The Singapore Family Physician

The College of General Practitioners Singapore
Vol. XI No. 1
Jan/Mar 1985

ISSN 0377-5305

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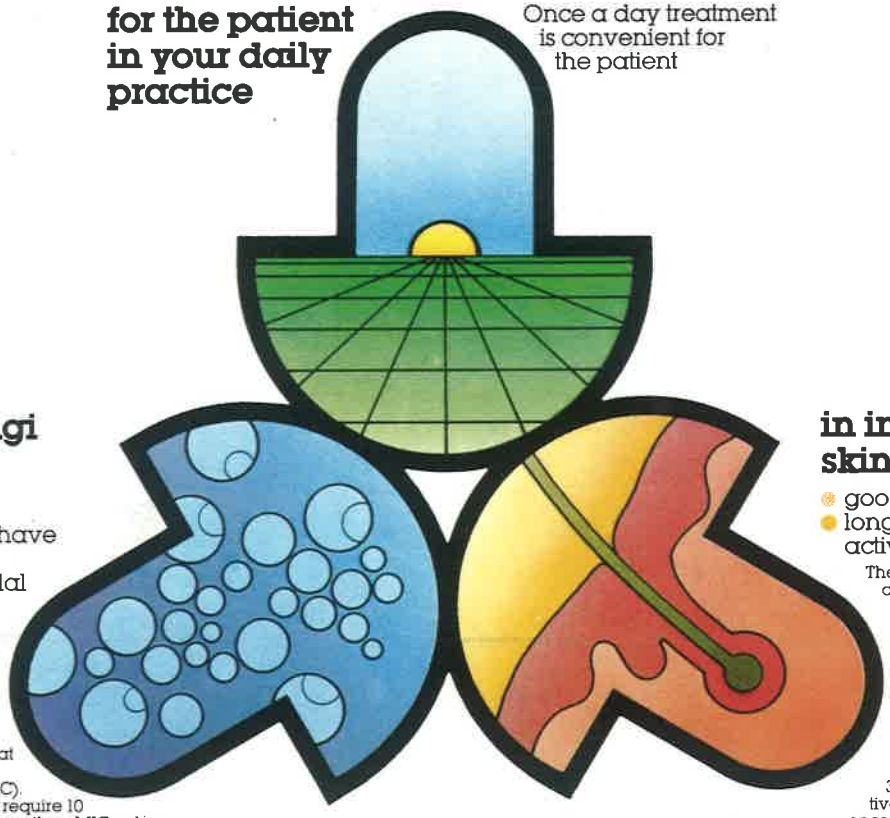

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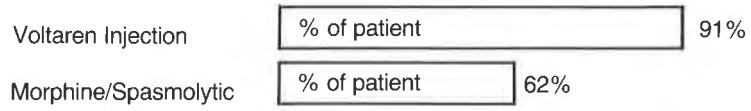

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No pain			3	8	46	50
Slight			26	27	37	36
Moderate	17	21	40	38	14	12
Severe	52	48	25	21	2	2
Very Severe	31	31	6	6	1	—

1 Sven O A Lundstam, Lars A Wahlander; Karl-Henrik Leissner; John G Kral Prostaglandin synthetase inhibition with diclofenac sodium in treatment of renal colic: comparison with use of a narcotic analgesic The Lancet, May 15 1982: 1096-97

2 A Folha Med 79 (5) 371-76, Nov 1979 A comparison of the analgesic activity of diclofenac sodium with that of dipyrone in pain following trauma

3 Miura, T: Long term tolerability study of diclofenac sodium J Int Med Res 3, 145 (1975)

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4-A College Road, Singapore 0316

Vol. XI, No. 1 January/March 1985 Price to Non-Members $5.00 MC(P) 87/3/85

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* WHO — International Code of Marketing of Breast Milk Substitutes, WHA 34.22, May 1981.

* *Codex Alimentarius Commission Joint FAO/WHO food standards for foods for infants and children. CAC/RS 72/74-1976. Rome: Secretariat of the joint FAO/WHO food standards programme 1976.*

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EDITORIAL

THE LABELLING LAWS

From the first day of 1985, medical practitioners and pharmacists in the private sector were obliged by law to label all dispensed medications to patients. Government hospitals and clinics had been voluntarily labelling for five years before the decision was made to compel compliance. It was a case of precept and example followed by official impatience despite an increasing trend by increasing numbers of private medical practitioners to label voluntarily.

No purpose is served in debating the timing of the implementation of the labelling laws. The fact is that they have been put into effect and those affected are expected to live with them.

It was obvious from the beginning even without the need and benefit of hands-on experience that the labelling laws were wanting in certain areas.

The main beneficiaries of the labelling laws were the patients but the news media chose to focus on the punitive aspects of the statutary obligations instead of highlighting how they could help patients achieve better understanding in health care. The core benefits were relegated to the periphery.

Reading labels and instructions is not a very strong habit of most Singaporeans. They would rather ask and hear. Patients are no exception. Those who read the labels printed on the containers of medications are seldom able to recall the names of the medications prescribed a visit ago. Five and six-syllable pharmaceutical names are certainly not easy to remember and without a background of chemistry or pharmacology they make no sense thus eluding memory. This is the strongest reason for labelling. In the absence of the ability to recall, the patient could at least proffer the empty labelled container to identify the medication taken.

The labelling laws were meant to establish an effective two-way communication channel so that the second doctor knew what the first had prescribed in the event that the patient turned to him for treatment of a related or unrelated problem. In the private sector this poses no problem because doctors here are familiar with the names of proprietary drugs and the labelling laws permit the use of these names. Doctors in government hospitals and clinics are not familiar with the names of proprietary medications. When confronted with these names they are lost. To make matters worse there is no register of proprietary medications which they can look up. The Drug Index of Malaysia and Singapore (DIMS) an excellent commercial publication does not have the names of all proprietary medications because advertisement of any medication is dependent on the payment of a fee. The preliminary registration of all medications sold and marketted in Singapore should have been done before implementing the labelling laws.

The labelling laws allow for non-disclosure of medicinal names only for research purposes as in a clinical trial. There are no allowances for non-disclosure for psychiatric patients and those identified as potential drug-abusers. Every clinic is competent to conduct research activities with the consent of patients. Thus "clinical trial" is a loophole for non-disclosure dispensing. It seems schizophrenic not to allow non-disclosure labelling for legitimate reasons but to allow a loophole for exploitation.

If a patient is unable to remember the names of medications he has taken and there is a need to safeguard his overall interests by evoking the labelling laws, the case is certainly stronger for legislating for the provision of information obtained in the course of investigation into his disease. It follows that he should be provided with the following information:-

a) biochemical data
b) radiological findings,
c) surgical intervention during which organs or parts of organs have been excised, rejoined, altered or replaced by modern surgical technology and
d) pathological findings.

Whereas doctors in the private sector do provide such information those in government hospitals and clinics appear reluctant to release these findings to their patients. The concept of the "informed patient" does not appear to carry much weight and patients are needlessly bonded by non-disclosure findings. If it is the right of patients to know what they are prescribed then it follows it is their right to know the results of all tests and investigations instituted for them including surgical measures and pathological findings. The concept of the totally informed patient must be pursued now that the labelling laws have been put into effect. The patient has been given a bite of the apple of information by the labelling laws. He is now entitled to the whole apple.

In a public address given on 8th September 1984 at the "Know Your Medicines" Seminar, the Director of Medical Services, Singapore pronounced that *"Accurate and adequate information regarding a patient's illness and the medicines he has been prescribed with is of fundamental importance to all patients".* The pronouncement consists of two parts — information pertaining to ILLNESS and information pertaining to MEDICINES. Now that the information pertaining to "medicines" is mandatory, patients very rightly expect that they be provided with information pertaining to their illnesses.

Family physicians in Singapore look forward to a better tomorrow with the Ministry of Health's stand that "accurate and adequate information regarding a patient's illness" is of fundamental importance to all patients. The question is how serious is it being regarded? This is the very area of inadequacy touched on by the President of the Republic in his address at the 5th Biennial General Scientific Meeting of the Association of Surgeons on 25th February 1985. If he finds the inadequacy irksome what indeed can the ordinary man-in-the-street attending public clinics and hospitals expect?

With the advent of full disclosure dispensing the statutary need to record day after day the serial numbers, names and addresses of patients together with the qualitative and quantitative particulars of dispensed medications into a day-book has become redundant and unnecessarily tedious. The Chinese calendar has ushered in the Year of the Ox but it should not be yoked to unproductive ploughing with the pen. VC

Workshop on Medical Writing and Editing

The 1st Workshop on Medical Writing and Editing will be held in Singapore from 26th to 29th July 1985. This Workshop is organised by the Academy of Medicine, Singapore.

The teaching faculty will comprise a team of four from the British Medical Journal, including its Editor, Dr Stephen Lock.

The three-day programme on Medical Writing will run from 26th to 28th July, and will include lectures and small group workshops on the various aspects involved in the writing of scientific papers for publication as well as public speaking.

A full-day Business Meeting will be held between the visiting faculty and local editorial boards on 29th July, to discuss the current concerns of Medical Editing.

Further details can be obtained from:
The Organising Secretary
Workshop on Medical Writing & Editing
c/o Academy of Medicine, Singapore
4A College Road
Singapore 0316

HOUSECALLS: A GENERAL PRACTICE SURVEY

Drs Paul SM Chan, Daniel Wong, KH Goh, CB Soh, James MY Chang & TM Chong.

Introduction

Singapore provides primary health care service in both the public and private sectors. One distinctive feature of private primary health care is that the providers (GPs) undertake housecalls, thus making their service available to their patients at all times. Who, where, how, when and why are these calls made? How do GPs cope with these calls? What proportion of these calls are "emergencies" within the context of either a medical or surgical definition? A survey was undertaken to answer some of these important questions.

Methods

A questionnaire was devised to cover the relevant aspects of our study. 30 GP-members of the College of GPs, Singapore participated in the survey.

Each participant recorded the details of every housecall request in the questionnaire provided irrespective of whether the housecall was undertaken or not.

A total of 954 completed questionnaires were received between the period 1.1.84 and 30.4.84.

From the data all the patients' main presenting complaints and diagnoses were indexed according to the standards laid down in ICHPPC-2-defined classification (International Classification of Health Problems in Primary Care).

A computer programme written in dbase II format was used to incorporate the data collected from the questionnaires and then to sort out the relevant information.

RESULTS AND COMMENTS.

1. Age groups of Patients.

The age groups of all patients, both males and females, requesting house-calls are presented in Table 1. It shows that elderly patients, defined as those 68 years or more, accounted for 63.7% of the patient population.

Table 1: Age Groups of all Patients.

Age Group(yrs)	No.	%
< to 9	16	1.7
10 to 19	25	2.6
20 to 29	53	5.5
30 to 39	62	6.5
40 to 49	76	8.0
50 to 59	82	8.6
60 to 69	185	19.4
70 to 79	194	20.3
80 to 89	139	14.6
90 to 99	90	9.4
Date Unrecorded	32	3.4
TOTAL	954	100.0

2. Ethnic Composition.

In Table 2, the racial composition of the patient population is shown, with Chinese patients accounting for 75.9% of all patients. "Others" refer to tourists and members of the expatriate community in Singapore who fell ill and were treated by some of the GPs taking part in this research project.

Table 2: Ethnic Composition of Patients

Race	No.	%
Chinese	724	75.9
Malays	83	8.7
Ind/Ceylonese	96	10.1
Others	46	4.8
Data Unrecorded	5	0.5
TOTAL	954	100.00

3. Sex

There were 605 female patients and 332 male patients in our cohort, giving a female to male ratio of 1.8:1. In 17 cases sex was unassigned.

4. Number of previously treated patients.

Of the 954 patients, 733 (76.8%) had been previously treated by their GPs. 201 (21.1%) had no previous treatment before the housecalls. In 20 (21.1%) patients this information was not recorded.

5. Response to Housecalls

Response to requests for housecalls fell into 3 categories as shown in Table 3.

Table 3: Response to Housecalls

Response	No.	%
Calls not done	62	6.5
Calls done once	682	63.1
Calls done twice or more times	298	30.4
TOTAL	954	100.0

Two important points deserve comments. Firstly, 6.5% of calls were not done. The reasons given for not calling were: the requests for calling were made on very trivial grounds, patients' homes were too distant from the GP clinics to benefit from the call, some clinics were too bogged down with patients to permit the GPs to respond and some patients (from the history given) were in need of immediate hospitalisation and would not benefit from the housecalls. However in all these cases the non-responding doctors provided advice on how best to deal with the situation.

Secondly, the high percentage of repeating calls was not unexpected since 63.7% of the patients were 60 years or more in age. These patients were more likely to suffer from chronic illnesses. Further evidence in support of this will be presented later.

6. Person Requesting Housecall

Table 4 below shows that 81.0% of requests for housecalls were made by family members against 13.3% that were made by the patients themselves.

Table 4: Person Requesting Call

Request from:	No.	%
Patient himself	127	13.3
Family member	773	81.0
Neighbour	10	1.1
Employer	16	1.7
Others	28	2.9
TOTAL	954	100.0

7. Manner of Contact

Table 5 lists how requests for housecalls were made.

Table 5: How GPs were contacted

By Means of:	No.	%
Telephone	573	60.1
Personal request	198	20.7
Pager	96	10.1
Pre-arrangement	83	8.7
Data unrecorded	4	0.4
TOTAL	954	100.0

The telephone (66.1%) and the pager (10.1%) were the most popular means of contacting the GP for housecalls. Personal request, usually by a family member calling at the GP's clinic accounted for 20.7% of total housecalls.

8. Time of the day Calls were Done.

The bulk of housecalls 70.9% were done during the GPs' daily working hours.

Table 6: Time Call was done

	No.	%
During Clinic Hours	676	70.9
After Clinic hours but before midnight	190	19.9
After midnight	18	1.9
Data Unrecorded	70	7.3
TOTAL:	954	100.0

9. Base of Departure of the GPs on Calls

Table 7: Base of Departure

Base	No.	%
GPs' Clinics	647	62.8
GPs' Homes	215	22.6
Other places	25	2.6
Unrecorded	67	7.0
TOTAL:	954	100.0

Table 7 showed that in 62.8% of cases, the base of departure was from GP's clinics as compared to 22.6% of cases where the base of departure was the doctor's home. This information was in keeping with the previous finding in Table 6 which showed that 70.9% of calls were done during the GPs' scheduled working hours.

10. Destination of Housecalls

Table 8 showed that in 86.6% of cases, GPs attended to calls at their patients' homes.

Table 8: Destination of Housecalls

Destination	No.	%
Patient's home	826	86.6
Office/worksite	12	1.3
Others eg. hotel, ship	49	5.1
Data Unrecorded	67	7.0
TOTAL:	954	100.0

11. Time Interval before Calls were answered.

Table 9 showed that GPs were able to respond "immediately" in only 20.5% of calls as against 72.8% of cases in which there was inevitably some delay. This may not be satisfactory in cases of acute medical emergencies like haemorrhage and myocardial infarction. Previous findings (Table 6) have shown that most of the requests for housecalls were made during the GPs' scheduled clinic hours. Whereas a group practice can "spare" a GP to respond immediately to a housecall, the ability to respond immediately to a housecall is not always possible with a GP in solo practice.

Table 9: How soon were Calls done?

	No.	%
Immediately	195	20.5
Done 1 to 2 hrs later	232	24.3
Done during GPs' free time	463	48.5
Data unrecorded	64	6.7
TOTAL:	954	100.0

12. TIME taken per Housecall.

Time taken per housecall was defined as total time expended from departure to return to base.

The time taken per call was variable. 46.0% of the calls were done "within 30 minutes" as compared to 47.0% of calls that required "more than 30 minutes" to complete. Proximity to destination and the nature of the illnesses attended to are factors determining the time taken per housecall.

Table 10: TIME taken per Call

TIME taken in Minutes	No.	%
Within 30 minutes	439	46.0
Within 45 minutes	235	24.7
Within 60 minutes	130	13.6
More than 60 min.	83	8.7
Data Unrecorded	67	7.0
TOTAL	954	100.0

13. Patients' Presenting Complaints.

Table 11 showed the main presenting complaints as gathered from the preliminary history taken from patients or their representatives. These complaints were indexed according to ICHPPC-2-defined Classification.

Table 11: Patients' Presenting Complaints.

	Presenting Complaint	No.	%
1.	Followup calls for geriatric patients	123	12.9
2.	Giddiness/syncopy	98	10.3
3.	Abdominal Pain	81	8.5
4.	Fever	79	8.3
5.	Injuries & Adverse effects	78	8.1
6.	Musculo-skeletal eg. arthritis, backache	76	8.0
7.	Dyspnoea	55	5.8
8.	Nausea/vomiting	43	4.5
9.	Chest PAIN	39	4.1
10.	"Gastritis"	34	3.6
11.	Diarrhoea	33	3.5
12.	Other CNS s/s eg. fit, coma, dysathria	32	3.3
13.	Cough	30	3.1
14.	Malaise, fatigue & tiredness	22	2.3
15.	Skin disorders eg. rashes, bed sores	22	2.3
16.	Mental disorders	17	1.8
17.	OTHERS in ICHPPC-2-defined Classif. not listed above	92	9.6
	TOTAL Cases:	954	100.0

"Calls for Geriatric patients" topped the list with 12.9%, followed closely by "giddiness/ syncopy", "abdominal pain" and "fever". "Injuries and adverse effects" and "musculoskeletal disorders" formed another important group of problems affecting patients needing house-calls.

The above results showed the usefulness of ICHPPC-2-defined classification in permitting indexation of common symptoms and signs like "abdominal pain, fever or chest pain" that do not fit into specific diagnostic labels.

14. GP's perception of the seriousness of illnesses

Based on the patient's presenting complaints (Table 11) GPs were asked to classify calls into "life threatening" or "non-life threatening" calls before they set out to see their patients. Their assessments were shown in Table 12.

Table 12: GPs perception of illnesses before calls

Severity	No.	%
Life threatening	100	10.5
Non-life threatening	814	85.3
Data Unrecorded	40	4.2
TOTAL Calls	954	100.0

The results showed the GPs perceived calls to be life threatening in 10.5% of cases as against 85.3% of calls that were regarded as non-life threatening. Illnesses perceived as life-threatening might not turn out to be so. Similarly illnesses perceived as non-life threatening might in fact be so. Table 13 compared what was perceived against actual findings.

Table 13: Illness Perception & Actual Findings

		Actual Findings			
GPs' Perception of Illness before Calls.		very ill	ill	Quite Well	Others*
Life threatening	100	42	44	4	10
Non-Life Threat.	814	15	309	417	73
Data Unrecorded	40	2	6	25	7
TOTAL :	954	59	359	446	90
% :	100	6.2	37.6	46.7	9.5

Calls that were perceived as life threatening had indeed a greater number of patients found very ill and ill as compared to calls that were perceived as non life threatening. However the presence of large numbers of patients found "ill" after examination in perceived non-life threatening calls was cause for concern. It showed that perception of severity of illness before calls was unreliable. Clinical evaluation is therefore a necessity.

The other interesting finding concerned the 46.7% of patients that were found to be "quite well" after examination. Our records showed that most of these patients were elderly, and had suffered from strokes or senile disabilities. Though these patients were not acutely ill, GPs felt satisfied in providing such a service to patients who were unable to go to their clinics.

15. Treatment accorded to Patients

Table 14 showed that the majority of patients on whom housecalls were undertaken were treated at home by the responding GPs. 7.8% of patients had to be hospitalised. There were 11 patients who refused to be admitted to hospitals. One possible reason was the preference for the very ill patients to die at home.

Table 14: Treatment accorded to Patients

Outcome	No.	%
Advice only	81	8.5
Medication only	480	50.3
Med. & See Again	223	23.4
Referred to Hosp.	74	7.8
Refused Hosp. Admission	11	1.1
Data Unrecorded	85	8.9
TOTAL:	954	100.0

16. Classification of Underlying Causes of Diseases.

ICHPPC-2-defined classification was again used to index all the underlying causes of diseases in our study. There were 1068 diagnoses for 954 patients, showing that some patients had multiple diagnoses. This was not unusual as two-thirds of our patient population were 60 years old or more.

Table 15: Classification of Underlying Causes of Diseases.

Disease Category	No. of Cases	%
1. Circulatory System Diseases (i.e, heart, BP, CVA, other vascular dis.)	182	17.0
2. Respiratory System Diseases	170	15.9
3. Data Unrecorded includ. calls not done	123	11.5
4. Sign, Symptoms & ill-defined conditons	121	11.3
5. Injuries & Adverse effects	78	7.3
6. Digestive System Diseases	69	6.5
7. Malignant Neoplasms	68	6.4
8. Diseases of musculo-skeletal System	61	5.7
9. Infective & Parasitic diseases	57	5.4
10. Diseases of Genito-urinary system	33	3.1
11. Nervous, Sense Organs diseases	31	2.9
12. Mental diseases	29	2.7
13. Endocrine, nutrit, metabolic diseases	19	1.8
14. Diseases of Skin, subcutaneous tissue	11	1.0
15. Others	16	1.5
TOTAL No. of Diagnoses:	1068	100.0

The results showed that diseases of the circulatory system, namely strokes, hypertension and cardiac conditions, were most prevalent constituting 17.0% of all diagnoses, followed closely by diseases of the respiratory system with 15.9%. Diseases from these two systems thus accounted for one-third of all diagnoses. Another group "signs, symptoms & ill-defined conditions" was responsible for 11.3% of all diagnoses, showing that it was not possible to reach a definitive diagnosis in every case of house-call done.

17. Most Common Diagnoses.

Table 16 showed that strokes and senile disabilities again occupied 1st and 2nd position respectively. Influenza was 3rd, while injuries occupied 4th place of importance. Injuries were due to home accidents resulting in abrasions, lacerations, fractures, joint sprains and burns. Mental disorders though not as commonly seen in house-call patients were also important from a management point of view.

Table 16: Diagnoses.

	No. of Cases
1. Strokes, all types	86
2. Senile disabilities	81
3. Influenza	60
4. Injuries	58
5. Gastro-enteritis	56
6. Hypert. w/wo Complications	54
7. "Gastritis"	34
8. Malignant Neoplasms	33
9. Mental Disorders	29
10. Cardiac Diseases	28

18. The "very ill" Patients.

Both Table 15 and Table 16 above were listings of diagnoses in general. Such diagnoses may not be helpful to new GPs wanting to know what are the common life-threatening conditions seen in general practice. Table 17 may be helpful as it is a compilation of the 59 cases of house-call patients that were found to be "very ill" after examination. This list is also useful as a guide to stocking up the GPs' call-bags with all the necessary equipment, medicines, injectables and even writing pads in case referral letters were needed.

Table 17: Diagnoses of "very ill" Patients.

Diagnosis	No. of Cases
Pneumonia	9
Dying/Dead on arrival	5
Renal Failure	5
Malignant Neoplasms	5
Coma*	3
Hypert. with complication	3
Acute Myocard. Infarction	3
Gastro-enteritis	3
Acute Resp, Failure	3
Acute C.V.A.	2
Bleeding G.I.T.	1
Ischaemic Heart Dis	1
Acute peptic ulceration	1
Acute haematuria**	1
Leaking Ectopic Preg.	1
Renal Colic	1
Drug Reaction	1
# neck femur	1
Asthma	1
Acute Depression	1
Head Injury	1
Epilepsy	1
Suicide (drug overdose)	1
Cardiac Arrhythmia	1
Acute Heart Failure	1
Influenza	1
Acute Arthritis	1
Senility	1

*** including 1 case of juvenile diabetic coma.**
**** from congenital polycystic kidneys in a 40-yr. old Indian Male.**

Of these 59 patients, 45 were Chinese, 7 were Malaysia and 6 were Indian or Ceylonese patients. There were 33 female and 25 male patients in this group of "very ill" patients.

A study of their ages showed that 61.0% or 36 patients were 60 years old or more, while there were only 2 patients or 3.4% below 30 years of age. There were 25.4% or 15 patients between 30 and 59 years of age. "Unrecorded Data" accounted for 10.2% or 6 patients. These age distributions were not greatly different from those given in Table 1.

19. Medical Justification of Calls.

The GPs were asked on completion of their calls to state their opinions as to whether the calls were medically justifiable or not 77.6% of cases were deemed medically justifiable as compared to 13.5% of calls done that were found to be medically not justifiable. These results are shown in Figure 1.

By and large the majority of housecalls were deemed medically justified indicating that patients had learned to utilise wisely this service provided by their GPs.

SUMMARY & DISCUSSION

63.7 of housecalls were made on elderly patients i.e. those 60 years and above. (Table 11)

Diseases attended to most frequently were those connected with age e.g. strokes, senile disabilities and circulatory problems such as hypertension and cardiac conditions. (Table 15 & 16)

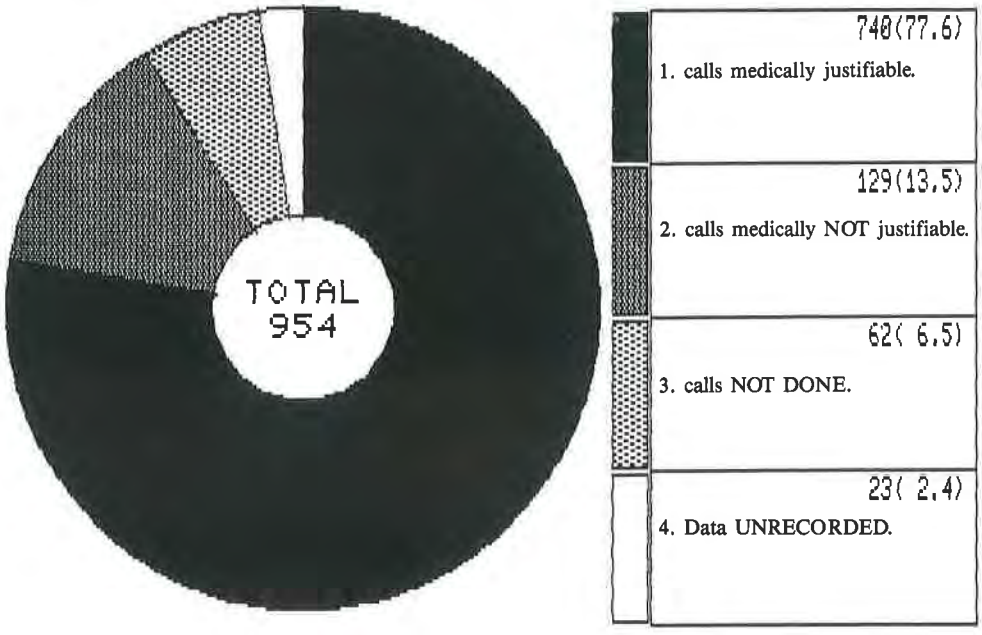
There was a high percentage of repeat-calls (one third of total housecalls) and these were mostly for elderly patients who were not "mobile" enough to attend GPs' clinics. (Table 3)

The above findings are a reflection of the increasing numbers of elderly citizens with their attendant problems in Singapore.

The ICHPPC-2-defined classification has been found useful in indexing the presenting symptoms and diagnoses encountered in this study. (Table 11 & 15)

46.0% of housecalls required less than 30 minutes for completion. 47.0% of calls needed

FIGURE 1: Pie Chart showing the medical justification of housecalls



more than 30 minutes. Most housecalls (62.8%) were made during the scheduled working hours of the GPs. A housecall during clinic hours implies at least a 30 minutes longer waiting time for patients attending the same clinic. Housecalls outside the scheduled working hours implies disruption to the GP's family and social life. In our study this accounted for only 22.6% of housecalls, a small price to pay in terms of service to patients.

OBSERVATIONS

Solo GP practices suffer the disadvantage of having to disrupt their scheduled working hours when housecalls have to be made. Group practices are better placed to meet such demands.

Three factors are identified that favour greater demand for medical health care at home. These are:-

(1) an increase in life-expectancy of Singaporeans,
(2) improved socio-economic wellbeing of the average family and
(3) the stratfied housing system of the bulk of Singapore citizens in high-rise homes. It must be pointed out that more than half the number of homes in a Housing Development Board block of flats are not serviced directly by elevators. The elevator stops at every third level. The inaccessible elevator is cause for concern. Not only is it an impediment to mobility of the aged sick, those in homes that are not located at the level of elevators, it can aggravate injuries such as fractures of the neck of the femur and compression-fractures of the spine during conveyance of the injured to hospital. The lifts installed at HDB housing estates are generally not built to anticipate such contingencies and are of a dimension which will not accommodate a trolley.

Gerontology and emergency medicine are areas where GPs should excell and should receive greater emphasis in educational programmes of General Practitioners.

This survey has provided useful feedback information to the College of GPs, Singapore despite the limitations of 30 participants.

Although 10.5% (100) of all housecalls (954) were made out to be life-threatening, in actual fact 4.4% (42) were regarded as such by the attending GPs. Although 85.3% (814) of the calls were represented as "non life-threatening", 1.6% (15) were regarded as life-threatening subsequently. The overall percentage of calls that were indeed life-threatening in this particular survey was 6.2%. In 77.6% of housecalls, the attending GPs were satisfied that they were "medically justifiable" and in 13.5% were they judged un-justifiable. The last point is an area where patient education will help to diminish and efforts made in this direction will be well spent.

ACKNOWLEDGEMENTS.

The Research Committee wishes to thank the following for their contribution and their assistance in this project.

1. The CPs who participated: Drs Paul S M Chan, James M Y Chang, L L Chang, S H Cheng, P atricia Chia, K F Chong, T M Chong, W S Choo, W T Chua, C K Foong, K H Goh, L T Hong, Freddie C B Kee, K W Lee, C C Lim, C L Lim, K L Lim, Jerry K T Lim, K M Loh, C K Ng, K S Ng, S Y Ng, C Y Ong, C W Tan, Jerry K W Tan, I G Thevathasan, Moti H Vaswani, L H Wong, T C Wong, Henry P H Yeo.
2. Mr P H Oon B. Econ., of Masters Computer Pte Ltd.
3. The President, Dr H S Wong, and Members of Council. ■

HOUSECALLS: PERSONAL REFLECTIONS

DR KC Quek
MBBS (S'PORE)

The term "housecall" evokes different reactions from different quarters. To the patient it means a cry for medical help, an emergency, an anticipation of forthcoming relief. Notwithstanding the fact that many a housecall is really not "called for", to the patient it still means the comfort and assurance that the physician is at hand when there are doubts and fears.

But what about the physician? What are his feelings, what go through his mind and what emotions pound his heart as he considers "housecall"? Will the patient ever understand or appreciate what goes on in the deepest recess of his being?

Very few patients would probably realise the conflicts his doctor faces when he is asked to go for a housecall, particularly just after midnight. How could they possibly know that he had just seen 80 patients that day and his back was aching and his head was throbbing? Will they ever understand that his own child was running a temperature that night and his wife was ill in bed? "Excuses, excuses" they probably would conclude.

So there he was, driving down the lonely stretch of highway at precisely 12.20 a.m., his eyes heavy and drooping and his mind racing back to recall the many vivid memories of housecalls he had encountered in his years of practice.

In his mind, he saw clearly the tumbled-down shack with children running around half-naked, screaming and shrieking. And there was Mrs Chan, lying on a wooden structure that was supposed to be the bed. Mrs Chan was dying with carcinoma of the cervix and metastasis... She was panting heavily and obviously in pain but she could manage a weak smile. "Thank you so much for coming", she whispered in Hokkien. "Could you please give me an injection to relieve the pain? I really can't take it anymore". Tears trickled down her cheeks as she spoke. Mr Chan tugged at his sleeve, begging, "please do something doctor, please...!!". He took out the vial of analgesic and proceeded to give the injection. He spoke gently and reassuringly to Mrs Chan and clasped her hands confidently. He was choked with compassion as he saw the suffering and poverty surrounding the situation. Looking at the little children now huddled in a corner, he remembered his own... How would these children fare, having to lose their mother at such a tender age. His eyes looked up at Mr Chan who was obviously grief-stricken and distressed. He just could not accept it and with firmness pushed away the money laden hand of Mr Chan, shook his head and said, "its alright — I'm not charging for the housecall." "Please use the money for the children and the needs of the home".

Another scene quickly flashed on to his mind and as he recalled, he was gripped with uncertainty and fear. He saw distinctly the group of people crying hysterically and the patient, a young man of 24, breathing heavily and shallowly. He tried hard to get a history but nobody seemed to be able to say anything coherent. All they wanted to know were "Is it serious?", "what's wrong?" and "will he recover?". In the depths of his heart he was rather distressed. His own thoughts were disquieting. "What do these people expect? 3 minutes only and without a history and an adequate examination and they wanted me to tell them what's wrong. Do they think I am superhuman or what? What shall I do? Should I send for an ambulance? Is it drug overdose? Is it a head injury??". Beads of perspiration appeared on his brow as he faced the many faces looking at him expectantly.

He shuddered as he turned the car into a lane, thinking of the uncertainty awaiting him. All they could tell him earlier was "the patient is very sick — we do not know what's wrong".

As he passed a row of flats along the lane, he recalled one particular housecall which really made his blood "boil". There he was, driving in and out of various "lorongs" of the housing estate and there was no such flat or address. He stopped by a public phone and rang the number the patient's husband gave. "How can it possibly be wrong number?" Climbing up and down several flights of stairs of different flats that looked like the given address did not make the situation better. Fortunately, he saw a familiar figure, a patient who was acquainted with the one requesting the housecall. 45 minutes later he stood at the right door and knocked. The patient's husband opened it and had the nerve to exclaim "why so late, doc?". Apparently the husband had given him his own office address and telephone number without being aware of the mistake! And to make matters worse, as he administered an injection, he accidentally pricked his own finger. Was he glad that he was not going to a flat this time!

Driving up to the gate of a terrace house, he stopped to check the address. It seemed it was not necessary as several individuals were standing expectantly at a gate a few metres away. "That must be the place", he thought to himself.

Miss Wong was propped up in bed, breathing rather heavily. The signs and symptoms were highly suggestive of acute bronchial asthma and the past history confirmed it. A bronchodilator injection was given slowly and carefully and before long, Miss Wong was breathing normally again, to the relief of all those around.

Soon, he was back on the road, driving home. Though it was late, or rather early in the morning, and he was very tired, yet he could not help but feel a sense of joy welling up, knowing that he had contributed to the relief of suffering of one patient. He still remembered the words spoken to him "Doc, we really appreciate your care and concern". And as he thought about it, he reflected, "is this not what the calling of a doctor means – to be able to care and to comfort always and to cure occasionally? It's surely worth it to be able to give and to serve those in need. Certainly it is a noble calling".

On reaching home, however, he found his child running a very high fever. He had to apply tepid sponging and administer an oral antipyretic. His own wife had stayed awake, rather concerned for his safety on the road and for their child. After a while, things began to settle down and everyone managed to go back to bed.

He lay back comfortably on his pillow with a sigh of relief and the satisfaction of having met the call of duty adequately. The clock struck two... 2 a.m. in the morning. Then suddenly it came...rring...rring...the ominous ringing of the telephone broke the silence. Another housecall??? "Oh No, not again!!!" ■

HOUSECALLS: A GROUP PRACTICE EXPERIENCE

Dr Alfred W T Loh
MBBS, MCGPS

The service of housecalls provided by Group Practices would vary in nature and manner according to the size of the group and other related factors. Perhaps it would be more appropriate if the discussion could be subdivided into the Policies, Procedures and Problems associated with housecalls.

Policy

The policies adopted by a Group Practice in the context of the housecall service it provides would cover many areas. Firstly, there would be the policy of which group or category of doctors in the group would go on the roster for housecalls. In some cases, the more senior members of the group would be left out of the roster as they would have their own select group of patients to service directly via their own residential phones. The junior doctors on roster would then share the duties on a daily, 2-days or weekly basis.

The other policy likely to need clarification and implementation would be one of whether every call should be personally attended to by the duty doctor. In most group practices, this would be left to the discretion of the doctor on call with the important proviso that every call made via the pager should be personally replied through the phone. Having verified the nature of the problem, the doctor would then decide accordingly.

Group practices having doctors on pager duties are usually targets for "stray calls" made by members of the public seeking urgent medical attention at home. Being known to be dependable in their answering of pager calls, these "stray calls" are inevitably channelled by the Answering Service to the groups. The group practice involved would, therefore, have to set the policy on this issue of answering these "stray calls". In some cases, these calls could mean dire emergencies whilst in others, they could be cranks calls or for some trivial problem and cause wastage of time and effort. In most groups, the duty doctor is usually required to personally ascertain the need for his or her service and act accordingly. A short conversation over the phone should enable the duty doctor to do one of three things:

a) attend to the medical needs of the caller on an urgent basis
b) advise the caller to seek medical attention at the A & E unit of the nearest hospital especially when the problem appears serious and would require more than what could be done at home, or
c) advise the patient on some simple home remedies, if the condition is judged to be not serious, and the patient advised to visit his or her own regular family doctor the next day.

These "stray calls" arise in most instances because some doctors do not provide the service of housecalls to their patients.

The policy of charging for services provided for housecalls by group practices is also an important one. It is not uncommon for the same patient to require several home visits and these would probably be done by different doctors from the group attending to the patient at different times. A policy on fees chargeable as a guideline would avert the possible likelihood of wide variations in charges made for the same service. Policies for such charging could be worked on the base of a basic charge (e.g. $50.00) to which could be added surcharges for (a) late night calls, (e.g. an extra $20.00 per calls made after midnight); (b) longer distances in travelling and (c) nature of illness attended to.

The policy of remuneration for the duty doctor would vary from group to group. Some groups would allow the duty doctor to retain all professional fees collected during the rostered days. In other groups, the duty doctor may be required to reimburse the practice with a small stipulated sum for the medications used during such calls. In some groups, however, all professional fees collected are fully retained by the practice and the doctor is given a fixed travelling allowance per duty. Whatever the policy adopted by the group, to a greater or lesser extent, the duty doctors' integrity and honesty is relied upon by the group to adhere to the policy laid

down. There is usually no fool-proof way to monitor such after office-hour services provided.

Finally, the policy of communicating the treatment given by the duty doctor to the patient's own doctor (either in the group itself or outside the group) would be something some group practices would insist upon. This could be considered important in that it provides the continuity of care. For cases of patient within the same group, a phone call the very next morning to inform the patient's personal doctor would be sufficient. In cases of patient not within the group, a short note to the family doctor is needed.

Procedures

The procedures laid down by the group practice would depend very much on the policies adopted.

In most group practices, the duty doctor would have to carry an island-wide pager during the hours of duty, a second doctor on standby duty (or second line duty) may also carry another pager to be requested to stay home to receive calls unable to be answered by the duty doctor. Whilst having the pager, the duty doctor is also not encouraged to commit to any functions so as to be available at all times. The roster for such duties may be prepared on a monthly or fortnightly basis to give the doctors sufficient time to reschedule social programmes.

As a procedure, all calls are to be answered via the phone and where necessary should be attended to immediately. Given the size of Singapore and the right traffic conditions, most calls could be attended to in 30-45 minutes.

Certain pitfalls have also to be avoided. Firstly, there is always the risk of the pager's batteries running out. As a precaution, all duty doctors may be requested to test the batteries regularly and if unsure, batteries should be charged for a new set. Duty doctors are also usually advised to check with the TAS to ascertain the functioning status of the pager as rough handling may occasionally cause malfunction. Duty doctors are also advised not to get into "black-out" areas of transmission (e.g. deep underground carparks or shopping basements) where the pager is unable to receive transmissions.

Perhaps the greatest problem in the administration of providing housecall services in a group context is the need to ensure equitable and fair distribution of calls as well as an even sharing of the weekends to all doctors concerned. Duty rosters for such calls may be made rotational on a Monday-to-Friday basis with the Saturdays, Sundays and Public Holidays having a different cycle to ensure fair and even distribution.

Problems

Perhaps the most common problem faced by group practices in the provision of housecall services to their patients is the varying attitudes of duty doctors in the provision of this service. Some may adopt a less caring or casual attitude about how such services should be provided. Some others may look upon the service as an opportunity to increase their professional remuneration by high charges despite well laid down group policy on charges.

It is, however, a common practice in Groups to closely monitor their doctors' attitudes and responsibilities towards housecalls and utilize this as one of the yardsticks to consider perhaps long term association and benefits on the group to young and promising doctors.

The other common problem faced by medical groups is the attitude of some patients especially those in senior positions in companies to which the medical practice has been appointed. Such patients would not hesitate to use their position to demand for prompt housecall service even for the most trivial problem. In such cases, diplomacy and tact of the finest kind may be needed to avoid time wastage in doctors personally attending to such calls. Yet such tact and diplomacy may be found wanting in some doctors already harassed by other calls for help.

Lastly, there is always the need to provide an efficient, fairly uniform approach in treatment and charges, prompt service and proper communication between doctors of the group to ensure continuity of care. Housecalls must be an integral part of any general or family practice as the practice of medicine is never a 9.00 a.m. to 5.00 p.m. affair.

HOUSECALLS: THE DOCTOR'S CALL BAG

Dr L G Goh
MBBS, M Med (Int. Med)

INTRODUCTION

The contents of the doctor's bag vary from that of one doctor and another for three reasons: the type of cases seen usually, the number of cases seen and personal preferences. What is described below should be considered in the light of these 3 factors.

THE BAG ITSELF

One has a choice of 3 types of bag (see Fig 1). Type A because of its large capacity is suitable for a doctor who sees several to many patients at a time (e.g. on a ship-call or on a sick parade at the work-site) or the doctor attends to several housecalls at a go. The biggest disadvantage is the weight when loaded.

Where only one or two patients need to be seen before the doctor returns to base, Type B or Type C appears to be enough. I prefer the Type C because it is like a briefcase and it has multiple partitions for 20 medicine containers and 16 injection compartments.

THE CONTENTS

The following list is based partly on my personal choice and partly on the types of problems I am likely to face on a housecall.

Oral Medications

* *Antibiotics*
(i) Penbritin Cap (ii) Septrin Forte Tab
(iii) Erythromycin Tab.
I do not like Tetracycline because it is a relatively weak antibiotic.

* *Analgesics/Antipyretics*
(i) Panadol Tab (ii) Ponstan Cap
(iii) Naprosyn Tab.

* *Gastrointestinal medications*
(i) Imodium Tab (ii) Probanthine Tab
(iii) Spasmocibalgin Tab (iv) Veragel Tab
(v) Dulcolax Tab.

* *Respiratory System medications*
(i) Franol Tab (ii) Ventolin Tab
(iii) Chlorpheniramine

* *Cardiovascular medications*
(i) Chlorthiazide Tab (ii) Lasix Tab
(iii) Inderal 40mg Tab
(iv) Methyldopa 250mg Tab

* *Nervous System Medications*
(i) Valium 2mg Tab (ii) Valium 5mg Tab
(iii) Gravol 25mg Tab

* *Others*
(i) Prednisolone 5mg Tab (ii) Incidal Tab

External Use Preparations

* *Ear, Eye & Skin*
(i) Neosporin Eye Drops
(ii) Neo-deca Eye Drops
(iii) Otosporin Ear Drops
(iv) Synalar cream (v) FG ointment.

* *Others*
(i) Microlax mini-enema

Injections

(i) Buscopan (ii) Tomanol or Voltaren (iii) Paracetamol (iv) Valium (v) Ventolin (vi) Aminophylline (vii) B-complex (viii) Lasix (ix) Adrenaline (x) Dramamine (xi) Prednisolone or Dexamethasone.

Antibiotic Injections (together with Inj Water), Vaccines are carried when needed.

Instruments

Scissors, tissue forceps, Nose-squire hook, pocket torch, ophthalmoscope cum otoscope, ampoule file. Optional: stitching set.

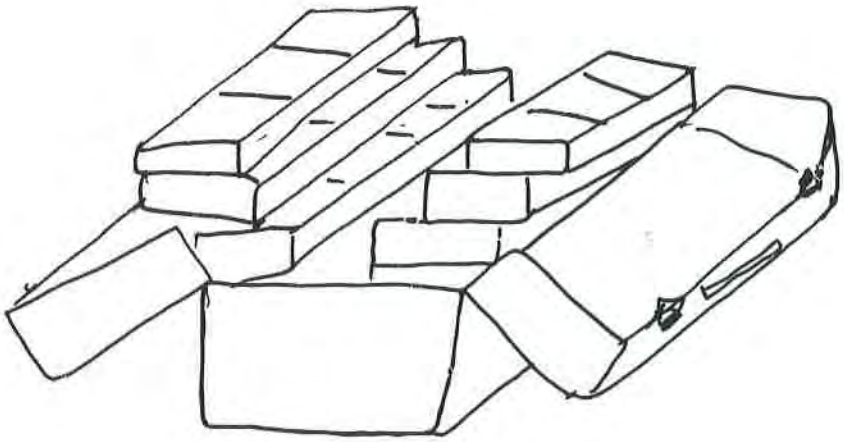
Medical supplies

Sterile alcohol swabs, Gauze, Plaster strips,

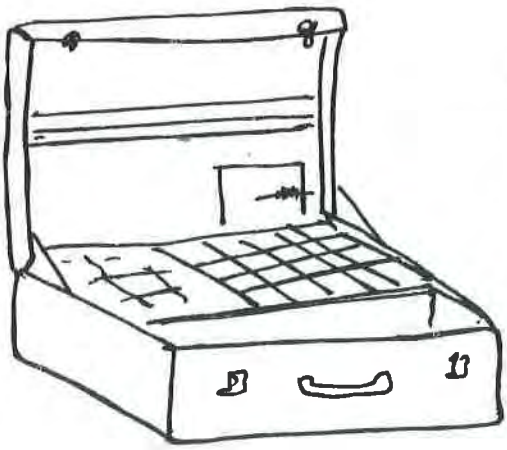
Crepe bandage, cotton buds, 2cc syringes, 10cc syringes.

Stationery
MC pad, letter pad, envelopes, receipt book, jotter book, medicine envelopes, ball-pen.

MAINTENANCE
Frequent topping up of spent items and regular housekeeping is necessary. I was a little embarassed one day when a small cockcroach ran out when I opened my doctor's bag. I made sure it was the last time.



Type A



Type B

Type C

FIG 1 DOCTOR'S CALL BAGS

A FAMILY PHYSICIAN'S APPROACH TO THE DIAGNOSIS OF DIABETES MELLITUS

Dr James M Y Chang *MBBS, FCGP(S)*
Dr L L Chang *MBBS, M MED (Paed)*

Synopsis

Two hundred patients with glycosuria had the modified glucose tolerance test performed in the family physicians' clinic. Ninety-one per cent were found to be abnormal. 68.1% of the abnormal G.T.Ts were due to diabetes mellitus, the others were due to renal glycosuria, alimentary glycosuria and impaired glucose tolerance. Renal glycosuria was a common cause of glycosuria in pregnancy. Of those diagnosed diabetics, 9 out of 10 were unaware that they had the disease. 41% of the diabetics did not present with symptoms and signs of the disease or its complications. The ease with which blood glucose can be monitored in the clinic has made the diagnosis of diabetes simple. The advantage of early detection is stressed.

Introduction

Diabetes mellitus is not uncommon in Singapore. A 2% prevalence rate was reported among Singaporeans 15 years and above in a national survey (Cheah et al, 1978). The prevalence rate was 5% for those in the age group 40 years and above. It is a disorder which frequently presents itself in the family physician's office, and as such should not be missed. Some patients present with overt signs and symptoms of the disorder and/or its complications. Others are picked up during routine urine tests. With the improvement in the general awareness of the public to the disease, it is not unusual to have patients requesting for such urine tests. Screening of the urine for the presence of glucose is a convenient method for diagnosing diabetes. However, glycosuria is not synonymous with diabetes. The introduction of simple methods for the measurement of blood glucose has made the detection of diabetes an office procedure within the reach of most family physicians. This paper records the usefulness of this procedure in the detection of diabetes among patients in a family practice.

Method of study

The Ames glucometer was used for the detection of diabetes using capillary whole blood. In patients with obvious signs and symptoms of the disease, random blood glucose levels exceeding 200 mg% and/or fasting levels exceeding 140 mg% could be deemed confirmatory of diabetes. However, for this study, 200 patients who had random glycosuria had the modified glucose tolerance test (GTT) performed. They included many who had no overt manifestations of the disorder.

After an overnight fast, blood and urine specimens were tested for glucose. A 75 gm glucose load was administered in a drink. Blood and urine tests were done after one hour and two hours. The recommendation of the WHO Expert Committee on Diabetes Mellitus 1980 for the diagnosis of diabetes from capillary blood, was used.

Glucose concentration in whole capillary blood

	Fasting	2nd hour
Normal	< 126 mg%	< 144 mg%
Diabetes mellitus	> 126 mg%	> 198 mg%
Impaired glucose tolerance	< 126 mg%	> 144 mg% < 198mg%

Following these criteria patients with renal glycosuria and alimentary glycosuria (lag storage) were also identified. In renal glycosuria the renal threshold is lowered and despite a normal GTT curve, glucose is detected in the urine. The normal renal threshold is set at 180 mg%. Some of these individuals would have been unjustifiably labelled diabetic if urine sugar had been the sole criteria for the diagnosis of diabetes. In alimentary glycosuria, the fasting and 2-hour blood and urine glucose levels are normal but the 1-hour specimens show blood glucose levels

in excess of 198 mg% and the presence of glycosuria.

Results

During a period of four years (1981-84) 200 patients who had glycosuria were studied. Abnormal GTTs were found in 91% of the patients studied. Only 68.1% were found to be diabetic among those with abnormal GTTs. The rest were cases of glycosuria due to various causes, of which renal glycosuria was the main (Tables 1 and 2). This compares well with the national study where among the 582 people with glycosuria, 88.8% had abnormal GTTs and of these 63.7% were diabetic (Cheah et al, 1978).

Table 1 — Results of the oral GTT (modified)

Result	No.	%
Normal	18	9
Abnormal	182	91
Total	200	100

Table 2 — The causes of abnormal GTTs

Diagnosis	No.	%
Diabetes Mellitus	124	68.1
Impaired glucose tolerance	22	12.1
Renal glycosuria	32	17.6
Alimentary glycosuria	4	2.2
All cases	182	100

Since it is known that glycosuria occurs more frequently during pregnancy as a result of the changes in carbohydrate handling, it was decided that pregnant women should form a separate group in our study. Table 3 reflects the differing causes of glycosuria between the groups. While 72.6% of the men and non-pregnant women were found to be diabetic, only 6.3% of the pregnant women were. Conversely, while 56.3% of the pregnant women were diagnosed to be having a lowered renal threshold for glucose, only 8.3% of the men and non-pregnant women were so diagnosed. An impaired tolerance to glucose was seen in 18.7% of the pregnant women, 9.5% of the men and non-pregnant women.

Table 3 — Comparison of the results of GTTs between men and non-pregnant women and pregnant women.

Diagnosis	Men & Non-pregnant women		Pregnant women	
	No.	%	No.	%
Normal	12	7.2	6	18.7
Diabetes Mellitus	122	72.6	2	6.3
Impaired glucose tolerance	16	9.5	6	18.7
Renal glycosuria	14	8.3	18	56.3
Alimentary glycosuria	4	2.4	0	0
All cases	168	100.0	32	100

Among the 168 men and non-pregnant women studied, 122 were diabetic. Table 4 shows the distribution of these according to their age and sex. There were more men than women. Among the men 97.2% of the diabetics were above 30 years of age, 29.6% were in the age group between 40 and 49 years. Only 3.9% of the diabetic women were in the age group between 30 to 39 years. After 40 years the incidence rises and 90.2% of the diabetics were older than 40 with a high of 37.3% in the age group 50 to 59 years. This confirms the general consensus that diabetes mellitus occurs more frequently in older people.

Table 4 — Distribution of cases of Diabetes Mellitus according to age and sex.

Age group	Males	%	Females	%
10-19	0	0	1	2.0
20-29	2	2.8	2	3.9
30-39	18	25.4	2	3.9
40-49	21	29.6	13	25.4
50-59	17	23.9	19	37.3
60+	13	18.3	14	27.5
Total	71	100.0	51	100.0

The majority of patients picked up as diabetic during the study did not know they had the disease. Among the men 87.3% and among the women 90.2% were diagnosed as diabetic for the first time. 59% of the patients

presented with signs and symptoms suggestive of the disease, 41% were asymptomatic and had been picked up during the course of routine medical check-up or in the course of consultation for unrelated ailments. (Tables 5 and 6).

Table 5 — Number of known and newly diagnosed cases of Diabetes after GTT

Type	Males (%)	Females (%)	Males & Females (%)
Known	9 (12.7)	5 (9.8)	14 (11.5)
Newly diagnosed	62 (87.3)	46 (90.2)	108 (88.5)
Total	71 (100)	51 (100)	122 (100)

Table 6 — No. of diabetics with or without signs and symptoms

	No.	%
With signs and symptoms	72	59
Without signs and symptoms	50	41
Total	122	100

The common signs and symptoms of diabetes are set up in Table 7. The single most significant complaint was that of polyuria and polydipsia. The commonest sign was that of recent weight loss. Among the women, the presence of monilial vulvitis and vaginitis, with the accompanying severe pruritus was common.

Table 7 — Common signs & symptoms of Diabetes

Signs & symptoms	No.	%
Polyuria & polydipsia	41	33.6
Weight loss	19	15.6
Tiredness, lethargy, weakness	13	10.7
Vulval/vaginal moniliasis	7	5.7
Recurrent skin infections	5	4.1
Others	11	9.0
Total	122	100.0

Discussion

This study highlights the ease with which diabetes mellitus can be diagnosed in the clinic. It also shows up the dangers of relying solely on urine glucose for diagnosing the condition. This is especially so in the younger patient where renal glycosuria is the commoner cause of glycosuria than diabetes. For the family physician, the diagnosis of diabetes is based mainly on the clinical suspicion of the disease, firstly from symptoms and signs suggestive of the metabolic disorder, and secondly from looking for it in those with predisposing factors. The common predisposing factors are a strong family history of diabetes, obesity, history of "big babies", hydramnios, unexplained foetal losses. The onset of the disease is often insidious and it is not uncommon to pick up the early onset of diabetes in patients being followed up long-term for conditions such as hypertension. It would be good practice to screen such patients periodically for glycosuria and hyperglycaemia, in the same way that one keeps a periodic check on their weight. On rarer occasions, diabetes may occur in an explosive manner following an infection. The awareness of the clinician to such possibilities coupled with the ease with which blood glucose can be performed makes diagnosis easier.

The early diagnosis of diabetes should lead to the early institution of management to prevent great fluctuations in blood glucose. This could be done by diet alone or together with the use of hypoglycaemics. The proper management of the condition should lead to lower mortality and certainly lower morbidity in these patients. In the pregnant diabetic, control of wide fluctuations in blood glucose is essential to lowering the high perinatal mortality, associated with the condition.

The group of patients with impaired carbohydrate tolerance should be counselled and followed up closely. Making the patient aware of his potential danger included educating him on diet and the need of weight control. It also provided an opportunity to look for other risk factors associated with atherosclerosis, for example, hypertension, smoking, obesity, high blood lipids and lack of exercise. Awareness at this stage could motivate him to modify his life style and thus hopefully prevent the onset and minimise the complications of the disease. The need to screen this group of patients periodically cannot be over emphasised.

The prevalence of renal glycosuria and alimentary glycosuria in Singapore was 0.78% and 0.3% respectively (Cheah et al, 1978). Renal glycosuria appears to be more pronounced during pregnancy. This is due to changes in carbohydrate handling in pregnancy. Ng et al, 1981, reporting in a preliminary study of 177 pregnant women with one bout of glycosuria, showed that 55.3% were non diabetic. Presumably these included cases of renal and alimentary glycosuria. Though those with a lowered renal threshold during pregnancy are considered normal, it is significant to note that some authors think otherwise. Briedahl, 1978, showed that these women had a 13.4% higher incidence of diabetes when followed up ten years later, as compared to controls matched for age and parity. A problem encountered often among women with renal glycosuria and especially those in pregnancy was vaginal moniliasis. Advice on the taking of smaller meals and the avoidance of foods high in sugars helped to control the glycosuria and the frequency of recurrent infection.

Periodic screening of patients with alimentary glycosuria for diabetes in subsequent years may also be necessary. Malins, 1968, showed in a Birmingham survey that among those with this condition a 5-year follow-up turned up an incidence of diabetes 17 times higher that could be expected for the population.

Conclusion

Diabetes mellitus as it appears in our practice is mainly of the non-insulin dependent type. Many cases are discovered by chance during routine examination for a job, insurance policy or during the course of consultation for an illness unrelated to diabetes. Realizing that prolonged states of hyperglycaemia are harmful and that diabetes with its many complications is a major cause of ill health, blindness and death, it behoves every practitioner to maintain a high degree of suspicion for the insidious nature of the disease and to employ the available "office" procedures to detect the disease early. ■

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GERIATRIC HYPERTENSION

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Hypertension in the elderly over 65 years can present as two subsets:-

(1) **Combined diastolic-systolic hypertension** – systolic value of 160mmHg or more together with diastolic value of 95mmHg or greater;
(2) **Isolated systolic hypertension** – systolic pressure of 160mmHg or greater and diastolic pressure of 95mmHg or less.

Diastolic blood pressure rises with age but this plateaus after 60 years of age (1) In contrast, systolic pressure rises steeply with aging (1). Both subsets of geriatric hypertension should not be left untreated as they are often associated with increasing morbidity and mortality in the elderly. (2)

Special pathophysiological features of geriatric hypertension

Though the etiology of geriatric hypertension is far from clear, it may be aggravated by the following factors:-

(1) The elderly have diminished aortic distensibility because of atherosclerosis; this is reflected by a widened pulse pressure.
(2) Plasma renin activity decreases with age due to aging of the juxtaglomerular apparatus while plasma norepinephrine levels rise because of sympathetic activity leading to excessive vasoconstriction.
(3) As the aging kidney has a reduced excretory capacity for sodium, the elderly may be prone to sodium retention as a result of increased salt intake. (2)

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Pitfalls in clinical evaluation

Misdiagnosis of geriatric hypertension often results from the myth that raised blood pressure in the elderly is a normal acceptable feature. It is now clear that any abnormal rise of blood pressure in the elderly beyond the norm should be treated as a diseased state. Data from the Framingham study show that hypertensives between 67-74 years old have an annual incidence of cardiovascular disease three times more than normotensive subjects (3,4) Systolic hypertension has to be considered as important as the diastolic – systolic subset as systolic pressures have been shown to have a stronger correlation to the risk of stroke, left ventricular hypertrophy and cardiac failure than diastolic pressures. (4)

Other factors which may contribute to misdiagnosis include:-

(1) **Lability** of blood pressure in the elderly. Multiple measurements of blood pressures on different occasions may be necessary.
(2) Increased incidence of the auscultatory gap with aging. This may lead to erroneously low blood pressures and can be avoided by inflating the cuff to 250mmHg rather than the usual 200mmHg.
(3) The presence of **pseudohypertension.** Due to the hardening of the brachial artery, indirect cuff values tend to overestimate the diastolic blood pressure by as much as 30mmHg as compared to direct intra-arterial blood pressure values. This discrepancy is however less marked for systolic blood pressures. Pseudohypertension may be suspected when there are no signs of target organ damage despite apparently severe hypertension or when postural symptoms develop readily in the presence of 'normal' blood pressure readings. (5)

Indications for treatment and therapeutic goals

(1) Systolic hypertension

Therapy should be started once the blood pressure exceeds 180mmHg. Though it is safer not to treat when systolic values lie between 160-180mmHg therapy is indicated when these patients develop cardiac failure, ischemic heart disease or transient ischemic attacks. (6) The therapeutic goal should be aimed at systolic pressure between 140-160mmHg provided diastolic hypotension does not occur.

(2) Diastolic-systolic hypertension

Drug therapy should be initiated for blood pressures exceeding 160/95mmHg. For those with diastolic blood pressure between 90-95mmHg, the presence of cardiovascular risk factors, diabetes or cigarette smoking may favour earlier treatment (7) The therapeutic goal should be diastolic pressure between 85-90mmHg and systolic pressure between 140-160mmHg.

Practical problems in pharmacological therapy

– *Postural hypotension* occurs in 10-15% of the elderly due to defective baroreceptor reflex, reduced cardiac output and overall decrease in plasma volume. Adrenergic neuron blockers are thus poorly tolerated. Though diuretics seldom induce postural hypotension, the dose must be reduced when dehydrating states occur.

– In the elderly the increase in fat stores and decrease in total body water and lean body mass may present with *altered pharmacokinetics* such as an enhanced effect of fat-soluble drugs. Thus reserpine, methyldopa and clonidine may cause depression of the central nervous system more readily than young patients leading to fatigue and somnolence.

– *Poor compliance* in the elderly increases with the complexity of the drug regimen.

– *Multiple drug interactions* occur more readily. eg, indomethacin may worsen the existing hypertension due to its sodium retaining effect.

Choice of drugs

Diuretics are preferred as the first line treatment in most cases – Thiazides are preferred to frusemide if the renal function is good as frusemide may cause acute retention or urinary incontinence in the elderly more readily (7) – Potassium supplements are often necessary especially when digoxin is used concurrently or when cardiac arrythmias are associated. A baseline renal function test is often essential to exclude renal impairment. As the elderly may have difficulty in swallowing large potassium tablets, a combined thiazide/potassium preparation or a thiazide/potassium-sparing diuretic combination is often more practical. The European Working Party Study of Hypertension in the Elderly recommended the use of hydrochlorothiazide 25mg combined with triamterene 15mg; this preparation achieved a reduction of 25mmHg systolic and 10mmHg diastolic in 85% of cases (8) In geriatric patients, hydrochlorothiazide may be started at 25mg o.m. and increased to a maximum of 50mg b.d. When diuretics fail to control the blood pressure adequately after 4 weeks trial, step-two agents such as hydrallazine, methyldopa or propranolol may be added.

Hydrallazine is a good choice from the physiological viewpoint. It increases the arterial compliance without much reflex tachycardia due to the blunted baroreceptor function in the elderly. Small doses of 10-20mg t.d.s. may be useful for systolic hypertension which is associated with increased rigidity of the arterial wall.

Beta-blockers such as propranolol are generally less effective in the older patient as decreased beta-receptor sensitivity and low plasma renin activity occurs with aging (9) Propranolol plasma levels are higher in the elderly than the young due to age-related decrease in hepatic flow and decreased first-pass metabolism (2) In the presence of reduced receptor sensitivity, this higher level may lead to higher incidence of adverse reactions such as nightmares, fatique and depression. Systolic hypertension may sometimes be worsened by beta-blockers due to the augmentation of increased peripheral resistance. (2) A practical approach is to use beta-blockers when there is coexisting arrythmia or angina. Even then care should be taken in the noncompliant elderly with ischemic heart disease as sudden self-withdrawal may worsen the cardiac status.

Methyldopa does not impair myocardial contractility or renal blood flow (2) Though it is often claimed that methyldopa can produce unwanted central nervous system side effects, the European Working Party Study of Hypertension in the Elderly showed that complications with methyldopa did not appear to be a problem. (8) However it should be avoided in geriatric patients with significant postural

hypotension, depression or liver disease. Diuretics should be routinely used together with methyldopa as it improves the latter's effectiveness by counteracting the increase in plasma volume.

Conclusion

Treatment of geriatric hypertension must be individualised. Diuretic sand salt restriction form the main aspects of management. Hydrallazine is a useful second-line agent especially for systolic hypertension. The use of methyldopa or propranolol depends on individual factors. If the blood pressure remains higher than 170/100mmHg despite optimal use of these drugs, secondary causes for geriatric hypertension such as renovascular hypertension must be excluded. Pseudoresistance may arise due to poor compliance, sub-optimal use of drugs and drug interactions eg. concurrent use of estrogens indocid or sympathomimetic eyedrops. Compliance in the elderly may be improved by simple written instructions, use of minimum drugs, regular reviews and involvement of family members in the overall management.

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YOGA AND THE DOCTOR

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What do people generally think of yoga? When one enters any common bookshop one readily sees books on yoga illustrating various postures. Even in T.V. we have seen popular yoga programmes showing the same postures — otherwise called Asanas. So one will not be wrong in assuming that yoga is a form of exercise or technique or gymnastics. After all, to be healthy, to look handsome and to live a long life is a basic desire of man and whatever can lead him to it, becomes popular. Many books are written and commercialised on the subject. This yoga that I have just mentioned is only a small aspect to the true meaning of yoga. In yogic term it is called Hatha Yoga and has become erroneously synonymous with the term yoga. Hatha Yoga is only a limb or aid to the true and total practice of Yoga.

WHAT YOGA REALLY IS

The word Yoga comes from the word 'Yug' which means to join or come to union or identical with the Supreme Being. Supreme Being (God) here means a state of all-round perfection. In the spiritual sense, it is the process by which the identity of the individual soul and supreme soul is realised by the practitioner or Yogi. Whatever one does in his transformation from a state of imperfection to perfection can be termed yoga. Yoga is the state of infinite bliss, supreme peace and abundant joy which is the goal of life. In simple terms yoga, is the process where man cleanses himself from acquired dirt or habit or attributes in its various forms and aims to reach a state of perfection or goodness or godliness for God is the picture of everything that is good. It is practical science within the reach of every individual. Knowingly or unknowingly everyone of us is engaged in yoga — to improve ourselves and become a better person to ourselves and to others and find happiness, health and peace in life. Yoga is a system of integral education, not only of the body and mind or the intellect but also the spirit. Yoga shows you the marvellous method of rising from badness to goodness and from goodness to godliness and then to eternal divine splendour. Yoga is the art of right living. The Yogi who has learned the art of right living is happy, harmonious, and peaceful. He is free from tension. Yoga is a science perfected by ancient seers of India, not only for India but for humanity as a whole. It is an exact science. Yoga does not mean turning away from life. It demands spiritualization of life. Yoga is not running away from home and human habitation, but a process of moulding one's attitude to home and society with a new understanding. Yoga is for all. Yoga is universal. Yoga has no religious, racial, age or social barrier. It is purely spiritual. It does not contradict any one's sincere faith. Yoga is not a religion but an aid tot he practice of the basic spiritual truths in all religions.

I shall now concentrate on the concept of Raja Yoga, the 'king of yogas' which concerns the ethical perfection and control of the mind. The practice of Raja Yoga will enable one to have vigorous healthy mind, strong will power, power of concentration and self control. In the ocean of life, the physical body is the boat. The captain of the boat is the soul or mind. The shore is the 'Brahman' or 'State of Perfection' — the abode of bliss, happiness, peace, joy, immortality and knowledge. The rudder is the well-directed meditation. Desire and thirst for objects are the crocodiles and whales (which one has to watch out). Lust, greed and anger are the ice-bergs (to be avoided). Satwa, Ragas

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and Tamas (mental qualities) are the three currents of life.

The Raja Yogi ascends the yogic ladder by practising eight steps. The eight steps are:

(1) Yama (restraints)
(2) Niyama (religious observances)
(3) Asanas (posture)
(4) Pranayama (control of the breath)
(5) Pratyahara (abstraction or withdrawal of the senses)
(6) Dharana (concentration)
(7) Dhyana (meditation)
(8) Samadhi (superconscious state)

They should be practised in the order given. One will not benefit much if one takes to the practice of Asana or Pranayama without first practising Yama and Niyama, for the latter are the very foundation of Yoga. The practice of Yama gives tremendous ethical power. By the practice of Yama and Niyama, the yogic student purifies the mind. By practising Asanas, he acquires steadiness and firmness of his body. By practising Pranayama, he removes the tossing of the mind. By practising withdrawal of the senses, he develops mental strength, peace of mind, and inner spiritual life. By concentration, he gets one-pointedness of mind. By meditation, he fills the mind of divine thoughts. On attaining Samadhi, he attains immortality or emancipation – which is the final beautitude and highest goal of human life.

With the above introduction I shall now deal in detail the concept of Yama and Niyama. Just like the study of anatomy, physiology of pathology are the pre-requisite for the study and practice of medicine. Yama and Niyama are the basic requirements for one to launch himself on the path of Yoga. Yama or restraint is the very foundation of yoga. Without it the superstructure cannot be constructed. The practice of Yama is really the practice of right conduct which is important to us as doctors, not only for ourselves, but also as an example of others. Yama consist of the practices of the following:-

(1) **AHIMSA or non-injury** means not causing pain to any creature (or fellow humans) in any way at anytime, in thought, word and deed. Ahimsa is a basic requirement before one can practice the other restraints mentioned. In extreme forms, giving up eating meat falls under ahimsa because meat eating involves cruelty. Sometimes one is forced to inflict injury. For example, a horse is killed when it is injured to prevent agony. Soldiers kill each other in wars. Thus it is the motive that matters. If the motive for causing injury is not wrong, then go ahead. The hanging of a convicted criminal to maintain law and order is an example. The practice of ahimsa will eventually culminate in the realization of unity and oneness of life.

(2) **SATYAM or truthfulness**
Satyam or speaking the truth is the most important qualification for the yogic practitioner. Truth must be observed in thought, word and deed. Truthfulness, equality, self-control, absence of envious emulation, forgiveness, endurance, charity, modesty, absence of jealously, thoughtfulness, self-possession, philanthropy and harmlessness are the various forms of truth. Some people hold that a lie which is calculated to bring good can be regarded as truth.

(3) **ASETYA or Non-stealing**
Asetya is abstaining from theft. The pilfering nature should be completely annihilated. One should be satisfied with what one gets by honest means. Illegal appropriation, the very thought of taking the property (or other doctors' patients) or things belonging to others should not enter the mind. When a man's desires are powerful and his mind uncontrolled, he wants many things for his own sensual enjoyment. If he cannot get the objects of sensual enjoyment (big car, house etc.), to satisfy his desires, the pilfering idea enters the mind. By constant thought of this kind, he eventually commits theft. The real cause of theft is the presence of too many desires, undisciplined senses and lack of contentment.

(4) **BRAHMACHARYA or Celibacy**
Purging the mind of illicit sexual desires or lust is an important pre-requisite. Brahmacharya really means purity in thought, word and deed. The very idea of lust should not enter one's mind.

(5) **APARIGRAHA or Non-covetousness**
Aparigraha is freedom from greed and covetousness. One should not keep or try to possess anything beyond the bare necessities of life. Receiving gifts affects the mind (corruption). In addition to the above restraints some school of thought

also include the following under the practice of Yama.

(a) **Saucha:** external and internal purity. Bathing and cleansing, hand washing is external purity. Filling the mind with pure, divine thoughts is internal purity.
(b) **Daya:** mercy or compassion in all places and for all creatures.
(c) **Arjava:** the maintenance of a balanced mind when performing actions.
(d) **Dhriti:** fortitude or mental power of endurance.
(e) **Mithahara:** moderation in eating.

NIYAMA

Niyama is the second limb for the practice of Raja Yoga. There are five observances to be made. These are:

(1) **INTERNAL & EXTERNAL PURITY**
Internal is mental and external is physical. Mental purity is more important than physical purity which is also needed. Internal purification leads to cheerfulness of mind, conquest of the senses and fitness for the realisation of the ultimate happiness.

(2) **CONTENTMENT OR SANTOSH**
Supreme happiness is obtained through the practice of contentment. Wealth and poverty are not judged by what one possesses. A king who has numerous unfulfilled desires is considered a beggar. A beggar, if he is contented with what he has, is really a king. From contentment comes supreme happiness. Without contentment, one will always be dissatisfied in life.

(3) **AUSTERITY or TAPAS**
By tapes or austerity the mind, speech and senses are purified.

(4) **STUDY OR SCRIPTURES**
This is to put into practice what one studies in the scriptures such as the Bible, Koran or the Hindu writings such as Gita and Ramayana. Constant study and practice will lead to communion with God.

(5) **DEVOTION TO THE LORD**
Our faith in God is important. This also includes faith in the words of the Guru and Scriptures. Under this group, one sees God in all and in the suffering and should practice DANA or Charity which is the distribution of food, clothes, and money, which had been earned lawfully. The charity should be done to deserving persons without expectation of reward. The feeling of shame when one does actions which are not in accordance with the teachings of scriptures or the rules of society also falls under this category. Repetition of mantra (religious text) – also called japa is included here.

CONCLUSION

In conclusion, I wish to summarise the benefits of Yoga from the point of view of the medical practitioner.

(1) The Yoga Asanas certainly have tremendous beneficial effects to the health of the individual. The internal organs – the brain, liver, spleen, pancreas, intestines, heart, lungs and the important endocrine glands are brought to state of maximum efficiency and give a sense of well-being to the practitioner. While ordinary physical exercises develop the muscles, the Asanas act on the internal organs.
(2) Deep breathing practised in what is called Pranayama are helpful to the whole respiratory system, for efficient oxygenation of the blood and its purification and thereby to the whole body. Asanas keep the muscles supple and the spine elastic, develop mental faculties and lung capacity, strengthen the internal organs and bestow longevity. The brain centres and spinal cord are strengthened. Memory is improved. Intellect is sharpened. The body is relaxed and mental tension is dispelled. Practice of Asanas removes diseases and makes the body light, firm and steady.

Life today is full of stress and strain, of tension and nervous irritability, of passions and hurry. If man puts into practice a few of the basic principles of Yoga, he becomes better equipped to face life. Yoga acts as an armour to the body and mind. Yoga brings in perfection, peace and lasting happiness. There is calmness of mind at all times. There is better sleep. There is increased energy, vigour, vitality and high standard of health. Efficiency is improved. Confidence is improved. Emotions are controlled. Concentration in studies and work are improved. There is tranquility. Yoga leads from ignorance to wisdom, from weakness to strength, from disharmony to harmony, from hatred to love, from want to fullness, from limitation to infinitude, from diversity to unity, and from imperfection to perfection. Yoga

gives hope to the sad and forlorn, strength to the weak, health to the sick and wisdom to the ignorant. Through Yoga discipline, the mind, body and speech work together harmoniously.

With the advent of better environmental sanitation, immunization and discovery of antibiotics, the medical profession has helped mankind to win his battle over communicable diseases. With the fading away of the communicable diseases, we now witness the dawn of diseases due to man's lifestyle (and in epidemic proportions too). I briefly mention the following, and how the medical profession can use Yoga to assist man to alter his lifestyle and thus free himself from self-destruction.

Lifestyle "diseases"	**Yoga response**
1. Cigarette smoking	Yama or purity
2. Over eating (gluttony)	Mithahara
3. Under exercising	Hatha yoga or Asanas
4. Alcohol & drug abuse	Saucha or purity
5. Sexually trasmitted diseases	Brahmacharya or celibacy
6. Undue psychological stresses	Santosh or contentment
7. Not breastfeeding (regarded as inflecting injury to the newborn by act of omission or commission)	Ahimsa or non-injury Saucha or purity
8. Abortion & its complications	Brahmacharya or celibacy
9. Overpopulation/ overcrowding	Brahmacharya or celibacy
10. Traffic accidents	Ahimsa
11. To add "Life to years" & "years to life" of old age.	Asanas, Pranayama, Ishwara Pujana, Japa, Scripture study etc.

The medical profession owes it to the patient and the community to include the Science of Yoga in its armamentarium in its effort to make man a better and healthier being. Medical history has shown that not all helpful changes were readily accepted by the profession. Semmelweiss had a difficult time and underwent personal ridicule and suffering in his attempts to convince his colleagues of the etiology of pueperal sepsis that was taking great toll of human lives during his time. In the horizon, I can see the birth of a new Science — Science of Yoga or "Yogalogy" with the Yoga Therapist joining hands with the patient in altering the latter's life-style for the betterment of his health and happiness. ■

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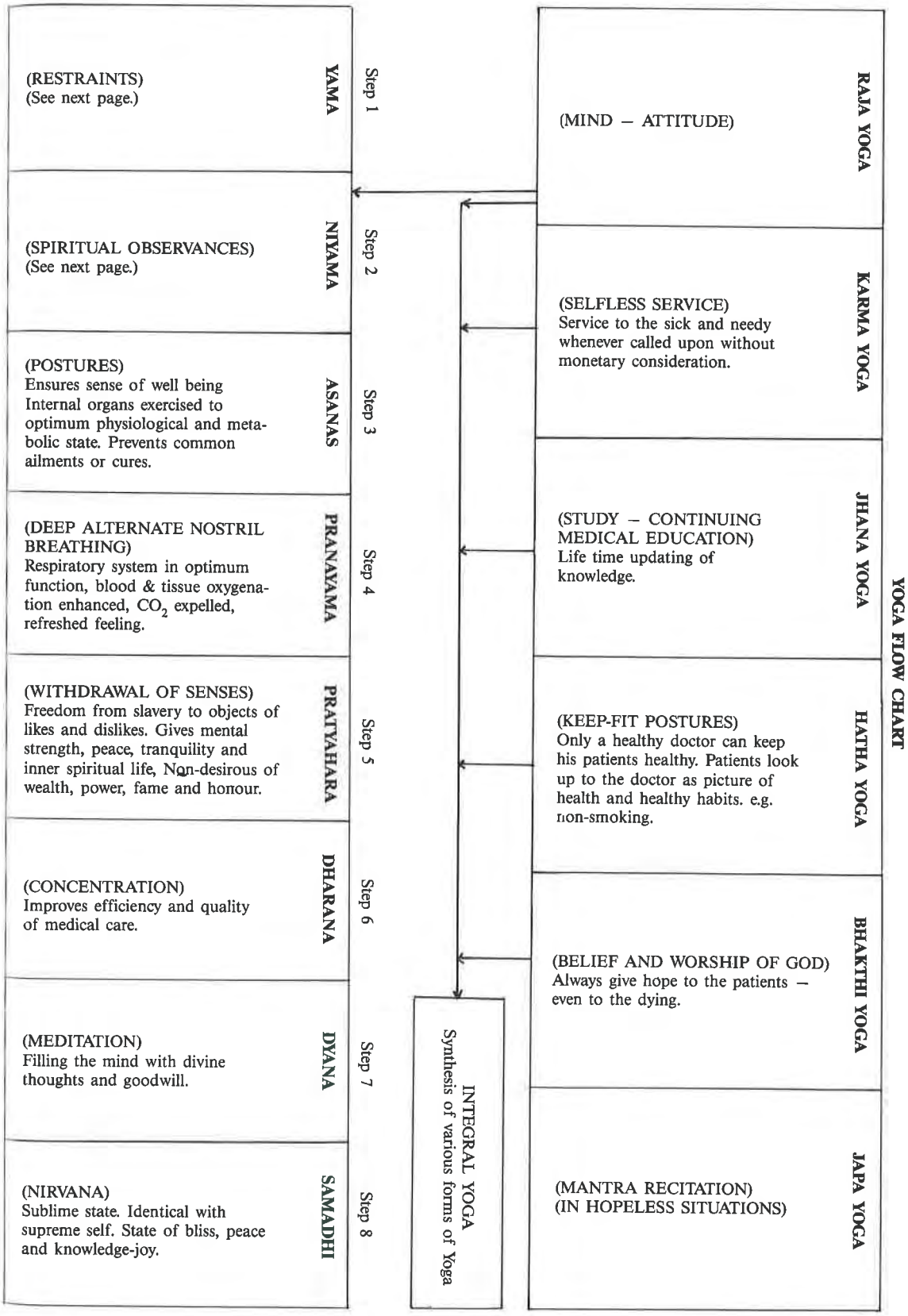
YOGA FLOW CHART
YAMA
(RESTRAINTS)
(See next page.)
Step 1
NIYAMA
(SPIRITUAL OBSERVANCES)
(See next page.)
Step 2
ASANAS
(POSTURES)
Ensures sense of well being
Internal organs exercised to optimum physiological and metabolic state. Prevents common ailments or cures.
Step 3
PRANAYAMA
(DEEP ALTERNATE NOSTRIL BREATHING)
Respiratory system in optimum function, blood & tissue oxygenation enhanced, CO_2 expelled, refreshed feeling.
Step 4
PRATYAHARA
(WITHDRAWAL OF SENSES)
Freedom from slavery to objects of likes and dislikes. Gives mental strength, peace, tranquility and inner spiritual life, Non-desirous of wealth, power, fame and honour.
Step 5
DHARANA
(CONCENTRATION)
Improves efficiency and quality of medical care.
Step 6
DYANA
(MEDITATION)
Filling the mind with divine thoughts and goodwill.
Step 7
SAMADHI
(NIRVANA)
Sublime state. Identical with supreme self. State of bliss, peace and knowledge-joy.
Step 8
INTEGRAL YOGA
Synthesis of various forms of Yoga
RAJA YOGA
(MIND – ATTITUDE)
KARMA YOGA
(SELFLESS SERVICE)
Service to the sick and needy whenever called upon without monetary consideration.
JHANA YOGA
(STUDY – CONTINUING MEDICAL EDUCATION)
Life time updating of knowledge.
HATHA YOGA
(KEEP-FIT POSTURES)
Only a healthy doctor can keep his patients healthy. Patients look up to the doctor as picture of health and healthy habits. e.g. non-smoking.
BHAKTHI YOGA
(BELIEF AND WORSHIP OF GOD)
Always give hope to the patients – even to the dying.
JAPA YOGA
(MANTRA RECITATION)
(IN HOPELESS SITUATIONS)

NIYAMA	
PURITY	(SINCERITY) Honesty.
SANTOSH	(CONTENTMENT) Relaxed, Free of stress and stress-related disorders Hypertension CHD.
TAPAS	(AUSTERITY) Curtail unnecessary prescriptions, surgery and tests. Keep cost to minimum.
SCRIPTURE STUDY	(SCRIPTURE STUDY) Bible, Koran, Gita, etc. In accordance to one's religion. Helpful in patient management.
DEVOTION TO GURU	To abide by the teachings of Guru, Saints, Sages.
VRATA	(FASTING) Leads to sense of well-being. Weight loss etc. Control of biochemical disorders.
DANA	(CHARITY) "Tax exemptions"??? community service.
ISHWARA PUJANA	(WORSHIP) in mosque, church, temples. In accordance to one's religion.
JAPA	(MANTRA RECITATION) Recitation or writing. Helpful in stressful situations.
HRIH	(REPENTENCE) For wrong-doing, useful in rehabitation of drug addiction, smoking habits, ex-convicts, etc.

YAMA	
AHIMSA	(NON-INJURY) Physical: crime, forensic medicine, traffic accidents. Psychological: stress, anger, violence, psychiatry, psychosomatic Chemical: Pollution, latrogenic.
SATYAM	(TRUTHFULNESS) eg. early referal to hospital or opinion of problem cases.
ASETYA	(NON-STEALING) Over-charging, over-investigations.
BRAMACHARYA	(CELIBACY) Premarital/extramarital sex STD. Abortions, sepsis, marital disharmony, divorce. Family planning. Population Control.
APARIGRAHA	(NON-COVETOUSNESS) Advertising, large sign-boards, criticising colleagues, etc.
SAUCHA	(PURITY) External: hygiene, pollution and littering. Internal: Alcohol, smoking, drugs, Breast Feeding.
DAYA	(MERCY) Service to the sick/wounded sufferings.
ARJANA	(BALANCED MIND) Non-emotional.
DHRITI	(ENDURANCE Bear suffering and pain.
MITHAHARA	(MODERATE EATING) Obesity, Hypertension, Heart Disease, Arthritis/Gout, Diabetes Mellitus.

HOME STUDY SECTION

SCOLIOSIS

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Scoliosis is a Greek word, meaning curva ture and in medical terminology means a lateral curvature of the spine. Scoliosis has been recognised since ancient times, as far back as Hippocrates. Although scoliosis is essentially a lateral curvature of the spine in the coronal plane it has two other deformities in two other planes. In the sagittal plane there is either increased anterior curvature or lordosis or increased posterior curvature or kyphosis. In the horizontal plane the vertebral bodies rotate towards the side of the convexity of the curve and the degree of rotation is variable. It is the rotation which to a large extent is responsible for the lateral prominence of the ribs or the so called "hump" in the thoracic region and the paravertebral prominence called the "bolster" in the lumbar region. One must not confuse this lateral prominence as kyphosis as in fact one could have a very marked lateral prominence from a scoliosis which has associated lordosis.

CLASSIFICATION AND TERMINOLOGY

For the sake of standardisation and accuracy of communication in scoliosis documentation, the Scoliosis Research Society has developed a glossary of scoliosis terminology which is used by all scoliosis surgeons and some of these will be referred to here. Basically scoliosis is either structural or non-structural. It is the structural curve that is the subject of discussion and concern.

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A. Non-structural Scoliosis:

This group of scoliosis is not due to any structural abnormality of the spine and is usually due to extra-spinal cuases. The commonest causes are

i) postural
ii) compensatory to leg length discrepancy
iii) due to adduction or abduction contracture of the hip
iv) due to nerve root irritation from a prolapsed disc or a tumour and
v) rarely of hysterical origin.

Non-structural scoliosis is essentially a lateral curvature, usually mild and without any appreciable vertebral body rotation. It can be reversed almost completely if the underlying cause is treated.

B. Structural Scoliosis:

i) Idiopathic Scoliosis:

This is the largest and the most common form of structural scoliosis seen in clinical practice, the cause of which still remains obscure. The popular belief of heavy school bag slung over the shoulder as the cause is appealing to the lay mind but lacks scientific thinking. It can occur in infancy that is anytime from birth upto 3 years of age, or in juvenile age group (3 to 10 years) or in the adolescent (above the age of 10 years). It is the adolescent curve which is the most common and can be progressive if left untreated.

Infantile curves are rare in the Asian population and also surprisingly they are rarely seen in the United States. They are more commonly seen in Britain and James and others (1959) reported that over a third of these infantile curves resolve completely. However those that persist beyond the age of 3 years and progress, could lead to very severe deformity which can compromise the cardiorespiratory and cord function. Such progressive infantile curves must be treated surgically during early childhood. (Fig. 1). Mehta in 1972 made a very ma-

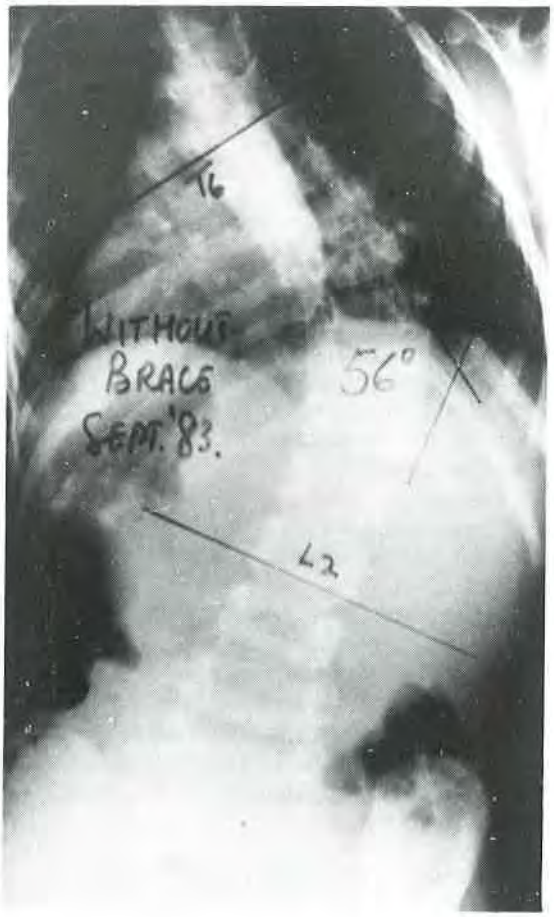


Figure 1.
Infantile Idiopathic Scoliosis in a child of 3. The curve progressed to 56 degrees and required surgical treatment.

jor contribution by describing the measurement of rib-vertebral-angle-different (R.V.A.D.) which could differentiate at an early stage between the progressive and the non-progressive type of curves. If the difference between the rib-vertebral angle on the convex and concave sides is no more than 20 at the apex of the curve then the chances of that curve progressing in the future are much less. The other points of interest are that the infantile curves generally effect male children and are more often left sided whereas the idopathic curves in the adolescents are more commonly in females and often right sided.

The juvenile idiopathic curves usually appear between the age of 3 to 10 and often remain static or slowly progressive until the age of adolescence when they may show very rapid progression.

Adolescent curves form the bulk of the scoliosis surveys all over the world and many of these curves are progressive if they measure more than 30 degrees at the first presentation in a child who has not reached spinal skeletal maturity. There have been numerous theories put forward regarding the etiology of the idiopathic adolescent scoliosis, none of which have been substantiated. However in the recent years there is increasing evidence to suggest that postural dysequilibrium from a disorder at the brain stem level may be a major responsible etiological factor (Yamanoto, 1982).

ii) Congenital Scoliosis:

Perhaps the second most important group of scoliosis is the one due to congenital abnormality of development of the vertebral column. This is in contrast to the idiopathic group where the scoliosis is structural but there is no abnormality in the formation or development of the vertebral bodies or the vertebral column. Congenital scoliosis is therefore present at birth and may or may not be noticable depending upon the severity of the deformity. Basically there are two main causes of congenital scoliosis.

a) failure of formation of vertebrae leading to wedged vertebrae or hemivertebrae and
b) failure of segmentation of the vertebral column which could be unilateral (leading to an unsegmented bar or fusion on one side) or there may be failure of segmentation on both sides leading to bilateral fusion. (Fig. 2).

It is not within the scope of this article to discuss in detail the complexities of congenital scoliosis but the important point to remember is that the unilateral failure of segmentation stops the growth of the spine on one side and

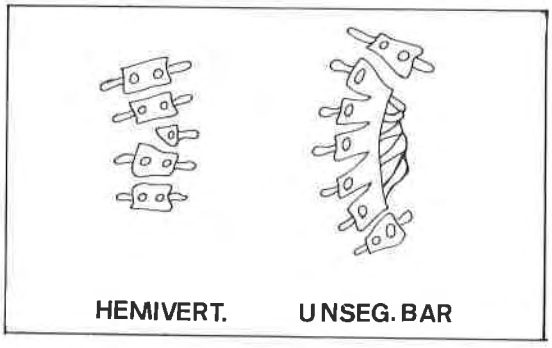


Figure 2.
Congenital Scoliosis. Failure of development – Hemivertebre and failure of segmentation – Unsegmented bar.

the growth continues on the opposite side where the growth plates of the vertebral bodies are open and this leads to a very rapidly progressive and often extremely severe deformity in early childhood. It is one of the most dreadful congenital deformities and carries a high risk of paraplegia from the acute angulation deformity it produces. It is often associated with kyphosis which further increases the risk of neurological complications. There is no place for conservative treatment of these severe curves and fusion of the unsegmented part of the spine in early childhood is indicated. Congenital scoliosis is often associated with intraspinal abnormalities like diastometomyelia and bifid spinal cord as well as congenital abnormalities of the ureters and kidneys. Myelographic examination and intravenous urography are mandatory before any surgical treatment is instituted. Because of the risk of traction on the neural tissues in these very tight curves any kind of traction on the spine and the use of the Harrington distraction rod during surgery is best avoided. The rod if it is used should function as an internal splint rather than a corrective force.

iii) Neuromuscular or Paralytic Scoliosis:

Scoliosis due to neuromuscular disorder forms the third most common group of scoliosis. It is often loosely referred to as "paralytic" scoliosis. In the part poliomyelitis accounted for the largest number of scoliosis in this group but with good control of the disease by mass immunisation it is becoming less and less common except for a few third world countries. Cerebral palsy, spinal muscular atrophy, muscular dystrophies and spina bifida are some of the main causes of the paralytic curves in the present day. Paralytic curves are somewhat difficult to control because of poor muscle control, poor muscle balance and often poor control of the limb muscles. They form a special group of difficult curves for treatment.

iv) Scoliosis in Neurofibromatosis:

This is a special group by itself as scoliosis occurring in a patient with neurofibromatosis presents complex problems and the scoliosis often is very rapidly progressive leading to neurological complications and paraplegia. These scoliosis are often associated with kyphosis and maintenance of correction and achieving a sound fusion can be quite difficult. There is hardly any place for conservative treatment in these cases if the curve is rapidly progressive.

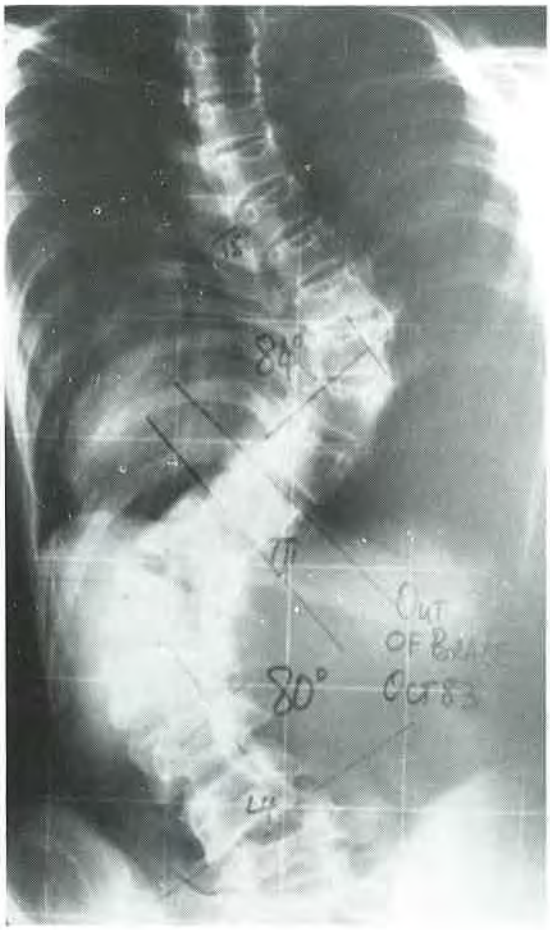
v) Scoliosis in Mesenchymal Disorders:

In this group, Marfan's syndrome is one of the commonest causes. Between 40% to 75% of patients with Marfan's syndrome develop scoliosis. Usually the scoliosis is severe and progressive and sometimes painful. Double curves are more common usually presenting as right thoracic and left lumbar curves. They appear in later childhood or adolescence but rarely they may present as early as the age of 3 years. When they present in early childhood, they tend to progress rapidly and eventually become very severe. (Fig. 3 a & b).

vi) Miscellaneous causes of Scoliosis:

There are several other rare causes of scoliosis which are of interest and challenge to the scoliosis surgeon; for example those resulting from irradiation and thoracoplasty and

Figure 3.
Marfan's syndrome. Double curve in a girl of 12.
a. at presentation



b. progression after 3 years of brace treatment requiring surgery

those associated with osteodystrophies and metabolic bone disorders. They are a special group and are beyond the scope of discussion here.

C. Classification by Anatomical Areas:

Curvatures are described by the areas of the spine in which the apex (that is the most convex part) of the curve is situated. The terminology for this is standardised as follows:

Scoliosis	Apex between
Cervical	C1-C6
Cervicothoracic	C7-T1
Thoracic	T2-T11
Thoracolumbar	T12-L1
Lumbar	L2-L4
Lumbosacral	L5-S1

D. Major and Minor Curves (Primary and Compensatory Curves):

Spine is a flexible structure and therefore if a curve develops in one part of it, the rest of the spine above or below curves and rotates in the opposite direction to compensate for it. This compensation may or may not be complete and the spine can still remain unbalanced or uncompensated.

The largest structural curve which is usually less flexible and more rotated is referred to as the "major" curve and is probably the first to appear and is a "primary" curve. The smaller curve which usually remains flexible and is less rotated is the "minor" curve and is probably a "compensatory" curve.

Over a period of time the minor or the compensatory curve may become less flexible and may behave as a second major curve.

Rarely two major curves may develop simulataneously and this combination usually presents as right thoracic and left lumbar curves. Such curves are referred to as double or double primary curves. The two curves measure within 5 degrees of each other and they usually have symmetrical degree of rotation. They often therefore balance each other and even if they measure as much as 45 degrees, they do not produce any obvious deformity.

EARLY DETECTION OF SCOLIOSIS

If a spinal deformity is detected early and if its progression is controlled, complicated surgical procedures and compromise of cardiorespiratory and neurological function can be everted. Early detection of scoliosis is therefore a great preventive measure. Since the highest incidence of the most common form of scoliosis (the adolescent idiopathic type) is in school children, it is logical to try and detect it at the school level. School screening for scoliosis is therefore vital. Singapore is one of the few countries in the world with a well organised school health screening which incorporates the methods of scoliosis detection. One of the simplest methods of detecting early scoliosis is by doing a forward bending test. The child is asked to bend forward to touch the toes and the examiner surveys the back tangentially. Any asymmetry of the body on either side of the midline should arouse a suspicion of scoliosis. (Fig. 4). The test is simple and can be carried out even by a trained school health nurse. Daruwalla and his colleagues from the University Department of Orthopaedic Surgery in Singapore surveyed more than 100,000 school children at different ages and concluded that the optimal age for screening of school children

Figure 4.
Forward bending test showing trunk asymmetry.

for scoliosis is between 11 and 12 years (Personal communication, data under publication).

To avoid the use of X-rays in the early detection of scoliosis a non-invasive method of photostereometric system called Moire topography has been developed in recent years. In this method a photograph of the back is taken with a camera through a grid to produce contour patterns of the body. The normal contour patterns of the body are altered due to body asymmetry in scoliosis and these can be detected by comparing the contourgraphs with those of normal children. There are only a few countries in the world where this new and sophisticated method is available, Singapore being one of them. Daruwalla and Balasubramaniam from the University Department of Orthopaedic Surgery in Singapore (personal communication, data under publication) incorporated this technique in the school health screening of children for early detection of scoliosis and found that this method was sensitive even for detection of very mild curves. Further work and evaluation of this technique is necessary and many centres in the world are now trying to perfect this method to widen its scope in clinical practice.

IMPORTANCE OF SPINAL MATURITY IN SCOLIOSIS

A large number of scoliosis present in the skeletally immature children. Continued growth of the spine increases the already existing deformity. Once the child reaches spinal skeletal maturity the risk of curve progression is less. It is therefore vital to know what are the pointers for spinal skeletal maturity.

A. Clinical Indicators:

The onset of breast and pubic hair development coincides with the beginning of the early adolescent growth spurt. Onset of menses indicates that nearly two thirds of the adolescent growth spurt is completed.

B. Radiological Indicators:

i) Skeletal age determination:

An A.P. view X-ray of the left hand and wrist when compared with standard views in Greulich and Pyle Atlas of hand X-rays of male and female children taken at different skeletal ages gives a good comparision of the chronological age of the child to the skeletal age of the child. For example if a child of a chronological age of 12 reveals on the hand X-ray a skeletal age of 11, it indicates that the skeletal maturity is behind the chronological age and that the curve may carry a higher risk of progression.

ii) Risser Sign:

The relationship of the growth of the epiphysis of the iliac crest to the spinal maturity was originally described by late Dr. Risser from Pasedena in California. Normally the ossification in the iliac crest epiphysis appears anteriorly and progresses posteriorly. He divided the extent of ossification as follows:

Iliac crest length	Risser sign
25%	1+
50%	2+
75%	3+
Complete	4+
Fusion with iliac bone	5+

A Risser sign of 4+ to 5+ would mean cessation of the spinal growth.

iii) Vertebral Ring Apophyses:

The growth plates of the vertebrae lie at the upper and the lower surfaces of the vertebral bodies. They can be seen quite well as ossifying rings on lateral X-rays. When they have completely fused with the vertebral body, the spinal growth can be considered to have ceased.

RADIOGRAPHIC EXAMINATION AND MEASUREMENT OF SCOLIOSIS

The standard projections for scoliosis at the first examination include a postero-anterior view of the spine in standing position, a true lateral projection in the standing position and prone postero-anterior views with maximum bending effort to the right and to the left. The bending films show the extent of flexibility of the curves and the amount of correction that can be safety achieved. In case of more severe curves a supine or a prone postero-anterior view with maximum manual traction applied to

the head and the legs is also useful to assess the amount of correction that can be obtained. Scoliosis X-rays should preferrably be done on the special long scoliosis cassettes so that the whole of the spine can be viewed from the cervical level to the level of the pelvis. Subsequent follow up X-ray examinations must be carefully planned so that the minimum number X-rays are done only two or three times a year to avoid the risk of cumulative exposure to radiation. Generally one erect postero-anterior film once in six months should be sufficient to evaluate the follow up progress of the curve, unless special circumstances demand more views. It has now been shown by several studies that a postero-anterior exposure with the X-ray tube facing the back reduces the risk of irradiation of the breasts by many times. These studies have shown that the breast tissue is the one most at risk of radiation in soliosis X-rays. Nash and his coleagues (1979) from Cleveland, Ohio reported that for an average of 22 X-rays over a period of 3 years in a scoliosis child the increase in organ carcinogenic risk from irradiation for the breast tissue was 110% if antero-posterior views were taken. With postero-anterior views the increase in this risk was reduced to 3.8%.

No scoliotic deformity should be treated without proper measurement of the curve. The method that is universally adopted is that described by Cobb. It is a simple and easily reproducible method at the follow up examinations. In a postero-anterior view of a scoliotic spine, the disc spaces are wider on the convex side and narrower on the concave side of the curve. At the upper and lower limits of the curve either the disc heights are equal or the disc height on the concave side begins to be wider than on the convex side because of the beginning of the compensatory or the minor curve. From the upper margin of the last vertebra in the curve above and the lower margin of the last vertebra in the curve below thus determined, perpendiculars are drawn. The angle of intersection of the two perpendiculars is the angle of scoliosis. (Fig. 5). If the curve increases this angle also increases. Similarly in kyphosis the disc spaces are narrow in the front and wider posteriorly on a lateral projection film of the spine. From the end vertebrae at the upper and lower limits of the kyphosis, perpendiculars are drawn and their angle of intersection is recorded as the angle of kypsosis. (Fig. 5).

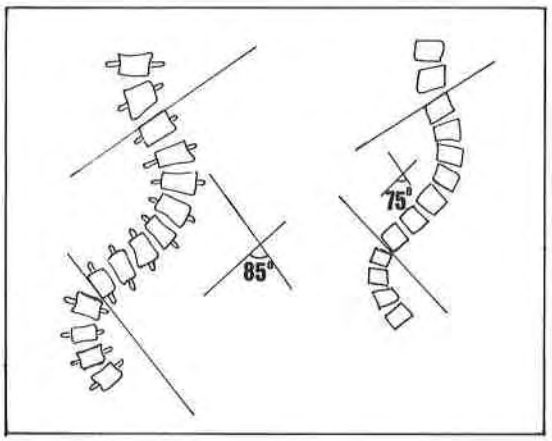


Figure 5.
Cobb's method of measurement of the curve.

GENETIC ASPECTS OF SCOLIOSIS

Parents always ask whether the scoliosis is hereditary of not. Many genetic studies have been done in various parts of the world and have thrown some light on this aspect of the condition.

i) Idiopathic Scoliosis:

It seems more than probable that idiopathic scoliosis is an inherited disorder although no chromosomal anomalies have been found. The mode of inheritance is probably multifactorial. It is more common in twins, families and siblings when compared to random distribution.

Studies have also been done of first degree, second degree and third degree relatives of scoliosis patients and incidence is higher in the first degree relatives.

ii) Congenital Scoliosis:

The genetic implications in congenital scoliosis are more strong. Parents will always be afraid of having other children with congenital scoliosis and will also ask whether their child with congenital scoliosis is likely to have children with congenital spinal deformities. Wynne-Davies (1975) from Edinburgh studied the families of 337 patients with congenital spinal anomalies. She found a definite hereditary tendency in those with multiple anomalies without spina bifida cystica whereas those with isolated single anomalies were sporadic and non-familial with minimal risk to subsequent siblings. Winter from Minneapolis, Minnesota found only 6 with positive family history out of 500 patients on record with congenital spinal

deformities. Thus hereditary congenital spinal deformity appears to be rare. He also found that complex lumbar anomalies were often associated with myelomeningocoele and tended to be hereditary. He confirmed Wynne-Davies' observation that single congenital anomalies were usually non-hereditary but multiple anomalies with fusion of the ribs would be hereditary especially in consanguineous families.

iii) Scoliosis in Neurofibromatosis:

Neurofibromatosis is a hereditary disease of autosomal dominant type with variable penetrance. There are many patients with neurofibromatosis who do not have scoliosis. Only 2% of all scoliosis are due to neurofibromatosis.

iv) Scoliosis in Marfan's Syndrome:

Marfan's syndrome is also a hereditary disease of the autosomal dominant type and is a connective tissue defect which includes cardiomuscular, occular and skeletal menifestations.

MANAGEMENT OF SCOLIOSIS

It is really not possible for an article of this nature to discuss in detail the management of different types of scoliosis but a broad overview outlining the general principles of treatment should provide a comprehensive understanding of scoliosis management.

1. Observation and Follow up:

All curves especially the idiopathic type under 20 degrees need no treatment. They need to be observed at regular intervals. In case of a growing child once in 6 months is adequate.

Parents always ask whether there is anything they could do or teach the child to prevent progression of the curve. Regular exercising (a set of scoliosis exercises), swimming and suspension and pull-ups from an overhead bar do no harm to the child, satisfy the parents, keep the spinal muscles toned up and improve the posture.

2. Brace Treatment:

Bracing the spine to correct and control the progression of the spinal deformity is not a new principle and dates back to the time of Hippocrates. Through the centuries bracing of one form or another has continued and our present day methods of bracing are no different from those practised in the past. The credit for the present day brace design and treatment must go to Blount and Schmidt of Milwaukee in Wisconsin. This brace essentially consists of a pelvic girdle, two posterior metal uprights, one anterior metal upright, a neck ring with occipital supports and a front throat mould and lateral pressure pads for the rib and lumbar prominences. (Fig. 6). In recent years underarm

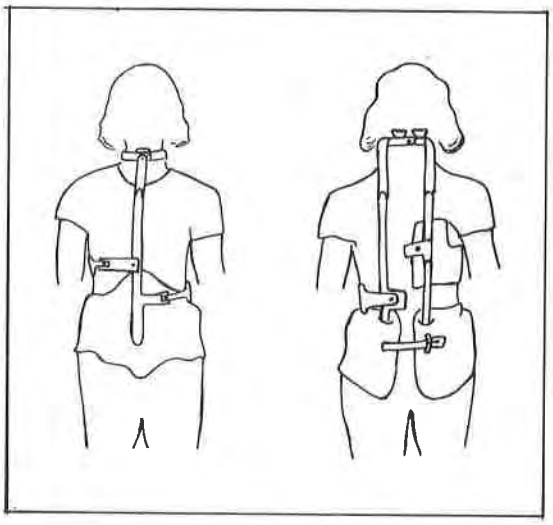


Figure 6.
Milwaukee Brace.

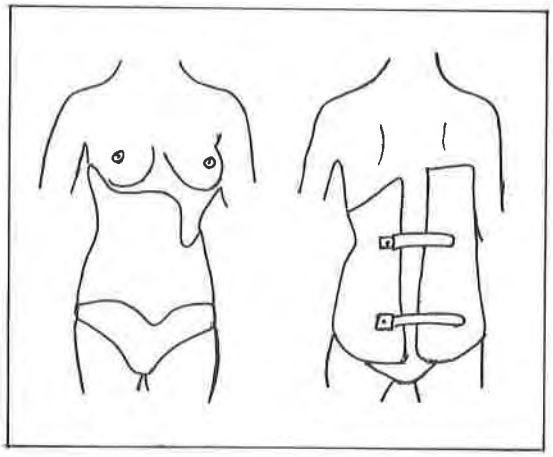
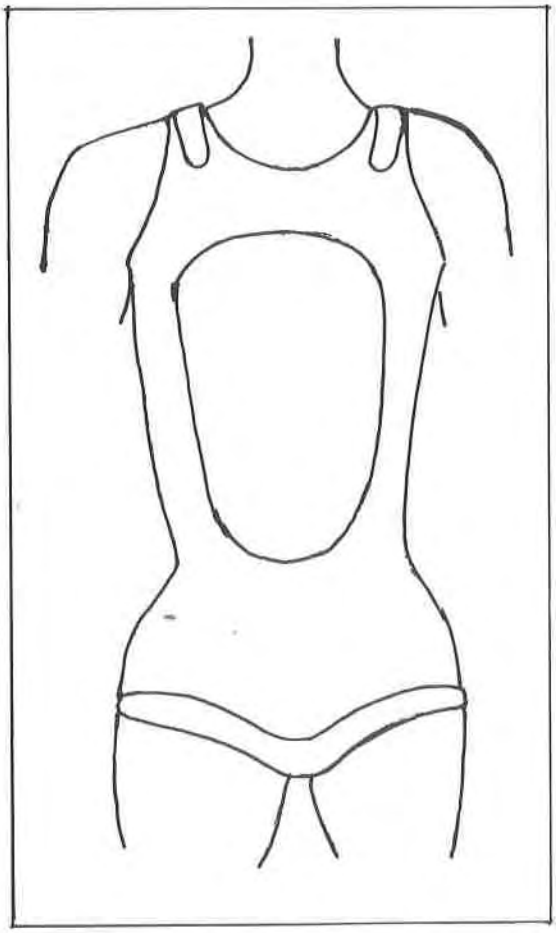


Figure 7.
Underarm Braces
a. T.L.S.O. Brace

braces for the lower curves (thoracolumbar and lumbar curves) called TLSO (Thorco-Lumbo-Sacral-Orthosis) or the Boston brace have been introduced. (Fig. 7 a). Because of the prominence of the metal uprights under the clothes and the obviously visible neck ring of the Milwaukee brace, many children show poor com-

pliance for treatment with this brace. This has led to the use of a body jacket with lateral pressure pads incorporated in the jacket and has been more acceptable to young adolescent school girls. Recent studies in several centres have shown that the effectiveness of a body jacket is just as good as that of a Milwaukee brace. The author himself has used a body jacket for the past four years and has found it quite satisfactory and more readily accepted by the adolescent children. (Fig. 7 b).



b. Body Jacket

What is the objective of the brace treatment:

Spinal bracing for scoliosis is done in the juvenile years to allow adequate growth of the spine to continue until the age of adolescence when the growth spurt takes place. If by then the curve is still controllable in the brace, then brace treatment can be continued. However, if the curve is progressive and difficult to control, correction and fusion of the curve must be done.

In the case of adolescent scoliosis before the age of skeletal maturity the main objective of the brace treatment is to prevent the curve from progressing. It must be understood clearly that the brace is not intended to reduce the curve although it may do so in the early months of bracing. The main objective is to prevent the progression of the curve. It has been shown by long term studies that 5 to 10 years after discontinuation of bracing, in a large majority of cases the curve measurement remained the same as it was before the brace treatment was started. This means that bracing prevented the curve from progressing beyond what it measured before the bracing was commenced. For example a girl of 13 with an initial curve of 30 degrees before bracing, may be improved to 20 degrees in the brace after a year of bracing, but the curve may still measure 27 degrees when the brace treatment is discontinued at the age of 17 or 18 and may then measure 30 degrees again at the age of 23, that is nearly five years after discontinuation of the brace. The curve that measured 30 degrees initially still measured 30 degrees 10 years later with 5 years of brace treatment. This is a good result of brace treatment and is what is to be expected of the brace treatment.

Do curves progress in the adult life?

This is a question often asked by the young patient and the parents. Although in the past it was thought that progression of a curve does not occur in the adult life after the cessation of the skeletal growth, this is not entirely true. If at the end of the growth period the curve measures more than 40 to 50 degrees, there is poor compensation of the curve with a torso list and there is a marked degree of rotation of the vertebral bodies, the risk of curve progression by about one degree per year of age in the adult life cannot be ruled out. It is therefore felt by many scoliosis surgeons, that an adolescent curve of 45 degrees and above which is unbalanced, has marked rotation and is associated with decreased normal thoracic kyphosis, should be critically evaluated and considered for surgical correction and fusion even towards the end of skeletal growth period.

Indicators for brace treatment:

Bracing is indicated in

i) a growing child,

ii) curves measuring more than 20 degrees and less than 45 degrees in a skeletally immature patient,
iii) flexible curves even if more than 45 degrees in a young child, to control the curve until such age when correction and fusion can be done and
iv) adolescent curves of less than 45 degrees before the age of maturity.

When is the brace treatment not worth pursuing:

It is not worth while persisting with the brace treatment under the following situations:
i) rapidly progressive infantile or early childhood curves despite the use of a brace,
ii) idiopathic adolescent curves of more than 45 degrees in the thoracic region in a skeletally immature patient,
iii) any curve in a skeletally mature patient even if the curve measures less than 45 degrees,
iv) congenital scoliosis due to unilateral unsegmented bar (early fusion in childhood is indicated),
v) congenital kyphosis (early fusion in childhood is indicated),
vi) scoliosis due to neurofibromatosis (early surgery is indicated and to achieve sound fusion a re-exploration of the fusion area five to six months after the initial operation may be required) and
vii) thoracic scoliosis in an adolescent with decreased normal thoracic kyphosis. Thoracic hypo-kyphosis is often associated with progressive type of curves and is an indication for surgical correction and fusion even if the curve is measuring a little under 45 degrees.

Should the brace be used full time and how to wean it:

Whether bracing should be done day and night or only part of the time has been a very controversial issue in the recent years. The classic teaching is to do full time bracing until the vertebral ring epiphyses have fused with the vertebral bodies. Then a weaning programme is started. First 2 hours out of the brace are allowed and if at the end of the 2 hours the curve does not increase more than 5 degrees on a postero-anterior radiograph (curve stability test) then every day 2 hours out of the brace can be allowed for the next 3 months. At the end of 3 months a "stability" test is done 4 hours out of the brace and 4 hours off the brace are allowed each day for the next 3 months. Then 8 hours out of the brace each day for 3 months, then 12 hours for 3 months and then only night bracing is instituted for the next 12 months before the brace is discontinued altogether.

The author has arbitrarily followed his own weaning programme. After the vertebral ring epiphyses have fused (about 17 years of age in our local females) a 6 hours out of the brace "stability" test is done. If the curve out of brace does not deteriorate more than 5 degrees, then night bracing only is continued for another 12 months.

There are some scoliosis surgeons who feel that night bracing alone is just as effective as full time bracing and reduces the problem of embarrassment at school that some of these children experience and a better compliance for the treatment could be expected. Only time will tell how successful it is when long term results of these studies are available.

The author feels that even with full time bracing, one must not institute too much regimentation and the child should be allowed to remove the brace to swim regularly, play certain games and do some regular scoliosis exercises. Such a regime leads to better co-operation both from the child and the parents and reduces emotional problems from brace resentment.

Bracing is difficult to tolerate in hot and humid climate like we have in Singapore and the contact and pressure areas in the brace must be checked regularly.

3. Operative Treatment:

i) Indications for Operative Treatment:

It is not possible to elaborate on many complex features and situations requiring operative treatment of scoliosis, but essentially all those situations listed earlier in which a brace treatment is unsuitable or has failed would be indicated for surgical treatment.

ii) Basic Objectives of the Surgical Treatment:

The basic objectives of any surgical procedure in scoliosis should be to
a) correct the deformity – if possible by instrumentation,
b) restore the trunk balance – by the correct choice of instrumentation and the extent of spinal correction,
c) maintain correction and prevent future progression – adequate length of the fusion area,
d) restore or maintain physiological thoracic kyphosis and lumbar lordosis,

e) maintain if possible at least two lower lumbar mobile segments so as to prevent back pain from disc degenerative changes and osteoarthritis of the facet joints in adult life.

iii) Basic Principles governing various Surgical Procedures:

a) Any idiopathic curve between 40 and 60 to 75 degrees which shows sufficient mobility on bending and manual traction flims can be treated by posterior correction, instrumentation and fusion.

b) Posterior fusion must always be meticulous and must include the facet joints and extend up to the transverse processes. The longitudinal extent of the fusion must include all the vertebrae rotated into the curve and must extend to the lowest vertebra that lies no more than 10 to 15 degrees tilted from the horizontal.

c) The idiopathic curves greater than 65 to 70 degrees which are rigid may require preoperative traction (skull-femoral) for a period of 10 to 14 days to achieve initial stretching and correction of the curve before posterior instrumentation and fusion.

d) More rigid non-congenital curves measuring more than 80 to 90 degrees may require a first stage anterior disc excision at multiple levels in the curve on the convex side through a transthoracic or a thoracoabdominal approach. This is followed by a short period of 10 to 14 days of skull-femoral traction if necessary before the second stage posterior instrumentation and fusion. The first stage anterior surgery helps to make the curve less rigid which reduces the risk of neurological complication when posterior correction and instrumentation is attempted at the second stage.

e) The congenital curves are most vulnerable to neurological complications from stretching and must never be treated by excessive pre-operative traction or distraction with a rod during the operation. If they have associated kyphosis, it is often preferrable to correct and fuse the kyphosis by an anterior operation first before fusing the curve in situ without attempting to distract the curve with a rod at the second stage posterior operation.

f) Curves with rigid kypsosis as in neurofibromatosis also require anterior release of the kyphus and fusion first, followed by a second stage posterior correction and fusion.

g) Extensive paralytic curves may need anterior interbody vertebral fusion in the thoracolumbar region with or without anterior instrumentation with vertebral screws and a cable (Dwyer's) or with vertebral screws and a flexible rod (Zielke's) as the first stage, followed by posterior instrumentation and fusion.

h) Most scoliosis operations require spinal immobilisation in the form of a spinal jacket or a brace for a period of 6 to 8 months after the operation to allow a good fusion to occur. If the fusion is not sound, instrument failure is likely to occur due to a pseudoarthosis in the fusion area. This eventually leads to a loss of correction and recurrence of the curvature.

iv) Types of Spinal Instrumentation:

a) Harrington Instrumentation:

The most extensively used posterior spinal instrumentation and the one that has stood the test of time is that designed by the late Dr. Paul Harrington in the fifties. It has two components. The distraction rod is a ratchetted rod passed between two hooks placed one or two levels beyond the upper and lower limits of the curve on the concave side of the curve. It distracts the curve as the ratchets of the rod are "jacked up" with a distractor. (Fig. 8 a & b).

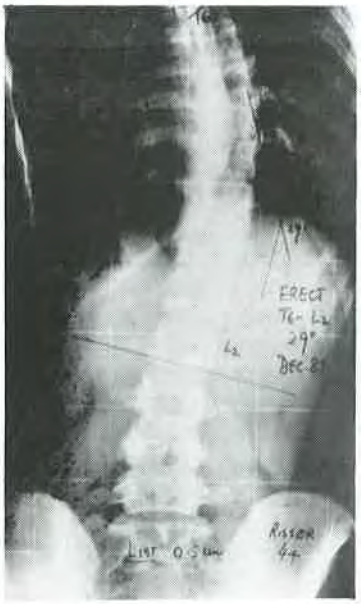
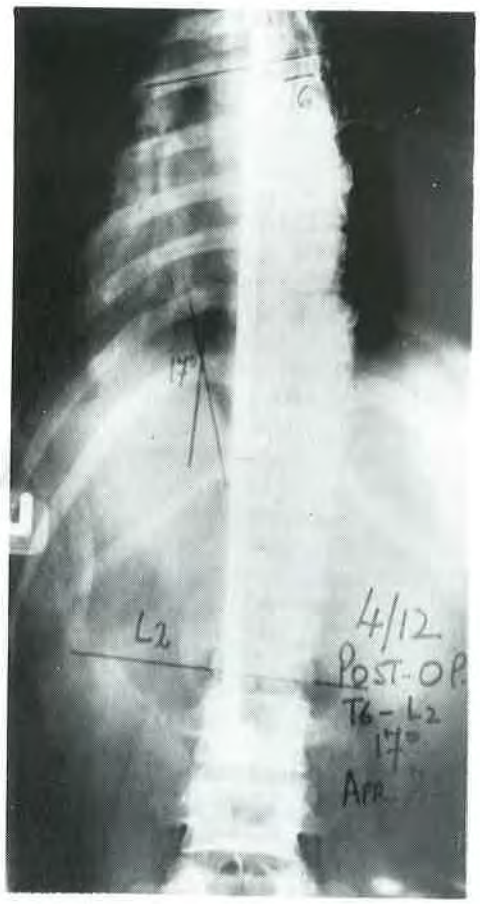


Figure 8.
Right thoracic scoliosis with hypokyphosis in a girl of 14. a. before operation



b. 4 months after Harrington distraction rod and fusion

The distraction rod maintains kyphosis and therefore it must be contoured to normal lumbar lordosis when the rod placement is extended to the lower lumbar region. The compression rod system consists of a flexible threaded rod on multiple hooks which are placed over the transverse processes above and under the transverse processes below on the convex side of the curve. By tightening the hexagonal nuts on the threaded rod the convex side of the curve is compressed and straightened further and gives extra correction when used in combination with the distraction rod. The compression assembly also decreases the kyphosis and is quite useful for those curves which have associated kyphosis. However for those thoracic curves that are associated with hypokyphosis (lordosis) one must not use the compression assembly as it will make the lordosis worse which will further reduce the vital capacity. Similarly if the distraction and compression assemblies are linked together by a transverse loading system (D.T.T.) the kyphosis can be further reduced.

b) Luque Segmental Spinal Instrumentation (S.S.I.):

In recent years, Eduardo Luque from Mexico designed an ingenious method of posterior instrumentation which is very rigid and allows the spine to be contoured in two planes. It consists of two L-shaped rods, one each placed on the concave and convex sides of the curve after contouring them adequately enough to achieve lateral correction of the curve as well as restore normal thoracic kyphosis and lumbar lordosis. The rods are held tightly against the laminae by passing 18 gauge stainless steel wires under the laminae at each level in the curve and tightening them over the rods. (Fig. 9 a & b). The fixation is strong and Luque himself does not protect the spine in any form of external support

Figure 9.
Right throcic scoliosis with hypokyphosis in a girl of 21.
a. before operation — 65 degrees

b. after Luque segmental spinal instrumentation and fusion — corrected to 28 degrees

post-operatively and allows his patients to be ambulated freely within a few days of the operation. However most surgeons including the author prefer to protect the spine post-operatively in a light polyethylene jacket for 6 to 8 months. This is an excellent method for neuromuscular scoliosis where application of a cast or a jacket psot-operatively is unsuitable due to respiratory, paralytic or sensory problems. The technique is more elaborate and time consuming and passing of the wires through the extra-dural space does carry a certain risk of neurological complications.

c) Anterior Dwyer or Zielke Instrumentation:

Late Dr. Alan Dwyer of Sydney, Australia and later Dr. Klaus Zielke of West Germany designed a system of screws which are passed into the vertebral bodies from the convex side. In the Dwyer system the screws are linked with a tension cable which compresses the adjacent vertebral bodies together on the convex side to correct the curve. The Zielke system is similiar except that instead of the tension cable a threaded flexible rod with hexagonal nuts is used to link the screws together and the compression is achieved by tightening the hexagonal nuts. This system also has a special derotating device which derotates the vertebral bodies and gives a better correction of the lumbar prominence. (Fig. 10 a & b). The anterior instrumentation systems have a very limited application in the treatment of the thoracolumbar curves that extend from T10 to L3 level. By instrumenting and fusing the curve up to L3 level, the lower three levels of the lumbar spine are left free and mobile which prevents disc degenerative and facet osteoarthritic changes in the adult life. The disadvantage of the anterior instrumentation system is that it entails a major thoracolumbar approach. Secondly if there is already an existing kyphosis in the curve, it can be worsened by this assembly.

It is not within the scope of this article to discuss in detail the various technical problems and complications of the surgical procedures in

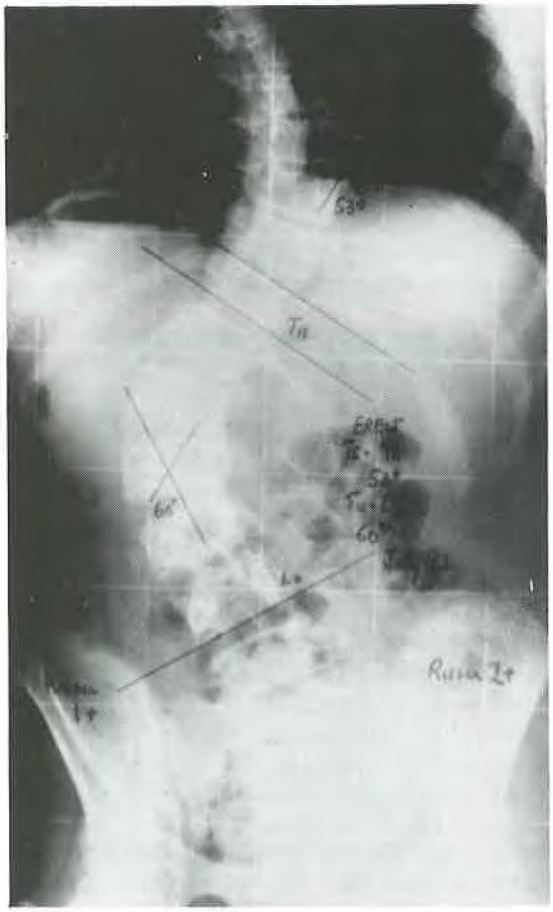
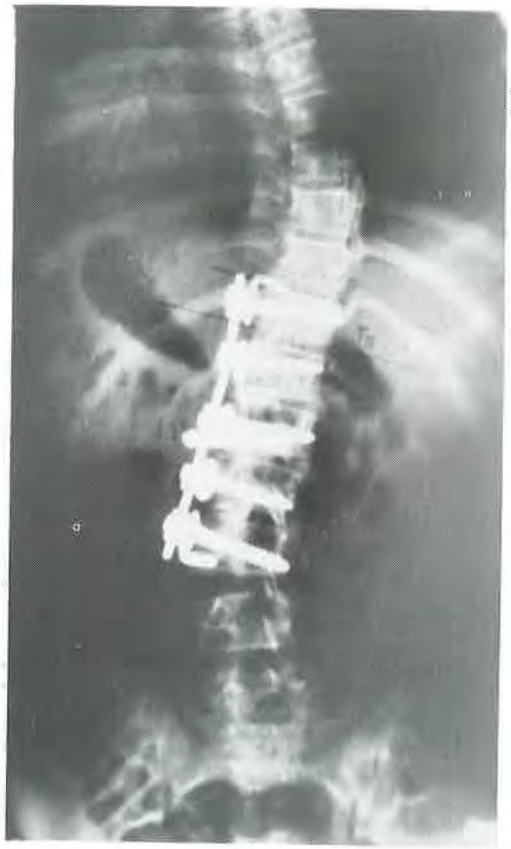


Figure 10.
Left thoracolumbar curve in a girl of 12.
a. before operation — 60 degrees



b. 4 months after Zielke anterior instrumentation and fusion — corrected to 19 degrees.

scoliosis. However one of the most feared complications of scoliosis surgery is the neurological involvement and paraplegia which can occur immediately after the operation or within the first 24 hours. The most common cause is the distraction of the neural tissues especially in the posterior Harrington distraction procedure and also to some extent in Luque segmental spinal instrumentation. It is now a routine practice to do a "wake up" test during the operation after the posterior instrumentation procedure is completed. This test was described by Stagnara from Lyon, France in 1973 and has become a routine test in scoliosis surgery. The author himself has used this test for the past seven years. During the wake up test the patient first opens the eyes and holds the hand of the anaesthetist. He or she is then asked to move each leg separately. If there is any suspicion about the neurological status of the child at this stage the instrumentation is immediately removed and the test repeated to see whether the neurological recovery has occured or not. In the recent years more sophisticated methods of spinal cord monitoring by recording either the cord evoked or the cortical evoked potentials have been used in larger scoliosis centers in many parts of the world. Fortunately the incidence of neurological complications from scoliosis surgery is quite low and many of the patients show recovery if the instrumentation is removed immediately. In the 1982 morbidity report compiled by the Scoliosis Research Society from a survery of 1686 patients, 15 patients had suffered nerve root lesions (0.9%) and only 6 had incomplete paraplegia (0.4%). All incomplete paraplegias recovered after the removal of the implants.

CONCLUSIONS

Scoliosis is a vast subject and a specially in itself within the practice of orthopaedic surgery. Early detection of scoliosis is certainly the answer to prevention of grotesque deformities and complex and hazardous corrective surgeries. Early recognition of the rapidly progressive curves (infantile and congenital curves) that are likely to produce severe deformity is important as they need early surgery. Brace treatment is not to reduce the curve but to prevent its progression. The rapidly progressive type of idiopathic curves, congenital curves and curves associated with neurofibromatosis are difficult to control with a brace and continue to progress despite the use of the brace. It is futile to pursue with brace treatment in such cases and instead surgery should be considered at an early stage before the curve has become very severe.

ACKNOWLEDGEMENTS

This article is based on the experience of several years of scoliosis work in which many of my past and present colleagues have helped me in many ways. It is not possible to list their names here but I extend my thanks to all of them.

However I wish to thank all those who have referred some of their difficult cases to me for treatment and those who have actively helped me in the management of these cases. I am particularly thankful to Drs. V.K.Pillay, C.M.Ling, W.N.Cheng and K.Soin. My special thanks are due to Dr. George Lim who has helped me with the anaesthetic and post-operative management in some of the difficult cases. I wish to thank Mr. Tay the photographer of the Academy of Medicine of Singapore for making the prints for illustrations for this article.

HOME STUDY SECTION

WHAT'S NEW IN GYNAECOLOGIC CANCER

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The search for better management of gynaecological cancers focuses on four areas: (1) understanding of basic pathology and epidemiological date, (2) improvement of ways and means of detecting early cancer, (3) improvement of chemotherapy and (4) development of new treatment modalities like laser.

In this review, I propose to consider only those papers which have been published during the eighties. The experimental data is mostly new. However, much of the clinical data is based on work done during the seventies (for example, five year survival figures are dependent on such long term studies) and some of the ideas go back much further. Sometimes, social changes produce a new trend, e.g. the emphasis on the screening of young sexually active females for cancer of the cervix. Sometimes, new instrumentation offer a new approach to diagnosis or treatment, e.g. ultrasonography picks up small ovarian masses and readily confirms a hydatidiform mole; cryosurgery and laser vaporisation effectively destroy cervical intraepithelial neoplasis. Sometimes, biochemical discoveries provide a new concept in management, e.g. the discovery of oestrogen and progesterone receptors, isolation of mullerian inhibitory factor, synthesis of analogues of gonadotrophin releasing hormones. And there are always new chemotherapeutic agents to be tried.

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CARCINOMA OF THE CERVIX

CERVICAL INTRAEPITHELIAL NEOPLASIA (CIN)

Classification

The concept that premalignant conditions of the cervix represent a spectrum in the development of the disease rather than separate entities has gained widespread acceptance following its proposal by Richart in 1968.[1] According to this classification:

CIN Grade I refers to *mild dysplasia;* basal 1/3 of epithelium replaced by atypical cells

CIN Grade II refers to moderate dysplasia; lower 2/3 occupied by undifferentiated cells

CIN Grade III refers to severe dysplasia or carcinoma-in-situ.

This classification resolves the dilemma of differentiating between severe dysplasia and carcinoma-in-situ. With regards to mild dysplasia, it is recognised that the dyskaryotic cells may revert to normal when infection has been cleared up, following biopsy, or spontaneously, but a quarter eventually progress to CIN III. About 10 percent (some say as high as 60 percent) of carcinoma-in-situ develop into invasive cancer.[2]

Aetiology

In the late 60s there was a brief interest on Herpes Type II virus as a possible causative agent of cervical cancer.[3] At the turn of the 80s, the hottest topic was cervical condyloma.[4,5,6] Human papilloma virus, the cause of venereal warts, produces a flat wart on the cervix and dyskaryotic cells in the Pap smear. But its role in squamous carcinogenesis is yet to be determined.

Diagnosis

Routine Pap smears on sexually active women is the key to early cancer detection. Unfortunately, this is an instance where the *Inverse-Care Law* operates, namely, those who are most in need of a smear are the least likely to avail themselves of the opportunity. A study in Cardiff showed that even after they had been interviewed and offered a free cervical smear, one third of the women did not keep their appointment, despite being revisited and reminded.[7]

With the change of socio-sexual patterns, the old rule that the highest yield will be obtained by screening women from age 35 no longer holds. Younger women are sexually more active, and the tendency to have more than one sexual partner puts them at greater risk. In Singapore, both in-situ and invasive cancer of the cervix are commonly encountered in young women in their twenties and thirties.

The Cardiff Cytological Study reported in 1981 showed that the highest incidence of cervical dysplasia was in the 25-30 age group whereas in-situ and invasive cancer was most common among women aged 45-50. In the development of screening strategies, Wright and Riopelle stated that age was not important: the interval from the first sexual contact was. In the five years following first coitus, less than 10 percent will have CIN, whereas between 5 to 20 years, 85% of CIN will be detected by cytological screening. My practice is to screen from the second year following first coitus.

The Oxford Group data showed that the number of sexual partners is the single most important factor in the causation of CIN, the risk being higher among women who reported two sexual partners than those reporting only one, and higher still for women reporting three or more.[8] This increase was seen at all age groups, and was independent of the age of first coitus. No relationship existed between the frequency of coitus and CIN.

The 1982 Canadian Task Force on Cervical Cancer Screening Programs recommends more frequent screening (i.e. more often than once in three years) for sexually active women aged 18-35, and improvement in the quality and sensitivity of screening programmes.[9] The task force viewed as unnecessary, the annual screening of women above 35 whose previous smears have been normal, an opinion also held by many British gynaecologists. However, Bain and Crocker (1983)[10] reported that 25% of their 130 patients with cervical cancer belonging to an upper socioeconomic group (previously, erronously, believed to be at low risk) had short intervals of less than three years from negative cytologic screens. They advocate an annual screening for all groups. Our Singapore experience corresponds. The American Cancer Society is also advocating more frequent screening.[11]

An interesting point to ponder is the vector role of males who have/had more than one sexual partner.

Newer Techniques

Among the methods being currently evaluated are the EA rosette test,[12] measurement of acid-labile DNA in exfoliated cells,[13] flow cytometric DNA analysis[14] and cervicography.[15] In 98.6% of CIN or invasive cancer, the cervical cell suspensions contained EA-rosette forming cells, but the test does not thereby appear to offer any significant advantage over routine cytology. Measurements of DNA in exfoliated cells represent attempts at automation. The development of these techniques are in the preliminary stage. Cervicography is a natural development of colposcopy. It attempts to replace subjective colposcopic evaluation with objective photographic assessment and the fact that it is being recommended by one of the great pioneers of American colposcopy, Adolf Staft, is significant. At our present stage of development in Singapore, cervicography would rapidly improve the skills of a larger panel of colposcopists and would eliminate observer bias if experiences are shared through exchange of photographs.

Treatment

There are five treatment modalities for CIN – electrocautery, cryosurgery, CO_2-laser vaporisation, cone biopsy and hysterectomy, the last two being generally reserved for CIN III. When Pap smears read Class III, it is important to obtain a suitable histological diagnosis by colposcopically directed punch biopsy before proceeding to conservative management. Such treatment is reserved for young patients in whom the retention of reproductive function is important. An alternative is cone biopsy. Only hysterectomy will ensure complete removal of an in-situ carcinoma.[18]

The published figures indicate that electrocautery, cryosurgery and CO_2 laser produce equally good results (Table 1).[19-23]

The variation in the exact percentages are

Table I. Cure Rates for Cervical Intraepithelial Neoplasia with electrocautery, cryosurgery and CO_2 laser vaporisation.

Method	No. of Patients	Cure Rate	Reference
Electrocautery	110	89.1%	Peckman et al (1982)[20]
Electrocautery	1864	97.3%	Chanen & Rome (1983)[19]
Electrocautery	413	86%	Schuurmans (1984)[16]
		96.6% (2nd t/t)	
Cryosurgery	247	95.9%	Peckman et al (1982)[20]
Cryosurgery	166	89.2%	Stuart et al (1982)[21]
Cryosurgery	102 (CIN III)	93%	van Lent (1983)[22]
Cryosurgery	105	88%	Hemmingson (1983)[23]
Laser	441	76.4%	
		98% (2nd t/t)	
Laser	297	96%	Baggish (1982)[26]

Table II. Failure Rates with conservative treatment in Cervical Dysplasia and Carcinoma-in-situ

Diagnosis	FAILURE RATE OF TREATMENT	
	Ostergaard (1980)	Peckman et al (1982)
Mild Dysplasia	6.3%	5.9%
Moderate Dysplasia	7.5%	11.3%
Severe Dysplasia	7.1%	9.3%
Carcinoma-in-situ	38.8%	25.7%

probably due to the percentages of CIN III in the series, and to some extent, on the thoroughness of treatment and skill of the surgeon. (Table II). Two groups of workers in the United States have shown that failure rates increased three to five fold between early cervical dysplasia and carcinoma in situ.[20, 24] Peckham et al. (1982) noted that cryosurgery produced fewer failures than electrocautery.

Malcolm Coppleson who is unrivalled in his experience with preinvasive lesions of the cervix stays with colposcopically-directed electrocautery and has impressive results.[25] The author's preference is for cryosurgery. Cryosurgery has the advantages of ease, economy, elegance, an even depth of treatment, equal effectiveness with other modalities, and it eliminates the need for general anaesthesia (6E). Presently the results of laser treatment do not justify the high expenditure on the equipment.

In 1982, the American College of Surgeons' Commission on Cancer released their figures on the follow-up of 8,468 patients with in-situ cervical cancer.[26] Ten year survival without treatment was 96.6%, with cone biopsy it improved to 99.3%, and with hysterectomy, it further improved by 0.5% (99.8%). The excellent survival without treatment is due to the slow progress of the disease and the fact that only a small percentage of in-situ cancer becomes invasive. But it would be a mistake to think that a policy of "watchful waiting" can be advocated. It would be interesting to study the figures of the 15 and 20 year reports.

In comparision, 14% of 220 patients with Cancer of the Cervix FIGO Stage IB treated at the University of Minnesota Hospitals during the same 10 year period developed recurrent disease and did not survive.[27] As expected, adeno-squamous cancer carried a worse prognosis than squamous cell carcinoma.

INVASIVE CANCER

From time to time there is a revival of interest in radical hysterectomy in various parts of the world, but the main interest during the late seventies has been the collaborative studies of various oncology groups in the USA on the chemotherapy of advanced squamous cell cancer.[28-35]

Radical hysterectomy in the hands of a skilled surgeon is an excellent choice for the young patient with Stage I disease. It is the treatment of choice for certain rare varieties like verrucous carcinoma which are radioresistant.[28] However, the selection of patients with early Stage II (Vagina) for surgery must be very stringent, and in cases of doubt it is better to use radiotherapy. The wise surgeon may abandon a case at laparotomy because once the uterus is removed, the opportunity for intracavitory radium is irrevocably lost, and external radiotherapy cannot achieve equally good results. As pointed out by Rutledge,[29] there are two common pitfalls in radical hysterectomy; the cautious surgeon staying too close to the uterus and the bold surgeon taking on cases with parametrial involvement both leave tumour behind at the edges of the excision.

Chemotherapy

Many oncologists now emphasise the need to identify the patients who are at risk of having disseminated disease and to subject them to systemic therapy. Until just a few years ago, combined chemotherapy has been reserved for patients with advanced disease and the results have been uniformly disappointing. Modern therapy produces a higher percentage of remission but renal, haematologic and gastrointestinal toxicities are severe.[30, 33-35] Cisplatin is the favourite drug. Although single agent treatment is not recommended some combinations are not more effective; for example, the addition of dianhydrogalactitol to cisplatin did not enhance the rate, quality or duration of response of the tumour to cisplatin alone.[30] The best results (remission rate of 66%) has been achieved with the combination of cisplatin, bleomycin, adriamycin and methotrexate.[33] It is important to remember that the quality of life during such treatment is poor, and some patients may opt out of treatment.

ENDOMETRIAL CANCER

Risk Factors

Many gynaecologists advocate oestrogen replacement for menopausal women in order to relieve menopausal symptoms, to delay aging of tissues and to prevent osteoporosis. It is effective. But when oestrogen alone is given, the risk of endometrial hyperplasis is increased to 3-9% as against a natural incidence of 1-3 per 1000 post-menopausal women.[40] The risk of endometrial cancer is increased two to threefold (i.e. if the natural incidence is 1:1000, oestrogen usage makes it 2-3:1000). This risk can be reduced by using the minimum amount of oestrogen, adding progestogens in a physiological pattern, and by reducing the duration of usage. It is important to remember that adenomatous hyperplasia and endometrial hyperplasia can occur without uterine bleeding, with normal cyclical bleeding or with dysfunctional uterine bleeding. Women who are on oestrogen replacement require a diagnostic curettage yearly, or once in two years if they are on oestrogen-progestogen combinations.

Diagnosis

At present there is no effective way to screen for endometrial cancer, apart from taking a thorough endometrial biopsy. Cost-effectiveness alone is enough to negate against this procedure being made a routine.

The pick-up rate of endometrial cancer through Pap smears is poor and endometrial brushes designed for sampling the endometrium are usualy too large, especially for the nullipara who are at highest risk. Jet washings have been used to obtain endometrial samples for cytology and they were reliable when used in the presence of symptoms.[42] Their effectiveness in routine screening remains to be demonstrated.

Treatment

Total hysterectomy with bilateral adnexectomy and radiotherapy is the standard treatment. The overall survival rate is 70%, and 5-year survival for Stage I is around 78%.[43]

Progestogens and Progesterone-Receptors

Megestrol acetate is an effective alternative to surgery in poor risk patients with atypical endometrial hyperplasia and 90% remission may be expected.[44] High dose progestogens may slow the progress of endometrial cancer by promoting the differentiation of the tumour. The absence of oestrogen receptors and progesterone receptors in malignant endometrial tissues have been associated with a poor response to progestogen treatment.[45, 46] So oes-

trogen priming to increase the content of progesterone receptors in the neoplastic tissue may help achieve better results, and since tamoxifen appears to work as well as oestradiol in this respect, it would appear to be the logical choice.[47]

New Development

Mullerian inhibitory substance has been discovered by Nathalie Josso of Paris. It is responsible for inhibiting the differentiation of the female reproductive system in males. Its antitumour activity against a human endometrial carcinoma cell line in-vitro has now been demonstrated[48] and we look forward to its synthesis by recombinant DNA technology.

CANCER OF THE OVARY

The biggest problem with cancer of the ovary is early diagnosis. Campbell recommends annual ultrasonographic scanning for women above 50.[49] In the post menopausal woman, if the ovary exceeds 5 ml. in volume, there is a 50% probability that it contains some pathology. As with cancer of the cervix and endometrium, prognosis with borderline malignancy is several times better than with a well differentiated carcinoma (93% versus 34% five-year survival).[50]

There is one report that progesterone is a possible tumour marker in "non-endocrine" ovarian tumours.[51] Futher studies corroborating this observation would be needed before it is employed as a routine screen.

Treatment

Surgery is the most effective treatment for cancer of the ovary and its success depends on how completely the tumour is removed.[52] In Stage II disease (tumour extending beyond the ovaries into adjacent pelvic structures), 4-year disease free survival drops from 69% with complete removal to 18% with incomplete surgery. Even when the tumour is more advanced a satisfactory response to subsequent therapy can be achieved if initial surgical debulking is successful.

Survival in Stage Ia (tumour confined to one ovary) with well differentiated tumours is probably not improved by post-operative treatment, this being shown to be the case at least for mucinous tumours.[53] In all other stages, its is now standard practice to follow with radiotherapy and chemotherapy.

Chemotherapy

The traditional chemotherapy of the sixties was cyclophosphamide. Single agent chemotherapy is still being used for Stage II disease, but apart from phenylalamine mustard (74% response)[54], the response to other agents, like melphalan, AMSA, tamoxifen, JM8, and leucocyte interferon have been poor (5-25% response).[53, 55-58] Better results are obtained with combination chemotherapy.[59-62] However, the dramatic fall in survival curves after 48 months suggests that the current chemotherapeutic regimes are not dramatically changing the long term survival rates.[63]

Most regimes use a platinum based combination, usually with adriamycin and cyclophosphamide, and also with hexamethylmelamine and cyclophosphamide.[5-639] Tumours which fail to respond to cisplatin may respond to its analogue, JM8.[57] Long term survival is not entirely dependent on a complete response so it is not necessarily a good thing to keep a patient on the brink of toxicity. Death from drug toxicity occurs in 1% of patients.[63]

Second Look Surgery

If tumour is left behind at primary surgery, a second look operation is now recommended following radiotherapy and/or six to ten courses of chemotherapy.[64-67] About 30-40% of unresectable tumours are resectable at re-laparotomy and radical operations may be successfully undertaken. The second look operation is also useful in evaluating patients in clinical remission and in individualising subsequent management.

TROPHOBLASTIC DISEASE

Complete or true hydatidiform mole is characterised by hydropic degeneration of the villi, hyperplasia of the trophoblast, absence of a fetus and a high malignant potential. Molar degeneration, the so-called partial hydatidiform mole, refers to hydropic changes in an otherwise normal placenta which is associated with abnormal embryos and fetuses.

Genetics

Recent cytogenetic studies showed that the two conditions are fundamentally different. The true hydatidiform mole has no maternal chromosomes, all its 46 chromosomes being derived from the father, whereas the partial mole is triploid (69XXX or 69XXX). This observation, originally made by Kajii et al in

1977[68], has been widely confirmed by Patricia Jacobs in Hawaii and numerous workers elsewhere[69-76]

The vast majority of hydatidiform mole are female, and they result from the fertilisation of an empty egg (no genome) by a haploid sperm which then duplicates without cytokinesis to restore the diploid number.[77] Y chromosomes are present in 8-9% of hydatidiform mole. This is the result of the fertilisation of an empty egg by two spermatozoa, one of which must be X-bearing and the other Y-bearing.[78] Heterozygosity is suspected of having a higher propensity for malignancy because 74% of choriocarcinoma (19 cases) were found to have the Y-chromatin by Davies et al[79] and Wake et al found that 3 out of 5 heterozygous moles developed post-molar disease whereas none of the 21 homozygous moles did.[80] However, in other studies, homozygous moles (5/27 cases) also develop pathological sequelae.[81]

Diagnosis

The clinical presentation of hydatidiform mole is too well known to merit repetition. With the advent of ultrasound, diagnosis no longer presents a problem. The routine use of ultrasonography at 8-10 weeks' amenorrhoea should eliminate a late diagnosis of hydatidiform mole.

Follow-up

About 15-20% of hydatidiform mole develop malignant sequelae.[82-86] Interestingly, the HongKong workers report an 11.4% malignant sequelae for partial hydatidiform mole.[86] In Singapore, we have shown that if the malignancy is recognised within 4 months of the original diagnosis, a 100% cure can be expected.[87] This observation has now been confirmed by a large series from the John I Brewer Trophoblastic Disease Center at Northwestern University where all 142 patients with invasive mole and choriocarcinoma that were diagnosed within 4 months of the mole experienced permanent remission following chemotherapy.[88] Similarly, at the USC, all 27 patients with post-molar trophoblastic disease achieved remission with treatment.[89]

Residual trophoblastic disease and true choriocarcinoma are as alike as a balloon to a cannonball. It is important to recognise the disease in its early spectrum by close monitoring of patients following the evacuation of a mole.[82] Beta-hCG remains the single most valuable tumour marker.[90] A secondary rise in beta-hCG or its persistence beyond the 12 week of primary treatment denotes residual trophoblastic disease.

Hysterectomy/Pregnancy

With the advent of suction curettage and safe, efficient chemotherapy, it has become unnecessary to remove the uterus in young patients. A waiting period of six months before embarking on the next pregnancy is adequate, provided beta-hCG reads below 5 miu/ml for three consecutive months. Oral contraceptives provide the best form of contraception. The observation from the RCOG Choriocarcinoma Registry that oestrogen based contraception gave rise to a three-fold need for chemotherapy[91] has not been confirmed by two studies from the United States.[84, 89]

Chemotherapy

Residual trophoblastic disease may be managed by single agent chemotherapy.[92] High dose, intravenous methotrexate alternating with folinic acid (the so-called "Tissue Rescue System") is the simplest and most effective method, and unlike the old conventional therapy, it is almost without side effect.[84] The patients may be managed safely on an outpatient basis after an uneventful first course in hospital. Actinomycin-D is a useful second line agent.

Combined chemotherapy is recommended for late trophoblastic disease. The usual combination is methotrexate-actinomycin-D-Chlorambucil (MAC).[84,93,94] More complex regimes may use 5 to 7 agents.[94] The combination of cisplatin, bleomycin and vincristine has been reported by several independent teams to be effective for choriocarcinoma not responding to various combination chemotherapy.[95-97] However, our experience with one case showed that this produced a remission but not a successful cure.[98]

High dose VP-16-213 (Etoposide) monotherapy is one of the more active agents for the treatment of germcell tumours.[99] But because of high toxicity it is generally reserved for those patients who are not expected to be cured by standard chemotherapy. Newlands and Bagshawe used it from 1976 to 1978 for choriocarcinoma patients who were resistant to the dugs and they found that 57% experienced improvement or partial remission: from 1979 they have been using VP-16-213 for medium risk patients and they achieved a 79% remission.[100] For high risk patients, VP-16-213 is combined with methotrexate and Actinomycin-D, followed by

vincristine and cyclophosphamide. This produced 67% remission. VP-16-213 may emerge as a first-line agent for choriocarcinoma falling into the medium to high risk category.

Interestingly, the workers at Northwestern reported that there was no advantage in treating all patients with choriocarcinoma-following-a-term-pregnancy with initial multiple agent chemotherapy unless high-risk characteristics were present.[101] Their overall remission rate was 61% for post-term choriocarcinoma as compared to 87% for choriocarcinoma following hydatidiform mole, abortion and ectopic pregnancy combined. However, post-term choriocarcinoma has a higher propensity for early mestatasis.[102]

It has been shown that an analogue of gonadotrophin releasing hormone could protect against testicular damage by cyclophosphamide.[103] The question as to whether young patients with choriocarcinoma need such protection during chemotherapy, and whether it is equally effective needs to be addressed.

Is Routine Prophylactic Screening Feasible?

If the time from delivery to treatment was greater than four months, the remission rate was reduced to 41% versus 80% for those cases disgnosed before the fourth month. One wonders whether, in high risk areas or among higher risk patients, the routine beta-hCG screening during the sixth post-natal week would eliminate this risk of choriocarcinoma. It is certainly a simple thing to do, and it would not be expensive if performed on a large scale.

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BOOK REVIEWS

LYMPHATIC FILARIASIS

Fourth report of the
WHO Expert Committee on Filariasis
Technical Report Series 702

This report in a booklet (15cm x 20cm) is pocketable in size but voluminous in contents. It covers a comprehensive range of what is known about lymphatic filariasis. What makes the report even more useful apart from its up-to-date knowledge is that after each chapter, suggestions are made for further study and research on aspects of the disease that require elucidation.

Lymphatic filariasis is often associated with socio-economic woes i.e. malnutrition, illiteracy, poor environmental conditions, inadequate housing and poverty. If these are preconditions for the disease then Singapore must be regarded as a most inhospitable place for lymphatic filariasis. Moreover the disease will be frustrated at each important link in the necessary chain of events on which lymphatic filariasis is dependent.

It is the absence of the disease in Singapore that makes the global magnitude of human lymphatic filariasis so mind boggling. It is hard to imagine that 90.2 million people are infected with the disease. Those at risk number 905 million and those living in endemic areas total 2677 million. China, India and Indonesia account for two thirds of the estimated total of infection.

The clinical recognition and laboratory demonstration of the filarial parasites including their periodic and subperiodic variants are not difficult. Animal reservoirs and insect vectors have been identified and effective measures of control are available. Chemotherapy with efficacy proven diethylcarbamazine (DEC) used over a 35 year period of time is both cost-effective and safe. Why then is the disease still of such magnitude in spite of the "know how" to combat it?

Lymphatic filariasis defies conquest because it is not an acute and fatal disease with dramatic impact. It has always been accorded a low priority rating in the health care delivery systems of the affected countries. Additionally, it is a disease associated with socio-economic woes compounded by unenlightened attitudes and behaviour of people to the disease. The real solution lies in uplifting the socio-economic well being and education of the people. This is of course easier said than done. Much has already been done but much more needs to be done.

The Expert Committee has suggested useful and important measures that can ameliorate the disease instead of just lamenting in despair. These suggestions are incorporated in the concluding chapters of the report, chapter 9 to 11. An interesting observation is the recommendation to incorporate the control of lymphatic filariasis into the primary health care system of the country and a more sustained effort at health education. No one can quarrel with the following statement by the Committee. "Much can be achieved with existing tools, but the problems are so formidable that the overall goal of health for all by the year 2000 will not be achieved unless Member States give filariasis control a higher priority in their health programmes." The eradication of human filariasis depends as much, if not even more, on politicians, economists and educationists as on medical scientists. ■ VC

FAMILY PLANNING AND SEX EDUCATION OF YOUNG PEOPLE:

– Report on a WHO meeting, 1982

This small booklet of just over forty pages records the recommendations of a Working Group on Family Planning and Sex Education of Young People which was convened by the WHO Regional Office for Europe. It explored the problem of sex education for adolescents and the question of family planning services for this age group.

Proposals for the development of sex edu-

cation programmes are discussed and guidelines for educational programmes, for the provision of family planning services for young people and for the training of staff can be found in this book.

This book is essential reading for anyone involved in the adminstration or development of sex education programmes or family planning services for the young. It provides some useful insight into the problem of human sexuality in the adolescent. ■

PK

HEALTH SYSTEM SUPPORT FOR PRIMARY HEALTH CARE

Bogdan M. Kleczkowski
Ray H. Elling
Duane L. Smith

The Member States of WHO in 1977 during a forum "Health for all by the year 2000" identified and recognised Primary Health Care as the key to reaching this goal.

Subsequently in 1981 the thirty-fourth World Health Assembly adopted a Global Strategy in consonant with the aim of achieving the above goal of providing health care for all by the end of this century.

During the same Health Assembly, Technical Discussions were held to deliberate the question of health system support for primary health care in order to achieve a better understanding of the concepts and changes needed in approaches to health problems and in health system throughout the world.

This interesting WHO publication in 1984 of 104 pages is based on the Technical Discussions above. The subject matter is surprisingly comprehensive and develops from the historical viewpoints of global health pattern to the requisite of national and international governmental roles in support of primary health care systems.

Whilst the concepts espoused during these discussions do not pretend to provide a panacea for the deficiencies of world health care systems it none-the-less should appeal to both the casual and serious readers interested in primary health care. The range stretches from the role individual medical personnel can contribute to broad national policies of financing and manpower developments.

Notable points in this book include:-

1. The call to most countries to reconsider the whole complex of factors motivating people to support (or not to support) primary health care.

2. Redirecting the flow of resources so that proportionately more goes towards primary health care rather then highly specialised work.

3. The need to stem the tide of irrelevant sophisticated medical technology i.e. Buildings, equipments and materials must be relevant to the performance of tasks required to meet local health needs and demands.

4. To explore the possibilities and develop national inter-sectoral support with primary health care e.g. agriculture with food supply and nutrition; labour and industries as regard occupational hazards; education with the prevention of ill-healths.

5. The training of primary health care workers to meet the shortage of health manpower.

6. The recommendation that to make the best use of limited financial resources, the available drugs be restricted to those proven to be therapeutically effective and acceptably safe and to satisfy the health needs of the population. Experience has supported the notion that the number of really necessary drugs is relatively small.

It is all-in-all a highly readable and inspiring little book quite apart from the usual dry and bland compilations of so many of its genre.

SY Yeo

NEWS FROM THE COUNCIL

1. Annual General Meeting

The Fourteenth Annual General Meeting of the College will be held on Sunday, 26 May 1985, at 2.30 p.m. Members are asked to take a note of this and keep the date free to attend the meeting. The Tenth College Council (1985-87) will be elected at this meeting.

2. Obstetrics & Gynaecology Update

The Continuing Medical Education Unit of the College has organised the above course, commencing 1 March 1985. The programme is as follows:

Lectures on Fridays

Date	Topic	Lecturer
1.3.85	Urogenital Tract Oncology	Prof S S Ratnam MBBS, FRCS, FRCS(E), FRCS(G), FACS, FRACS, FRCOG, MD
8.3.85	9.00 — 9.45 p.m.: Contraception	Dr Mary Rauff MBBS, MRCOG, M Med
	9.45 — 10.15 p.m.: Natural Methods of Family Planning	Dr Victor Wee Sip Leong MBBS, MCGP(S) Mrs Vivienne Wee
15.3.85	9.00 — 9.30 p.m.: Management of vaginal discharge	Dr Lim Lean Huat MBBS, MCGP(S)
	9.30 — 10.00 p.m.: Management of human sexuality	Dr Lim Su Min MBBS, MCROG
22.3.85	Management of Gynaecological problems in: (i) Adolescence (ii) Elderly	Dr Cheng Wei Chen MBBS, FRCOG. FRCS(E), FRCS(G)
29.3.85	Management of menstrual irregularities and dysmenorrhoea	Dr Paul M Tan MBBS, MRCOG
5.4.85	**PUBLIC HOLIDAY — NO SESSION**	
12.4.85	9.00 — 9.45 p.m.: Management of female infertility and subfertility	Dr Peter C T Chew MBBS, MRCOG
	9.45 — 10.15 p.m.: Management of male infertility and subfertility	Dr Charles Lim MBBS, M Med, MRCOG, FRCS
19.4.85	Antenatal Care	Dr O A C Viegas MB chB, MRCOG
26.4.85	Management of pregnancies with chronic medical and surgical conditions	Assoc Prof Charles S A Ng MA, MB BChir, MRCS, LRCP, FRCOG

Clinical demonstrations on Sunday afternoons from 2.30 — 4.30 pm

3.3.85	Clinical case demonstrations	)
10.3.85	Clinical case demonstrations	) Group "A" participants
17.3.85	Clinical case demonstrations	)
24.3.85	Clinical case demonstrations	) Group "B" participants

N.B.: Group "A" participants = Doctors with surnames from A to L
Group "B" participants = Doctors with surnames from M to Z.

3. New Members

The following have been accepted by Council into membership of the College during January/March 1985:

Dr Auw Tiang Meng	Associate Membership
Dr Chong Hoi Leong	Associate Membership
Dr Khoo Sork Hoon	Associate Membership
Dr Lai Oi Leng	Associate Membership
Dr Lum Kuan Yin	Associate Membership
Dr Tay Kok Ling	Ordinary Membership
Dr Wu Dah Wei, David	Ordinary Membership

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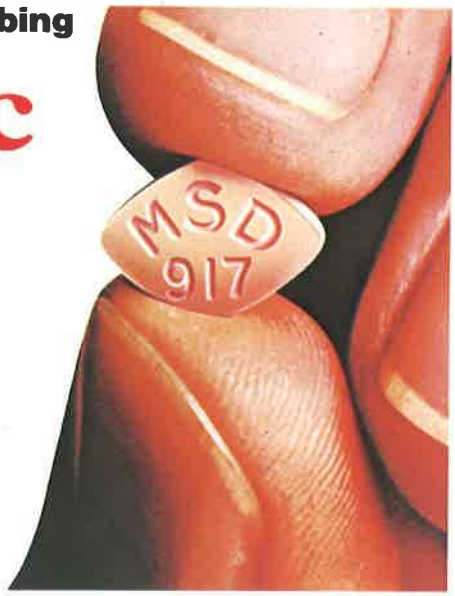

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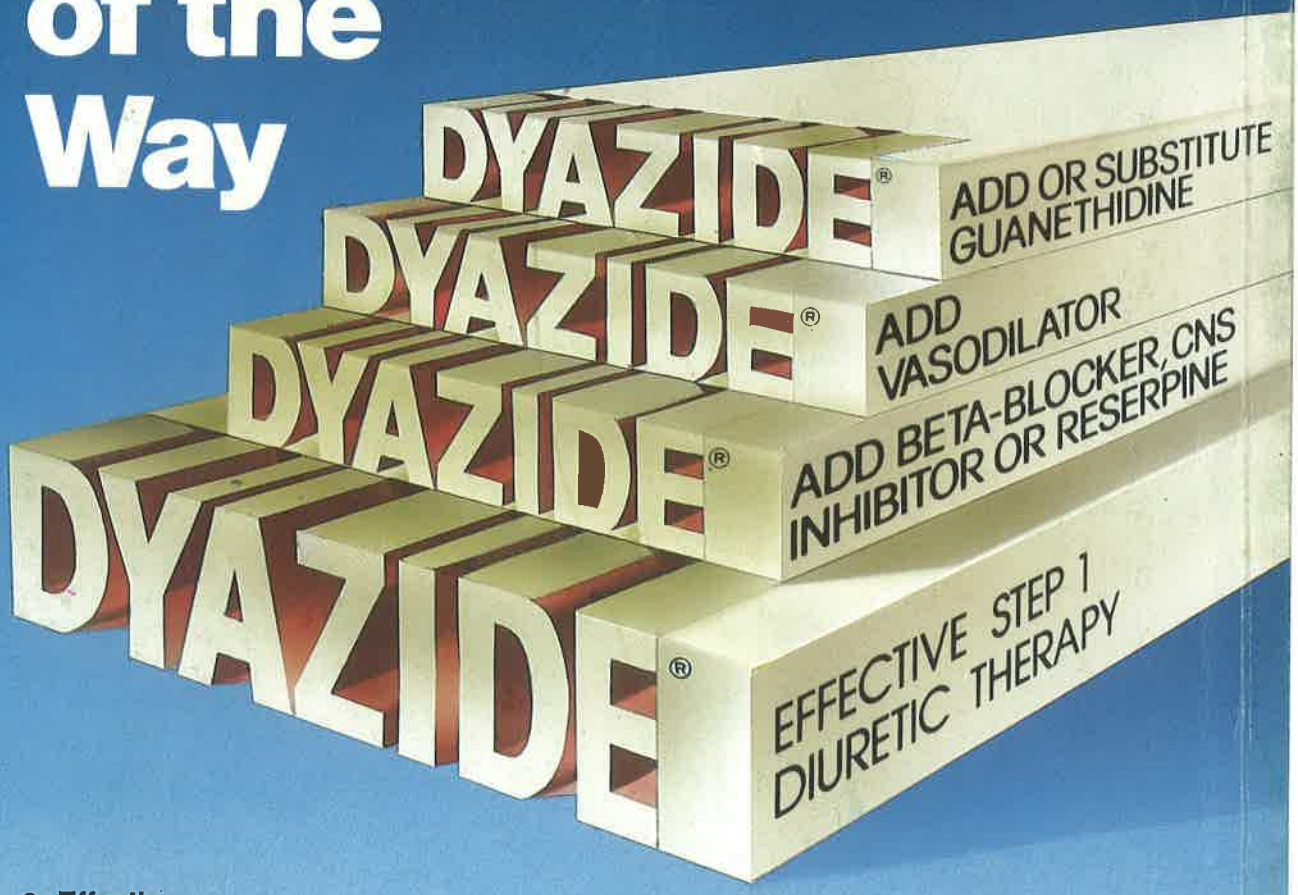

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