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Patterns of Surgical Practice in Nova Scotia 1967-1972

This study by Dr. Gordon and associates of the Dalhousie Department of Preventive Medicine deals with 15 common operations. The five "minor" ones were tonsillectomy, hernia repair, appendectomy, surgical treatment of varicose veins and hemorrhoidectomy. There were five female surgical procedures: hysterectomy, D. & C., Caesarean section, perineal repair and mastectomy. The five major operations were gastric resection, colon resection, cholecystectomy, prostatectomy and thyroidectomy.

A major trend was in increased separation rate for patients during this six year period. Separation rate of course follows admission rate so there was an accelerated admission rate. As far as I can determine this was due to more hospital beds and shorter stay for patients; and possibly more complete utilization of beds.

During this period the surgical rate increased markedly. Surgical rate means the number of hospital admissions with a surgical procedure done and it increased from 65.1 per 1000 population in 1967 to 79.9 per 1000 in 1972, an increase of 22.7%. The non surgical rate during the same time increased from 85.8 in 1967 to 88.4 in 1972, an increase of 3%. To express it in another way, in 1967, 43% of patients who were hospitalized had surgery and in 1972, 47.5% had surgery.

Most operations increased markedly in 1969, the first year of M.S.I. This may have been due to the removal of the economic barrier, to increased physician incentive and to an increased number of physicians. Since 1969 cholecystectomies, hysterectomies and Caesarean sections continued to increase; tonsillectomies became less common; the other procedures changed less. Hysterectomies increased from 1712 in 1967 to 3286 in 1972, an 85.3% increase. The increase in diagnosis of Ca - in - situ of cervix accounts for only a small part of this. Caesarean sections rate increased from 4.9% of all births in 1967 to 7.2% in 1972, the highest rate in any Canadian province except Newfoundland. Again the Nova Scotia Fetal Risk Study seems to account for only a small part of this change.

Where is the surgery done? The province is divided into eight regions. It follows that the surgery can be done in the home regions or in another region. Practically it is done in the home region, or in Halifax, or in a region other than home or Halifax. The percent of procedures done in home regions varies from 22% to 100% but for most procedures and most regions it is around 75% to 95%. The percent of procedures done in Halifax varies greatly too, being high for certain major procedures from certain regions but being very low for all procedures from the regions most distant from Halifax. The percent of procedures done in regions other than home and Halifax is low except for region VI.

About 4.4% of the operations were done in hospitals of less than 50 beds; about 16% were done in hospitals of 50-100 beds; and the rest were done in the large hospitals. There are 20 of the small hospitals, 12 in the middle group and 16 in the large group.

To get away from statistics and draw a few unscientific personal conclusions:

Cholecystectomy is more commonly done each year. This is not peculiar to Nova Scotia but is true of all the affluent world, and it may be due to our living on the fat of the land without trying to burn up the fat. There is only one common indication for cholecystectomy and that is gallstones. Noncalculous cholecystitis may exist but it's probably commoner in medical (non-surgical) textbooks than elsewhere, and cancer of the gallbladder is a good reason for cholecystectomy but who can diagnose it pre-op?

Hysterectomies are done in greater numbers every year. The possible reasons include: it's free to the patient; it's pretty safe with modern anesthesia and a

tough patient (a woman); it eliminates the possibility of cancer of the uterus (provided of course she hasn't got it before you start); it eliminates excessive or irregular or bothersome uterine bleeding much more surely than medical treatment; and it is a sure-fire contraceptive. The nagging doubt remains though in some of these instances: how much right have we got to be cutting out normal tissues?

Tonsillectomy is declining in popularity. This may bear out the British dictum that it is just as reasonable to castrate a patient and knock his teeth down his throat as to cut out his tonsils. Incidentally for all their woes the British are a pretty enlightened people and their surgical rates are far below ours for almost everything. But parents still want their kids' tonsils out and I am not sure how the Halifax Herald feels about it. And that brings to mind, what about surgery in the home, or the nursing home? What about the early days of MacDougall, MacDonald, Murphy and Hogan? □

James C. Vibert, M.D.

Dr. D. Brian O'Brien

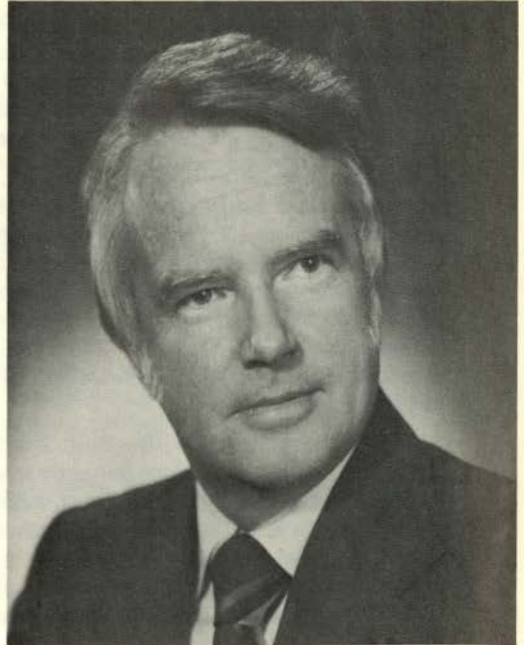
THE MEDICAL SOCIETY OF NOVA SCOTIA PRESIDENT 1974-1975

Dr. D. Brian O'Brien is a native Haligonian who later moved to Moncton where he completed high school studies. He earned his B.Sc. at St. Francis Xavier University, Antigonish, and went on to acquire his M.D. at Dalhousie University, graduating in 1957. He then set up a general practice in Shediac, N.B. Four years later, he entered postgraduate training in ophthalmology in the Royal Victoria Hospital, Montreal, and for the better part of 1964-65 at the Toronto General and at Toronto's St. Michael's Hospital. He specialized in diseases of the retina, retinal detachment surgery and the application of laser and photocoagulation techniques in the treatment of diabetic retinopathy. In 1965, he established his present practice in Halifax.

Dr. O'Brien has already served the Society as chairman of the Public Relations Committee and as treasurer. He has been the Nova Scotia representative to the board of directors of the CMA M.D. Management Committee and a 1971-73 CMA Finance Committee member.

He is on staff at the Victoria General Hospital, the Halifax Infirmary, The I. W. Killam Childrens' Hospital, and holds a part time teaching position at the Dalhousie Medical School. He is also on the board of directors of CAAS and is vice-president of the St. Frances Xavier Alumni Society.

His hobbies include sailing and golf. □



Trends in the Frequency of Selected Surgical Procedures in Nova Scotia 1967-1972

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In an earlier paper¹, a procedure was developed to provide summary reports of utilization data relating to all public hospitals in Nova Scotia on an annual basis. To demonstrate how this data base can be used to provide information about the hospital system, we have reported studies of the effect on in-patient utilization rates of initiating diabetic day-care clinics², and on the trends in the "demand" and the "supply" of hospital beds.^{3,4} As a continuation of this demonstration, we provide here an analysis of the trends and certain geographic variations associated with surgical procedures during 1967-72. One of the major trends noted in our earlier paper³ was the accelerated increase in the annual separation rate† for patients receiving one or more surgical procedures during their hospital stay, following the introduction of

Medical Care Insurance (M.S.I.) in April 1969. The rate increased up to 1971 but in 1972 it appeared to be levelling off.

Other recent studies of surgical rates, including geographical comparisons, have been published by Lewis (1969)⁵, Vayda (1973)⁶ and Wenneberg et al. (1973)⁷. The focus on surgical rates has partly been due to the relative reliability of the recording of surgical procedures in comparison with the recording of diagnoses for non-surgical hospital patients.

This report focuses primarily on fifteen surgical procedures selected because they were relatively common, and because they included various systems of the body and certain surgical subspecialties.

TABLE I
Surgical and Non-Surgical Separations (Excluding Newborns)
Nova Scotia 1967-1972

	1967	1968	1969	1970	1971	1972
Surgical						
No. of Separations	49,448	51,824	54,767	58,844	62,535	63,448
% of Total	43.1	44.3	44.8	45.7	47.4	47.5
Separation Rate*	65.1	67.5	70.7	75.3	79.3	79.9
Patient-Day Rate*	763.4	775.7	804.9	847.1	890.8	871.3
Non-Surgical						
No. of Separations	65,206	65,227	67,508	69,802	69,802	70,096
% of Total	56.9	55.7	55.2	54.3	52.6	52.5
Separation Rate*	85.8	85.0	87.2	89.2	88.0	88.4
Patient-Day Rate*	917.6	905.0	893.4	907.6	881.3	853.6
Total						
No. of Separations	114,654	117,051	122,275	128,646	131,968	133,544
Separation Rate*	150.9	153.5	157.9	164.5	167.3	168.3
Patient-Day Rate*	1,681.0	1,680.7	1,698.3	1,754.7	1,772.1	1,724.9

*per 1,000 population

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†"Separations" refer to patients "discharged" from hospitals alive or dead. For most purposes it may be considered equivalent to the "admission" rate.

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OVERALL TRENDS (Table I)

The major trends in surgical and non-surgical separations from 1967 to 1972 are shown in Table 1. The overall surgical rate (the rate for all admissions during which a surgical procedure of any kind was performed) increased from 65.1 per 1,000 population in 1967 to 79.9 per 1,000 in 1972, an increase of 22.7%, whereas, the non-surgical rate increased by only 3.0% from 85.8 per 1,000 to 88.4 per 1,000. The case-mix in hospitals over this period changed accordingly: in 1967, 43.1% of all patients admitted received surgery, whereas, in 1972 this proportion increased to 47.5%.

The total patient-day rate for all admissions remained almost constant, increasing by only 2.6%, a fact commented upon in an earlier paper in this series¹. Thus an increase in surgical patient-day rates of 14.1% and a decrease in non-surgical patient-day rates of 7.0% were complementary in terms of bed requirements. Consequently, one is led to the inference that the tendency to perform surgery during a hospital stay has increased, with the statistical effect of shifting patients from the non-surgical category to the surgical. Thus the increased surgical separation rates may be seen as being largely due to a shift in the mix of surgical versus medical treatment, rather than an addition to total hospital services.

TRENDS IN SELECTED PROCEDURES

The fifteen selected surgical procedures were grouped into five relatively minor procedures, five major procedures and five female surgical procedures. Figure 1 shows the trends in separation rates for five relatively minor surgical procedures.

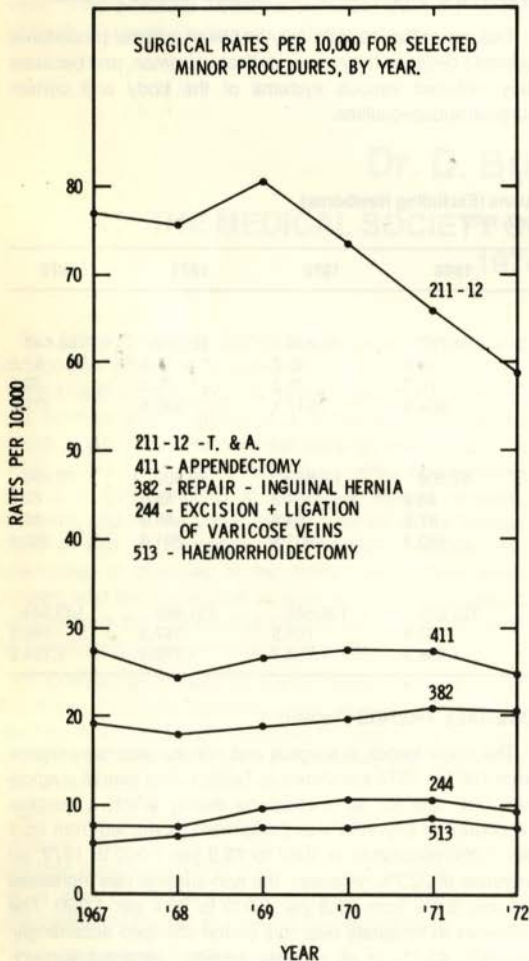


FIGURE 1

The rates show a distinct up-turn following the advent of M.S.I. in 1969 but, for all these procedures, this trend was reversed in more recent years. Rates for Tonsillectomy declined dramatically (by 22.2%) after 1969. The other four minor procedures show a levelling off over 1969 to 1971 and a slight decline over 1971-72.

Figure 2 displays trends for five major surgical procedures. All but one (Thyroidectomy) show a distinct increase over the 1968-69 period. After this period, rates for all five major procedures tend to level off. The most striking change occurred for Cholecystectomies which increased only 2.3% in 1967-68 but by 23.9% in 1968-69, and by 24%, 12%, and 6% over the succeeding years.

Figure 3 shows the trends for five selected female surgical procedures. The rates for Hysterectomy, Repair of Cyclocele and/or Rectocele and Caesarian Section all show marked increases from 1968 to 1969. The trend in the rates for D. and C. and "Repair" then follow the previously described pattern. For Hysterectomy and Caesarian Section, however,

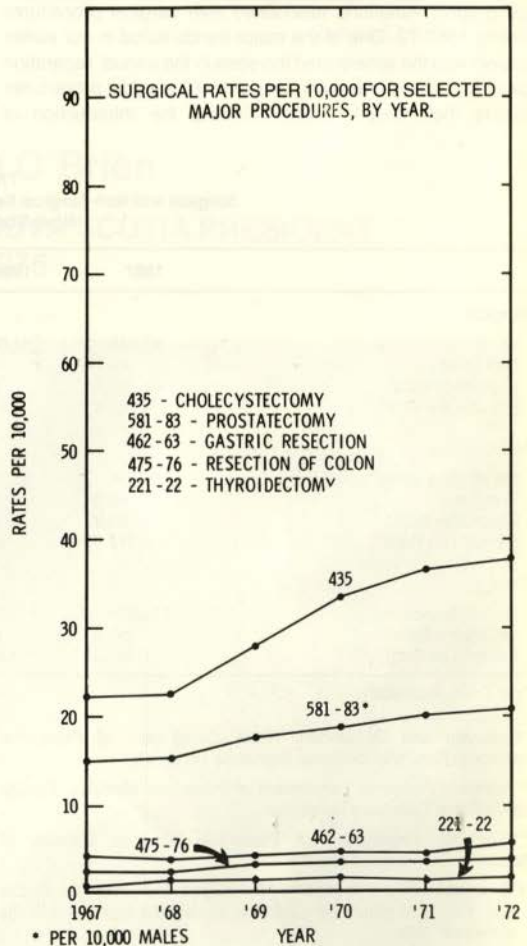


FIGURE 2

* PER 10,000 MALES

the rates continue to show average yearly increases of 18.9% and 17.9%, respectively. The rates for Mastectomy remain relatively stable over the period 1969-72, following a decline associated with the introduction of M.S.I.

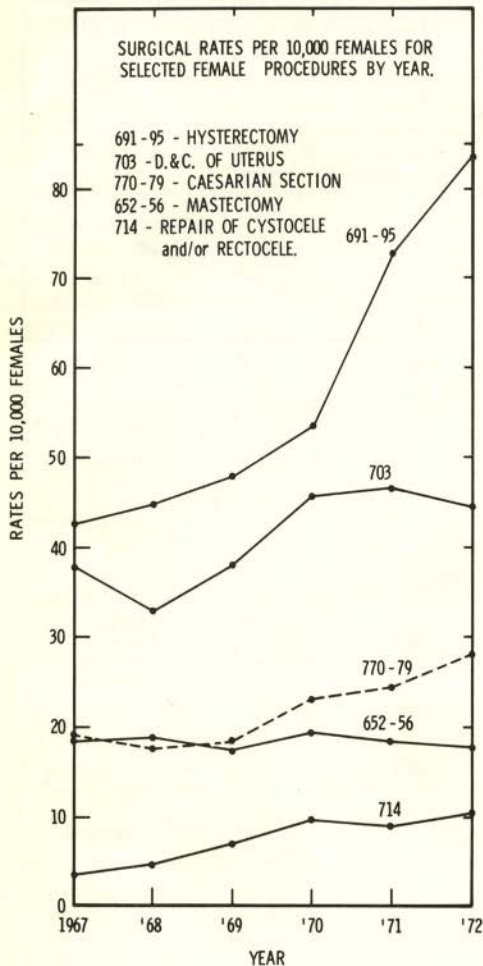


FIGURE 3

EXPLANATIONS FOR OVERALL TRENDS

1 Removal of the Economic Barrier

The generally temporary but consistent acceleration in the rates for all surgical procedures combined and for most of the fifteen selected procedures, associated with the introduction of M.S.I., strongly suggest that prior to M.S.I. there were many persons in Nova Scotia with conditions amenable to surgery who remained untreated or were treated medically. Since one of the major objectives of M.S.I. was to remove the economic barrier to needed medical care these trends may simply represent a "catching up" on the "back-log" of previously unmet needs and in those cases where the rates have levelled off or slightly declined the current rates may now be reflecting the on-going demand. This would apply

particularly to those procedures, such as Excision and Ligation of Varicose Veins, for which there is a high degree of electivity.

2 Other Factors

It would surely be an over-simplification, however, to purport that the removal of the economic barrier to the patient was the only factor involved in these trends. There was a concomitant incentive to the physician, with the introduction of M.S.I., to perform surgery as an alternative to medical treatment. In addition, other factors which might be involved include increases in the supply of physicians, the supply of hospital beds, the incidence of the conditions underlying the need for surgery and changing indications for surgery in the light of new knowledge.

With the limited data available it is impossible to fully evaluate the extent to which these factors have influenced the observed trends. It should be noted, however, that in order to attribute a significant effect on the surgical rates to changes in any of the above factors *these changes should be observed to occur at, or close to, the advent of M.S.I.*, when, for the most part, the surgical rates showed their largest increase.

(a) Changes in Underlying Morbidity

Valid morbidity data based on the total population, to show the trends in the incidence of the conditions underlying the need for the surgical procedures examined, are generally unavailable. One source of data which might be considered as providing a reliable index of the incidence of the underlying conditions is the routinely reported hospital morbidity list as published in the annual Reports of the Nova Scotia Hospital Insurance Commission. These lists show for each year the number of patients admitted to all hospitals in Nova Scotia according to diagnostic category. From these it was possible to select those conditions considered to be the most likely underlying diagnoses for specified surgical procedures and observe their trends over time. Figures 4, 5 and 6 and Table II show these trends for representative conditions selected from the minor, major and female surgical groups together with the trends in the surgical rates for these conditions. These show a consistent pattern, in that admissions for the underlying conditions all show a distinct

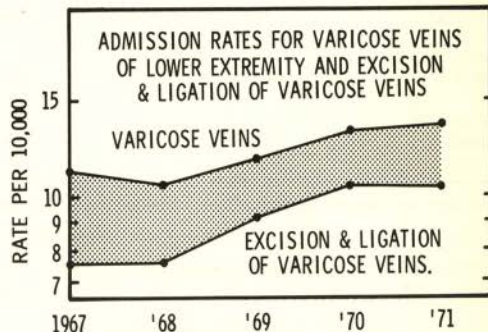
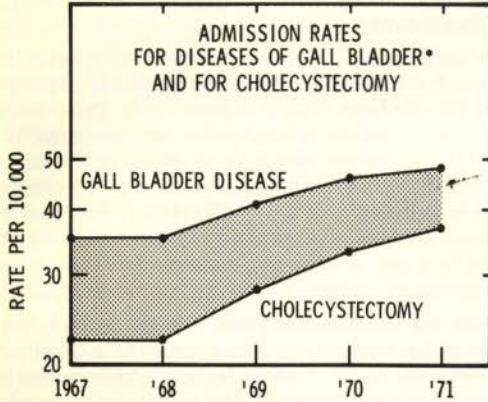


FIGURE 4

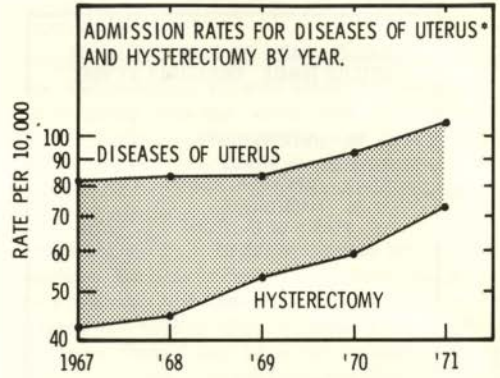
jump after the introduction of M.S.I. It is extremely unlikely that these trends mimic true coincidental increases in

disease incidence, however. Rather, it is more likely that they reflect artefacts of the medical care system previously described.



* INCLUDES - CHOLELITHIASIS
- CHOLECYSTITIS & CHOLANGITIS
- OTHER DISEASES OF GALL BLADDER

FIGURE 5



* INCLUDES - DISORDERS OF MENSTRUATION
- OTHER DISEASES OF GENITAL ORGANS
- BENIGN NEOPLASMS OF UTERUS

FIGURE 6

TABLE II
Percent of Underlying Conditions
Receiving Surgery During Hospitalization by Year

Underlying Condition	1967	1968	1969	1970	1971	Surgical Procedures
Varicose Veins	68.5	72.4	77.9	80.1	78.2	Excision and Ligation of Varicose Veins (244)
Haemorrhoids	84.3	88.7	89.0	88.4	93.3	Haemorrhoidectomy (513)
Gall Bladder Diseases ¹	61.2	62.3	67.7	72.8	75.0	Cholecystectomy (435)
Prostate Diseases ²	55.9	59.7	60.2	60.3	65.8	Prostatectomy (581-83)
Gastric Diseases ³	10.8	10.9	10.1	11.3	10.6	Gastric Resection (462-63)
Colon Diseases ⁴	40.4	44.1	58.5	56.7	58.1	Resection of Colon (475-76)
Uterine Diseases ⁵	52.0	53.7	62.7	62.3	78.8	Hysterectomy (691-95)
Uterovaginal Prolapse	18.9	25.5	33.3	39.9	34.5	Plastic Repair of Cystocele and/or Rectocele (714)

Conditions selected from Diagnostic Categories listed in N.S.H.I.C. Reports:

1. Cholelithiasis; Cholecystitis & Cholangitis; Other Diseases of Gall Bladder (Neoplasms of Gall Bladder are listed as a separate category).
2. Hyperplasia of Prostate; Malignant Neoplasms of Prostate.
3. Ulcer of Stomach, Duodenum & Jejunum; Gastritis, Duodenitis & Other.
4. Malignant Diseases of Large Intestine except Rectum.
5. Disorders of Menstruation; Other Diseases of Genital Organs & Benign Neoplasms of Uterus.

(b) Propensity to Surgical Treatment

The surgical rates described in the above paragraph follow the previously observed trends but the new feature shown in these figures is that these rates increase throughout the period for which data were available at an even more rapid rate than those for the underlying conditions. It is therefore apparent that not only were more patients admitted to hospital with these conditions following the advent of M.S.I. but a progressively increasing proportion received surgical treatment for these conditions (as was also inferred from the data in Table I.)

(c) Changes in the Indications for Surgery

The decline in the rates for Tonsillectomy after 1969 very probably reflect the generally accepted more limited indications for this procedure. On the other hand, the marked increase in Cholecystectomies is in keeping with generally broader indications for that procedure.

The trends in the rates for Caesarian Section and Hysterectomy are particularly striking and deserve special comment. The Nova Scotia Fetal Risk Study has been enrolling physicians (on a voluntary basis) in a study involving the collection of standardized data relating to the degree of risk in pregnancies they supervise. This has been in progress since 1971. Note that the largest increases in the Caesarian Section rate per 10,000 females occurred between 1969-70. Thus the accelerated increase in Caesarian Section from 1969-1970 cannot be attributed to the Fetal Risk Study. However, it may be that the acceleration in the rate after 1971 was at least partly influenced by this study.

In 1972, there were 1,117 Caesarian Sections performed representing 8.2% of all births (live births and stillbirths 28 weeks +)⁸ in that year. In 1967, 4.9% of all births⁸ were delivered by Caesarian Section. Comparable data for Canada and the other Provinces are not available for 1972 but in 1971, 7.2% of all deliveries in Nova Scotia were by Caesarian Section compared with a rate of 6.5% for all of the other nine Provinces combined⁹. The rates ranged from 4.9% in Manitoba to 7.4% in Newfoundland, the only Province with a rate higher than Nova Scotia's.

TABLE III
Number of Cases of Carcinoma-in-Situ, all Hysterectomies and Hysterectomies less Cases of Carcinoma-in-Situ by Year

Year	Ca.-in-Situ	Hysterectomies		Hysterectomies Less Ca.-in-Situ	
		N	Rate/10,000	N	Rate/10,000
1968	199	1712	44.9	1513	39.6
1969	195	2039	53.0	1844	47.7
1970	216	2291	58.3	2075	53.3
1971	220	2887	72.8	2667	67.9
1972	255	3286	83.2	3031	76.8

The rate for Hysterectomy has been increasing more rapidly than for all of the other procedures and this is particularly difficult to explain. Is it that, because of the growing pap smear program, more and more cases of non-invasive Cancer of the Cervix have been detected thus increasing the incidence of one of the underlying conditions for which this procedure is indicated? Data are available to deal with this question and are shown in Table III. The number of Hysterectomies increased from 1,712 in 1967 to 3,286 in 1972, representing an 85.3% increase in the rate per 10,000 women. However, even if one assumes that all women with Cancer of the Cervix-in-Situ received a Hysterectomy, in the year the cancer was discovered, then the rates for Hysterectomy performed for all other reasons still increased from 39.6 per 10,000 in 1967 to 76.8 per 10,000 in 1972, an increase of 93.9%. Thus, the increase in the number of women detected with Carcinoma-in-Situ does not account for the trend observed.

Another possibility is that the need or demand for sterilization became an increasingly accepted indication for hysterectomy. There are no data currently available to explore this and a special study would be required.

(d) Physician Supply

Figure 7 shows that physician supply¹⁰ was increasing faster than surgical procedure rates between 1967 and 1969 but between 1969 and 1971 this trend reversed. The 1972 data suggest that the ratio of the surgical rate index to the physician supply index would return to its 1967 value by mid 1973.

The coincidence of the change in pattern in 1969 with the introduction of M.S.I. in that year suggests the two events are related. If one were to accept this relationship as causal, an explanation of the patterns in Figure 7 might be as follows. In 1967 and 1968, physician supply increased rapidly in anticipation of the introduction of M.S.I. With the removal of the economic barrier due to the introduction of M.S.I. in 1969, surgical rates began to increase rapidly, while physician

Indices of the number of physicians / 10,000 population and the number of surgical procedures / 10,000 (JUNE 30, 1967 = 100)

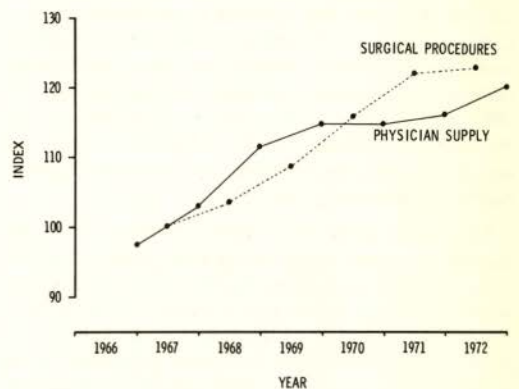


FIGURE 7

PER CENT ANNUAL CHANGE IN RATES FOR SURGICAL PROCEDURES AND TOTAL PHYSICIANS

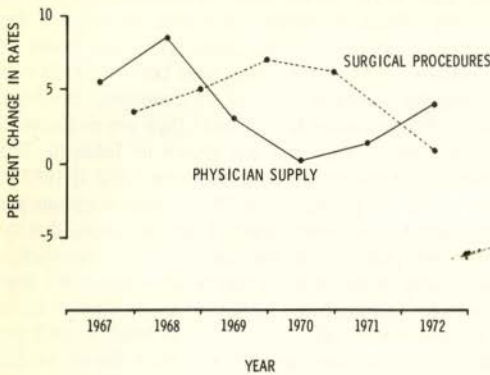


FIGURE 8

PER CENT ANNUAL CHANGE IN RATES OF SURGEONS, GENERAL PRACTITIONERS AND ALL OTHER PHYSICIANS

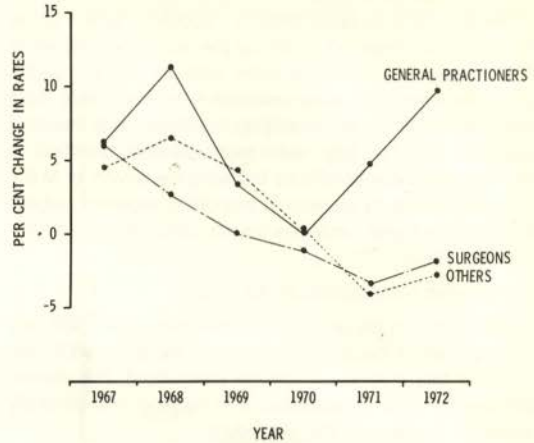


FIGURE 10

INDICES OF RATE / 10,000 SURGEONS, GENERAL PRACTITIONERS AND ALL OTHER PHYSICIANS (1967 = 100.0)

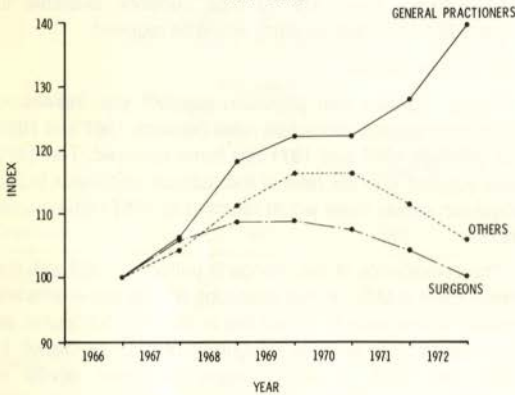


FIGURE 9

Physician supply over 1967-73 is broken down into G.P.'s, surgeons, and other non-surgical specialists, in Figure 9. It is clear that during this period the numbers of G.P.'s has increased by 40% while the numbers of specialists had increased by a lesser amount by 1969 or 1970, only to decrease thereafter leaving little net change over the whole period.

The details of the patterns of Figure 9 are best displayed as year-to-year changes, as in Figure 10. The first evidence of a modulation of the increase in the indices for G.P.'s and Others (Nonsurgical Specialists) comes in 1969, while for surgeons this same effect occurs in 1968. There is a similarity in the changes in physician-supply for each sector, up until 1971, when the pattern for G.P.'s diverges from that for specialists. While it is not clear to us why these effects have come about, it does seem reasonable that the introduction of M.S.I. in 1969 may be one of the important causes of these changes.

supply levelled off. During 1971-72 physician supply began to increase again, but at a slower rate than before, while the surgical procedures rate appeared to be levelling off, as if physician supply and surgical rates were returning to a 1967 equilibrium relationship. Whether the system has actually stabilized or not remains to be seen. The data from 1973 and 1974 should allow a reasonable assessment of this. However, the evidence that the introduction of M.S.I. did perturb the supply-demand relationship for surgical services seems fairly convincing to us.

An intriguing aspect of the pattern in Figure 7 is that the surgical procedures index appears to mimic the movements of the physician supply index, but following a one and a half year lag. Figure 8 shows rates of change for the graphs in Figure 7, and points up this similarity. This suggests that the volume of physician supply is a major determinant of the volume of surgery performed, and suggests that the surgical procedures rate may accelerate again in 1974-75.

DETERMINANTS OF VARIATION IN THE FREQUENCY OF SELECTED SURGICAL PROCEDURES

(a) Geographical Location

Tables IV, V and VI show for the year 1972, the proportions of each of the fifteen procedures that were performed in hospitals located in the patient's home region and the proportions "referred" to Halifax or to other regions. (The geographical boundaries of the regions employed in this study are shown in Figure 11).

In general, the vast majority (over 85% in most cases) of the five relatively minor procedures were performed in the patients' home region and this was especially true for those regions (I, II, V and VII) most distant from Halifax (Table IV). Moreover, patients receiving these operations out-of-region are more likely to have had them performed in regions other than Halifax. This is not so in the case of patients who live in

"referred" includes self-referrals as well as those referred by physicians.

Regions IIIa and IV where Halifax serves as the major referral centre for those receiving these procedures out-of-region. Region VI is somewhat unique, in that, though distant from Halifax, the proportion of home region procedures for most conditions is relatively low. Again, however, Halifax does not play any significant role as a referral centre in this instance, and further analysis revealed that most patients from Region VI, not treated in their home region, were referred to Region VII.

One of the general patterns observed above is also apparent for the five major surgical procedures but it is less marked and there are more exceptions (Table V). The majority of most procedures are carried out in the patient's home region; again this is particularly true for the regions most distant from Halifax (I, II, V and VII); but, as expected, Halifax plays a much more important role as a referral center for these major procedures and this is true for all regions except VI but especially so for Regions IIIa and IV. Region VI

TABLE IV
Percent of Selected Surgical Procedures Carried Out in Home Region, "Referred" to Halifax and Other Regions
1972

Procedure (I.C.D.A. Code)		Region of Residence							
		I	II	III(a)	III(b)	IV	V	VI	VII
Tonsillectomy with or without Adenoidectomy (211-212)	Home Region	90.3	98.1	88.3	99.2	83.9	97.6	90.8	94.3
	Hfx. Region	3.1	.6	9.9	91.3	12.7	1.6	1.2	3.5
	Other Hospital	6.6	1.3	1.8	.8	3.4	.8	7.9	2.2
Appendectomy (411)	Home Region	93.8	94.6	93.8	95.0	90.8	95.2	81.4	96.8
	Hfx. Region	0.0	1.2	.8	84.6	4.9	0.0	2.3	.7
	Other Hospital	6.2	4.2	5.4	5.0	4.3	4.8	16.3	2.5
Repair of Inguinal Hernia, except recurrent (382)	Home Region	93.3	91.8	78.7	99.7	83.2	95.3	75.0	95.1
	Hfx. Region	0.0	5.5	19.7	91.8	11.7	2.8	3.9	3.4
	Other Hospital	6.7	2.7	1.6	.3	5.1	1.9	21.1	1.5
Excision and Ligation of Varicose Veins (244)	Home Region	96.4	93.2	65.5	99.7	78.3	85.4	65.1	96.8
	Hfx. Region	0.0	2.7	24.1	94.5	20.3	12.2	18.6	2.4
	Other Hospital	3.6	4.1	10.3	.3	1.4	2.4	16.3	.8
Haemorrhoidectomy (513)	Home Region	96.1	88.5	69.2	100.0	77.4	96.3	80.0	96.5
	Hfx. Region	2.0	3.3	25.6	92.6	17.0	3.7	0.0	1.8
	Other Hospital	2.0	8.2	5.1	0.0	5.7	0.0	20.0	1.8

TABLE V
Percent of Selected Surgical Procedures Carried Out in Home Region, "Referred" to Halifax and Other Regions
1972

Procedure (I.C.D.A. Code)		Region of Residence							
		I	II	III(a)	III(b)	IV	V	VI	VII
Cholecystectomy (435)	Home Region	94.7	90.4	81.3	99.6	83.6	94.7	76.1	96.3
	Hfx. Region	.8	5.7	18.7	94.0	13.4	4.1	3.5	2.1
	Other Hospital	4.5	3.9	0.0	.4	3.1	1.2	20.4	1.6
Prostatectomy (581-83)	Home Region	84.6	86.9	12.9	97.8	76.0	37.8	54.8	87.0
	Hfx. Region	15.4	10.8	82.3	96.5	24.0	55.6	9.5	12.3
	Other Hospital	0.0	2.3	4.8	2.2	0.0	6.7	35.7	.7
Gastric Resection (462-63)	Home Region	95.5	63.3	32.1	97.9	79.1	78.6	37.0	92.2
	Hfx. Region	4.5	26.7	67.9	96.9	20.9	14.3	29.6	7.2
	Other Hospital	0.0	10.0	0.0	2.1	0.0	7.1	33.3	.7
Resection of Colon (475-76)	Home Region	90.0	45.5	59.3	98.9	85.3	100.0	22.2	86.4
	Hfx. Region	10.0	45.5	29.6	91.1	14.7	0.0	44.4	12.1
	Other Hospital	0.0	9.1	11.1	1.1	0.0	0.0	33.3	1.5
Thyroidectomy (221-22)	Home Region	88.9	25.0	23.1	100.0	46.7	66.7	37.5	70.7
	Hfx. Region	11.1	60.0	76.9	93.8	53.3	33.3	50.0	26.8
	Other Hospital	0.0	15.0	0.0	0.0	0.0	0.0	12.5	2.4

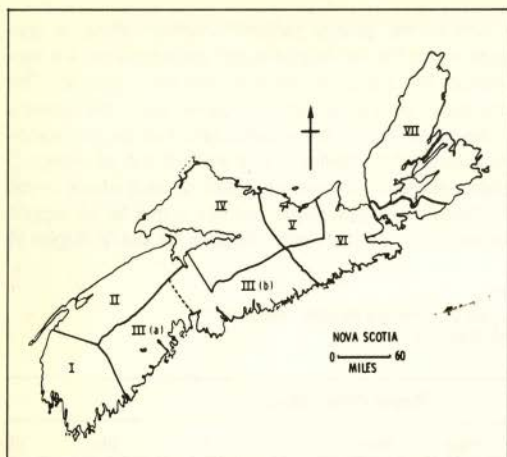


FIGURE 11

is the exception again where relatively few of these procedures are performed in the home region and for three, Cholecystectomy, Prostatectomy and Gastric Resection, a high proportion of the patients are referred to hospitals other than in Halifax, mostly to Region VII.

The pattern for the five female surgical procedures (Table VI) resembles very closely the pattern for the previously described minor surgical procedures — the vast majority are performed in the patient's home region (over 85% in most cases) and this is especially marked in regions distant from Halifax. Here, however, Halifax plays a somewhat more important role as a referral center though not to the extent it does for the major surgical procedures described. Once again, Region VI is the exception.

(b) Hospital Size

From the previous section it appears that a good deal of both major and minor surgery is being conducted in hospitals throughout Nova Scotia. In this section we look at the size of the hospitals in which surgery is performed.

Table VII shows, for 1972, the hospitals in Nova Scotia categorized into three size groupings, the beds they contain and the amount of surgery performed. For example, 20 hospitals (41.7%) are under 50 beds in size, they contain 386 beds (7.8% of the total) and performed 2,561 surgical procedures (4.4% of all surgery). Since 1967, the number of hospitals in each grouping has remained the same but the number of beds in each size class has increased. However, the proportion of beds in each size class has remained essentially unchanged. Similarly, while the amount of surgery performed has increased in all groups the proportion of all surgery performed in the three classes remained unchanged from 1967 to 1972.

Table VIII shows the percentage change in the number of procedures performed between 1967 and 1968 and 1969, and the average annual change over the years 1969 to 1972 by hospital size. In this table the procedures have been combined to show the changes in the minor surgical group, the major surgical group and the female surgical group.

Three major points emerge from these data. First, the previously described increase in the amount of surgery performed, after the advent of M.S.I. for the province as a whole, occurred in all hospital groupings — small, medium and large. Second, this percentage increase from 1969 was most marked in the smallest hospitals for all groups of surgery, and third, various associations with hospital size were observed for the period 1969-72, depending on the particular group of surgical procedures: the five female

TABLE VI
Percent of Selected Surgical Procedures Carried Out in Home Region, "Referred" to Halifax and Other Regions
1972

Procedure (I.C.D.A. Code)		Region of Residence							
		I	II	III(a)	III(b)	IV	V	VI	VII
Hysterectomy (691-95)	Home Region	91.9	84.7	81.3	99.4	73.9	87.5	75.8	91.9
	Hfx. Region	5.4	12.4	17.7	93.4	23.5	11.0	10.1	6.5
	Other Hospital	2.7	2.8	1.0	.6	2.6	1.5	14.1	1.6
D. and C. of Uterus (703)	Home Region	84.2	96.7	89.9	97.6	86.3	94.9	87.1	96.9
	Hfx. Region	4.2	2.5	9.2	94.0	10.8	3.2	6.5	1.3
	Other Hospital	11.6	.8	.9	2.4	2.9	1.9	6.5	1.8
Caesarian Section (770-79)	Home Region	93.8	91.6	87.8	98.9	77.5	95.1	61.8	98.0
	Hfx. Region	2.5	8.4	10.2	9.57	1.96	3.7	2.9	2.0
	Other Hospital	3.7	0.0	2.0	1.1	2.9	1.2	35.3	0.0
Mastectomy (652-56)	Home Region	82.6	86.4	65.9	100.0	80.5	92.0	56.3	88.8
	Hfx. Region	13.0	10.6	34.1	95.4	18.3	4.0	15.6	9.2
	Other Hospital	4.3	3.0	0.0	0.0	1.2	4.0	28.1	2.0
Plastic Repair of Cystocele and/or Rectocele (714)	Home Region	97.6	80.4	85.7	100.0	87.5	87.5	61.5	99.1
	Hfx. Region	0.0	15.2	14.3	85.1	10.4	9.4	7.7	.9
	Other Hospital	2.4	4.3	0.0	0.0	2.1	3.1	30.8	0.0

TABLE VII
Number and Proportion of Hospitals, Beds and Surgical Procedures by Hospital Size, 1972

Bed Size	Hospitals*		Beds		Surgical Procedures	
	N	%	N	%	N	%
< 50	20	41.7	386	7.8	2,561	4.4
50-99	12	25.0	908	18.3	9,237	15.9
100+	16	33.3	3,659	73.9	46,464	79.7
All	48	100.0	4,953	100.0	58,262	100.0

*All Hospitals in Nova Scotia except Camp Hill Hospital (D.V.A.)

surgical procedures increased most in the small and large hospitals, the five major surgical procedures increased most in the medium and large size hospitals, and the five minor procedures decreased by about 5% per year in all hospital size categories.

The amount of surgery performed in hospitals with less than 50 beds deserves further attention in view of the services and facilities which they may be expected to provide. There were 113 of the five major procedures performed in these hospitals in Nova Scotia in 1972. However, all of these were performed in only six of the 20 hospitals of this size. Moreover, only 10 of these hospitals performed any of the fifteen surgical procedures (major, minor, or female) which we have analyzed in this paper.

(c) Other Determinants

In addition to the physician population there are other measures of supply which could be associated with demand for surgery. In particular, we can consider bed supply and its associated measures — length of stay and occupancy rate — to see how their patterns of change compare with that for surgical procedures. Figure 12 contains the relevant data on these measures from 1967-72. The demand variables (separation rate, occupancy rate and length of stay) are related to the supply variable (beds) by the equation $\text{separation rate} = \text{occupancy rate} \times \text{beds} \times \text{length of stay} \times 365$, so the changes must balance.

As was previously observed, the greatest rate of increase for surgical procedures occurred from 1969 to 1970. Interestingly, the greatest rate of increase in beds preceded that for surgical procedures, being from 1968 to 1969. This certainly made the increase in surgical procedures more possible.

Occupancy rate and length of stay might be thought to be either supply or demand variables. They are measures of demand in so far as their values are determined in response to changes in patient-day rates, but are supply measures in so far as they control the number of beds available at any given time. Occupancy rate can be interpreted as changing for both reasons: a decrease in 1968-69 due to the sharp increase in the supply of beds (a supply change), and an increase over 1969-71 due presumably to the increase in

TABLE VIII
Percent Change in Number of Procedures by Hospital Size

Five Minor Surgical Procedures Combined			
Bed Size	1967-68	1968-69	Annual Average 1969-72
< 50	-13.5	+32.6	- 6.3
50-99	- 2.5	+ 8.6	- 5.6
100+	- 2.3	+ 7.8	- 4.4

Five Major Surgical Procedures Combined			
Bed Size	1967-68	1968-69	Annual Average 1969-72
< 50	+12.7	+50.6	- 1.7
50-99	+12.4	+14.9	+14.2
100+	+ 1.7	+20.7	+ 9.9

Five Female Surgical Procedures Combined			
Bed Size	1967-68	1968-69	Annual Average 1969-72
< 50	-37.9	+50.5	+19.9
50-99	+ 5.5	+23.9	+ 7.2
100+	- 0.1	+ 9.7	+15.1

patient-day rates following the introduction of M.S.I. (a demand change). Length of stay appears to be declining over the whole period, but declines most rapidly when bed supply is most stable. This suggests that length of stay must also be viewed as both a supply variable (which hospital administrators have been attempting to decrease for many years) and as a demand variable.

INDICES OF SUPPLY AND DEMAND 1967 - 1972

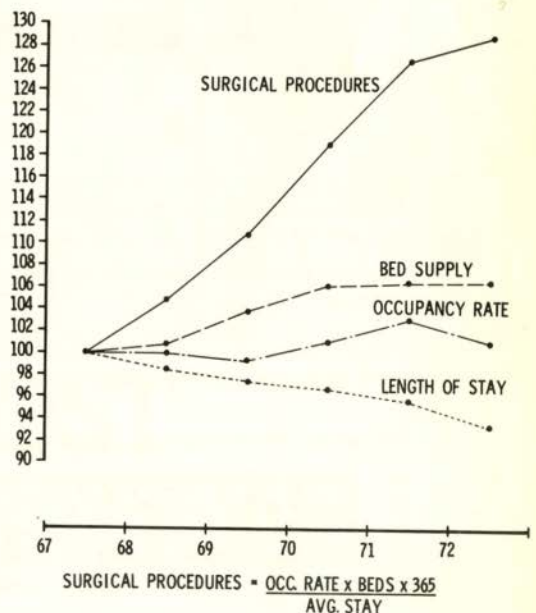


FIGURE 12

DISCUSSION

Several important trends have emerged from this analysis: the shift in the surgical-non-surgical mix in hospitals, the increase in the propensity to surgical, as opposed to medical, treatment in hospitals, reflection of changing indications for certain surgical procedures (tonsillectomy, cholecystectomy, and hysterectomy), the establishment of certain referral patterns for surgical procedures, the role of hospital size in surgical rates. These trends alone may influence policy decisions regarding the hospital system.

But more important, some light has been cast on the influence of the implementation of M.S.I. on the hospital system. We have provided evidence suggesting that physicians may have been attracted to the province in anticipation of M.S.I., and that this may have contributed to the hospitals' capacity to provide the sudden increase in surgical services that followed the removal of the economic barrier to medical care.

Most important, however, data relating to trends in specific surgical procedures in Nova Scotia have now been made available to the medical profession at-large. Our observations are obviously open to various interpretations and, consequently, it is hoped that they will serve to stimulate discussion and provide the basis for further investigation. □

Acknowledgement

We are indebted to the Nova Scotia Hospital Insurance Commission for their full cooperation in making available the data required for this study and to the following personnel in the Department of Preventive Medicine, Dalhousie University

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Physician Self - Assessment

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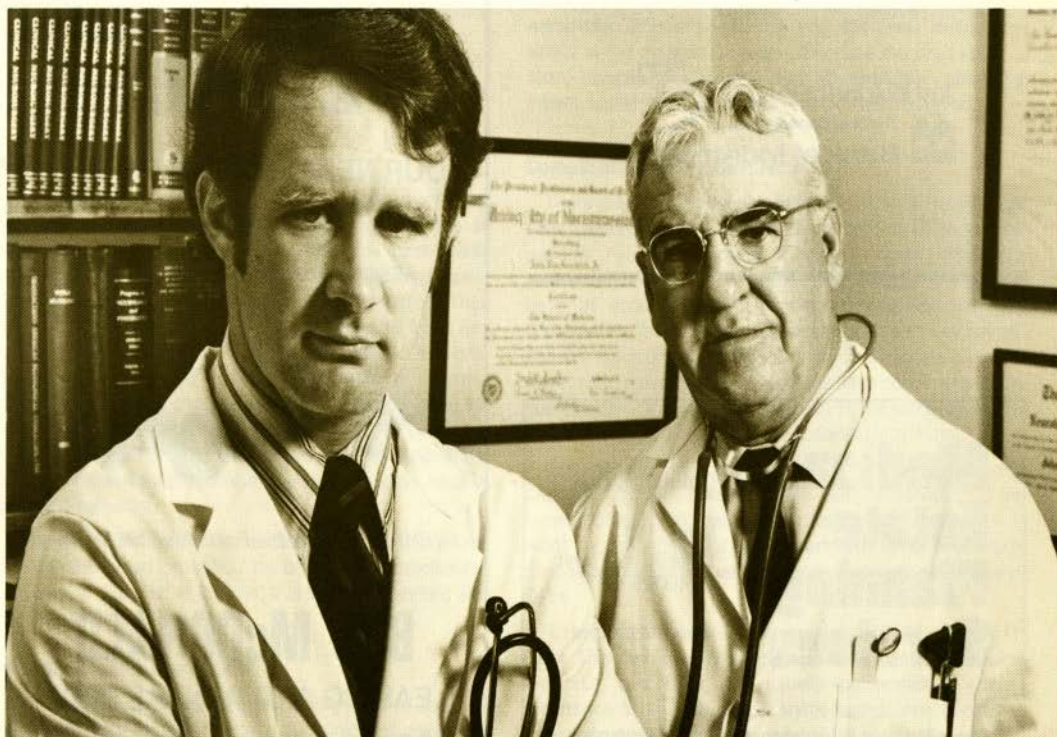
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DIRECTIONS: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the ONE that is BEST in each case.

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 - (a) abolition of the cephalic phase of gastric secretion
 - (b) removal of the vagal release of gastrin
 - (c) decreased responsiveness of the parietal cells to stimulation by gastrin
 - (d) decreased responsiveness of the parietal cells to stimulation by histamine
 - (e) decreased production of a gastric secretagogue from the small intestine

(Please turn to page 31 for answers) □

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The Clinical Use of Diphenylhydantoin (Dilantin) Blood Levels

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Halifax, N.S.

Diphenylhydantoin (DPH, Dilantin) has been around for a relatively long time, first being used in treating epilepsy by Merritt and Putnam in 1938. It still remains the most widely used and effective anticonvulsant in general use. It has been known that therapeutic effectiveness of DPH depends on maintaining the blood level within certain range, and it is also known that the complications of DPH occur at rather specific blood levels. Thus the recent development of tests to measure DPH blood levels are of great importance in the management of patients with epilepsy.

Because a routine insured outpatient test for DPH blood levels is presently available in Nova Scotia, we thought it would be useful to review the clinical pharmacology of DPH and the clinical usefulness of DPH blood levels in the management of patients with epilepsy.

How DPH Works

DPH prevents the local spread of epileptic discharges even though the local epileptic focus may continue to discharge. DPH also tends to decrease the post-tetanic potentiation, which is the enhancement of synaptic transmission that follows rapid repetitive neuronal stimulation. Thus DPH will decrease the spread around an epileptic focus and also decrease the spread along axons to distant neurons. This effect is apparently due to a stabilization of neuronal activity by decreasing intracellular sodium and increasing the extracellular to intracellular sodium ratio. In brief, the primary action of DPH is in stabilizing excitable membranes. It is this characteristic that also makes it useful in treating cardiac arrhythmias.

When taken orally, DPH is absorbed in the gastrointestinal tract and distributed throughout the body. It is metabolized in the liver and excreted in the bile. It is then re-absorbed and eliminated mainly in the urine.

Indications for the Use of DPH

DPH is effective in the management of grand mal seizures and is usually the drug of choice in this clinical situation. It is also useful in treating focal seizures either of motor or sensory type, or temporal lobe (psychomotor) type. However, it is not useful in petit mal seizures, and in some patients may increase their seizures.

DPH may be effective in the treatment of status epilepticus when given in very high doses intravenously, but it has been replaced by intravenous Valium, which is simpler to use and relatively free of complications.

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DPH has a few specific uses in cardiology, particularly in the treatment of arrhythmias, and is also useful in the treatment of certain pain syndromes.

Route of Administration

DPH is most effectively administered orally in the treatment of epilepsy. The patient started on oral DPH will often acquire therapeutic levels after only 5-15 days. In status epilepticus or in patients who cannot take oral medications because of acute illness, it may be required to administer DPH intravenously and this gives rapid blood levels in the therapeutic range. Because the drug tends to form crystals in tissues, and is erratically absorbed, intramuscular injections of DPH should never be given.

Complications and Side Effects

There is a clear relationship between the early neurological complications of DPH and the blood level of DPH. In most patients, nystagmus occurs at about 2 mgs%, ataxia and incoordination at about 3 mgs%, and lethargy and drowsiness at about 4 mgs%. Confusion and irritability are occasionally noticed, and occasionally patients have hallucinations, delusions and psychotic reactions associated with a more marked overdosage. There has been concern for many years about the possibility of DPH causing cerebellar atrophy, but this has rarely been observed in humans.

Gum hypertrophy is common with DPH and may be partly prevented by good dental hygiene. Surgical resection of the hypertrophied gum tissue is occasionally necessary. It is worth remembering that gum hypertrophy is not necessarily dose related and may persist despite decreasing the dose of DPH.

A measles-like rash occurs in about 5% of patients on DPH. This rash usually disappears rapidly on discontinuing the drug and DPH can usually be restarted without recurrence of the rash. Lupus erythematosus may occur, but this is rare and prompt withdrawal of the drug usually results in complete recovery. There is a family history of lupus in 20% of the patients who develop lupus on DPH, and this suggests that DPH may just precipitate a latent tendency to collagen vascular disease.

Some degree of hirsutism occurs in 75% of the patients taking DPH and may be due to a stimulating action on steroid production. For this reason, it may be advisable to select another anticonvulsant in some patients, particularly young brunette girls with dark complexions.

Megaloblastic anemia occurs only rarely and is due to an interference with folic acid metabolism. This can be

prevented by giving 0.1 mgs. of folic acid daily. Because of this complication, it is important to do a hemogram occasionally in patients on long-term DPH to look for megaloblastic changes. There has been some concern that the addition of folic acid to DPH therapy will decrease seizure control, but this does not appear to be a significant clinical problem. The interference of folic acid metabolism may also explain the neuropathy that occasionally occurs in patients using DPH, but this is not often a clinically significant abnormality and is usually only found if specifically looked for.

An interesting complication that has recently been noted, particularly in children, is the development of rickets or osteomalacia during long-term anticonvulsant therapy. There is some question as to whether or not the cases reported are due to Phenobarb or DPH, but there is increasing evidence that DPH is involved.

DPH Blood Levels

Method. DPH blood levels can be determined by a number of spectrophotometric, thin layer and gas chromatographic procedures. The Provincial Laboratory at the Pathology Institute in Halifax uses a spectrophotometric method, employing 5 ml. of serum. Barbiturates can be determined in the same aliquot of serum.

Why DPH Levels are Important. There is a wide range of blood levels possible in different individuals taking the same dose of DPH. It has been noted that the therapeutic effect of DPH corresponds specifically to the blood level, and not necessarily to the amount of DPH taken by mouth. Also, the toxic effects of DPH correspond quite specifically to the blood level.

Since the oral dose taken may result in a variable blood level, and the blood level must be within a certain range for maximal therapeutic effect, the DPH blood levels are extremely important in making sure that your patient is getting adequate therapy.

Always a problem in clinical medicine is the difficulty of getting patients to take their medication as prescribed. This poor compliance is particularly common in long-term therapy. Poor compliance in DPH therapy can be detected by doing blood levels.

Dosage Regimen. DPH blood levels are achieved slowly and DPH is eliminated slowly, causing a relatively stable blood level that is little affected by sudden changes in the dosage. Patients are usually given 100 mgs. three times a day, but it has been found to be just as effective to give the patient his total daily dose at one time if this is more convenient. For instance, a salesman on the road might find it very convenient to take his daily dose at breakfast. Because a large dose given at once may cause some gastric irritation, it is usually taken with an antacid or after a meal.

Therapeutic Blood Levels. If a patient is taking 300 mgs. of DPH each day, you can expect a blood level ranging anywhere from 0.4 to 1.8 mgs% (average 1 mg%). It takes anywhere from 5 to 15 days to achieve this level after

starting the drug. The effective therapeutic level in the treatment of epilepsy is 1 mg. to 2 mgs%. Below this, the effectiveness of DPH is measurably less, and above this, the incidence of side effects is appreciable.

Phenobarb causes induction of enzymes in the liver, including the enzymes that metabolize DPH. As a result, patients on both these drugs may have somewhat lower DPH blood levels than expected.

The Value of DPH Blood Levels in the Management of Epilepsy

A number of recent cases in which a DPH blood level was of value in managing our patients will illustrate some of the uses of this test.

Case 1: — A 55-year-old janitor had an unusual history of sudden rage attacks in which he would stand still, tremble, stare ahead, and "roar like a lion". He felt that these were due to his "nerves". However, the wife's description sounded more like an epileptic phenomenon. His EEG showed evidence of a right temporal focal epileptic discharge and he was placed on DPH 100 mgs. t.i.d. His episodes initially disappeared completely but after a year they returned again. A serum DPH level was done and showed his level to be only 0.7 mgs% even though he maintained that he never missed a dose of his medication. His DPH was increased to 100 mgs. q.i.d. and his episodes completely disappeared at a blood level of 1.5 mgs%.

This case illustrates the use of DPH blood levels to show that the dosage of anticonvulsants should be increased, rather than adding another medication or changing the medication altogether. There has been a tendency in the past to add or switch medications if seizures are not well controlled, when the problem may just be inadequate dosage.

Case 2: — A 68-year-old farmer was admitted to Camp Hill Hospital with a history of confusion, staggering gait and frequent falls. When seen on admission, he had a large bruise over his face and it was considered that he might have a subdural hematoma. Because it was known that he had seizures in the past and was on DPH, a DPH blood level was done. The report showed a level of 5.4 mgs% and adequately explained his presenting clinical picture.

In this situation an acute neurological presentation was explained by considering the possibility of DPH toxicity. Without the DPH blood level, we would have been committed to much more extensive investigations, including arteriography.

Case 3: — An 18-year-old young man with a four-year history of nocturnal seizures was initially poorly controlled on DPH. He was emphatic that he regularly took his medication, but the DPH blood level was only 0.4 mgs%. The DPH was increased to 400 mgs. a day and this gave a blood level of 0.7 mgs%. His seizures were still not controlled and the DPH was increased further. Eventually he was on 600 mgs% and, at this level, achieved a serum

DPH level of 2.0 mgs% and his seizures were well controlled. He was subsequently admitted to hospital and found to have a malabsorption syndrome.

In this situation, his seizures were not controlled because of malabsorption of DPH, an unusual occurrence. It was apparent from the blood DPH levels that he required very high doses to control his seizures and once these doses were administered, he came under good control.

Case 4: — A 16-year-old girl with a disturbed family background was seen on a number of occasions by her family practitioner for apparent hysterical behaviour. One manifestation was repeated fainting in any situation of stress. Eventually an EEG was done and this showed definite epileptic activity. She was placed on a trial of DPH 300 mgs. t.i.d. but this did not alter the fainting. A serum DPH was only 0.3 mgs% and the DPH was thus increased to 400 mgs. a day. At this level, the fainting stopped. However, she continued to manifest histrionic behaviour and in one situation was admitted to hospital because of complaints that she could not walk. She was again thought to be hysterical because of her dramatic unsteadiness and inability to stand up. However, on examination she also had a marked nystagmus and a serum DPH level of 5.6 mgs%. When her DPH was discontinued the marked ataxia disappeared. She was then started on DPH again at a lower dose and continues to be symptom free.

In this situation there was a mixture of epileptiform and hysterical behaviour. The confusion occurred when an episode of DPH toxicity looked like hysteria. However, the situation was clarified by a blood DPH level which showed a very high level. It was apparent in retrospect that her initial low level was due to poor compliance and when she began to regularly take the increased dosage, she developed marked toxicity.

Case 5: — A 13-year-old girl had a history of grand mal seizures. These were initially controlled well on DPH 100 mgs. t.i.d. but after a year she began to have an increase in her seizures. A blood DPH level at that time showed only 0.2 mgs%. The patient said that she was taking the medication regularly but, on discussing this further with her, she admitted that she did not like taking the medication and often skipped it. The importance of regular medication was explained to her and a later DPH level was 1.3 mgs%. Two years later she again became poorly controlled and despite her statements that she took her medication regularly, there was no detectable DPH in her blood. The mother said that she had always felt the daughter was taking the medication regularly. She was again informed that she must take her medication and her blood level returned to therapeutic range and her seizures came under control again.

This is a situation in which a young adolescent did not like taking her medication and informed her mother that she was taking it when she was not. As a result, she appeared to be a child who was poorly controlled on adequate anticonvulsants. The DPH level showed that at some period she had no

detectable DPH, indicating that she had probably not had any DPH for weeks. Poor patient compliance is a problem with any long-term medication, and the DPH levels can be extremely helpful in determining who is taking their proper dosage.

Case 6: — A 32-year-old woman had a long history of grand mal seizures well controlled on DPH. She initially took 400 mgs. of DPH a day and her seizures were well controlled for many years. Eventually she began to decrease the DPH on her own in a somewhat erratic fashion. At the time she was seen in consultation, she was taking only 1 DPH a day but convinced herself and everyone else that this was all she required for anticonvulsant control. A blood DPH level showed only 0.17 mgs%. As a result, the DPH was discontinued.

In this situation, the very small DPH dosage was too low to have any significant therapeutic effect, but confused the clinical situation. It is probably a good rule to have people on adequate doses of DPH or none. Low doses are probably of little therapeutic value, and just muddy the clinical waters.

Conclusion

Serum DPH levels are now a useful clinical tool in managing epileptic patients. There is also a role for the use of DPH blood levels in other clinical situations that require DPH such as cardiac arrhythmias, certain pain syndromes, etc. Because the amount taken by mouth may give variable blood levels, and it is the blood level that determines the therapeutic effectiveness, the use of DPH blood levels in following patients is extremely important.

When any patient is put on long-term DPH therapy, they should have a blood level performed about one month after starting therapy. At this point, the patient's blood level will have stabilized and you can determine if the dosage is adequate, (making sure that the patient is taking his drug regularly). DPH levels should then be done whenever there is any indication of poor control, toxicity, or a question of poor compliance. The use of DPH blood levels enables you to better control these patients and encourages patients to take their drug regularly. □

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Ultrasound and X-Ray in Clinical Obstetrics

Edward B. Grantmyre,* M.D., C.M.

Halifax, N.S.

The provision of diagnostic ultrasound as an insured service to Nova Scotians will have a significant influence on diagnostic procedures in many fields, but particularly in the field of clinical obstetrics. The traditional role of diagnostic radiology is already being modified by this different type of diagnostic procedure.

During the past year, more than 1000 ultrasound scans have been performed at the Grace Maternity Hospital and from this experience, as well as the experience of others using similar equipment and techniques, certain conclusions and impressions regarding the relative roles of Ultrasound and X-Ray studies will be made.

SAFETY: Diagnostic ultrasound has been in clinical use in some centers for approximately sixteen years. Extensive studies on human pregnancy have shown no evidence of harmful biological effect.¹ Animal experiments, and also the exposure of cells in tissue culture to diagnostic levels of ultrasonic energy⁸ have similarly revealed no evidence of harmful effect. At present, it seems reasonable to conclude that there is no known hazard to ultrasound examination.⁴ The hazards of X-Ray examinations to the fetus have probably been over-emphasized, but the possibility of a small but definite increase in the incidence of childhood malignancies, as suggested by English investigators⁷ continues to be a real consideration.

FETAL AGE: When the usual methods of assessing fetal age such as menstrual history, size and growth of the uterus, date of the onset of quickening are inconclusive, the physician may wish further information in the assessment of this problem. There is no doubt, when comparing the two non-invasive methods of estimating gestational age, that until at least 36 weeks, ultrasound measurement of either the gestational sac, or in later weeks of pregnancy, the parietal diameter of the skull, is the preferred method.

In approximately 95 percent of patients it is possible to obtain a satisfactory biparietal diameter at the time of the initial ultrasound examination. The procedure is painless, apparently free from risk, and takes about 15 minutes. If the fetal head lies in an inaccessible position a repeat scan after a few days is usually successful.

Since the mean weekly growth rate of the biparietal diameter is almost 3 millimetres from 20 to 30 weeks gestation and then slows to approximately 1 millimetre during the last four weeks, ultrasound estimation is much more accurate during the second trimester. Campbell² has concluded that the correct duration of gestation could be predicted plus or minus 9 days in 95 percent of cases provided the measurement was taken during the period from

the twentieth to the thirtieth week of pregnancy. At least two measurements are required during the last trimester if this degree of accuracy is to be approached. This is often unnecessary since there is a relationship between biparietal diameter and weight in grams. Cohen³ has stated that as the biparietal diameter increases to 9.0 centimetres the likelihood of the baby weighing at least 2500 grams approaches 100 percent. In our own experience with 33 patients who delivered within 7 days of ultrasound examination, no fetus with a biparietal measurement of 8.9 centimetres or greater weighed less than 2500 grams at birth. There were 6 new-borns in this series with birthweights less than 2500 grams and their biparietal diameters varied from 8.8 to a low of 7.5 centimetres in a 1585 gram infant. This series is admittedly small for firm conclusions, but supports the conclusions of other workers that an infant with a biparietal diameter of 9.0 centimetres will almost certainly weigh more than 2500 grams at birth.

Many radiographic measurements and methods have been used for the assessment of gestational age and these include various skull measurements, the length of the lumbar spine, the length of the femoral shaft, the presence of placental calcification, the presence of fetal fat, tooth development and finally appearance of various ossification centers. Of all these radiological methods, the simplest and most reliable is the assessment of the time of appearance of the lower femoral center and also the upper tibial center. As a generality the former center appears at 36 weeks and the latter at 38 weeks. Schreiber et. al.⁶ found that antepartum visualization of the femoral center indicated a mature fetus in 96 percent of cases. This, of course, also means that 4 percent of infants with visible femoral centers were not mature. When both centers were present the fetus was mature in 98 percent of cases. Conversely, the failure to visualize either of the knee centers, even with optimum detail, is of little help, since they may not be seen in as high as 20 percent of mature babies.³

Thus, it seems reasonable when both ultrasonic and X-Ray facilities are available, to use the ultrasound examination as the primary procedure. The examination can be repeated without known hazard and the radiographic study should be reserved as a secondary procedure.

PLACENTAL LOCALIZATION: The need for placental localization has become much greater in recent years due to the newer indications for amniocentesis. There is, of course, the need for placental localization in any patient in whom because of either antepartum hemorrhage or unusual fetal position, there is a suspicion of a low lying placenta. The common techniques used at present include plain film radiography, isotope localization and ultrasonic scanning. Arteriography has been used in some centers, but as there is

*Director, Department of Radiology, Grace Maternity Hospital, Izaak Walton Killam Hospital for Children.

a definite morbidity to any procedure requiring arterial puncture, it has been largely abandoned for the non-invasive techniques. None of the methods offers total accuracy.

Donald⁵ has reported a reliability in placental localization using ultrasound scanning of just over 94 percent. As this degree of accuracy is possible — albeit with superb equipment, physician instead of technician scanning, and years of experience — and the method is rapid with no trauma or radiation hazard to mother or fetus, then it is the method of choice. The anterior placenta can usually be localized in a few minutes on an ultrasound scan, although at times the posterior placenta can give difficulty as the sound waves must first travel through the fetus before being reflected. The isotope scan is reported to be as accurate as ultrasound, and the radiation dose to mother and fetus is quite low. Plain film radiography has the advantage of being available in every hospital, and in some series a high degree of accuracy has been obtained. The degree of inaccuracy with any of these methods even in the most expert hands, is significant enough that if there is any doubt as to the placental localization, it is advantageous to use more than one method.

PELVIMETRY: Within the past year, Swedish authors⁹ have reported the development of an ultrasonic method for measuring the interspinous diameter, but they stress that this is a preliminary report. At present X-Ray examination remains the better method for pelvic assessment, but the rapid advance of sophisticated ultrasound systems may change even this.

THE FUTURE: Almost monthly, the radiologic and obstetric literature features newer and more accurate ultrasonic methods for diagnosing pregnancy, multiple births (the Hanson quintuplets were diagnosed by Campbell and

Dewhurst at the ninth week of pregnancy), blighting of the ovum, respiration in utero, bladder capacity of the fetus, hydatidiform mole, anencephaly, fetal death, fibroids, cysts, retained products of conception, and of course, the topics covered in this article. Unless some future investigators indicate that the use of diagnostic ultrasound is of high hazard, it is likely to replace all X-Ray examination related to pregnancy, with the possible exception of films taken for information of progress during labor. □

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Brief Note

SURGICAL TREATMENT OF ALCOHOLISM

It has come to my attention that there is a major deficiency in the Nova Scotia fee schedule under "Surgery".

Specifically, there is no fee for the surgical treatment of alcoholism! The latest treatment as reported in the British Journal of Psychiatry, (1974), Vol. 124, Pages 42-44 in an article entitled "DISULFURAM IMPLANT: A CONTROLLED TRIAL" by Drs. White and O'Brien, involves the surgical implantation of Antabuse tablets

Why don't you get a Xerox copy and look it up for yourself? You might help some of your most troubled and troublesome patients. □

Patrick Flynn, M.D.,
V.G. Hospital, Halifax, N.S.

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Toronto Maple Leafs M.D. Speaks Out

A \$500 million dollar investment in a co-ordinated, uniform physical fitness program by the federal government could, according to Toronto Maple Leafs team physician Dr. David Hastings, pay for itself within 15 years and go on paying for itself exponentially in succeeding years.

Dr. Hastings told the Bulletin: "To a certain extent we are squandering our health dollars because there are so many diseases which are related to a lack of physical fitness and which could be prevented through a serious national physical fitness program."

While citing the need for government operated physical fitness centres across the country, Dr. Hastings admitted: "If we're really going to get serious about this sort of thing, then we'll probably have to forget about our generation and concentrate on the kids."

He said the current federal drive toward physical fitness (participation) represented a "non-policy." Dr. Hastings added: "Mainly, it seems, government is salvaging its conscience through an ad campaign."

He agreed that the tradition of elitism in secondary school sports had contributed to the apathy with which physical fitness is generally met. He cited the Ontario policy which permits a child to opt out of any physical fitness or sports programs once Grade IX has been achieved, and added that the Ontario Medical Association had so far unsuccessfully protested the ruling.

He also agreed that to some extent organized medicine had fallen down in actively promoting physical fitness programs, but noted that, through the OMA, two scientific programs for physicians were being conducted annually — and they include personal participation by attending physicians in physically demanding events.

Meanwhile, Dr. Hastings had news about sports medicine which, he said, "seems to indicate that we have been laboring under some misconceptions as to the cause of hockey injuries."

A survey of hockey injuries among 542 fifteen to twenty-one year olds indicates that goal posts, skates and the — apparently nowadays inevitable — on-ice brawls account for "only about eight percent of hockey injuries" while the main culprit is that indispensable element to the game, the stick, which comes in for around a 42 percent guilty mark. The other indispensable element, the puck, rates so low in the culprit standings as to be almost a negligible factor.

Perhaps similar surveys under Canadian Academy of Sports Medicine auspices in conjunction with football, basketball, baseball, softball, etc. amateur league authorities could also provide some helpful pointers in terms of rule and equipment adjustments to help cut down on unnecessary calls on physicians' time. □



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ANNUAL MEETING

The Canadian Society of Allergy and Clinical Immunology

June 13-14, 1975 — London, Ontario

A post-graduate course on topics of current interest in Allergy and Clinical Immunology will take place the first day, followed by the presentation of scientific papers on the second day.

For further information please write:

Secretariat, The Canadian Society of Allergy and Clinical Immunology,
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Bagpiping as a Hobby

"That's our doctor!" "No, that's our piper!"

Maj. George A. Fraser, M.D.

Halifax, N.S.

Traditionally it is said it takes seven years to be a bagpiper and five years to be a medical doctor. Both require a lot of training and practice, and both are quite rewarding. The following is a 'wee bit' on piping and what it's like to be a 'piping-doctor.'

Since this series is related to doctors' hobbies, I will mention a little about my background in medicine. Though I have lived in the six provinces from Nova Scotia to Manitoba, I was born in P.E.I. I did my pre-med in what used to be called P.W.C. and S.D.U. (now combined into U.P.E.I.) and graduated from Dalhousie Medical School in 1967 (piping in my graduating class). Then the Canadian Armed Forces (I'm still with them) sent me to N.B. as a general practitioner for two years followed by a year of residency in internal medicine in Halifax. They then 'loaned' me to the Ghanaian Army in West Africa for two years where I spent most of the time in the casualty department and my spare time searching-out witch-doctors. At present ('74-'75) I am in my final year in psychiatry as Doctor R. O. Jones' chief resident.

I'm really not sure how I became involved in piping. I asked my parents but all they can remember was that when I was twelve years old I told them I wanted to learn bagpiping. They did say that during World War II in Halifax (Dad was a United Press War Correspondent) that they used to play a lot of 78 r.p.m. bagpipe records at home, and perhaps this had an influence on me. In any event I gradually learned — getting a lot of help from the Gaelic College in Cape Breton.

Piping is something like psychiatry — people think you must be a little "different" to be involved in it. Perhaps they're right! When people hear piping they will often politely respond (after an initial pause), "Oh, I like the pipes at a distance." I always wonder to myself if they mean a hundred yards, or a hundred miles. Others say "You either love bagpipes or you hate them" — and then *don't* go on to tell me which side *they* favor. Actually I don't blame them, for I must confess that there are many more poor pipers in the Maritimes than good ones. Also most of the pipe bands heard in parades in the summer are weak, monotonous, and

BEST SHOW THIS SIDE OF SCOTLAND



LOVAT SCOTS PIPE BAND

playing by *rote* what should be played by *spirit*. As a result, few Maritimers are exposed to good piping. Then an unfortunate cycle starts: since good piping is rarely heard, it is not generally understood or appreciated; therefore good pipers are not encouraged for there are no goals to push them onwards after achievements such as winning the professional class at the local annual Highland Games; and finally they may drift away to other parts of Canada where piping is better understood — probably Southern Ontario.

It's hard to describe what it's like to be a piper. Once you are in your kilt you lose all your previous identities. You are an entertainer; you love an audience. At a concert you can tell if the audience are with you or not. It takes a little working at first. You must play something they recognize — save the complicated competition pieces for competitions. Try to get *feeling* into your music, not just a monotonous series of memorized notes. This *feeling* comes from inside — you can't learn it from a note book — you either have it or you don't. Then suddenly you have them! They are clapping or beating time — when you stop you know they will want you to play again. This time they have encouraged you to play even better than before. One last thing you keep in mind; you always leave them wanting just a little bit more. A good musician knows when to stop.

If you have a son or daughter who wants to learn bagpipes then don't hesitate to encourage them to do so. Even if they never become a "MacCrimmon" they will learn fine finger-brain co-ordination and have a rewarding hobby. Perhaps between ages 10 and 12 years is a good time to start. I always remember an old Scottish saying: "to be a good piper you must learn from the milk-bottle and not the wine bottle." First you begin with a practice chanter which is similar to a 'flute' or a 'recorder.' After perhaps six months of learning the scale, basic exercises, and memorizing note-by-note a few basic tunes, then you are ready for the big challenge — the bagpipe itself.

The air goes in the *bag* (usually a hide) through the blow pipe which luckily has a one-way valve. It then goes out the three pipes (or *drones*) which are seen over the piper's arm. The large one is 'bass' the smaller two 'tenor'. These are tuned in synchronization to each other and to the pitch of the *chanter* which contains the holes which provide the melody. To the uninitiated person who has not mastered the art of pressing with his arm on the bag to maintain the flow of air when the piper takes a breath, the first attempt is much akin to blowing in a balloon with four holes in it. Make no mistake about it, learning bagpipes is no easy feat. For those who persist, the enjoyment is worth the effort.

Every piper has moments that he will always remember. One of my early memories was piping across the Canso Causeway in 1955 . . . which I proudly related several months later on the old and well-known radio program "The Uncle Bill Show" as "the greatest thrill of my piping days." However, other 'thrills' were to follow; there were four tours with pipe bands to the States and Central Canada. In Ottawa I brushed with politics by piping in the voting results which elected Lester Pearson as head of the Liberal Party (to be



Pipe Major George A. Fraser

non-partisan I piped for Diefenbaker the next week). While in medical school I was able to raise my own pipe band (The Lovat Scots) to competitive standards and also taught for a year the Queen Elizabeth High School band, and the Dartmouth Legion Pipe Band. In fourth year medicine I went to Toronto and cut an L.P. album called "Dancers' Delight" — it didn't sell too well but it's nice to have made a record. I won't mention some of the piping 'events' at Phi Rho Fraternity, nor what Doctor Tabby Bethune did to me at my wedding reception when I was in my kilt! Doctor R. C. Dickson is a devout piping fan and had me play at the opening of the Centennial Wing of the Victoria General Hospital. Then there was the time in Ghana when I was the official piper of the Caledonia Society of that area of West Africa (they had little choice, as I was the only piper in that country) . . . anyway, I went to a cocktail party and heard someone say "That's our doctor!" The person beside him answered (with a wink to me) "No, that's our piper!"

These are all fond memories, but for me the most important one was in 1968 when the Pipe Major of the Black Watch of Canada asked me to compete professionally with them in the North American Championships. At one time I had to make a serious decision between medicine or being a professional piper with the Black Watch. Obviously I chose medicine. I was proud years later to be posted to the Black Watch (2 RHC) as their medical officer. But to have piped with them professionally *and* be a doctor was "The greatest thrill of my piping days." □

Appreciations



DR. M. G. TOMPKINS, SR.

Dr. Miles Gregory Tompkins, Sr., died at St. Joseph's Hospital, Glace Bay, Cape Breton, on Sunday, November 17, 1974, at the age of 88.

Dr. "M.G." — as he was better known — was born in Margaree, attended school there and later at St. Francis Xavier University. He entered Dalhousie Medical School in 1909 and graduated in 1914. On May 5th, 1914, he established a practice in Dominion and for the next 50 years served Dominion and surrounding areas with skill and devotion.

Dr. Tompkins did post-graduate work at the University of Edinburgh from 1923-24 and in 1925 was awarded a Fellowship in the American College of Physicians and Surgeons.

He was past President of the Cape Breton Medical Society, the Medical Society of Nova Scotia, honorary senior member of the Canadian Medical Association, honorary member of the Medical Society of Nova Scotia and past President of the Provincial Medical Board.

Dr. Tompkins was always active in community affairs and was especially active in all charitable works.

On July 13, 1974, he was honored by the Town of Dominion.

He is survived by three sons, James B., Gregory and Kevin, all doctors, and by four daughters, Kathryn, Mary, Clare and Patricia. He is also survived by 29 grandchildren and two great grandchildren.

In the death of Dr. M. G. Tompkins, the profession has lost one of "the grand old men", and the Bulletin extends its sincerest sympathy to members of the family.

H. J. D.



DR. JEAN (MACDONALD) LAWSON

A multi-faceted career was prematurely ended by the recent death in Waterloo, Ontario, of Doctor Jean (Macdonald) Lawson.

A graduate of the Dalhousie Medical School, Class of 1944, Dr. Lawson went on to contribute to society as a physician, minister's wife and mother. She first occupied a position on the staff of the Nova Scotia Sanatorium Kentville, following which she did graduate training at the Royal Victoria Women's Maternity Hospital, Montreal, and Women's College Hospital, Toronto. She was certified in obstetrics and gynaecology by the Royal College of Physicians and Surgeons of Canada in 1948.

Returning to Halifax, she entered private practise in her specialty and her activity in this area was continued in a manner that was compatible with her family life.

Always interested in teaching, Dr. Lawson served as demonstrator in anatomy, gynaecology and psychiatry in the year 1948-49. From 1949 to 1951 she was demonstrator in obstetrics and gynaecology and from 1956 to 1958 she was again demonstrator in anatomy.

Dr. Lawson's election to the Presidency of the Federation of Medical Women of Canada in 1950 reflected the esteem of her colleagues. In 1965 she was made an alumni representative on the Board of Governors of Dalhousie University.

Jean and The Reverend Frank Lawson, a Presbyterian Minister, were married in 1950. Subsequently she played an active role in the life of Saint David's Church, Halifax, particularly in the Janet Andrew's Group and the Ladies Guild.

The Lawson family includes two sons and a daughter.

Continued on next page.

DR. JEAN (MACDONALD) LAWSON

Continued from page 25.

John is a senior at the University of Western Ontario, while Keith is in his second year at Victoria College of the University of Toronto. Kathleen is completing grade 12 at Kitchener-Waterloo High School.

In 1965 her husband was called to Southampton, Ontario

where she continued her practice of obstetrics and gynaecology. On her husband's retirement the family moved to Waterloo, Ontario, where she practised with three other members of her specialty.

A woman of great sincerity and charm, Jean was beloved by all who knew her. Our sympathy is extended to her family and others close to her. □

H. K. H.



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NEW MEMBERS

The Physicians listed below have joined The Medical Society of Nova Scotia between October 1, 1974 and December 31, 1974. A most cordial welcome is extended from the Society.

Dr. John McG. Archibald	Truro
Dr. Robert P. Baillie	Sydney
Dr. Audley J. Bodurtha	Halifax
Dr. Diana C. Dobson	Sydney Mines
Dr. Christopher R. Elliott	New Glasgow
Dr. Frederick C. Guy	Halifax
Dr. John A. Hardy	Sydney
Dr. Brian K. E. Hennen	Dartmouth
Dr. John S. Hickey	Antigonish
Dr. John T. Hindmarsh	Halifax
Dr. Donald L. Johnston	Wolfville
Dr. Kai Kok Lai	Amherst
Dr. Wayne D. Longmore	Halifax
Dr. Rolf-Dieter Neu	Halifax
Dr. Ranjit K. Parminder	Sydney
Dr. William G. Pollett	Halifax
Dr. Bruce R. Pretty	Armdale
Dr. Margaret L. Ross	Halifax
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SUPPOSITORIES

Once upon a time, in the quaint hamlet of Dominion, in Cape Breton, a young G.P. made an urgent house call. The patient was a middle-aged lady with an attack of asthma. The lady responded to the usual treatment but was discovered to have nothing on hand that she might use to abort a future attack. The young doctor decided that the patient should be given a preparation with which to handle the next attack of asthma. He decided to give her Aminophylline suppositories. He very carefully told her that they were to be inserted up the

"back passage" at the first sign of asthma. The doctor had heard the story of the lady who had tried to swallow the suppositories, so he wasn't falling into that pit of omission. However, the young man was going to learn that it isn't enough to tell the patient when, where and how. Every detail must be explained to every patient; nothing must be taken for granted. But let me go on with the anecdote.

Several weeks had elapsed before the aforementioned lady returned to the doctor's surgery. Her complaint was of bleeding per rectum with pain on defecation, all of about five days duration. Well, our young healer assured the lady that she had haemorrhoids or possibly a fissure. He put on a glove and proceeded to do a rectal. Lo and behold, the examining finger struck something sharp and metallic, the movement of which caused pain. He quickly withdrew his finger and inserted an anoscope. Into view came a shiny metallic-looking object sticking in the wall of the rectum, about 6 cms. from the anus. Grasping the object with long forceps he pulled out a piece of tin foil. Non-plussed, the young man gasped: "What in hell is this tin-foil doing up your rectum?" "You told me to put it there", the lady replied, "whenever I got a wheeze." "And I got wheezy one night last week so I stuck one of those tin-foil things up the passage, like you said to do. Is that what's causing the bleeding?"

And ever since then our hero has instructed patients as if they were children, and not too bright children at that. □

M.E.B.

GUIDELINES FOR AUTHORS

Reference to these guidelines and recent issues of the Bulletin will help authors in preparation of their papers. Send the original typed copy to the Editor and keep a carbon copy.

The entire manuscript (including references and tables) should be typed double-spaced, with a generous margin on the left, on only one side of the pages. Do not underline unless the type is to be set in italics. Standard abbreviations (e.g., hr, mg, ml) are acceptable without definition; less-common abbreviations should be written in full the first time they are used. Give generic as well as proprietary names and the manufacturer's name for drugs.

References. Identify references by numbers within the text, and list them in numerical order on a separate sheet [see (f)].

Figures. Provide an unmounted glossy print of each, clearly marked on the back with a SOFT marker, indicating top, figure no., and author's name. Show scale when relevant. Do not write legends on them [see (h)].

The usual framework of a paper is as given in (a) to (h) below, starting each section on a new page and numbering pages consecutively to the end of (h).

- a) Front page, showing title, author(s) and degrees, whether the author is in family practice or the institution where the work was done, and address for correspondence.
- b) Brief summary.
- c) Introduction.
- d) Materials and methods, then Results; or Case report.
- e) Discussion.
- f) References.
Examples: **Journal papers** — EBBERT, A., Jr. Two-way radio in medical education. *J. Med. Educ.* 38: 319-28, 1963.
Books — MAJOR, R. H., and OELP, M. H. *Physical Diagnosis*, 6th ed. Philadelphia, Saunders, 1962, p. 51.
Contributions in books — Voheer, H. Disorders of uterine function during pregnancy, labor, and puerperium. In: *Pathophysiology of Gestation*, ed. by N.S. Assali. New York, Academic Press, 1972, vol. 1, pp. 145-268.
- g) Tables (each, including heading and footnotes, on a separate page).
- h) Figure legends (all listed on one page); state magnification of photomicrographs.



THE CANADIAN MEDICAL ASSOCIATION RETIREMENT SAVINGS PLAN

C.M.A.R.S.P. IS STILL ONE OF THE BEST POSSIBLE WAYS TO SAVE MONEY AND REDUCE TAXES

C.M.A.R.S.P. was established in 1957 to provide Canadian doctors with their own registered retirement savings plan. Because the Plan was designed specifically to meet the unique needs of doctors it has a number of advantages not usually found in commercially sponsored programs. The Plan is up-dated periodically to take advantage of changing conditions and tax laws. This year two new features have been added: separate accounts for a member's spouse and a new Short-term Deposit Account. Since no sales commissions are charged on C.M.A.R.S.P. contributions, 100% of the funds you deposit are credited to your account.

Feb. 28 is the deadline to save up to \$2000.00 on 1974 Taxes

Don't miss this opportunity to put aside for your retirement, substantial funds which would otherwise be paid out in taxes next April. If you have not yet made arrangements to take full advantage of the tax savings possible through C.M.A.R.S.P. you should consider enrolling in the Plan right away. If you

lack ready cash to invest before the Feb. 28 deadline, you may wish to borrow the money from your bank. Interest on loans for investment in a registered retirement savings plan is fully tax deductible.

C.M.A.R.S.P. now provides for 3 types of investments

Since its inception, C.M.A.R.S.P. has offered members a choice in the way their savings are invested:

The Insured Annuity Fund. Monies allocated to this fund are invested in long term interest bearing securities. Interest rates vary with the money market. Interest on new money invested in this fund in 1974 averaged approximately 9.5 %

The Common Stock Fund. Contributions to this fund are invested in common stocks of Canadian and U.S. corporations. It was designed for those doctors who wish to use common stock investments as a long term hedge against inflation, realizing that stock prices will rise and fall depending on economic conditions. Regular and continued investment in this fund tends to average the effect of such cyclical fluctuations. The same averaging principle can be applied by a

gradual transfer of monies in the Common Stock Fund to the Insured Annuity Fund as a doctor approaches retirement.

The Short-Term Deposit Account. This account was recently introduced to provide members with a temporary investment vehicle whereby they could realize tax savings but without have to immediately commit retirement money to either the Insured Annuity or Common Stock Funds during a period of uncertainty. Contributions allocated to the short-term deposit will be managed by the Royal Trust Co. Emphasis will be on investment in short term interest bearing securities. While the interest rates earned will not likely be as high as those paid by the Insured Annuity Fund, members can be assured that their money will earn short term interest until they decide to transfer their holdings to either of the Funds in the Plan. This can be done at the end of any month, on 10 days notice.

Members spouses may now open C.M.A.R.S.P. accounts

The new tax regulations allow spouses to set up retirement savings plans even though they have no earned income, with the taxpaying spouse dividing contributions between his own plan and that of his or her partner. However, the maximum for tax deductible contributions remains at \$4000 per year to both plans. By setting up two plans instead of one, both husband and wife can receive pensions in their own right thus reducing

the tax on the pension income received in later life.

If you now have a C.M.A.R.S.P. account and wish to open one for your spouse please use the application form on the following page and include your own name and CMARSP account number in the space provided. This application form may also be used for C.M.A. members to enroll in the Plan. Additional application forms are available on request.

There is still time for you or your spouse to enroll in C.M.A.R.S.P. Here's How To Do It!

Simply complete the application on the opposite page (a French language version is also provided) and return it with your personal cheque made payable to C.M.A. Retirement Savings Plan in the amount that you wish to contribute for application to the 1974 tax year. Mail it to the address shown on the application before Feb. 28, 1975. Here are a few points to remember.

If you are self-employed you may contribute up to a maximum of \$4000 per year (or 20% of earned income if this is less).

If you are salaried you are allowed to contribute up to 20 % of your earned income to a maximum of \$2500. to all registered plans. If you have made contributions to an employee-

employer plan and these contributions are less than the allowable amount, you may contribute the balance to C.M.A.R.S.P. and reduce your taxes accordingly.

If your wife has no earned income you may open a separate account for her and divide your contributions. You may also open an account for a spouse with earned income. The maximum amount of contributions will be governed by the regulations noted above.

Should you have any questions, please call Mr. R.P. Bannerman at CMA House in Ottawa (Area Code 613 731-9331).

Application for Participation in - THE CANADIAN MEDICAL ASSOCIATION RETIREMENT SAVINGS PLAN

I hereby apply to the Trustee for participation in the Canadian Medical Association Retirement Savings Plan, ("the Plan") the provisions of which are familiar to me. I understand that the Plan is sponsored by The Canadian Medical Association in conjunction with The National Life Assurance Company of Canada and The Royal Trust Company. I request that the instruments evidencing the terms of the Plan be registered as a Retirement Savings Plan under the Income Tax Act (Canada). I understand that as a consequence of such registration payments out of the Plan can only be made in the form of a life-contingency annuity or as a death benefit and that such payments to me or to my beneficiaries, executors or legal representatives will be subject to tax under the provisions of the Income Tax Act (Canada). However, I understand that I may deregister my Plan by amendment but in so doing I will be required to include in computing my income for a taxation year all amounts received by me in that year from my deregistered Plan.

I request that future contributions be apportioned to The National Life Assurance Company of Canada, Group Savings Policy No. G.A. 485 and to the Canadian Medical Association Investment Fund managed by The Royal Trust Company in the percentages as specified on the form below. I understand that this percentage allocation may subsequently be varied by written notice in accordance with the provisions of the Plan.

I understand that all premiums (contributions) made in the year or within 60 days after the end of the year are receiptable for income tax purposes subject to the amount of premium deductible as specified under the provisions of the Income Tax Act (Canada).

I undertake, upon request, to provide proof of age satisfactory to the issuer in respect of any annuity contracts provided to me as a benefit under these plans.

I hereby appoint The Canadian Medical Association to act as my Agent in the negotiation of contracts and agreements to carry out the provisions of the Plan.

If I am domiciled in the province of Quebec, I further request that my application be approved in accordance with the provisions of Order In Council No. 280 of the province of Quebec, with all consequences this involves.

Return to - THE CANADIAN MEDICAL ASSOCIATION - 1867 Alta Vista Dr., Ottawa, Ontario K1G 0G8

In order to take advantage of 1974 tax relief your contribution herewith must be in lump sum. Future contributions may be made monthly, quarterly, or annually and allocated to the Common Stock or Annuity Fund in the proportions you designate on each contribution date.

A statement of account recording your current and accumulated contributions will be mailed to you at the month end after your contribution is received.

C.M.A.R.S.P. APPLICATION

for office use only

NAME Dr. / Mr. / Mrs. / Miss _____ (Family Name) _____ (Given Names)

ADDRESS _____ No. & Street _____ Apt. No. _____

_____ City _____ Province _____

_____ Postal Code _____

DATE OF BIRTH Day Month Year Sex Male Female Language Choice French English

SOCIAL INSURANCE NO. _____

BENEFICIARY _____ (Family Name) _____ (Given Names)

RELATIONSHIP OF BENEFICIARY TO YOU _____

NOTE: In the event of your death, your benefits in the Insured Annuity Fund will accrue to the beneficiary named and may be used to purchase one of a variety of annuities. Your benefits in the Common Stock Fund are considered as part of your estate and disposition should be by your will. There are tax advantages in bequeathing these assets specifically to your spouse.

ALLOCATION OF CONTRIBUTIONS

Percentage of contributions to be invested in the Common Stock Fund (C.M.A.I.F.—Fund "A")	_____	%
Percentage of contributions to be invested in the Short Term Deposit Fund	_____	%
Percentage of contributions to be invested in the Insured Annuity Fund	_____	%
TOTAL	100%	

_____ (WITNESS)

_____ (SIGNATURE OF APPLICANT)

DATE _____

PLEASE READ REVERSE SIDE

If you would like to receive information on the automatic contribution system - Pre-Authorized Payments Plan, please check this box

If this application is being submitted by a C.M.A. member's spouse, please print your own name in full and indicate your own C.M.A.R.S.P. account number if you have an account.

NAME _____ C.M.A.R.S.P. No. 11- _____

THE MEDICAL SOCIETY OF NOVA SCOTIA

NOVA SCOTIA DIVISION OF THE CANADIAN MEDICAL ASSOCIATION

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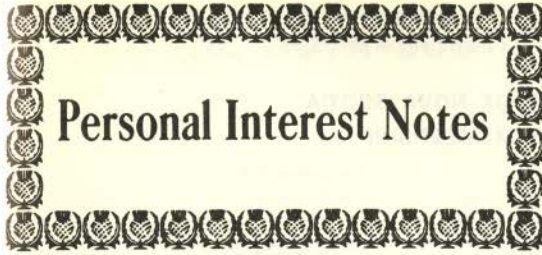
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Personal Interest Notes

Dr. Gabriel Boudreau, for 40 years a country general practitioner in Cape Breton, is finally fulfilling a life-time dream — he has become a farmer.

Dr. Boudreau attended Dalhousie's Medical School and graduated in 1935. Dr. Boudreau began his practice in Port Hood. During the past 32 years until his retirement last month he was the family doctor in Cheticamp.

He was honored on his retirement recently by friends and family in Cheticamp.

Dr. & Mrs. William D. Stevenson, left Halifax December 28th for Tunis where Dr. Stevenson will be working for six months.

Following his official retirement last July as head of the Department of Neuro-Surgery at Dalhousie University and of the Victoria General Hospital, Dr. Stevenson inquired of The World Health Foundation where he would be of the best use, and was told there was a request for aid from Tunisia.

For an old man or woman who is seriously ill but may recover, the best place is usually the hospital. For one who is dying the best place, or at any rate the happiest place, is his own home. Although it will add greatly to his work, to the number of visits he must make for small medical attentions or merely for friendship, the doctor should try to keep the dying man at home, and to encourage his relatives to give him this last solace. For most people the home is associated with the experiences and the surroundings that make his personality. The pattern on the wallpaper, the shaft of sunlight coming through the window, the school groups and wedding photographs on the wall, the creak of the door, the postman's knock, the recurring noises of the street outside, all these make a familiar pattern in a mind that is drowsing over the past and wondering about the future. He wants a book, a gramophone record, flowers in the vase that used to stand on his desk, his own red silk handkerchief. They are all at hand. He would miss them in hospital.

Sir Heneage Ogilvie

Physician Self-Assessment

Question No. 15

Correct Answer E

Dr. Stevenson has served two trips on the vessel, *The Hope* — in 1969, when he was in Ceylon for two months, and 1972, when he was in Brazil.

He leaves private practice to serve six months in Tunis, he will then travel to Singapore, to help similarly there, during July and August.

Dr. Donald I. Rice of Toronto, native of Bridgewater, was elected president of the recently formed World Organization of National Colleges, Academies and Academic Associations of General Practitioners-Family Physicians (WONCA) during the 6th World Conference of the organization in Mexico City.

Born in Bridgewater, Dr. Rice attended Dalhousie University in Halifax and entered general practice in that city following graduation. Dr. Rice was made an Honorary Member of The Medical Society of Nova Scotia in 1964.

Dr. Rice is executive director of the College of Family Physicians of Canada.

OBITUARY

Dr. David McD. Archibald, 52, of Waterloo, Ontario died January 15, 1975. He was educated in Glace Bay and graduated from Dalhousie University Medical School in 1947. He practiced at Bear River and Kingston, N.S. and moved to Kitchener in 1967 where he practiced until illness forced his retirement. Dr. Archibald was Past-President of the Valley Medical Society and was active in The Medical Society of Nova Scotia. Our sympathy is extended to his widow, sons and daughter. □

EDITOR'S NOTE

It has been drawn to our attention by Dr. Paul Landrigan that the correct answer to the Physician Self-Assessment question in the October 1974 issue of The Nova Scotia Medical Bulletin is "Farmer's lung" rather than "Hamman-Rich syndrome".

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[To Members of the Medical Society of Nova Scotia : In view of the advantages of a strong professional organization, kindly make this page available to a non-member associate.]

**THE MEDICAL SOCIETY OF NOVA SCOTIA
APPLICATION FOR MEMBERSHIP**

NAME
Surname Given names

ADDRESS

TELEPHONE NUMBER DATE OF BIRTH

MEDICAL SCHOOL DATE OF GRADUATION

LICENSURE PROVINCE DATE ISSUED

OTHER DEGREES

POST GRADUATE TRAINING

PRESENT TYPE OF PRACTICE

SECTIONS: Membership in the Society entitles you to make application for membership in the Section(s) of your choice. Please mark Section(s) you may be interested in.

- | | | |
|--|--|--|
| <input type="checkbox"/> Anaesthesia | <input type="checkbox"/> Paediatrics | <input type="checkbox"/> Radiology |
| <input type="checkbox"/> General Practice | <input type="checkbox"/> Pathology | <input type="checkbox"/> Salaried physicians |
| <input type="checkbox"/> Internal Medicine | <input type="checkbox"/> Psychiatry | <input type="checkbox"/> Surgery |
| <input type="checkbox"/> Ophthalmology and
Otolaryngology | <input type="checkbox"/> Residents in Training | <input type="checkbox"/> Urology |
| | | <input type="checkbox"/> Obs and Gyn. |

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A BRANCH SOCIETY? WHICH BRANCH SOCIETY?

NAMES OF TWO SPONSORING MEMBERS OF
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DATE SIGNATURE