were given this handout by the receptionist and instructed to read it while waiting for the examination. The third chart audit took place for one month during this period of patient education.

Charts were chosen for audit using the daily appointment schedule. The charts of all adults scheduled for a routine 30-minute physical examination were reviewed by the author without the knowledge of the clinic physicians. Omitted were examinations of active duty soldiers, who are routinely required to undergo an extensive battery of tests by Army regulations.

Items audited included the patient's age and sex, physician use of the flow sheet, and all tests or examinations ordered or performed by the physician at the time of the visit. Patients were considered eligible for each test according to the audit criteria listed in Table 1. Statistical analysis was performed using the significance ratio test. The alpha level was set at the .05 level of significance.

## RESULTS

A total of 384 charts were audited. Eighty-five percent of the patients were women with a mean age of 44 years. Fifteen percent of patients were men with a mean age of 58 years. The male and female populations differ markedly because of the omission from the study of the primarily young, male active duty soldier.

The effect of physician and patient education on physician compliance with the screening flow-sheet recommendations is detailed in Table 2. Influenza vaccination was included on the flow sheet but not in Table 2 because of the seasonal nature of its administration. Compliance with all of the screening flow-sheet recommendations improved by the conclusion of the study when compared with baseline performance. The only statistically significant improvements, however, occurred with proctosigmoidoscopic examination and tetanus-diphtheria immunization. Compliance with the tetanus booster improved significantly with physician education only. No further improvement was noted with patient education. Physicians ordered proctosigmoidoscopy more frequently after physician and patient education on this test. The improvement reached statistical significance only when both groups had been educated.

Six of the seven procedures on the flow sheet were ordered more often after physician education. Patient education resulted in additional improvement in only four of the seven recommended procedures.

The changes in the ordering of common tests not recommended by the screening flow sheet are displayed in Table 3. Both physician and patient education discouraged the routine use of these tests in asymptomatic patients.

TABLE 2. CHANGES IN RATES OF PERFORMANCE OF PROCEDURES RECOMMENDED ON THE SCREENING FLOW SHEET

Test	Baseline Audit Ordered/Eligible	Audit After Physician Education Ordered/Eligible	Audit After Patient Education Ordered/Eligible
	No. (%)	No. (%)	No. (%)
Papanicolaou smear	103/106 (97)	103/111 (93)	107/109 (98)
Physician breast examination	82/106 (77)	91/111 (82)	87/109 (80)
Mammogram	20/39 (51)	25/35 (71)	25/40 (63)
Fecal occult blood test	7/48 (15)	11/49 (22)	15/61 (25)
Flexible proctosigmoidoscopy*	3/48 (6)	9/49 (18)	16/61 (26)
Tetanus-diphtheria booster*	2/122 (2)	10/130 (8)	9/132 (7)
Pneumococcal vaccine	0/11 (0)	2/17 (12)	4/16 (25)

\*  $P < .05$ 

TABLE 3. CHANGES IN ORDERING OF TESTS NOT RECOMMENDED ON THE SCREENING FLOW SHEET

Test	Baseline Audit Ordered (n = 122)	Audit After Physician Education Ordered (n = 130)	Audit After Patient Education Ordered (n = 132)
	No. (%)	No. (%)	No. (%)
Automated chemistry—20 tests	25 (20)	20 (15)	33 (25)
Complete blood count*	23 (19)	23 (18)	41 (31)
Urinalysis	12 (10)	20 (15)	22 (17)
Chest roentgenogram	10 (8)	11 (8)	10 (8)
Electrocardiogram	7 (6)	5 (4)	7 (5)
Tuberculosis skin test	1 (0.8)	0 (0)	1 (0.8)

\*  $P < .05$ 

Three of six tests were ordered more often after physician and patient education. Two tests were ordered at the identical rate before and after education. The electrocardiogram was the only test that was ordered less frequently, and that decrease was negligible. The only statistically significant change occurred in the ordering of the complete blood count, which actually increased after patient education.

After physician education only, three of six tests were ordered less often. After patient education, none of the tests were ordered less frequently.

The flow sheet was used relatively infrequently to document the tests ordered. Only 14 percent of the charts had testing documented on the flow sheet after physician education. This rate improved to 20 percent following patient education.

## DISCUSSION

Many methods have been used to try to improve physician compliance with periodic health examinations. The use

of a screening flow sheet with physician education has had mixed results in previous reports.<sup>8,11-13</sup> Significant improvements in the performance of immunizations, mammograms,<sup>8</sup> and breast examinations<sup>13</sup> have been noted. Compliance for almost all procedures remained well below the recommended level, however, in most of these studies. Use of the screening flow sheet for procedure documentation has also been poor, with rates ranging from 12 percent to 29 percent reported previously.<sup>11,12</sup>

This study had similar results with the use of physician education and a screening flow chart. The 14 percent rate of use of the flow chart for documentation found here is consistent with other studies. Although six of seven procedures were ordered more frequently after physician education, the only significant improvement was in the ordering of the tetanus booster. The improvement in the ordering of mammograms and the pneumococcal vaccine probably did not reach statistical significance because few patients were eligible for these tests, resulting in small sample sizes.

Only the Papanicolaou smear was performed at near the recommended rate. This high rate is probably an effect

of the Eisenhower Family Practice Clinic protocol that has women who are scheduled for a physical examination automatically set up for the performance of a Papanicolaou smear. Other studies have also noted the best compliance with screening procedures occurs with those procedures that are incorporated into nursing protocols.<sup>10,11</sup>

The use of patient education to improve compliance with screening recommendations has not been previously described. Improvement in four of seven procedures was noted following patient education, but none was statistically significant by itself. Patient education contributed to a significant increase in proctosigmoidoscopy examinations.

In several surveys patients have reported a great interest in periodic screening procedures.<sup>7,14</sup> In the military setting where patients are not charged for these tests, patient education is an especially potent potential method of increasing compliance with screening recommendations. Although the patient education method used here was not effective, it is reasonable to expect that alternative methods could be quite successful.

Physician and patient education was not at all successful in decreasing testing that was not included on the screening flow sheet. In fact, the complete blood count was ordered significantly more often after physician and patient education, despite convincing evidence that this test has no value in the screening of asymptomatic people.<sup>15</sup> In some patients this and other tests may indeed have been medically indicated, based on the medical history and medications. No attempt was made during the audit to determine whether these tests were indeed ordered routinely or because of a valid medical indication, a potential weakness of the study. Because the patients' sex and age distribution are similar in the three audit periods, however, there is no reason to suspect that significantly different numbers of patients had valid indications for these tests.

Many physicians and patients are strong advocates of routine screening tests that are of no proven benefit.<sup>7,14</sup> In one survey physicians recommended screening procedures more frequently than published guidelines in 48 situations. Their patients desired far more frequent screening than recommended either by the physicians or by the recommended guidelines.<sup>7</sup> Any attempt to educate physicians and patients on the lack of evidence for this routine testing will inevitably meet much resistance.

Physician education has been used to attempt to decrease unnecessary testing in other settings, also with limited and often temporary success.<sup>16</sup> One program did successfully decrease testing on hospitalized patients by 25 percent by placing an arbitrary limit on the number of laboratory tests that could be ordered in one day.<sup>17</sup> Most physicians would find such restrictions unacceptable. Other reported strategies to decrease unnecessary tests in-

clude peer review with feedback and financial rewards and penalties.<sup>16</sup>

The optimal method of improving the periodic health examination for patients has yet to be found. In this study physician and patient education in the use of a screening flow sheet resulted in some improvement in the ordering of recommended tests. It was not successful in decreasing unnecessary testing. The reasons for this discrepancy between ideal and actual practice of the periodic health examination are complex,<sup>8</sup> and it is not surprising that a simple solution to this problem has not been discovered.

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