

Does continuing medical education by peer review really work?

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Summary: A peer review of breast operation statistics was conducted. Standards for the proportion of biopsies positive for cancer, and for length of postoperative stay following operation for benign and malignant conditions were developed and each surgeon was informed of his performance and how it compared with that of his colleagues. The same parameters of care were reviewed one year later to study changes in performance. Low volume of clinical material, failure of two surgeons to change, and a steady general improvement in all parameters in the years prior to the presentation of the peer review, confused the demonstration of improvement in the year after the educational effort. There was a statistically significant improvement in the proportion of biopsies positive for cancer, reflecting reduction in unnecessary biopsies, but the pre-existing annual improvement in reducing postoperative stays was not accelerated. Does continuing medical education by peer review really work? Probably.

Does continuing medical education by peer review really work? Many recent articles advocate it as a way to improve the quality of medical practice. Peer reviews are able to identify deficiencies in the care provided, and it is assumed that there are techniques that can demonstrate improvement in a doctor's performance once the deficiencies have been indicated to him.^{1,2} Though there are reports of the difficulties

involved in conducting peer reviews,^{3,4} there are few accounts⁵ of follow-up studies showing whether patient care really improves after such reviews. This is such a report.

Material and method

The charts of all female patients undergoing breast operations in the Ottawa Civic Hospital through the years 1965 to 1969 were reviewed. The appropriate data (Table I) were presented at grand rounds of the general surgical staff in early January 1971 and were subsequently published.⁶

It was observed that there was an unacceptably wide variation (from 4.3 to 55.4%) in the likelihood of individual surgeons finding cancer at breast biopsy. As cancer was found by 4 of 29 surgeons in approximately 50% of the biopsies they performed, it was suggested that all surgeons could be expected to achieve a 40% positive-for-malignancy rate, with the avoidance of many unnecessary breast biopsies. The data reviewed indicated that the probability of finding cancer was low in women under 40 years of age, before the menopause, with a history of a previous benign biopsy or with multiple lesions. It was suggested that discrimination particularly in these patients should reduce the number of unnecessary biopsies.

It was also observed that among individual surgeons treating patients with benign breast disorders mean postoperative days' stay ranged from 1.2 to 5.3 days, an unacceptably wide spread. Since one third of the women had been discharged within 24 hours of operation it was suggested that all could be discharged on the first postoperative day and that many apparently benign lesions could be biopsied in the outpatient department.

It was further observed that following operations for breast cancer, the patients of individual surgeons had an unacceptably wide difference in the mean postoperative stay —

6.4 to 28.8 days. It was suggested that since the patients of five surgeons averaged postoperative stays of 9.0 days or less, this was a reasonable figure to expect all surgeons to achieve.

In February 1971 each surgeon was sent the data listed in Table I. His individual statistics were circled so that he could see what his performance was and how it compared with that of his colleagues, yet anonymity was preserved.

The review was continued through 1971 and the results are presented here to permit assessment of the impact of the presentations.

Results

In the period 1965 to 1971 there were additions to, and withdrawals from the medical staff of the hospital. The data from two surgeons included in the 1971 figures were not included in the 1965-1969 report because of insufficient numbers of biopsies in the earlier period. Eighteen surgeons included in the earlier report were excluded

Table I
Peer review of breast operations 1965-1969

Percent of breast biopsies positive for cancer for individual surgeons doing 20 or more biopsies

55.4	33.3	25.5	22.7	18.4	14.0
50.8	31.2	25.0	22.5	17.2	11.5
47.8	28.9	25.0	21.8	16.7	10.8
45.5	28.8	25.0	18.5	15.5	4.3
36.4	28.3	22.7	18.5	15.0	

Mean postoperative days' stay after diagnosis of benign disease for patients of individual surgeons doing 15 or more benign biopsies

1.2	1.6	2.0	2.3	2.9	3.9
1.2	1.6	2.0	2.4	3.1	4.1
1.3	1.7	2.0	2.5	3.2	4.2
1.5	1.8	2.2	2.7	3.4	4.5
1.5	2.0	2.2	2.9	3.5	5.3

Mean postoperative days' stay after operation for cancer of breast for patients of individual surgeons doing 5 or more procedures

6.4	9.4	11.1	13.5	16.8	19.9
8.0	9.6	11.8	13.8	17.3	22.6
8.5	10.0	12.6	14.6	18.2	28.8
8.7	10.6	12.7	14.9	19.2	
9.0	10.6	12.9	15.2	19.8	

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from the 1971 study because they did not perform the requisite number of procedures.

Although 25 surgeons performed inpatient biopsies during 1971, only five performed 20 or more. This illustrates the chief problem in obtaining valid follow-up evidence of change in quality of individual performance: because of practice variations, it takes time to acquire sufficient clinical material to produce meaningful data.

Table II lists the percentage of inpatient biopsies positive for cancer for each surgeon performing nine or more in 1971. There would appear to have been a real reduction in unnecessary breast biopsies in that year. Only one surgeon of 13 (compared to 11 of 29 in 1965-1969) failed to reach a 20% rate of positive results for cancer, and only 4 of 13 (compared to 23 of 29) failed to reach a 33% rate. Ten of 11 surgeons included in the 1965-1969 period improved their score.

This is also seen in Table III which records the percentage of all biopsies positive for cancer for each year from 1965 to 1971. Though there had tended to be a steady improvement, the improvement in 1971 exceeded that of any other year (X^2 test, $P = 0.02$). Indeed, if the data of two surgeons who performed a large number of biopsies but showed no change in performance (14.0 to 14.6% and 18.4 to 20.0%) are excluded from these statistics, the improvement of the remaining surgeons is much more impressive. The adjusted percentages for each year from 1965 through 1971 then become 22.7, 25.0, 27.1, 34.8, 33.3, 33.6 and 48.9%. This increase illustrates the negative (or it could be positive) effect that a few individuals doing a large volume of work can have on hospital statistics. It also demonstrates a disappointing lack of association between quantity of work and quality.

In 1971 only three surgeons performed 15 or more breast biopsies which proved to be benign. Ten surgeons performed seven or more benign biopsies (Table II). The patients of eight of the 10 surgeons had mean postoperative stays of less than two days; this was so for the patients of only 9 of 30 surgeons in the 1965-1969 period and seven of these showed improvement in this

regard. However, the mean postoperative stay (Table III), which had shown a steady improvement over the years, was no greater in 1971. Also the number of patients discharged within 24 hours increased steadily over the years, but not at a higher rate in 1971. Though bed-days were saved in 1971, fewer were saved than in the years 1966, 1968 and 1970. There was an increase in outpatient biopsies in 1971 (Table III) but it was achieved by three surgeons who performed 28 of the 33 procedures; five other surgeons each did one.

Only eight surgeons operated on five or more patients with breast cancer in 1971. The mean postoperative stays for the patients of each of the 10 surgeons who operated on four or more breast cancer patients in 1971 are set forth in Table II. For eight surgeons the mean stay was less than 10 days whereas only 7 of 28 achieved this in the 1965-1969 period. All the surgeons included in the 1965-1969 series improved in this respect. However, the mean stay after breast cancer operation for all patients (Table III) was also improving over the years and did not change more in 1971 than in the earlier years. This is also true of the proportion of patients discharged within seven days of cancer operations.

Discussion

No doctor knowingly practises poor medicine. To improve his practice he must be shown the character of the care he provides and his individual deficiencies. It is not enough to indicate to him the deficiencies which prevail in the hospital as a whole, for he will attribute any faults to his colleagues,

lacking a personal profile for comparison. By showing each surgeon how his performance compared with that of his peers, it was hoped that all could be stimulated to strive to equal those with the best performances. Since some surgeons were already achieving the standards recommended it was hoped that these would be accepted by all and not considered as too arbitrary.

To provide an individual's profile of practice, studies have to be limited to procedures or disorders that are sufficiently common to allow the gathering of meaningful statistical data within a reasonable period of time. Even in respect of procedures as common as operations for benign and malignant breast disorders many surgeons in this review did not perform enough in one year to provide significant data. For this

Table II
Peer review of breast operations 1971

Percent of breast biopsies positive for cancer for individual surgeons doing 9 or more biopsies

90.9	41.6	23.1
71.4	37.1	20.0
62.5	36.4	20.0
50.0	36.4	14.6
	33.3	

Mean postoperative days' stay after diagnosis of benign disease for patients of individual surgeons doing 7 or more benign biopsies

1.0	1.5	1.9
1.0	1.6	2.2
1.3	1.8	2.3
1.4		

Mean postoperative days' stay after operation for cancer of breast for patients of individual surgeons doing 4 or more procedures

4.7	9.0	9.8
7.7	9.3	10.7
8.4	9.7	15.5
8.6		

Table III
Yearly standards of breast operations 1965-1971

	% of biopsies positive for cancer	Mean stay after benign diagnosis (days)	Outpatient biopsies	% discharged in 24 hours	Mean stay after operation for cancer (days)	% discharged in 7 days
1965	21.1	2.49	2	35	13.5	10
1966	22.8	2.32	4	44	14.3	9
1967	26.3	2.57	4	36	14.1	10
1968	30.5	2.22	2	37	12.1	16
1969	28.4	2.16	2	42	10.3	22
1970	28.6	1.79	16	48	9.7	25
1971	37.5	1.65	33	57	8.8	32

study at least one more year of follow-up will be necessary. The investigation will then have covered an eight-year period during which there will have been a turnover of nearly one quarter of the staff.

It is easier to limit a study to the parameters of performance of a whole hospital or group. Not only does this fail to identify the individual's performance but, as was found in the likelihood of finding cancer at breast biopsy, the failure to improve of one or two individuals with large case volumes can mask the improved performances of their colleagues.

Had this investigation been limited to the years 1969 and 1971 it would have appeared that continuing medical education by peer review really works for there was obvious improvement in all the parameters listed in Table III. However, the longer study has demonstrated that a steady improvement had been occurring in all parameters since 1965 and only in the percentage of biopsies positive for cancer was there an improvement in 1971, following the educational effort, significantly greater than might have been expected to take place anyway.

Does continuing medical education by peer review really work? From the data presented one can only answer "probably". Theoretically it should. This peer review revealed that unnecessary breast biopsies were being done and that following breast operations patients were kept unnecessarily long in hospital. It identified for each surgeon if and where he could improve his performance. This should cause an improvement in health care by reducing both patient suffering and waste of community health resources. This is a gain that cannot be demonstrated or be proved to ensue from changes in licensing practices or from compulsory attendance at lecture courses purporting to be educational.

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Résumé

Le médecin peut-il vraiment s'améliorer en comparant ses résultats à ceux de ses confrères?

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La réponse à cette question a été tentée dans un domaine spécial, celui des opérations mammaires, pour lequel on a recueilli des statistiques parmi des chirurgiens. On a établi des normes sur la proportion des biopsies positives pour le cancer et sur la durée de l'hospitalisation postopératoire dans des cas de lésions bénignes et malignes. Chaque chirurgien a été informé de ses résultats personnels et a pu les comparer à ceux de ses confrères. Un an plus tard, les mêmes paramètres de traitement ont été analysés pour évaluer les changements éventuels. Une diminution du nombre de cas, le fait que deux chirurgiens n'ont pas modifié leur façon de procéder, et une amélioration générale régulière de tous les paramètres au cours de l'année précédant cet essai ont eu pour résultat de rendre peu probante une amélioration éventuelle. On a cependant noté une amélioration, notable sur le plan statistique, de la proportion des biopsies positives pour le cancer, ce qui signifiait une réduction des biopsies inutiles, mais l'amélioration annuelle constatée auparavant dans la durée de l'hospitalisation postopératoire n'a pas été accélérée. A la question posée en tête de cet article, on peut répondre probablement par l'affirmative.

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Trobicin

(spectinomycin)

Indications: Trobicin is indicated in urethritis and proctitis in males and infections of the lower genital tract, rectum and urethra in females caused by *Neisseria gonorrhoeae*. Trobicin is particularly effective in males after a single dose of 2 grams and in females after a single dose of 4 grams. (A cure rate of 94%.)

Cautions: Generally well tolerated both locally and systemically. Discomfort at the injection site has been reported to occur in less than 1% of patients. Infrequently, dizziness and chills-fever have been observed.

Until further clinical experience is obtained, Trobicin is not indicated during pregnancy or in the newborn.

Trobicin is not indicated for the treatment of syphilis. The treatment of acute syphilis demands prolonged therapy with any antibiotic effective against *Treponema pallidum*. Therefore, antibiotics used in high doses for short periods of time to treat gonorrhoea may mask or delay the symptoms of incubating syphilis. Accordingly, patients being treated for gonorrhoea should be closely observed for a period of four to six weeks. Appropriate serological follow-ups should be instituted if the diagnosis of syphilis is suspected.

Preparation of Drug: To prepare suspension for intramuscular use, add the contents of the accompanying 3.5 ml ampoule of bacteriostatic water for injection to the vial of Trobicin powder and shake thoroughly. If not used immediately, prepared suspensions should be stored at room temperature (25°C) and used within 24 hours.

It is recommended that disposable syringes and needles be used to avoid contamination with penicillin residues, especially when treating patients known to be highly sensitive to penicillin.

Dosage: Intramuscular injections should be made deeply into the upper outer quadrant of the buttock.

Male — single 2-gram dose (5 ml) intramuscularly.

Female — single 4-gram dose (10 ml) intramuscularly (should be divided between two gluteal injection sites).

Availability: Sterile Trobicin (spectinomycin dihydrochloride pentahydrate intramuscular) for aqueous suspension — is supplied in the following package size: 2-gram vial — containing 2 grams of Trobicin (base equivalents) which, when reconstituted with the contents of the accompanying 3.5 ml ampoule of bacteriostatic water for injection, yields a volume of 5 ml, with a concentration of 400 mg/ml of Trobicin.

Also in packages of five 2-gram vials with five 3.5 ml ampoules of bacteriostatic water for injection.

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