COLLEGE OF FAMILY PHYSICIANS SINGAPORE

The SINGAPORE FAMILY PHYSICIAN

OFFICE GYNAECOLOGY

- Hormone Replacement Therapy
- Abnormal PAP Smear
- Pelvic Inflammatory Disease
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ISSN 0377-5305

Vol. XXII No. 1
Jan / Mar 1996

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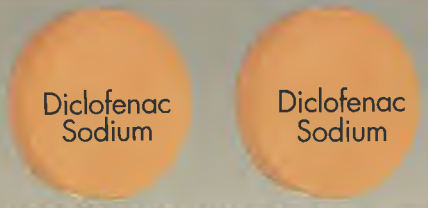

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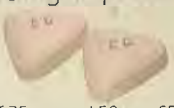

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The Singapore Family Physician

College of Family Physicians Singapore
College of Medicine Building
16 College Road #01-02, Singapore 169854

Vol XXII No. 1 **January - March 1996** M.I.T.A.(P) No. 014/01/95
Price to Non-Members S$10.00

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GYNAECOLOGY, ECONOMICS AND SCREENING IN PRIMARY CARE

Singapore, like many other countries, is experiencing rising health care costs. There are as many contributing factors as there are measures taken to contain costs. However, the most basic and cost effective measures are at the primary care level where prevention of onset of disease can be addressed.

Women are powerful and effective contributors to a country's economy. As a result of dramatic increases in life expectancy over the last few decades, women may now live one third of their lives post-menopause and today's women count upon maintaining a high quality of life throughout these later years. Further, many mature women expect to lead active lives and to participate in the work force, goals that are not served by symptoms of oestrogen deficiency.

Today, menopause has assumed greater importance due to this large increase in the number of women older than 45 years, placing heavy demands on future health-care resources.

The menopause, a physiologic event that occurs in all women after the age of 50 years, can be associated with distressing symptoms and long-term life-threatening diseases, such as osteoporosis and cardiovascular disease. While the clinical use of HRT for specific relief of menopausal symptoms is well accepted, the major debate concerning HRT is whether widespread general use should be encouraged as a policy in asymptomatic healthy post-menopausal women for prevention of osteoporosis and cardiovascular disease.

While HRT has improved the quality of life for many women, discontinuance of HRT and compliance to therapy have to be addressed. Here, primary care physicians have an important role, for patient compliance to HRT is enhanced when physicians encourage communication with their patients, promote trust by providing comprehensive information and maintain sensitivity to the issues surrounding compliance with diligent follow-up.

In the midst of controversies surrounding HRT, we must not fail to recognise that the woman who suffers most, both physically and socially from the menopause, and from ageing, is the less educated, less affluent woman. This woman, unfortunately, is the one who is least likely to seek or receive medical help. To reach her, to understand and to help her, is a major challenge to the family physician.

The Papanicolaou smear test, since its introduction for the detection of cervial cancer, has resulted in a dramatic drop in the incidence of cervical neoplasia. PAP smear screening schedules vary from country to country - generally it is advisable for it to be performed annually on all women who are sexually active or who have reached the age of 18; less frequent testing at up to 3 years' intervals is considered permissable after 3 or more consecutive annual smears are reported normal.

However, there have been no recommendations regarding the age at which to stop testing, although 60 is generally accepted for termination of screening.

Family physicians not only have a responsibility to educate their patients about the value of PAP smear tests, particularly when they should be

taken, they should also themselves be adequately trained to carry out PAP smears and advise on the management of abnormal smears.

Colposcopy has become the standard for further evaluation of the patient with abnormal PAP smears; it is also a cost- effective method.

The question then is "Should primary care / family physicians be trained in the concepts, knowledge and techniques of colposcopy?" and "Can the College of Family Physicians, Singapore, together with appropriate specialist bodies, government and the University offer and train family physicians?" Qualified and certified family physicians can then perform many therapeutic procedures in the office at minimal cost safely for non-invasive cervical disease. However, it is important and necessary that frank squamous cell carcinoma, endometrial cancer or other obvious neoplasm be referred to gynaecologists straightaway since it is pointless to do a screening test when there is obvious malignancy.

The PAP smear is a powerful tool for screening women for cervical neoplasia, and primary care physicians should be in the forefront in providing this service.

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Dr Lim Lean Huat

MENOPAUSE AND HORMONE REPLACEMENT THERAPY (HRT)

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INTRODUCTION

We live in an ageing society. For women, increased life expectancy means that they now may live 30 years in the postmenopausal state. Although menopause is a natural event, it has been found that a lack of estrogen caused by ovarian failure can have a significant impact on health. Also, each woman experiences an individual menopause tempered by her biology, culture and life experiences.

The best way to diagnose the perimenopause (climacteric) is by a careful history of recent onset of hot flushes and night sweats, vaginal dryness and infrequent menses in women aged over 40 years. Measurements of follicle stimulating hormone (FSH) and estradiol levels are not needed and may indeed be unhelpful because of marked daily variations. However, it is prudent to perform them in younger women when a diagnosis of premature menopause is suspected.

SHORT-TERM SYMPTOMS

Short-term symptoms of estrogen dificency which include vasomotor symptoms, psychological symptoms and urogenital atrophy can cause considerable distress, but will resolve with time. The long-term estrogen deficiency problems of osteoporosis and cardiovascular disease result in greater risk to a woman's health, causing considerable suffering and morbidity.

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Vasomotor symptoms include hot flushes palpitations, night sweats, headaches, giddiness and insomnia.The hot flush is the most common and most easily recognisable symptom of the menopause. Vasomotor symptoms are more commonly reported within a few years prior to the menopause. Estrogen is the treatment of choice for hot flushes, and symptom relief can be expected within a few weeks of commencing treatment. Relatively low doses of estrogen are sufficient to treat hot flushes as well as alleviate headaches and insomnia, leading to improved general well-being.

Psychological symptons including depression, irritability, mood swings, poor memory, difficulty in concentration, lethargy and loss of libido are also often most troublesome in the few years preceeding the cessation of menses. This is thought to be due to fluctuating hormone levels. It must also be acknowledged that socio-cultural factors, individual characteristics and the environment all interact at this time to influence the menopause experience.

It has been argued that the excess of depression in climacteric women may be secondary to other somatic climacteric symptoms, such as hot flushes and insomnia, and that improvement in mood seen with estrogen replacement therapy (ERT) is simply due to the alleviation of such somatic symptoms, However, it has been shown that ERT improves mood in women without somatic symptoms. While estrogen may help women with depressed mood, more serious depression requires psychiatric referral. Also the addition of progestogen in HRT dampens the beneficial effects of estrogen on mood.

Estrogen also enshances cognitive function. New data strongly suggest that in appropriately treated menopausal women, estrogen does play an important role in the maintenance of short-term memory. Very new, preliminary data suggest that estrogen may retard the likelihood or the severity of Alzheimer's disease. While relatively low doses of estrogen can alleviate hot flushes, higher doses may be required for the relief of psychological symptoms.

Atrophic Changes

The estrogen deficiency of the menopause results in localized atrophy of the urogenital tract, as well as more generalized atrophy affecting a variety of tissues.

Urogenital Tract

Atrophy of the vulva and vagina gives rise to atrophic vaginitis, leading to vaginal dryness and dyspareunia. Atrophy of the lower urinary tract results in the urethral syndrome of dysuria, frequency, nocturia, urgency and incontinence, as well as the development of recurrent urinary tract infections. These may socially isolate a woman.

These atrophic changes can be prevented or reversed with systemic estrogen replacement. Local estrogen therapy is also effective in the alleviation of atrophic symptoms, including recurrent urinary tract infections. Prolonged usage is required and symptoms often recur on discontinuing treatment.

Generalized atrophic changes

Generalized atrophy is most obvious in the skin, as this becomes thinner, less elastic and more liable to bruising. Other atrophic changes which respond to estrogen include hair loss, brittle nails and aching joints.

LONG-TERM PROBLEMS

As women age they also incur rising incidences of two other major problems, osteoporosis and atherosclerosis. Prophylaxis for retarding their development is usually much more effective than the therapy needed when they become clinically manifest. Appropriately selected, aymptomatic women should be informed and offered long-term treatment with estrogen to retard and reduce the possible development of these diseases.

Osteoporosis

Skeletal mass increases steadily throughout childhood and peaks at a mean age of 30 years. A period of relative stability then ensues. Bone loss then begins, with a rapid acceleration occuring in many women whenever they are estrogen deficient regardless of the age or cause.

Genetic factors are important in determining the peak adult skeletal mass. In contrast, environmental factors are more important than genetic factors when one considers bone loss. Such environmental concerns include the following:

1) for retardation of development of peak bone mass density - amenorrhoea with hypoestrogenism (regardles of the cause), sedentary lifestyle, calcium intake and cigarette smoking and

2) for accelerating bone loss - cigarette smoking, alcohol intake, sedentary lifestyle, thinness, and estrogen levels.

The development of osteoporosis is determined by peak bone mass and the rate of bone loss. Neither exercise nor calcium supplementation will provide adequate prophylaxis of osteoporosis. In contrast, estrogen, even in very small amounts and particularly with added calcium, is quite effective. Numerous studies show positive effects when estrogen is given at the onset of menopause and even when started in later years.

Cardiovascular Disease

Arterial disease is the major cause of death in postmenopausal women, with ovarian failure significantly increasing the risk of cardiovascular disease (CVD). The increase in CVD is mediated by many factors, including changes in lipid profile and blood vessel metabolism.

An abundance of epidemiological data indicate that ERT retards the development of atherosclerosis in postmenopausal women and reduces their risks of developing myocardial infarction and cerebrovascular accident (stroke). In addition, many prospective studies have also demonstrated that approximately a 50% reduction in myocardial

infarction occurs in estrogen users. Additional evidence from studies of women undergoing coronary artery angiography supports the belief that estrogen use retards the development of atherosclerosis.

While the addition of progestogen to an ERT regimen to protect the endometrium may introduce side-effects and create some concerns in patients about the overall risk-benefit equation, it appears to have no negative or at most a minimal impact on estrogen's beneficial effects. Results of a recent prospective randomized study of the effects of estrogen and of estrogen-progestogen combination on cardiovascular risk factors confirm many of the earlier observations.

The mechanisms by which ERT reduces the risk of CVD may include lipids and lipoproteins, body composition/fat distribution, coagulation/ fibrinolysis, insulin resistance and direct vascular effects.

HRT TREATMENT: TYPES AND ROUTES OF ADMINISTRATION

HRT consists of natural estrogens combined with progestogens in non-hysterectomised women. Progestogens are given cyclically or continuously with the estrogen. Different routes of administration are employed: oral, transdermal, subcutaneous and vaginal. The treatment endpoints are menopausal symptom control (e.g. vasomotor, vaginal dryness), cardiovascular and osteoporosis protection.

Estrogens

Natural versus synthetic

There are two types of estrogens: synthetic and natural. Synthetic estrogens, such as ethinyl estradiol and mestranol, should not be used in HRT due to their greater metabolic impact. Natural estrogens include estradiol, estrone, estriol and conjugated equine estrogens.

Oral versus transdermal

A major decision in selecting treatment is deciding between the oral and parenteral administration routes. The latter avoids the gut and first-pass effect on the liver. After oral administration, the dominant circulating estrogen is estrone, but after parenteral administration it is estradiol. The liver metabolises estrogens; it has been estimated that between 30% and 90% of an oral dose may be inactivated by the liver before reaching the systemic circulation. Other substances produced by the liver may be differentially affected by the two routes. High doses of conjugated equine estrogens increase the production of renin substrate but the clinical significance is unclear as blood pressure does not increase on this form of HRT. Also, production of certain coagulation factors is increased by oral estrogens, but no increased risk of venous thrombotic disease has been documented. However, it would appear prudent to use transdermal estrogens in women who have experienced a previous deep vein thrombosis. Both routes suppress total and LDL cholestrerol, but the oral route may produce slightly more beneficial effects on HDL cholesterol. Conversely, oral estrogens increase plasma triglyceride levels, while non-oral estrogens have either no effect or reduce levels. It is wise therefore to use transdermal estrogens in women with hypertriglyceridaemia. All estrogens, however - regardless of administration route - eventually pass through the liver and are recycled.

Vaginal estrogen

Some women complain only of vaginal symptoms. These women are usually many years postmenopausal and do not wish to bleed or take systemic HRT. For them local vaginal estrogen in cream, pessary or tablet form is all that is necessary.

Progestogens

Types of progestogen

The progestogens used in HRT are structurally different from progesterone and are synthetic. Currently, they are mainly used in tablet form, though norethisterone is available in an alcoholic reservoir transdermal patch combined with estradiol. Progestogens fall into two main groups:

1) 17-hydroxyprogesterone derivatives (dydrogesterone, medroxyprogesterone acetate),
2) 19-nortestosterone derivatives (norethisterone, norgestrel).

The former group is not androgenic and should have no adverse effect on blood lipids, while the later is androgenic and could potentially have an adverse effect by reducing HDL cholesterol when combined with estrogen. Progestogens are added to estrogens to prevent the increased risk of endometrial hyperplasia and carcinoma that occurs with unopposed estrogen. Also, the risk of cancer persists for years after stopping estrogen.

Other HRT Treatments

Tibolone has mixed estrogenic, progestogenic and androgenic actions and is used in women who wish to have amenorrhoea. It is used to treat vasomotor, psychological and libido problems. It may help osteoporosis prevention since studies suggest it reduces bone turnover. It is best used in postmenopausal women with one year or more of amenorrhoea; used earlier it can cause vaginal bleeding. The dose is 2.5 mg daily continuously.

INDICATIONS FOR HRT IN MENOPAUSAL WOMEN

- Alleviation of vasomotor symptoms and mood alterations associated with decreased hormonal levels perimenopausally
- Amelioration of vaginal dryness, dyspareunia and urinary urgency
- Prevention and treatment of osteoporosis
- Improvement of cardiovascular health by lessening the risk of myocardial infarctions and strokes.

Contrary to previous belief, cardiovascular risk factors such as smoking, hypertension, diabetes mellitus, hyperlipidaemia or even previous myocardial infarction are not contraindications for HRT, and may even be considered as indications.

CONTRAINDICATIONS

There are very few women in whom HRT is contraindicated. It is unfortunate that information about contraindications in many data sheets pertain to high dose contraceptive pills rather than HRT. Currently, ERT is contraindicated in patients with unexplained vaginal bleeding, suspected pregnancy or a recent past medical history of deep venous thrombosis or pulmonary embolism. The use of estrogen in patients with a history of estrogen-related tumours, such as breast carcinoma and endometrial carcinoma, is currently the subject of study and debate. Until further data are available, estrogen is contraindicated in this setting. HRT is not contraindicated in patients with cervical, epithelial ovarian (except perhaps endometrioid), vulval or vaginal carcinomas. In women with relative contraindications HRT can be prescribed, but additional investigations may be necessary first, and the type, dose and route of administration may need to be tailored according to the clinical presentation of the individual patient.

Alternatives to HRT may be preferred by some women, but their benefits are more limited. They can be classified as agents which potentially control symptoms (clonidine, hypnotics, vaginal lubricants hypnosis, exercise) or those which have beneficial effect on bone (dietary calcium, exercise, bisphophonates, calcitonin, etc).

USE OF HORMONES PREMENOPAUSALLY

As long as ovarian function is sufficient to maintain some uterine bleeding, no treatment is usually required. In some women, climacteric symptoms may be severe enough to warrant treatment even before cessation of menstruation. If estrogen replacement is begun, the patient should be warned that irregular vaginal bleeding may occur because standard dosages of hormone replacement will not suppress ovarian function. To avoid these problems, low dose oral contraceptives may be administered to women who do not smoke. With use of this type of hormonal therapy, dysfunctional uterine bleeding in premenopausal women is often substantially diminished and operative procedures such as dilation and curettage or hysterectomy are often avoided. Birth control pills can effectively prevent endometrial hyperplasia and decrease the occurrence of functional ovarian cysts. Low dose oral contraceptives also provide approximately 4 to 5 times the bioavailability dose of common postmenopausal estrogen replacement and thus decrease the rate of bone loss. They also provide contraception as HRT when given at an earlier

stage in the climacteric is not a contraceptive. Preference should be givn to preparations containing a so-called third generation progestogen, such as gestodene or desogestrel. These preparations can be continued safely in this low-risk group until at least the age of 50 with the aim of transferring long-term users onto HRT in due course.

Table 1. Absolute and Relative Contraindications of Estrogen Use

Absolute
Undiagnosed vaginal bleeding
Suspected pregnancy
Suspected breast cancer
Suspected endometrial cancer
Active venous thrombosis
History of breast cancer or endometrial cancer*
Malignant melanoma*
Relative+
Uterine leiomyoma
Endometriosis
History of cholelithiasis
History of migraine or otosclerosis
Hypetriglyceridaemia
History of pregnancy-related thrombosis
History of oral contraceptive-related thrombosis
Liver disease

* *currently under debate*

\+ *counsel patient specifically about the potential negative consequences of taking estrogen, if any of the relative contraindications are present*

ADVERSE EFFECTS

In addition, women prescribed HRT should be informed about adverse effects, in particular the neoplastic effects of breast and endometrial cancer, since these areas are estrogen target tissues.

Breast Cancer

Epidemiological data are generally reassuring as most studies show no increased risk of development of breast cancer among postmenopausal estrogen users, with the possibility of a slightly increased risk with long-term use. In a recent update of the Nurses' health study, increased risks of breast cancer were reported for women who were currently using estrogen alone or with a progestogen. There was also an increased risk for women who used HRT for 5 to 9 years. Women between the ages of 60 and 64 who had used HRT for more than 5 years had the highest risk.

However, in another study one month later, no increased risk of breast cancer was noted in women who used HRT. Thus, as in the past, different studies have shown opposing results.

Endometrial Cancer

Many epidemiological studies have reported that there is significantly increased risk of endometrial cancer developing in postmenopausal women given estrogen without progestogens, as compared with non-estrogen users. The risk increases with increasing duration of use of estrogen as well as with increasing dosage. The risk can be markedly reduced by giving the patient progestogens. The duration of progestogen therapy is more important than the dosage. Therefore progestogens should be given to postmenopausal women receiving estrogen if they have a uterus.

INITIAL SCREENING AND ASSESSMENT

HRT should be offered to eligible postmenopausal women at or shortly after the menopause. Patients who are most likely to benefit are those women who are experiencing vasomotor or urogenital symptoms of estrogen withdrawal, those with risk factors for osteoporosis and cardiovascular disease and those who undergo surgical menopause at a young age.

HRT should be instituted after a complete medical assessment consisting of review of past medical history, physical examination including breast and pelvic examination and a Papanicolaou smear and a screening mammography (if not recently performed) to rule out occult breast cancer. A lifestyle review of smoking and alcohol habits as

well as diet and exercise regiments and special attention to intake of calcium is also important. Other laboratory analyses such as liver function tests and serum lipid profile are performed when indicated. The potential risks, benefits, alternatives and choices of regimens as well as common side-effects should be discussed with the patient before commencement of therapy.

COMMON HRT REGIMENS

In general, the ideal HRT is the lowest dose of estrogen that effectively retards bone loss, ameliorates vasomotor symptoms, treats the symptoms of urogenital atrophy, maintains the collagen content of the skin and prevents acceleration of atherosclerosis, Estrogen therapy given to postmenopausal women should result in physiological and not pharmacological circulating levels of estrogen so that the risks of hypertension and thromboembolic disease are not increased. This physiological dose of estrogen is 0.625 mg of conjugated equine estrogens (or 0.3 mg with 1000 mg of calcium), 1 mg of micronised estradiol or 0.05 mg skin patch. The effects of estrogen are dependent on dose and not on the route of administration. Younger women who experience surgical menopause may require a higher dose of estrogen to control vasomotor symptoms than do other women.

The ideal dose of progestogen is one that adequately protects the endometrium from hyperplasia and carcinoma but is low enough to limit the negative effects of progestogens on serum lipids. Furthermore, progestational side-effects such as depression, weight gain and irritability should be minimized. The recommended minimum daily doses of progestogen to be used for 12 days per calendar month to avoid endometrial hyperstimulation are: norethisterone 0.7 - 1.05mg, medroxyprogesterone acetate 5 - 10 mg, dl-norgestrel 150ug, dydrogesterone 10-20 mg. Dosages may need to be adjusted according to bleeding pattern.

Women who have undergone a hysterectomy are no longer at risk for endometrial cancer. Until significant benefits of progestogen therapy are established, an unopposed estrogen regimen, cyclic or continuous, is recommended for postmenopausal women who no longer have a uterus.

For postmenopausal women who have not had a hysterectomy, both sequential and continuous combined have been utilized. In the cyclic regimen, the estrogen is given every day of the month in a continuous fashion and the progestogen given daily for the 10 - 14 days of the month. With the continuous combined regimen, both the estrogen and the progestogen are administered evey day of the month. The cyclic regimen usually results in monthly withdrawal bleeding, which may lessen with continued use. The continuous regimen may result in breakthrough bleeding during the first few months, but with longer use nearly all women remain amenorrhoeic. Because endogenous flucturating estrogen levels in the early manopause may contribute to uterine bleeding with continuous combined regimen, it has been recommended that the sequential regimen be used in the first 5 years after menopause, after which the continuous combined regimen can be utilized to increase patient compliance. Since the side-effects of progestogen therapy are dose-related, reduction in dose of progestogen to the minimum that still protects the endomentrium may lead to improved patient compliance. Therefore, while 5 - 10 mg of medroxyprogesterone acetate is usually prescribed in the sequential regimen, only 2.5 mg is needed when given continuously to prevent endometrial hyperplasia.

BLEEDING DURING HRT

Bleeding that occurs at the time of progestational withdrawal in a cyclic combined HRT regimen is due to hormonal stimulation of the endometrium. Regular withdrawal bleeding is expected, especialy in women who are newly menopausal. Withdrawal bleeding is usually not associated with endometrial hyperplasia or carcinoma. Hence endometrial biopsy is unnecessary. In the setting of cyclic combined HRT, abnormal bleeding is defined as bleeding that occurs at a time during the cycle other than at the cessation of the progestogen. Referral to specialist is advisable. Spotting or irregular bleeding is common in the first three to six months in patients using continuous combined HRT. If bleeding persist after six months, again referral is indicated.

DURATION OF HRT USE

The question is no longer whether HRT should be given but when it should be stopped. When prescribing HRT, the various endpoints that a woman aims to achieve from her treatment should be discussed, such as symptom control and reduction in cardiovascular and osteoporosis risks.

If HRT is taken only for a short time, there may be rebound of vasomotor symptoms. More importantly, protection against osteoporosis and cardiovascular disease (CVD) is lost when treatment is stopped. The benefits of HRT are mostly dependent on the duration of treatment. Recent data indicate that if a woman stops taking estrogen, particularly if she has been taking it for less 7 years, she will receive no additonal benefit in terms of bone loss; eventually bone loss will occur at the same rate as at the onset of estrogen deficiency. Thus, it is now believed that estrogen may need to be prescribed for a much longer time frame, perhaps the lifetime, particularly in women who already have osteoporosis. Similarly, whereas estrogen has a protective effect against CVD, only women who take ERT for long periods will reap the benefits of overall increased longevity. To accomplish these long-term goals, only very low doses of estrogen should be used to minimize their proliferating effects on the endometrium and breast. Large doses should be used only for short-term symptom control and not for long-term maintenance therapy.

THE DECISION FOR ESTROGEN USE

The pros and cons affecting a woman's decision to use estrogen are weighted according to risk-benefit assessments. From the perspective of decreased mortality, the scales would tip in favour of using estrogen.

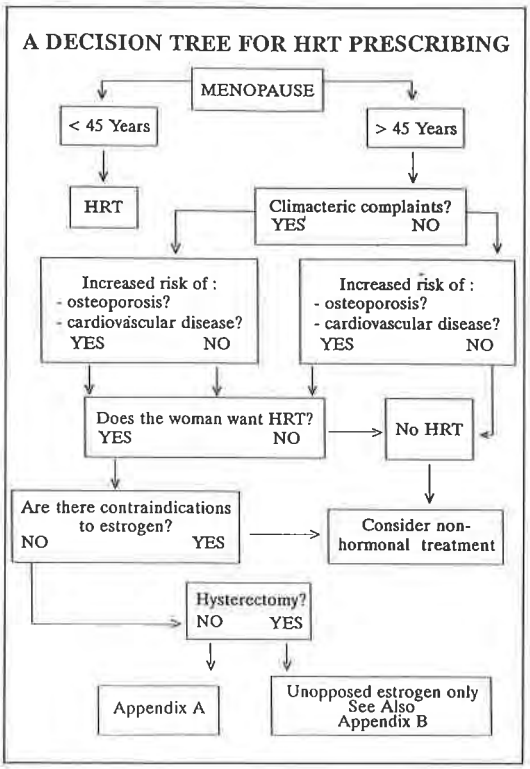
Many more lives are saved because of reduction in osteoporotic hip fractures, ischaemic heart disease and stroke than are deaths due to breast cancer and endometrial cancer. Other less quantifiable variables also affect a woman's decision to receive HRT. On the benefits side are quality of life issues, which affect her ability to function well in society. Recent data strongly indicate that a woman's overall quality of life is enhanced with estrogen use through improvement in her symptoms, mood and psychological well-being.

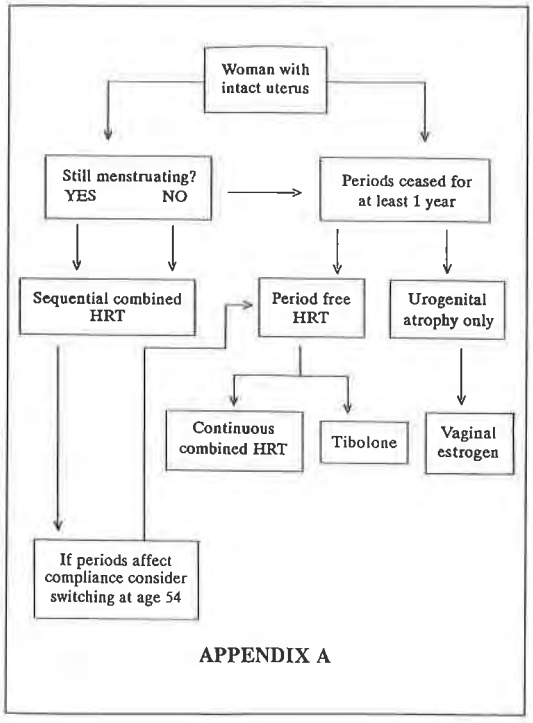
On the risk side are issues of cancer "phobia", the concerns of withdrawal bleeding (unless a bleed-free HRT is used), and the cost of therapy.

CONCLUSION

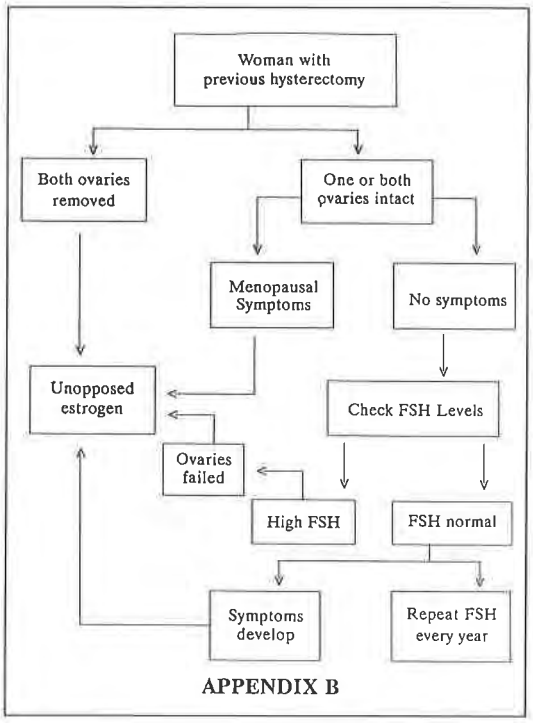
The climacteric should be viewed as an opportunity in primary care to review a woman's health status with attention to her risk factors and as a time for setting goals to achieve a long and functional life. Data are unfortunately not available to assess the ultimate benefits and risks of HRT treatment over a third of a lifetime. The Women's Health Initiative (a National Institutes of Health-sponsored multicentre, prospective, longitudinal, randomized trial comparing HRT with placebo in USA) may eventually clarify some of the existing ambiguities regarding treatment recommendations.

Finally, the decision to treat rests with each woman and her doctor. Because public education is haphazard and from a variety of sources, fear of cancer, intolerance of potentially adjustable side-effects, and dislike of taking medications may deprive many women of this life-enhancing therapy.





APPENDIX A



APPENDIX B

MANAGEMENT OF THE ABNORMAL PAP SMEAR

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INTRODUCTION

It has been 55 years since Papanicolaou and Traut in 1941 described the examination of cells from the vagina to detect cervical cancer[1]. They laid down some of the main principles of screening, when they wondered "if by chance a simple, inexpensive method of diagnosis could be evolved which could be applied to large numbers of women...to discover the disease (cervical cancer) much more frequently than is now possible". Since then the cervical smear has been one of the most effective screening tools in preventive medicine, and the principles of exfoliative cytology and the fixation of the slide in 95% alcohol have remained the same, as described in the seminal paper of 1941.

It is now generally accepted that there is a continuum of changes in the cervix which, if left untreated, is likely to lead to invasive cancer[2-5]. This concept of a pre-invasive stage in the evolution of cervical cancer implied that timely treatment would pre-empt the development of cervical cancer. The renaissance of colposcopy in the 1950s allowed the evaluation of clinically inapparent cervical lesions, and the diagnosis of pre-invasive stage in cervical cancer led to hopes that cervical cancer as a disease could eventually be eradicated [6]. There is little doubt that national Pap smear screening programs have led to a significant decrease in the incidence as well as mortality of cervical cancer. There has been a corresponding increase in the detection of pre-invasive disease and early stage 1 lesions.

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FREQUENCY OF PAP SMEARS

Guidelines on the frequency of Pap smears differ. The recent recommendations by the American College of Obstetricians & Gynaecologists[7] are:

"All women who are or who have been sexually active or who have reached age 18 should undergo an annual Pap test and pelvic examination. After a woman has had three or more consecutive, satisfactory annual examinations (smears) with normal findings, the Pap test may be performed less frequently in a low-risk woman at the discretion of her physician."

A high-risk woman was defined mainly on the basis of sexual practice/history, and other risk factors included the presence of past and present genital infections, a history of genital cancer, immunosuppression, low socio-economic status and women who smoked. With this definition practically all women would fall into the high risk group, especially in Western countries. In family practice with the individual woman it is appropriate to offer screening on a yearly basis, whether the three preceding smears have been normal or otherwise. In women who have reached menopause, and in whom the previous smear history has been normal screening may be extended to once every 2-3 years.

REPORTING OF PAP SMEARS

Unfortunately in Singapore there is no standardisation in the way Pap smears are reported.

Certain laboratories still use the classification with smears divided into classes I-V, and others the system based on descriptive terms, i.e. whether atypical or dysplastic cells are present. In 1988 the Bethesda system was introduced in the United States, which was modified in 1991[8,9]. This system recognises the various categories of normal, reactive/inflammatory, atypical squamous cells of undetermined significance (ASCUS), and squamous intraepithelial lesion (SIL). The Bethesda system is yet to be used in Singapore.

It may be difficult occasionally to decide if a smear is abnormal and requires further evaluation, because of the confusion in the reporting of Pap smears. The best approach would be to appreciate the types of cells reported. Any smear which contains atypical or dysplastic (mild to severe) cells should be considered as abnormal. The presence of koilocytes, indicating the presence of human papilloma virus (HPV) infection, should also be further evaluated with colposcopy because of the frequent co-existence of HPV infection with cervical intraepithelial neoplasia (CIN). The patient with inflammatory smear should be treated and the smear repeated 4 to 6 weeks later. The type of organisms present may at times be indicated on the smear, such as *Candida albicans, Trichomonas, Gardnerella*, and mixed bacterial infection. The appropriate treatment can then be given. An atrophic smear is best treated by local oestrogen therapy for two weeks, followed subsequently by a repeat smear.

Other indications for colposcopy include persistent post-coital bleeding, even in the presence of a normal smear, and a cervix which grossly looks suspicious. A smear from a frank, invasive cervical carcinoma has on occasion been reported to contain just "degenerate" cells, with the recommendation to repeat the smear at a subsequent date. A fungating growth may give rise to necrotic cells which are difficult for the pathologist to interpret. This pitfall is avoided if a patient with a suspicious cervix is evaluated further, despite the presence of a non conclusive or negative smear.

COLPOSCOPY

In 1925 Hinselmann in Germany described the use of a microscope for the examination of the cervix to detect clinically inapparent lesions. The technique however was not widely accepted, because the initial equipment was cumbersome and the literature and terminology were largely in German. Subsequently colposcopy became an accepted part of gynaecologic practice, because of refinements in techniques and equipment and standardisation of terms used.

The colposcope produces a stereoscopic image of the cervix at magnifications of 6 to 20 times, at a focal length of 20 to 30 centimetres. Colposcopy is done on an outpatient basis, and is associated with minimal inconvenience and discomfort to the patients. A colposcopic assessment is termed "satisfactory" if the whole lesion is seen, as well as the whole of the transformation zone. The examination is "unsatisfactory" or incomplete if only part of the lesion or transformation zone has been visualised. The upper reaches of the transformation zone are usually more difficult to see in women over 40 years of age, especially those who are postmenopausal.

Classical colposcopic features of human papilloma virus infection and cervical intraepithelial neoplasia (CIN) include acetowhite epithelium, mosaicism, punctation and abnormal vasculature. With experience the colposcopist should be able to grade the severity of the lesion present, from CIN 1-3 to microinvasive and invasive cancer. Biopsies are taken from the most abnormal areas, and the diagnosis is always confirmed histologically.

TREATMENT OF CERVICAL INTRAEPITHELIAL NEOPLASIA (CIN)

The treatment of CIN has changed over the years, and the tendency is towards less radical and more conservative forms of treatment. This trend has been possible because of a better understanding of the pathophysiology of the disease, and the increasing occurrence and detection of CIN in younger women. In the past treatment for carcinoma-in-situ has covered the entire spectrum from conization to radical hysterectomy, and the use of radiotherapy with radium insertions and external irradiation has also been reported[10]. The fear of undertreating an invasive lesion which has been missed probably influenced the more radical

approach to in-situ lesions.

Presently the treatment of choice for CIN lesions, including in-situ lesions, is conservative treatment with some form of local therapy. Except for electrodiathermy all the various methods of local therapy can be carried out on an outpatient basis, without the need for general anaesthesia. Local therapy can be either ablative or excisional, and there are presently six methods available:

- Cryosurgery
- Cold coagulation
- Electrodiathermy
- Electrocautery
- Laser vapourisation
- Loop diathermy excision

In practice the two methods most frequently employed are laser vapourisation and loop diathermy excision, and the rest are seldom if at all used.

Cold Coagulation

The term cold coagulation is a misnomer because destruction is by a probe that has a temperature of about 100 degrees Celsius. In a series of 1005 patients with varying degrees of CIN a single treatment with the cold coagulator was found to be effective in up to 97% of patients after a follow up period of six months[11]. It is a convenient and inexpensive means of treatment, and the equipment is light and portable. There is a lack of smoke and smell, compared to some of the other methods.

However the major disadvantages of cold coagulation are the amount of discharge which occurs following treatment, and the seemingly imprecise nature of destruction. Cold coagulation is now hardly ever used for the treatment of CIN, when other more effective methods are available.

Cryosurgery

Cryosurgery involves the destruction of the transformation zone by freezing, with nitrous oxide as the refrigerant. One major disadvantage is a lack of consistency in achieving a satisfactory depth of destruction, and poor results have been reported especially for CIN 3 or carcinoma-in-situ lesions[12,13]. Cure rates vary widely, from 27% to 96% as indicated in one review[14]. Discharge after the treatment is often copious and may last up to three to four weeks. Presently other methods of ablative therapy are more often used, compared to cryosurgery.

Electrodiathermy

Heat is applied via a diathermy machine to needle-and-ball electrodes placed within the cervix. It is an effective means of ablative therapy, and excellent results have been reported with complete eradication of CIN in up to 97% of patients with one treatment[15,16]. There is usually a troublesome discharge which can last up to four weeks postoperatively. The major disadvantage of electrodiathermy is the requirement for general anaesthesia, which is necessary to allow destruction to an adequate depth.

Electrocautery

Electrocautery is similar to electrodiathermy, but is done on an outpatient basis. However without a general anaesthetic it is difficult to achieve a depth of destruction of more than two to three millimeters without inducing significant pain. This method may be useful when the area of abnormality is localised, especially for milder degrees of dysplasia.

Laser Vapourisation

Laser is an acronym for *l*ight *a*mplication by *s*imulated *e*mission of *r*adiation, and the key mechanism relates to the concept of stimulated emission. The CO_2 laser allows precise destruction of the transformation zone and the associated lesion. There is satisfactory haemostasis, and rapid healing occurs because there is minimal necrotic tissue and discharge after treatment is significantly less copious compared to electrodiathermy, cryosurgery or cold coagulation.

The results of treatment of CIN with the laser are highly satisfactory, with cure rates of up to 98%[17-20]. In our local series of 33 patients with CIN who had laser vapourisation the cure rate was 94%[21].

The main disadvantage of the CO_2 laser is cost. The equipment is expensive, and requires constant maintenance. The delivery system can be cumbersome and difficult to manoeuvre. Presently it is not resolved whether the vapourisation fumes present health hazard[22,23], and an efficient suction

apparatus is essential.

Loop Diathermy Excision /Large Loop Excision of Transformation Zone (LLETZ)

In 1984 Cartier[24] described the use of a low voltage, small (0.5 by 0.5 cm) diathermy loop for both diagnostic and therapeutic biopsies of the cervix. Prendiville et al[25] in 1989 modified the technique and described what is now known as large loop excision of the transformation zone (LLETZ) for the treatment of women with CIN. Another name for the procedure, used in the United States, is loop electrosurgical excision procedure (LEEP). This procedure essentially involves the passage of a heated wire loop through the cervix, with the removal of the transformation zone and the associated lesion. The concept is so simple and effective that it is surprising that no one has thought of it earlier.

LLETZ or LEEP has the distinct advantage over the local ablative methods of providing a specimen for histological examination. Microinvasive or invasive disease can then be excluded with certainty, and clear margins can be confirmed. Ablative techniques are dependent on a thorough and expert colposcopic assessment to exclude invasive disease, and microinvasive lesions may be missed on colposcopy[26-28]. Table 1 lists some of the anecdotal reports of invasive disease on LLETZ specimens after colposcopic assessment. Prior to LLETZ these patients would have had some form of local ablative therapy, and present subsequently with invasive disease.

Table 1. Incidence of Microinvasive/Invasive Disease on LLETZ Specimens

(Anecdotal Reports)

Authors	Number
Phipps et al, 1989[38]	1
Fenton et al, 1989[39]	1
Hallam et al, 1989	4

The availability of a specimen for histology with LLETZ allows the final exclusion of invasive disease with confidence[25,26,29]. Cases of invasive cancer of the cervix after colposcopic assessment and local destruction have been well documented[27,30,31,32]. Table 2 summarises some of the reports which have documented the presence of invasive disease on LLETZ specimens, and it is noted invasive disease was not suspected or detected in 0.9% of all patients in whom the colposcopic assessment had been deemed "satisfactory".

There are several possible reasons to account for the occurrence of invasive disease after local destructive therapy:

1. Incomplete colposcopic assessment
2. Unrecognised invasive lesion
3. Inadequate colposcope directed punch biopsy
4. Inadequate extent and depth of destruction, leaving a focus of CIN which progresses to cancer
5. Recurrent CIN which progresses to cancer
6. Development of an aggressive form of cervical cancer which was not present previously

LLETZ is done on an outpatient basis, with colposcopic guidance. Local infiltration with an

Table 2. Incidence of Micro-invasive/Invasive Disease on LLETZ Specimens

Authors	Year	Number	No. with Invasive Disease (%)	Suspected on Colposcopy (%)	Unsuspected on Colposcopy (%)
Byrne & Cassia[40]	1989	200	2(1.0%)	-	2(1.0%)
Prendiville et al	1989	111	1(0.9%)	-	1(0.9%)
Luesley et al	1990	616	4(0.7%)	-	4(0.7%)
Bigrigg et al	1990	1000	9(0.9%)	4(0.4%)	5(0.5%)
Lim et al	1993	53	2(3.7%)	2(3.7%)	-

anaesthetic agent usually suffices for pain relief. The equipment is inexpensive, and easily maintained compared to the CO_2 laser system. Haemostasis of the cervical bed is often easily achieved by using the ball diathermy, which will also destroy any residual gland crypt bases. The cure rates with LLETZ that have been reported are excellent, ranging from 96% to 100% (Table 3).

Table 3. Cure* Rates with Large Loop Diathermy Excision (LLETZ)

Authors	Year	Number	*Cure (%)
Prendiville et al	1989	102	98%
Bigrigg et al	1990	969	98.2%
Luesley et al	1990	557	95.6%
Lim et al	1993	35	100%

**Normal cytology/colposcopy/histology*

With LLETZ there is some concern over the degree of thermal damage to the margins of the specimen. This could be minimized by advancing the loop very slowly and gently beneath the transformation zone, so that the current will jump ahead of the wire producing a clean cut[25]. Loop diathermy excision has important implications for the workload of histopathology departments, as it involves much more processing and reporting compared to a punch biopsy[33]. As it is relatively a new procedure the effects of LLETZ on fertility and reproductive function are still to be determined.

Cone Biopsy / Hysterectomy

There is very little place for cone biopsy or hysterectomy in the treatment of CIN, in the young woman who has yet to start or who has not completed her family. In these circumstances cone biopsy is frowned upon because of the potential effects on fertility, and the occurrence of cervical stenosis or cervical incompetence with subsequent second trimester abortion and preterm delivery.

Cone biopsy may occasionally be necessary when the colposcopic assessment is inadequate because the whole of the transformation has not been seen, when there is suspicion of an invasive lesion, or when a glandular endocervical lesion is present. Cone biopsy can be performed with the cold knife, CO_2 laser[34,35] or more recently with the loop diathermy[36,37].

Hysterectomy is rarely resorted to in the treatment of CIN, but may be indicated in the older woman who has recurrent CIN or a co-existing gynaecological problem such as fibroids, adenomyosis or menorrhagia. In some postmenopausal women, hysterectomy may be the treatment of choice if the cervix is extremely atrophic and local therapy or conisation technically difficult and hazardous.

CONCLUSION

The management of preinvasive disease of the cervix has changed and evolved over the years. The advent of cervical screening brought to the fore the problem of how to find a balance between over and under treatment of cytological abnormalities. Before the widespread acceptance and use of colposcopy, over-treatment with hysterectomy or conization was the norm. Colposcopy had allowed the precise localisation of the preinvasive lesion, and this has led to the increasing popularity of local ablative or excisional treatment. However, reliable colposcopic expertise must be available, and certain strict guidelines adhered to if invasive disease is not to be missed and under-treated. Local excision with the loop diathermy appears to offer the advantages of conization with those of outpatient destructive techniques. However it is still a relatively new procedure compared to the other forms of treatment, and longer follow-up will yield more data in due course. For the present moment, it is sensible to treat the patient with pre-invasive disease of the cervix with a local ablative therapy or loop diathermy excision of the transformation zone, especially when she is young and has not completed her family.

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PELVIC INFLAMMATORY DISEASE

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INTRODUCTION

The term pelvic inflammatory disease, often referred to as "PID", denotes a condition in women where an infective process has involved the reproductive organs of the upper genital tract. The latter includes the endocervical canal, the endometrium, fallopian tubes, ovaries and the adjacent pelvic peritoneum. A clear distinction is made from infections affecting the lower genital tract such as vulvitis, vaginitis and ecto-cervicitis, which are strictly not classified as PID. Nevertheless, it is well recognised that PID very often begins as an ascending infection from the lower genital tract, particularily in sexually active women. For practical purposes, the endocervical canal is used as the anatomical landmark to differentiate between upper genital tract (PID) and lower genital tract infections.

It is also pertinent to note that the term "PID" does not give any indication of the specific anatomic site of the upper genital tract infection or its severity. Hence, while it will be useful to know if one is dealing with endometritis, parametritis, salpingitis, salpingo-oophoritis, pelvic peritonitis or a pelvic abscess, very often in clinical practice this is not possible, unless one resorts to the routine use of laparoscopy, laparotomy or endometrial biopsy. In this context, it should be appreciated that of all the sites of the reproductive tract involved in PID, salpingitis is the most important component, since this is specifically responisble for the two most serious sequale of PID in women in the reproductive age group, those of infertility and ectopic pregnancy.

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EARLY DIAGNOSIS: SIGNIFICANCE

It has been estimated that 1% of all women between the ages of 15 and 34 years have experienced at least one episode of an upper genital tract infection. While the acute and severe symptoms of PID enable prompt diagnosis and treatment, milder forms of the disease can be totally asymptomatic. Indeed, accurate early diagnosis of PID, particularily salpingitis, is difficult without the routine use of laparoscopy. On the other hand, it is increasingly being recognised that the severity of tubal damage seen at laparoscopy has no consistent correlation with the severity of the presenting symptoms and signs of PID. A study in Sweden showed that there was no correlation between the degree of fever, white blood cell count, direct abdominal and rebound tenderness, and cervical, uterine and adnexal tenderness with the degree of tubal damage. In other words, an outpatient with the mildest symptoms and signs is just as likely to have the same degree of tubal damage as an inpatient with severe clinical features.

The need to recognise, diagnose and treat the initial mild stages of PID, particularly in women belonging to the reproductive age-group, becomes, therefore, an important issue for family physicians, since they are the primary doctors who are most likely to encounter such outpatient cases. It must be appreciated that these cases need to be aggressively treated with antibiotics in the initial stages in order to prevent salpingitis and its potentially serious sequelae of infertility and ectopic pregnancy. By the time cases of PID get referred to a tertiary center as inpatients, they are

generally in the more advanced stages of infection when irreparable damage to the fallopian tubes has already been inflicted.

ORGANISMS AND PATHOGENESIS

Pelvic inflammatory disease may be caused by a variety of micro-organisms which can be present in the genital tract in different combinations during the course of the disease[1]. While the natural course of PID is incompletely understood, it is generally believed that there is an initial infection with a sexually transmitted disease which causes only clinically mild disease. Classically, *Neisseria gonorrhoeae* is the organism implicated, although *Chlamydia trachomatis* has now taken on equal importance worldwide. Following this acute, short-lived inflammatory stage, continuance of the disease is thought to only occur if superinfection with other less pathogenic organisms takes place. These include anaerobic organisms such as those of the *Bacteriodes* and *Peptococcus* species which are frequently found in the lower genital tract of asymptomatic sexually active women, and aerobic bacteria which are normal commensals of the endogenous flora of a woman's lower genital tract may become pathogenic if they ascend to the upper genital tract.

The aetiology of PID has thus been described as polymicrobial, with the initial infection being caused by a sexually transmitted disease and subsequent superinfection occurring with aerobic and anaerobic organisms normally found in the lower genital tract. Even in cases where no sexually transmitted agent is found, it is assumed that the offending organisms causing PID have originated in the lower genital tract where they may be present for a variable length of time, with or without symptoms.

The concept, then, is that these organisms ascend from the lower genital tract through the cervical canal, into the endometrium before finding their way to the endosalpinx and pelvic peritoneum. The mechanism by which organisms ascend from the cervix into the upper genital tract is unknown, with both motile spermatozoa and *Trichomonas vaginalis* being postulated as possible carriers. Gynaecological procedures such as insertion of an intra-uterine contraceptive device, dilation and currettage, termination of pregnancy and chromotubation at laparoscopy certainly facilitate the transmission of lower genital tract organisms into the upper genital tract. Lymphatic spread through the parametrium, bypassing the endometrium, has been postulated in cases of PID caused by *Mycoplasma hominis*.

Following endometritis, the infection is believed to ascend into the endosalpinx where it causes mucosal inflammation with oedema of the tubal wall and production of an exudate which leaks out through the fimbrial ends of the fallopian tubes. The infective exudate causes inflammation of the adjacent peritoneum, ovaries and other pelvic structures, resulting in the formation of sticky adhesions between the inflamed organs. These adhesions occur concurrently with the acute stage of infection and may lead to permanent sealing and occlusion of the fimbrial ends of the fallopian tubes. Further progression of the infection leads to the formation of tubo-ovarian abscesses, whilst spread along the paracolic gutters or lymphatics to involve the liver and sub-diaphragmatic areas causes the Fitz-Hugh Curtis Syndrome. In this context, tuberculous disease is presently not regarded as PID by definition, as this term implies an ascending infection.

Based on the current understanding of the pathogenesis of PID it is postulated that there is a stage, before tubal damage takes place, when prompt treatment could prevent the formation of adhesions in the pelvis. Indeeed, prevention of the passage of the infection to the fallopian tubes is possible at an even earlier stage, by treatment at the stage of endometrial infection itself. Family physicians must understand this concept in order to appreciate the recommendation that even the mild forms of PID must be diagnosed early and treated aggressively with antibiotics in the first instance.

CLINICAL PRESENTATION AND DIAGNOSIS

Unfortunately, there are no specific symptoms, physical findings or simple laboratory tests which are pathognomonic for PID. Pelvic inflammatory disease can present with a wide spectrum of clinical features, ranging from no symptoms to a life-

threatening state. It is estimated that up to one-third of cases are undiagnosed at the time of the acute infection.

The primary complaint in PID is generally that of lower abdominal pain. Other non-specific symptoms include abnormal bleeding, dyspareunia, increased vaginal discharge and vaginal malodour. Gastrointestinal tract symptoms such as vomiting, diarrhoea, tenesmus and proctitis may also be present, whilst urinary tract symptoms of dysuria and frequency could be related to a sexually transmitted infection.

Although expected, an elevated temperature is not a common sign of PID. Lower abdominal tenderness and guarding may be elicited, and the presence of purulent cervicitis and bleeding per vaginum may indicate an ascending infection. Pelvic examination may reveal tenderness on palpation of the cervix, uterus or adnexae.

Athough many of these symptoms and signs are not absolutely specific for PID, their sensitivity and specificity are increased when they are associated with risk factors for PID in the patient. These include a record of promiscuous sexual activity, multiple sexual partners, previous history of PID or infection with a sexually transmitted disease, a recent child-birth, induced abortion or pelvic surgery, or presence of an intra-uterine contraceptive device. Otherwise, a differential diagnosis of an ectopic pregnancy, haemorhage or torsion of an ovarian cyst, endometriosis, appendicitis or urinary tract infection will have to be considered. Some epidemiologic data indicate that bacterial vaginosis could be a risk factor for PID[2].

In an effort to facilitate the early diagnosis of PID, a number of studies have proposed alogorithms to predict the likelihood of PID. These comprise a series of certain minimum criteria and additional clinical features which should be present before a diagnosis of PID is established. Unfortunately, none of these criteria have been standardised, which limits the comparison that can be made between different findings and, hence, its clinical usefulness[3]. Nevertheless, the set of criteria proposed by Westrom and Mardh[4] and shown in Table 1, can serve as a practical guide in clinical practice. The accuracy of using these criterion was tested by confirmation of PID at laparoscopy. They reported that with only the three minimum criteria present, PID was diagnosed in 61% of cases; with an additional criterion, it was 68%; with two additional criteria it was 89% and when all the minimum and additional significant criteria were present, the diagnostic accuracy was 96%.

Table 1: Clinical Diagnosis of Acute PID

Minimum criteria
• Purulent vaginitis
• Lower abdominal pain
• Adnexal tenderness
Significant additional criteria
• Rectal temperature > 38 ° C
• Adnexal swellings
• ESR > 15 mm/hr

Diagnostic tests

To date, laparoscopy remains the gold standard for diagnostic confirmation of PID, although clinical diagnosis becomes more accurate with more severe disease. For the family physician, though, relevant investigations that can be undertaken in the office include:

1. Taking a swab from the endocervical canal (not a high vaginal swab) for Gram stain to identify Gram-negative diplococci, and culture for *Gonococcus*, *Chlamydia*, aerobic and anerobic bacteria. If warranted, similar culture swabs can also be taken from the urethra and rectum.

2. Blood for determination of total white cell count, differential count and ESR. Serology for detection of antibodies against *Gonococcus*, *Chlamydia* and *Mycoplasma* has its limitations, as it may not represent an active infection.

3. If in doubt, a urine pregnancy test should be done. A mid-stream urine sample can be taken for microscopy and culture.

4. Screening of the sexual partner is an important investigation, not only in the identification of the possible source of infection, but in the

overall treatment of the couple.

5. The role of out-patient endometrial sampling to detect endometritis is controversial, and is generally not recommended in clinical practice.

6. A pelvic ultrasound is only useful in PID to delineate a tubo-ovarian abscess.

OUTPATIENT MANAGEMENT OF PID

The need for aggressive treatment of PID with antibiotics must be foremost in the minds of all family physicians even when a case of mild PID is encountered, particularly with women in the reproductive age-group. The rationale for this approach is to prevent the devastating sequelae resulting fron salpingitis and permanent tubal damage, the latter having no predictable correlation with the severity of the clinical presentation.

Initial antibiotic therapy of acute PID is usually emperical and is guided by the most likely cause(s) and severity of clinical manifestations. Predictably, no single agent is effective in all cases of PID and combination therapy is recommended. The choice of antibiotics, therefore, generally covers a broad spectrum of organisms to include pencillinase-positive *Neisseria gonorrhoeae, Chlamydia trachomatis, Mycoplasma hominis*, and facultative aerobic and anaerobic organisms found in the lower genital tract.

The proposed treatment guidelines for out-patient therapy of PID as recommended by the National Institutes of Health (NIH) and Centers for Disease Control (CDC)[5] in the United States are as follows:

- Cefoxitin, 2 gm IM, plus probencid, 1 gm orally, concurrently or Ceftriaxone, 250 mg IM, or any equivalent cepahalosporin

plus

- Doxycycline, 100 mg orally b.d. for 10 to 14 days or Tetracycline, 500 mg orally q.d.s for 10-14 days. For patients who do not tolerate Doxycycline or Tetracycline, an alternative regimen is Erythromycin 500 mg q.d.s for 10 to 14 days.

The rationale for using this combination of antibiotics is that, firstly, in the light of the increasing incidence of resistance of *Neisseria gonorrhoeae* to penicillin, cephalosporins are effective against gram-negative organisms, including enteric rods, anaerobic organisms, and *Gonococci*. Secondly, Doxycycline provides definitive therapy for chlamydial infections.

The main prerequisite if patients are treated on an ambulatory basis is that they must be closely observed and reevaluated on a regular schedule. Initially, they must be seen two to three days after starting antibiotic treatment, and then on a weekly basis, to ensure compliance and an approproate clinical response. Many patients abandon their antibiotics when they feel better or if they develop any side-effects, resulting in under-treatment of their condition and a higher risk of presenting with recurrent PID.

It is also important to enquire about symptoms of sexully transmitted diseases in the male sexual partner and to examine him for signs of genital infection. If necessary, treatment may need to be instituted for him too. In addition, it is the responsibility of the family physician to educate the couple about ways to prevent PID (avoiding the acquisition of *Gonorrhoea* and *Chlamydia*, appropriate contraception, avoid douching etc.) and to advise them to seek early consultation should symptoms of increased vaginal discharge, abnormal uterine bleeding or abdominal pain recur, as these may indicate re-activation or recurrent PID. Patients should also be counselled about their long-term risk of infertility and, more importantly, since they have a higher risk of an ectopic pregnancy should they become pregnant, they must present early for a pregnancy test once they miss their periods.

Finally, it is important to know which cases of PID should not from the outset be managed at an outpatient level. Certainly, those with a temperature above 38°C, suspected pelvic abscess, peritonitis, or if the PID is associated with a concurrent pregnancy, must be admitted to hospital without delay for more aggressive treatment. Otherwise, the need for referral will arise during ambulatory treatment and followup with poor or non-compliant patients, and for those who failed to respond to oral antibiotic therapy.

CONCLUSION

Pelvic inflammatory disease is not an easy condition to diagnose in the early stages of its pathogenesis. Moreover, mild PID is now known to cause the same degree of tubal damage as severe cases of PID. While predictive alogorithms have been devised to help physicians make an early and more accurate clinical diagnosis, visual inspection with a laparoscope and sampling of pelvic tissue for culture for micro-organisms still remains the only means for final confirmation of PID. For the family physician, therefore, there is a need to be constantly vigilant of the possibility of PID in any woman, particularily in the reproductive age-group, who presents with abdominal pain and vaginal discharge, irrespective of the severity of her symptoms. Aggressive treatment with antibiotics must be instituted at an early stage to prevent infection reaching the fallopian tubes and causing salpingitis and permanent tubal damage, since this is responsible for the serious sequelae of infertility and ectopic pregnancy in these women.

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VAGINAL DISCHARGE

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DEFINITION

Vaginal discharge is defined as emission from or through the vagina as an excretion or secretion.

The clinical approach is to establish the clinical diagnosis (whether it is physiological or pathological), carry out relevant investigations to confirm the cause and then treat accordingly.

CAUSES

Physiological

It is essential for the clinician to know the physiological changes of the vaginal discharge with respect to menstrual cycle and pregnancy. Usually it is evident with diligent history taking.

Menstrual cycle

Immediately after the menstruation, as the plasma oestradiol is low, some patient may notice a "dry" period. Just before the ovulation, with the mid cycle oestrogen peak, the discharge becomes copious and watery. After the ovulation, the progesterone turns the discharge to whitish and viscid secretion.

Pregnancy

With the increase of the female hormones, women may experience increased vaginal discharge even in the first trimester. This discharge is regarded normal unless it becomes purulent, foul smelling or causes pruritus.

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After the delivery, the lochia is initially red (lochia rubrum), slowly changing to pale brownish (lochia serosa) and finally to yellowish white (lochia alba).

Pathological

Infection

The infection can be bacterial, viral, fungal, protozoal.

BACTERIAL

(i) *Neisseria gonorrhoea*

This is the most common sexually transmitted disease (STD). In Singapore, the incidence is decreased (from 629/100,000 in 1980s to 69/100,000 population in 1994)[1]. This gram-negative diplococcus, infects the columnar epithelium of the endocervix, urethra, even the rectum, pharynx and conjunctiva. It classically gives purulent vaginal discharge detected at the cervical os. It may be associated with urinary tract infection or even ascending pelvic inflammatory disease, resulting in fallopian tube damage and infertility.

(ii) *Chlamydia trachomatis*

This small intracellular "bacterium" is the most prevalent STD in some industrialised countries. In Singapore, the incidence has decreased from 80/100,000 to 43/100,000 population[1].

(iii) *Gardnerella vaginalis*

This, together with *Mobiluncus*, *Mycoplasma hominis*, and other anaerobes have been identified to cause bacterial vaginosis (previously called non-specific vaginitis). As high as 25% has been reported in STD clinics. Diagnosis is based on at least 3 of the following signs:

- thin homogenous vaginal discharge,
- vaginal pH > 4.5,
- positive amine odour test (exposed to potassium hydroxide solution)
- clue cells in the vaginal discharge

(iv) *Others*
Group B streptococcus in the genital tract may cause neonatal infection after vaginal delivery. It may also cause puerperal sepsis and fever, or pelvic infection. Reported carrier state in pregnant women was 15% to 30%[2]. *E. coli* also can give puerperal sepsis and infection.

Other bacterial infections may include those by *Treponema pallidum*, *Haemophilus ducreyi*, *Calymmatobacterium granulomatis* and other Enterococci species. Again, vaginal discharge may not be the presenting symptom.

VIRAL
(i) *Herpes simplex (HSV)*
This is the most common cause of genital ulceration in industrialised countries, and it accounts for 10% of the cases in the STD clinics. 90% were due to HSV type 2 and 10% due to HSV type 1. The discharge is associated with burning, itching and hyperaesthesia.

(ii) *Human Papilloma Virus (HPV)*
It has become a most common STD. The HPV DNA was isolated in 40-70% of the cervices of the women with STD[3]. Again, vaginal discharge may not be the most important presenting symptom.

(iii) *Others*
Varicella and cytomegalovirus may also give vaginal discharge which again may not be the main complaint.

FUNGAL
Candida albicans
It is the most common yeast from genital candidiasis. It is an opportunistic organism and more common in pregnancy, immunosuppression, diabetes mellitus and prolonged antibiotic treatment. In STD clinics, the incidence is as high as 15%[3]. Typically it gives cheese-like or whitish curd-like discharge.

PROTOZOAL/PARASITIC
(i) *Trichomonas vaginalis*
In STD, incidence of up to 10% was reported[3]. This is regarded as sexually transmitted. It produces typically foul smelling, frothy, greenish discharge associated with pain, dysuria and dyspareunia. Pelvic inflammatory disease (PID) can be a complication.

(ii) *Others*
Entamoeba and *Enterobius vermicularis* may rarely cause vaginal discharge.

Neoplasm
BENIGN
(i) *Polyps*
Intermenstrual or postcoital bleeding are the more common presentation. Vaginal discharge is possible when secondary infection sets in.

(ii) *Vaginal Adenosis*
One in 3 women born to mothers exposed to diethyl stilboestroel during pregnancy will develop columnar epithelium in the vagina or, more rarely, clear cell carcinoma.

MALIGNANT
Carcinoma of vulva, vagina, cervix, endometrium and fallopian tubes can all cause vaginal discharge. The detailed description is beyond the scope of this article.

Miscellaneous
These include:

- foreign bodies
- cervical ectropion/erosions
- drugs
- atrophic vaginitis.

HISTORY

Age
In pre-menarcheal girls, bacterial infection is the most common cause. However, the possibility of foreign body and child abuse must be excluded.

In the reproductive age-groups, infections, especially fungal or trichomonas, are common.

However, care is taken to exclude neoplasm.

In post-menopausal women, the possibility of atrophic vaginitis and neoplasm should be considered.

Odour
Vaginal discharge which has a fishy odour especially after coitus or menstruation may raise the suspicion of bacterial vaginosis. However, foul smelling discharge also occurs with trichomoniasis or secondarily infected neoplasm.

Associated symptons
Pelvic pain with fever may suggest PID. Pelvic pain with loss of weight and appetite, or irregular vaginal bleeding, raise the suspicion of malignancy.

Foreign body
Common forgotten items in the vagina include tampon or ring pessary. The use of intrauterine contraceptive device should be noted in the history.

Social history
It is obvious prostitutes and social escorts are likely to be associated with STD. Multiple sexual partners or STD history in either partner should be sought.

Menstrual history
Menorrhagia, intermenstrual or postcoital bleeding all suggest a neoplastic cause.

Past medical history
History of diabetes mellitus, prolonged antibiotic or steroid usage may suggest candidiasis. Previous pelvic surgery or radiation followed by watery discharge implies fistula, which must be excluded.

PHYSICAL EXAMINATION

General
Pallor may be associated with chronic ill health (e.g. infection or malignancy) or menstrual disorders. In case of malignancy, signs of lymph node, liver, lung and bony involvement are to be noted. Intra-abdominal involvement may show up as ascites, mass or distension causing lower limb varicosity or oedema.

Genital
Inspection for excoriation, erythema, lesions of *Herpes* genitalia, chancre are important.

Speculum examination may reveal obvious causes like atrophic vaginitis, foreign bodies and neoplasm. The characteristics of the vaginal discharge may give spot diagnosis. Urinary fistula may also be noticed. Bimanual examination is important to diagnose uterine or adnexal pathologies.

INVESTIGATIONS

Infection
There are many laboratory tests for the various organisms. The following summarise the common ones used.

MICROSCOPY
The vaginal secretion is mixed with the normal saline on a glass slide and covered with a cover slip.

White blood cells
An excess of WBC over epithelial cells suggest inflammatory process.

Lactobacillus
In candidiasis or normal discharge, there is a predominance of these gram-positive rods. The presence is reversed in *Gardnerella* infection.

Short bacterial morphotypes
In bacterial vaginitis, there is a predominance of small, short organisms.

Trichomonads
This motile, flagellated organism is large than WBCs and recognised by the swimming motions.

Candidiasis
The yeast and hyphae can be seen.

CULTURE
This is the mainstay for diagnosis. To check for *N. gonorrhoea*, the purulent discharge from urethra, endocervical canal, rectum and pharynx may be taken. For *Chlamydia*, the endocervical discharge

should be removed before the endocervical canal is scraped (e.g. with a cytobrush or swab). For *N. gonorrhoea*, the swab should be placed immediately into a transport medium (e.g. Ames) before going into culture medium (e.g. Thayer-Martin). For *Chlamydia*, it should be placed into a transport medium (e.g. 2-sucrose phosphate and sucroseglutamate phosphate) before processing. For *Candidia* and *Trichomonas*, a high vaginal swab of the vaginal discharge is taken. For Candida, Ames may be used as a transport medium and Sabourand's medium is the preferred culture medium. As for *Gardnerella*, culture is not suggested as it is part of the normal flora in some healthy women.

IMMUNOFLUORESCENCE

This is also a common method to diagnose Chlamydia infection rapidly. The difficulty is to differentiate the fluorescing Chlamydial particles and nonspecific fluorescence. An experienced microscopist is essential. Other biochemical, serological or DNA probe tests can be used. However, in clinical practice, the above-methods represent the common diagnostic tests.

The investigations for pelvic inflammatory disease (e.g. use of laparoscopy and culture) require different discussion and is beyond the scope of this article.

The presence of a cervical polyp requires a histological examination after avulsion to be followed preferably by a hysteroscopic examination (which can be performed as an outpatient procedure) with endometrial sampling for histology.

The Pap smear is used as a screening test for carcinoma of cervix. Final diagnosis of malignancy depends on the histology (e.g. cervical biopsy, endometrial tissue, or biopsies from vulva, vagina)

The diagnosis of urinary fistula is based on history, findings of urine-like fluid in vagina and confirmed with 3-swab test, intravenous pyelogram and cystoscopy.

TREATMENT

Candidiasis

Candida albicans can be treated by polyenes (nystatin), imidazoles (e.g. clotrimazole, miconazole, econazole, isoconazole) and povidone iodine. For vaginal and vulval involvement, both vaginal pessaries and cream are useful. Recently, studies suggest that oral fluconazole or itraconazole are as effective as intravaginal clotrimazole. Clotrimazole pessary 200mg daily for 3 days or nystatin pessary 10,000 IU daily for 7 days are used. Oral nystatin is not recommended[4].

For recurrent moniliasis, intermittent prophylactic treatment (e.g. clotrimazole or miconazole or gluconazole at 2-4 weeks intervals) for 6 months can be given. Reassessment can then be made before deciding whether further therapy should be given.

It is worth noting that *Candida glabata* is less sensitive to fluconazoles or other azoles. Nystatin or boric acid may be a better choice. Local application of gentian violet can also be tried.

Trichomonas

Oral metronidazole 200mg thrice daily for 7 days is the standard regime. Alternatively, single oral dose of 2g or 400mg twice daily for 7 days can be used. Teratogenic effects in pregnant women in the first trimester have to be borne in mind. If treatment is required in the first trimester, clotrimazole pessary daily at bedtime for 2 weeks can be tried. If indicated in second and third trimester, a single oral 2g metronidazole is acceptable.

The sexual partner should be treated as well. Until the disease is eradicated, the use of condom should be advised.

Gonorrhoea

Where penicillinase-producing *N. gonorrhoea* is not a problem, penicilln 2g and probenecid 1g single oral dose can be given for simple uncomplicated gonorrhoea. Alternatively intramuscular ceftriaxone 250mg single dose can be used.

Single dose therapy may be more economical and offers good tolerance, minimal alteration of normal bacterial flora, and better compliance. Single dose cefuroxime 1g intramuscularly, ceftizoxine 500mg intramuscularly coupled with 1g oral

probencid are alternatives. Cephalosporins are safe in pregnancy.

Single dose of quinolones (e.g. ciprofloxacin 500mg orally, perfloxacin 800mg orally, ofloxacin 400mg orally) have also been used. However, fluoroquinolines are not advised in pregnancy or in people under 16 years age.

Spectinomycin 2g intramuscularly in a single dose is also effective.

Cultures should be performed 3 to 5 days after completion of therapy. Serological test for syphilis at 6 weeks and 3 months after treatment should be carried out. Test for HIV infection can be offered privately. Contact tracing in the last 30 days should be carried out.

Chlamydia

For uncomplicated urethritis or cervicitis, oral doxcycline 100mg twice daily, or minocycline 100mg twice daily, or tetracycline 500mg four times daily for 7 days are the standard regimes. In cases where tetracycline group is contraindicated (e.g. pregnancy) oral erythromycin base or stearate 500mg four times daily or erythromycin ethylsuccinate 800mg four times daily for 7 days are alternatives. Macrolides (e.g. roxithromycin) or azithromycin have also been shown to be effective.

In chlamydial PID, the duration of doxycycline or minocycline should be 14 days instead.

Gardnerella or Anaerobes

Metronidazole orally 400mg twice daily for 7 days is the standard. Side effects such as pseudomembranous colitis, gastrointestinal upset and metallic taste in the mouth should be warned about and looked out for. Where metronidazole is contraindicated, clindamycin or ampicillin can be used.

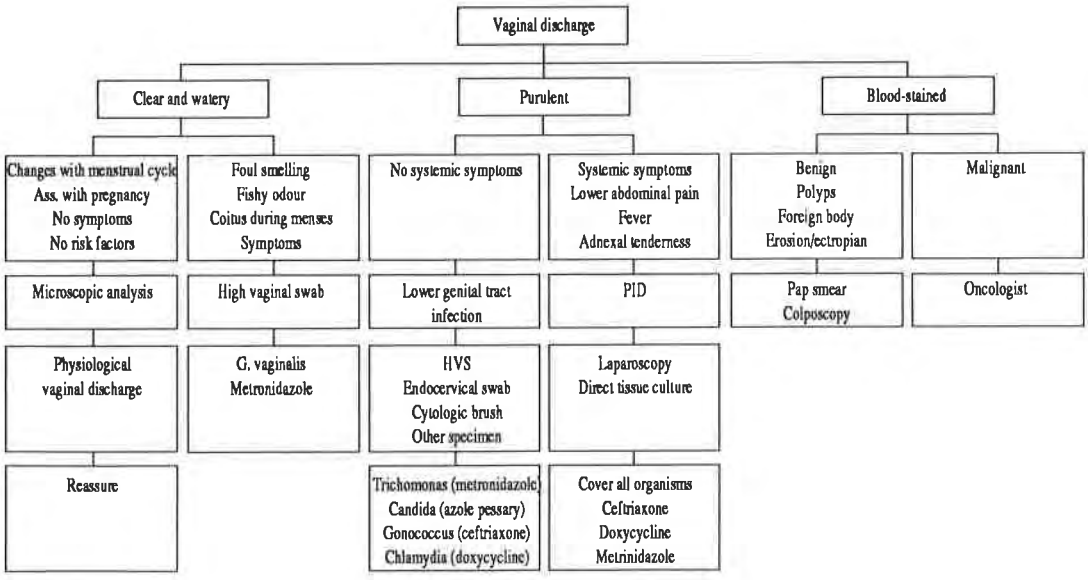
The use of lactate gel and *Lactobacillus acidophilus* can also be tried.

CONCLUSION

The management of infections has been detailed. Proper examination should reveal obvious causes like cervical erosion, cervicitis, cervical polyp, foreign bodies, or malignancy. The treatment of these conditions is beyond the scope of this article.

Most of the infections can be managed by family physicians. However, where other causes are diagnosed or resistant cases arise, referral to a

Management of Vaginal Discharge



gynaecologist may be a better alternative. The enclosed flow chart summarises the management of vaginal discharge.

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CANDIDAL VULVOVAGINITIS

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Vulvovaginitis is a common infection and is frequently caused by *Candida albicans*. Infections by other *Candida* species such as *C. glabrata* and *C. tropicalis* are less common but may cause similar symptoms and signs. It has been estimated that 75% of women in their reproductive years will have at least one episode of candidiasis. Of these, 40-50% will have a second attack and approximately 5% have recurrent infections. In addition, *Candida spp.* can be isolated in a fifth of asymptomatic healthy women in their reproductive years.

High levels of oestrogen provide a higher glycogen content in the vaginal environment and this encourages growth of *Candida spp.* For this reason, symptomatic infections are especially common in pregnancy and *C. albicans* is rarely isolated in premenarcheal and postmenopausal females.

PREDISPOSING FACTORS

Pregnancy

Increased oestrogen levels during pregnancy predispose to increased vaginal colonisation by *C. albicans*. This is maximal in the third trimester.

Oral Contraceptives

Previous studies have shown increased vaginal candidal colonisation with high-oestrogen content oral contraceptives. By contrast, use of low-oestrogen content oral contraceptives has not been shown to increase colonisation rates.

Diabetes Mellitus

Candidal vaginosis can be the first indication of diabetes mellitus. Established diabetics are prone to recurrent infections. Oral glucose tolerance test to exclude diabetes is indicated in patients who present with recurrent infections.

Antibiotics

Broad-spectrum antibiotics (e.g. ampicilliin, tetracycline) eliminate the normal protective vaginal flora, especially hydrogen peroxide-producing *Lactobacilli*. This has been associated with increased vaginal candidal colonisation from approximately 10% to 30%.

PATHOGENESIS

Candidal organisms may gain access to the vagina from the perianal area. The organisms are also common commensals in the vagina. Changes in the host environment induce pathological infection. Germination of *Candida spp.* results in colonisation and facilitates tissue invasion. Proteolytic enzymes, toxins and phospholipase may determine the virulence of the organism. Tissue invasion with resulting mucosal inflammation produces oedema, erythema and desquamation of vaginal epithellal cells.

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CLINICAL MANIFESTATION

Vulval pruritus and vaginal discharge are the most common clinical presentations. Vulval pruritus can be very distressing. Vaginal discharge is characteristically described as cottage cheese-like in appearance. Odour is minimal and inoffensive. With severe vulvovaginitis, the patient may complain of soreness, burning, irritation, dyspareunia and even dysuria. Symptoms are often exacerbated in the week preceeding the menstrual period.

Examination of the vulva shows erythema, oedema and the presence of papular or plaque-like lesions and deposits of discharge.

DIAGNOSIS

Vaginal secretions can be examined under the microscope using a wet mount of saline or potassium hydroxide to identify the yeast cells or mycelia. However, this method has a low sensitivity and up to 50% of patients with culture-positive symptomatic candidiasis will have negative microscopy. Those with negative microscopy should have vaginal cultures performed.

The Papanicolaou smear is positive in only about 25% of culture-positive candidiasis. New latex-agglutination slides with polyclonal antibodies reactive to Candida are available commercially.

TREATMENT

Use of tight, poorly ventilated clothing and nylon under-clothing increases perineal moisture and temperature. Well-vantilated clothing and clean cotton underwear help prevent infections. Chemical douches and soaps may promote candidiasis by altering the vaginal environment and should therefore be avoided.

Antimycotic drugs may be delivered in topical applications, vaginal suppositories and oral medication. Recent treatment trends have been towards high and single dose therapautic regimens. The average mycological cure rate for nystatin (a polyene) has been reported to be of the order of 75-80% whereas that of azole derivatives may be as high as 85-90%. Clinical trials with orally active agents show that these may be minimally superior to topical antimycotic therapy.

Side effects are less common with vaginal therapy. Local application may be accompanied initially by burning and discomfort. Systemic complications are rare. There is potential for toxicity with oral therapy and may include gastrointestinal upset, hepatotoxicity and, rarely, anaphylaxis.

Recurrent and chronic candidal vulvovaginitis is a difficult problem and when recognized by the patient may be treated with topical antimycotics. The use of long-term maintenance suppressive prophyiaxis with either topical or low-dose systemic therapy must be weighed against the potential toxicity of long term oral therapy. The partner should also be treated.

CONCLUSION

Candidal vulvovaginitis is a common gynaecological ailment. It is often simple to treat with prompt results. Occasionally, the vulvovaginitis may be associated with diabetes melliltus and other sexually transmitted diseases. With chronic and recurrent candidal vulvovaginitis that may affect sexual and marital relations, it is important to reassure, support and counsel patients as the disease can be adequately treated.

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AN OUTPATIENT APPROACH TO VAGINAL DISCHARGE

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INTRODUCTION

One of the commonest gynaecological problems that a family physician encounters in his practice is perhaps the complaint of vaginal discharge. The female patient is usually distressed by this problem, and the family physician must be well equipped with a logical approach to the problem without adding on more stress to the patient.

It is essential in the first instance to distinguish a physiological from a pathological discharge. Physiological discharge arises from secretions from Skene's and Bartholin's glands and from the endocervix. The discharge changes during the different phases of the patient's menstrual cycle. Pathological discharge, on the other hand, is abnormal and may be due to a variety of causes. It is the physician's role to identify the aetiology of the discharge before embarking on any form of treatment.

GATHERING OF INFORMATION FROM THE PATIENT

As family physicians, we must not only look at vaginal discharge as an entity by itself. We must concern ourselves with the question of whether there are any hidden messages or worries that the patient may have. She may be concerned about sexually transmitted diseases. She may be worried about cancer which she may have read about recently, or she may have known somone who had just died from a gynaecological malignancy. She may be greatly distressed by her physiological vaginal discharge and requires reassurance that it is not something abnormal. She may have underlying sexual problems that she may not be willing to reveal and instead present to you as a case of vaginal discharge. In other words we must be aware of the possibility of any hidden problems or "hidden agenda" that the patient may have.

It is an art to elucidate useful information about the patient's vaginal discharge without embarrassing or discomforting the female patient. Sensitive and sensible history taking in the clinic is the first step to successful treatment of the patient. The following questions should be included in the family physician's conversation with the patient.

1. What is the age of the patient?
This is an important question as different age groups will have their own possible diagnosis.

Pre-pubertal age group
Not uncommonly do we encounter anxious mothers bringing their pre-pubertal children to our clinics for complaints of vaginal discharge. It is important to realise that patients in this age group must be dealt with patiently and carefully without causing upset and discomfort to the child and especially to the parents. Again sensitivity and sensibility on the part of the family physician is required here.

The causes for vaginal discharge in this age-group include:

- Local Trauma
- Foreign body in the vagina
- Sexual assault

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- Infective causes - *Candidiasis*, *Trichomoniasis*, threadworms, *Gonorrhoea*.

Once it is established that there is sexually transmitted disease in the pre-pubertal patients, sexual abuse can be inferred.

Post-memopausal age-group

Patients in this age group may be worried about malignancy. Careful assessment is therefore required to rule out this possibility. Malignancy of the cervix, uterus and fallopian tubes may present with blood-stained or watery discharge.

Usually, vaginal discharge in this age-group is due to a lack of oestrogens, leading to atrophic vaginitis. There is also concomitant reduction in the normal flora of the vagina, especially *Lactobacilli*. These result in a predisposition to infection. Of course, we must not discount the possibility of sexually transmitted diseases in the post-menopausal age group. Similarly, all other infective causes of vaginal discharge must be borne in mind.

Another possibility in the post-menopausal age group is the presence of vaginal ulcerations from uterovaginal prolapse, especially from neglect in the care of the UV prolapse and neglect in the care and change of the vaginal pessaries used.

Reproductive Age-Group

Most of us are very familiar with the causes of vaginal discharge in this age-group. Most of the time, it is due to infection by *Candida*, or *Trichomonas*. Of course, we must remember that sexually transmitted diseases e.g. gonorrhoea, chlamydial infection etc. are also possible causes, especially if the history is suggestive.

Some patients are fond of excessive douching of the vagina. These may result in the washing off of the normal flora of vagina and therefore predisposing it to infection. Certain soaps may also act as irritants to the vagina and result in vaginal discharge. We must also remember that in the reproductive age group, use of oral contraceptives, IUCD or insertion of various types of tampons and other "gimmicks" into the vaginal tract may also lead to vaginal discharge.

2. What is the colour, texture, smell or odour of the vaginal discharge?

We often hear that history is the most important part in the consultation. Indeed, it is true in a case of vaginal discharge. Usually, by asking the patient about the nature of the discharge, we are able, more or less, to diagnose a possible aetiology of the discharge. For example, a lady who has a single, stable sexual partner complaining of white, curd-like vaginal discharge can be safely diagnosed to have candidiasis (Moniliasis), even without examination. However, if treatment fails, further evaluation will be required in the form of more detailed examination and investigations.

Below is a table on the possible diagnosis based on the nature of the vaginal discharge described by the patient. It is by no means comprehensive but serves as a guide to our approach to vaginal discharge.

Table 1: Diagnosis of Vaginal Discharge

Nature of Discharge	Possible diagnosis
White and curd-like	Candidiasis
Yellow-green frothy and foul smelling	Trichomoniasis
Purulent	Genital tract infection (bacterial, herpes, gonorrhoea, etc)
Off-white with fishy odour	Bacterial vaginosis
Blood-stained	Infective cause, malignancy or menses,UV prolapse with vaginal ulceration
Mucoid	Cervical origin, IUCD, OC pill, physiological discharge
Watery	Urinary leakage, hydrosalpinx

3. Has the discharge been there all the time? If not, for how long?

It must be ascertained whether the discharge varies with the different phases of the menstrual cycle. If it does, it is probably physiological. Caution must be exercised as long-standing vaginal discharge need not be physiological. Examination and investigation are required for those with chronic or recurrent vaginal discharge.

4. Is there pain in the lower abdomen?
Pain in the lower abdomen may indicate pelvic inflammatory disease, especially when associated with a vaginal discharge.

5. Sexual history
This must be asked in a non-confrontational manner with great sensitivity, preferably after a good rapport has been established. Otherwise, false and useless information will be obtained. A patient with multiple sex partners is a likely candidate for sexually transmitted diseases, and investigations must be done to exclude them. On the other hand, if a patient presents with a white curd-like vaginal discharge and we are sure that the patient is not sexually active or has a stable and faithful partner, we can safely diagnose candidiasis even without further evaluation.

EXAMINATION AND INVESTIGATIONS

Having an overall idea of the possible diagnosis from the history, we may want to further assess her problem. We need to examine the patient, unless we are already sure that she has candidiasis from the history obtained. Apart from such obvious cases (which actually form a bulk of the family physicians' vaginal discharge cases), we need to do a pelvic and vaginal examination. The vulva, vagina and the cervix must be visualised. A speculum examination to differentiate between *cervical* discharge and *vaginal* discharge must be performed. It must be remembered that the source of the discharge is important. Furthermore, it must be emphasised that to detect and culture *Chlamydia*, an *endocervical swab* is required, not a high vaginal swab. Similarly, high vaginal swabs do not give a good yield for *Neisseria gonorrhoea*, unless an endocervical swab is taken.

Any genital ulcerations noted on examination must be referred for further evaluation. The family physician should not hold on to the patient, as further evaluation is urgently required to rule out other sexually transmitted diseases like herpes, syphilis etc, and the possibility of malignancy.

Investigations that the family physician can rely on are:

1. Microscopic examination of the vaginal discharge - a high vaginal swab for candidiasis, trichomoniasis and "clue cells" should be done. "Clue cells" is one of the indicators of the presence of bacterial vaginosis. Results from microscopic examination are fast and reliable and can be used as the basis for initiation of treatment. In fact, in the primary health setting, this may be the only relevant investigation that we need to order.

2. Endocervical swabs for *Neisseria gonorrhoea* and *Chlamydia trachomatis*.

   This is indicated if the history suggests that the patient may have sexually transmitted disease, or if we suspect that the patient may have venereal disease. It is important to note that swabs must be taken from the endocervix for detection of *Neisseria gonorrhoea* and *Chlamydia trachomatis*.

3. Cultures - Organisms that may be cultured from a high vaginal swab include Bacteroides, *Gardnerella*, *Streptococci* (including *Peptostreptococci)*, *Staphylococci* and *Escherichia coli*. *Neisseria gonorrhoea* may be detected although only positive in about 40% of cases. For better yield, cultures should be taken from the endocervix. A specific endocervical swab for Chlamydial detection may also be taken.

   Normally, a microscopic examination of the swab is sufficient in a family physician's practice to make a diagnosis and to initiate treatment.

TREATMENT

As in most conditions, treatment can be divided into pharmacological and non-pharmacological treatment.

Non-pharmacological treatment
The patient with vaginal discharge should be advised against using talcum powder, shower gels, douching and washing intravaginally as these may make symptoms worse by altering the normal flora and pH of the vagina.

Similarly, they should be advised against using

perfumed soaps and soap powder, as these may result in contact dermatitis.

Tight underwear may worsen symptoms of pruritus, and patients should be advised to wear cotton or silk underwear which are not too tight.

If there is a retained tampon in a patient with vaginal discharge, it should be removed.

Pharmacological treatment
Specific drug therapy is initiated once the causative organism is identified.

Candidiasis
This is the commonest fungal infection in the vagina and indeed a major cause of vaginal discharge seen in the primary health setting. Candida often exists commensally. Hence, if the patient is asymptomatic, there is no indication for treatment. Predisposing factors for symptomatic candidiasis include diabetes mellitus, long term oral antibiotics and oral contraceptives.

Treatment of genital candidiasis is effected through the use of antifungal pessaries. Some of these pessaries include:

- Nystatin pessary 100 000 U at night for 14 days or
- Clotrimazole pessary 200 mg at night for 3 days or 100 mg at night for 6 days or
- Tioconazole pessary 100 mg at night for 3 to 6 days.

Trichomoniasis
It is important to note that the male sex partners of patients with trichomoniasis must be treated. Treatment of trichomoniasis (whether symptomatic or asymptomatic) is as follows:

Adults:
- Metronidazole 2 g orally as a single dose or
- Metronidazole 200 g orally three times daily for 7 days or
- Metronidazole 400 g orally twice a day for 7 days.

Children:
- Metronidazole 15mg/kg orally three times a day for 7 days.

Chlamydia trachomatis infections
These infections may present with mucopurulent discharge from the endocervix. There is often associated oedema and erythema of the cervix. If an endocervical smear is taken for gram-staining, there may be more than 30 pus cells per high power field.

However it must be noted that Chlamydial infection may be asymptomatic.

Treatment of Chlamydial infection of the endocervix is simple, provided there are no other associated infections such as gonorrhoea. The recommended drug therapy is as follows:

- Tetracycline 500 my four times a day for 7 days or
- Doxycycline 100 mg twice a day for 7 days or
- Minocycline 100 mg twice a day for 7 days.

If the patient is allergic to tetracycline or if she is pregnant, the following regimen may be followed:

- Erythromycin base or stearate 500 mg four times a day for 7 days or
- Erythromycin ethylsuccinate 800 mg four times a day for 7 days.

Gonorrhoea
There is often a purulent vaginal discharge, although asymptomatic infection is possible. I would usually refer patients with gonorrhoea to the Department of STD Control. Sexual contacts must be evaluated and treated as well. The recommended treatment regimen for uncomplicated gonorrhoea in adults is with I/M Ceftriaxone 250 mg single dose with treatment for nongonococcal urethritis (see treatment for Chlamydial infection above). The reason for combination therapy is the high incidence of coexisting non-gonococcal urethritis (NGU) with gonorrhoea.

Bacterial vaginosis
Diagnosis is from the presence of at least 3 of the following features:

1. Vaginal pH of greater than 4.5
2. A grey homogenous vaginal discharge
3. The presence of clue cells in a wet mount

preparation of vaginal fluid
4. A positive amine test, in which a fish odour is released ("sniff test").

Treatment of bacterial vaginosis is with Metronidazole 400 mg twice a day for 7 days for symptomatic women only. Trials with Clindamycin cream (2% 5 g, intravaginally once daily for 7 days) have shown very encouraging results in some studies.

Atrophic vaginitis

Management of atrophic vaginitis is by local administration of oestrogen cream. It may be preferable to initiate hormone replacement therapy for those with menopausal symptoms as well. However, malignancy must first be excluded.

INDICATIONS FOR REFERRAL

I would refer the following categories of patients for specialist management:

1. Any ulcerations or suspicious lesions in the genital tract noted on examination.
2. Vaginal discharge that does not resolve with appropriate therapy.
3. Chronic recurrent vaginal discharge.

CONCLUSION

Vaginal discharge is a very common condition seen by family physicians. The family doctor must learn to gather relevant information from the patient and to perform simple examination and appropriate investigations to identify the aetiology of the vaginal discharge. Knowledge of proper drug therapy is essential. Relevant advice to patients and the identification of their fears and concerns are equally important. In short, the family physician must have a logical approach to the problem of vaginal discharge. Approaches may differ from one doctor to another, but ultimately what counts is the rendering of an effective, sensible, and workable treatment for the patient.

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RELAXATION TECHNIQUES: AN ALTERNATIVE TO BENZODIAZEPINES IN THE MANAGEMENT OF STRESS AND ANXIETY

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INTRODUCTION

Stress is part of life; it happens to everyone as we cope with daily events, interact with people and meet with different demands. Excessive stress affects everyone differently. Some become anxious or depressed, while others become angry or withdrawn.

Until recently benzodiazepines were seen as first line in the management of stress and anxiety. With the necessary recognition of its potentially addictive pharmacological qualities, relaxation techniqus have been explored as potential alternatives.

This article looks at various relaxation techniques which are simple and effective at reducing levels of tension and stress.

Relaxation techniques are but part of a comprehensive stress management programme. Simple strategies such as effective time planning, having an avenue to ventilate and share one's problems, mobilising and building a support system, proper diet and nutrition, as well as setting realistic goals for oneself also go a long way in decreasing the daily stresses of everyday living.

Relaxation techniques can result in physiological processes. The relaxed state is a hypometabolic state consisting of lowered blood pressure, heart rate, muscle tension and galvanic skin response. For this reason, it is important for patients who are on medication or under medical care to consult their general practitioner before beginning relaxation training. In particular, those with hypertension, epilepsy or coronary heart disease should seek medical opinion before starting.

PROGRESSIVE RELAXATION

It has been postulated that when a person is under mental stress, he or she tenses the muscles. By tensing the muscles, he or she experiences physical discomfort which tends to make mental stress even worse. Developed by Edward Jacobson in 1929, Progressive Relaxation is a technique used to break this tense-mind, tense-muscle cycle, and thereby relieve physical tension[1].

The technique involves the successive tensing and relaxing of voluntary muscles in an orderly sequence until the entire body is in a state of total relaxation. We soon learn to identify and contrast the sensations of tension with that of letting go. This technique relaxes the mind by first relaxing the body.

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Mastering the process

1. To try the technique yourself, sit on a comfortable armchair or lie on your bed.

2. Close your eyes and begin with deep breathing exercise. Let all the tension flow out of your body.

3. As you begin to relax, focus your attention on your right hand and arm. Clench your fist, squeeze very hard, hold the tension for a few seconds.

4. Now release the tension from your right hand and arm. Let the tension flow out of your arm slowly. Your arm feels very relaxed and heavy now.

5. Repeat the whole sequence, using your left hand.

6. Next try to shrug your shoulders as hard as you can, bringing them up and in. Relax and repeat.

7. Now press your head back, feel the tension in the neck muscles. Slowly release the tension and repeat the procedure.

8. Move on to the facial muscles. Think about tensing your forehead and jaw. Squeeze your eyes tightly together and slightly bite down. Relax and repeat.

9. Straighten your legs, point your toes towards your face. Relax and repeat. Your entire body should feel more at peace.

10. Take a slow, deep breath again. Enjoy the wonderful feeling of relaxation.

11. To conclude the exercise, slowly count to ten. Stretch your arms and legs, open your eyes before you get up. You will feel very fresh and relaxed.

Progressive relaxation has been proven effective and does not require any special equipment. Benefits can be felt in several weeks of three daily sessions of just five minutes each[2]. It has also been found to be useful in treating a wide variety of disorders including generalized anxiety, tension headaches, migraine, insomnia, neck and back pain. Its effects improve with practice[3,4,5].

AUTOGENIC TRAINING

Autogenic training is another natural form of relaxation, first developed by the German psychiatrist Johannes Schultz. The basic premise of the technique is that a person's mind can induce the body to relax by concentrating on the feelings of heaviness and warmth, thereby resulting in an auto-hypnotic state. Both these sensations are caused by perplexed vasodilation and muscle relaxation respectively.

The physiological effects of autogenic training are similiar to those of other relaxation techniques. Heart rate, respiratory rate, muscle tension and serum cholesterol levels decrease. Alpha brain waves and blood flow to the limbs increase. Because of this, autogenic training has been used with some success in treating Raynaud's disease[6,7].

Other studies show that autogenics also help with brochial asthma, ulcers, diabetes, lower back pain and tension headache[8,9].

The stages of autogenics training focus on sensations of heaviness, warmth and coolness in various parts of the body, namely the limbs, the left chest, the abdomen and the forehead. With practice, it would take only a few minutes to feel heaviness and warmth followed by a state of relaxation. This method is employed one to six times a day each session lasting ten to thirty minutes.

Later imagery is superimposed to augment the state of relaxation. Many employ images such as birds flying through the air, or a quiet cool morning by the beach. Often, as many senses as possible are used to make the images as vivid as possible, e.g. the smell of wildflowers, the colour of the sea and the sky, the sounds of birds.

BIOFEEDBACK

In biofeedback training, an instrument is used to measure certain physiological parameters, and

this information is relayed back to the subject, who will then learn to control his or her body processes.

Studies have shown that subjects can change the heart rate and galvanised skin reponses[10,11,12] by biofeedback training. However it has still not been determined how people control their physiological processes.

Biofeedback demonstrates that we have much greater control over our own bodies than realised. It also alters the doctor-patient relationship to a more balanced one as the patient is able to recognise that he has a great deal of control over himself and that he has to do a great deal more work in order to get better. They soon learn that they can depend upon their own resources rather than depending on medications alone.

However this technique has its own limitations. Biofeedback equipment is not readily available, and is certainly more expensive than other forms of relaxation techniques. Moreover, since the machine cannot be strapped to the patient all the time, the patient has to learn another relaxation technique in conjunction for stress management.

MEDITATION

Meditation is a mental exercise that has its tradition grounded in Eastern cultures. The purpose of meditation is to assume control over one's attention so that one would choose what to focus upon rather than being subjected to environmental circumstances.

There are many forms of meditation systems. These include Zen meditation, Mudra yoga and Transcendental meditation. Regardless of the form, the approach used is common to all, i.e. focusing attention onto an object. By focusing attention on one object, other channels are excluded from the field of vision. Some people use external objects to focus upon, others a geometric figure while some concentrate on silently repeated words or sounds.

Meditation is best performed in a relatively quiet and comfortable environment. However once mastered it can be practised practically anywhere. As sleep is a different physiological phenomenon from meditation, one will not get the benefit of meditation by falling asleep. To prevent this from occurring, it is better to use a straight-backed chair which also supports spinal alignment. Once positioned with buttocks pressed against the back of the chair, one should allow all the muscles to relax. The eyes are then closed and one word is repeated in the mind, once during each inspiration and twice during each expiration. When the period of meditation is over, a short period of time should be given to allow the body a chance to become readjusted to normal routine.

Meditation's effectiveness is hindered by concurrent administration of stimulants which interfere with the relaxation response. Studies into meditation have shown that the respiratory and heart rates of a meditating subject decrease[13,14,15] and there is a concomitant decrease in muslce tension. Some Indian yogis have been known to decrease their respiratory rates to 4 to 6 per minute and their heart rate by about 25%[16].

SUMMARY

Relaxation techniques result in changes in psychological process. Blood pressure and heart rates are lowered[10,17,18] and muscle tension is decreased and because of these changes in physiological parameters, patients who are on medication are often advised to seek the opinion of their general practitioners before practising relaxation techniques.

There have not been many controlled investigations and research into relaxation methods. Clinical experience suggests that the anxiolytic effects of relaxation techiques if properly carried out are roughly equivalent to a moderate therapeutic dose of benzodiazepines. However patients who willingly take prescribed anxiolytics very often refuse to practice relaxation techniques diligently enough to reap its benefits. For those willing to practise, the anxiolytic effects of relaxation increase with practice as opposed to benzodiazepines which diminish with time.

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A CASE OF FAMILIAL HYPERCHOLESTEROLEMIA

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Miss CLQ is a 26 year old Chinese who was noted to have nodular swelling over both her elbows in the course of a routine consultation. They were painless and had been present for a few years.

Clinically, she had tuberous xanthomas over the extensor surface of her elbows and her left knee. These were lobulated, soft lesions found in the subcutaneous layer over the elbows, measuring about 4 x 1 cm. Her Achilles tendons were also thickened. No xanthelesma or arcus cornea were detected. Her blood pressure was normal and she was not obese (BMI 23). There were no clinical evidence of atherosclerosis.

Her fasting lipid profile was as follows:

Total cholesterol - 417 mg/dl
LDL cholesterol - 340 mg/dl
HDL cholesterol- 63 mg/dl
Triglycerides - 71 mg/dl
Chol/HDL ratio - 6.6

She had a significiant family history of high cholesterol. Her father and 30 year old brother were both said to have high cholesterol. We screened her younger sister and found that she had tendon xanthomas. Her blood lipid profile was:

Total cholesterol - 324 mg/dl
LDL - cholesterol - 245 mg/dl
HDL - cholesterol - 66 mg/dl
Triglycerides - 64 mg/dl
Chol/HDL ratio - 4.9

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The patient's grandfather and uncle both died of acute myocardial infarction in their early fifties (see family genogram).

DISCUSSION

Familial hypercholesterolemia (FH) is an autosomal dominant disorder affecting approximately 1 in 500 persons and meets the World Health Organisation criteria for a worthwhile screening programme, which include the ability to detect the condition in the pre-clinical phase, the existence of an accurate, acceptable inexpensive test and an acceptable and effective treatment[1]. The index patient and her two siblings and their father have heterogygous familial hypercholesterolemia (hFH). The index patient's mother is probably not afflicted.

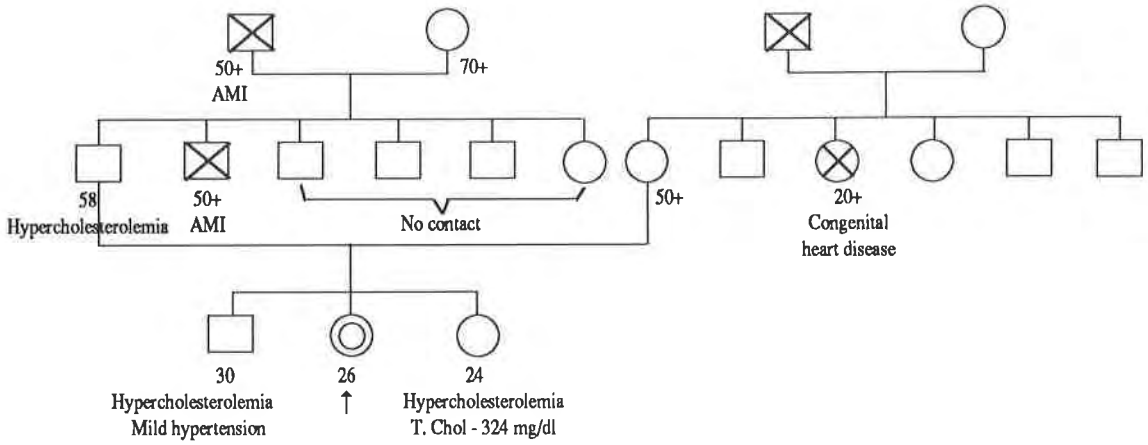
FH is caused by a mutation in the gene for the LDL receptor resulting in 3 possible defects:

1. *Receptor-negative* - non-functional gene product
2. *Receptor-defective* - receptor has 1 - 10% the normal LDL binding capacity
3. *Internalization - defective* - inability to transport bound LDL into the cell.

LDL catabolism is blocked and the level of LDL rises. There is also enhanced production of LDL due to lack of LDL receptor on liver cells. The LDL is taken up by tissue macrophages which accumulate in various sites in the body producing xanthomas.

Xanthomas are found in 70% of persons with FH after the age of 20 years. These are nodular swellings over the Achilles tendon and tendons

FAMILY GENOGRAM OF MISS CLQ



over the elbows, knees and dorsum of the hand. Their presence is virtually diagnostic of familial hypercholesterolemia. Tuberous xanthomas may also be present (as evident in our index patient) and so may xanthelesma and arcus cornea.

Tendon xanthoma is diagnosed more on morphology than on the actual width of the tendon. At times, the surface of the tendon may feel irregular or nodular to palpation. Ultrasonography which would reveal focal hypoechoic lesions compatible with xanthomas has been found to be more useful than MRI in the detection of xanthoma in one recent study[2].

The high LDL levels also infiltrate the artery wall during endothelial damage and the cholesterol released undergoes oxidation, producing substances which increase plaque formation and enhance platelet aggregation.

Homozygotes for this condition usually die before the age of 20 from a cardiovascular event. Heterozygotes of FH present with symptoms of premature atherosclerosis during the third and forth decades. 50 - 75% of untreated men would have had a myocardial infarction by the age of 60. Incidence of stroke and peripheral vascular disease is also higher.

The diagnosis of familial hypercholesterolemia is made when one finds a patient with Type IIa hypercholesterolemia and tendon xanthoma. The plasma cholesterol level is usually in the range of 350-400 mg/dl. Family screening should be undertaken upon diagnosis of the index patient. As this is an autosomal dominant disease, 1 in 2 of the relatives will have the condition. In the case illustrated, all the siblings of the patient were found to have familial hypercholesterolemia.

It is important to identify those who have FH early so that steps to lower the LDL cholesterol can be instituted, therby delaying the onset of atherosclerosis and myocardial infarction. Treatment includes:

Dietary changes[3]

Phase 1

- Avoid foods high in cholesterol and saturated fat.
- Delete egg yolk, butterfat, lard and organ meat.
- Substitute soft margarine for butter, vegetable oils and shortening for lard, skim milk for whole milk, egg white for whole eggs.

Phase 2

- Gradually use less meat and more fish, chicken and turkey. No more than 6-8oz/day.
- Use less fat and cheese.

Phase 3

- Eat mainly cereals, legumes, fruit and vegetables.
- Use meat as a condiment.

- Use low cholesterol cheeses.
- Save these foods for use only on special occasions: extra meats, regular cheese, chocolate, sweets and coconut.

One would expect a 6-7% decrease in plasma total and LDL cholesterol for each dietary phase. If a patient is able to reach phase 3, there would be an average of 18-21% lowering of the plasma cholesterol.

Table 1. Various Factors Influencing Lipoprotein Levels

	VLDL	LDL	HDL
Lifestyle			
Obesity	↑	↑	↓
High saturated fat intake		↑	
Polyunsaturated fat diet	↓	↓	
High fibre diet	↓	↓	
Alcohol	↑		↑
Exercise			↑
Disease state / drugs			
Hypothyroidism	↑	↑	
Diabetes mellitus	↑		
Nephrotic syndrome	↑	↑	
Oral contraceptives	↑		
Thiazide diuretics	↑		
Alcohol	↑		

Drug therapy

- Bile acid-binding resins e.g. cholestyramine.
- HMG CoA reductase inhibitors.

Combination therapy of 2 or 3 agents in low or moderate doses appears to offer the most cost-effective and side-effect free therapy. 50-60% reduction in LDL cholesterol can be achieved.

Nonpharmacological therapy

- LDL pheresis[4]
- Intestinal bypass of the terminal ileum
- Portacaval shunts
- Liver transplant
- Autologuous transplantation of genetically altered hepatocytes

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EVALUATION OF A SUMMER PRECEPTORSHIP

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ABSTRACT:

Background: There are shortages in primary care residency applicants. Preclinical preceptorship in community medicine is a way to encourage more applicants to the specialty. Methods: A voluntary summer preceptorship was designed at the University of Arizona College of Medicine. The purpose of this study is to evaluate the performance of students, and the value of such experience. Results: On a five-point scale (1=poor, 5=excellent), the overall quality of the program was noted by a mean of 4.32 by students vs. 4.18 by preceptors. Preceptors were impressed by performance of students. Most students (86%) felt that the experience provided was appropriate. Half of the students felt that the feedback provided by preceptors was helpful. Conclusion: The externship experience at Arizona's Area Health Education Centers (AHEC) of the University of Arizona is an addition to the literature on the importance of a preceptorship programe.

Key words: *Preceptorship, Student, Evaluation, Family, Community, Primary, Performance, Interest.*

INTRODUCTION

The conventional wisdom in medical education holds that community-based training experiences away from academic medical centers represents a reasonable strategy to encourage medical students to seek careers in primary care. It is well documented that there is a shortage of primary care physicians in rural areas[1,2]. This shortage is best met by family physicians [3,4,5,6] since there is a tendency for family physicians to practise in non-metropolitan areas more frequently than other specialists[7].

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It is important to identify early the medical students who are interested in primary care in order to try to enrich their experience in primary care and community medicine. Previous reports stressed the importance of primary care preceptorship in introducing medical students to community-based medical education and to create a desire to pursue a career in primary care [8,9,10].

The preclinical preceptorship described here is offered outside of the present medical curriculum to students during the summer vacation between their first and second year of medical school. Students are placed with a preceptor in a rural or urban community-based clinical site during their vacation period. Students see patients in their preceptors' setting under supervision and do basic histories and physicals and they may also learn about and assist in some office procedures such as minor surgery and laceration repair. Students may, at the discretion of their primary preceptor, rotate with other physicians in the community setting and are encouraged to learn about the community in which their preceptors provide health care services. Students may also go on home visit with

visiting nurses, visit the public health department and in general participate in the total life of their community. Through the cooperation of the AHEC (Area Health Education Centers) progams students receive housing and often lodging in local community. The majority of preceptors are physicians in practice in rural settings or urban clinics serving the underserved. Most, but not all, are family physicians. The preceptor must be willing to take responsibility for the students' experience at the site. This includes working with students to establish a schedule of experiences, supervising student-patient contacts, helping the students to evaluate their progress. Some preclinical rotations may focus on community projects and consequently entail less direct involvement for the preceptor. Clinical and community experiences may vary slightly from community to community. No student has independent patient care responsibilities and are always under direct and immediate supervision when involved with patients.

In the summer of 1992 nearly one-quarter of the first medical student class participated in the Summer Externships (N=22). Because this experience carries no credit, enrolling is assumed to be a strong predictor of interest in a primary care career. The program benefited from the enthusiasm and energy of the medical students and the willingness of physicians throughtout the State of Arizona to volunteer to host these students and expose them to their individual practice settings. Preceptors and students were encouraged to share their expectations and develop a learning contract around which the preceptorship experience could be evaluated. We were interested in evaluating the performance of the students by preceptors in addition to the value of the experience by the students and preceptors.

METHODS

Evaluation forms were given to all preceptors and students who participated in the Summer Externship. Within these forms, students were asked to indicate their level of interest in pirmary care as a future career choice on a five point scale-1=very interested and 5=not at all interested. Preceptors were asked to respond to the following statement: "My student is definitely considering primary care as a career" by using the same five point scale-1=strongly agree an 5=strong disagree. The essence of this report is to compare the responses of the preceptors and the students both from the perspective of the two cohorts as well as by measuring the degree of agreement between each pair.

RESULTS

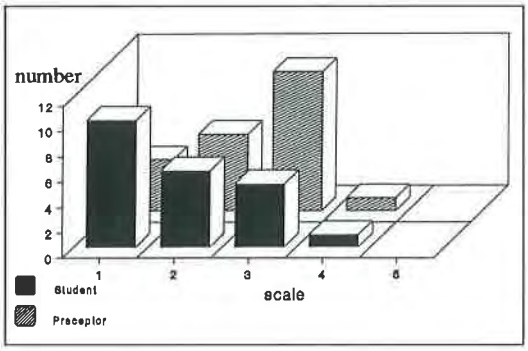
All students (22) and preceptors (22) completed evaluations. Both students and preceptors rated all aspects of the externship experience highly. On a five-point scale (1=poor, 5=excellent) the overall quality of the program received a mean rating of 4.32 by students vs. 4.18 by preceptors. However the organizational aspect was rated as 3.64 by students vs. 4.09 by preceptors. AHEC staff support was rated at 3.95 by students and 3.91 by preceptors.

Preceptors' evaluations of students (1=poor, 5=excellent) were high. Preceptors were most positively impressed by the integrity of students (mean=4.73) followed by their interpersonal skills (mean=4.36). Students were highly motivated (mean=4.64). The overall evaluation of the performance of students was high (mean=4.64).

A high percentage of students were interested in pursuing a career in primary care. On a five-point scale (1=very interested, 5=not at all interested) the mean score was 1.86 with 45.5 percent being "very interested" and 27.3 percent "interested" in pursuing such a career, which represents over 70 percent of our students (fig 1).

Most students (86.4%) felt that the experience provided was appropriate to their educational level. They believed that the degree of responsibility for

Fig 1. Student Interest and Preceptor Prediction of Interest in Primary Care



patient care was about right (63.6%). At the end of the externship, all students except one felt more comfortable working with patients. Half of the students felt that the feedback provided by preceptors was helpful (Table 1).

Table 1. Students' Evaluation of Their Clinical Experiences in the Externship

	Average Rating*
A) Experiences provided appropriate to your current education level.	1.77
B) Degree of responsibility offered to you for patient care	3.18
C) At the completion, how comfortable did you feel about working with patients?	1.73
D) The feedback provided to you by your preceptor	2.09

*A) *1 = All appropriate - 5 = All inappropriate*
B) 1 = Too much - 5 = Too little
C) 1 = Very comfortable - 5 = Very uncomfortable
D) 1 = Very helpful - 5 = Not helpful

The students were somewhat positive about their community-oriented experience. Analysis on a scale of 1 to 5 (1=poor, 5=excellent) revealed that most students felt that they were able to describe the overall health status of the community (mean=3.23), to identify ethnic/cultural groups (mean=3.54), health agencies (mean=3.59) and the most pressing health needs of the community (mean=2.95) (Table 2).

Table 2. Evaluation of Community Oriented Experience by Students During Their Externship

Descriptors	Average Rating*
Ability to describe the overall health status of the community	3.93
Ability to identify cultural/ethnic groups within the community which are "at risk" or have special needs	3.54
Ability to identify public and private institutions or agencies that provide health services to the community	3.59
Ability to identify the most pressing health care needs or problems in the community	2.95

* 1 = poor 5 = excellent

On a scale of 1 to 5 (1=too much, 5=too little) the analysis of the amount of time spent together by students and preceptors revealed that students felt that in 86.4 percent of the cases, the time was about right (mean=3.23), whereas only 72.7 percent of the preceptors felt the time was about right (mean=3.14). The percentage of preceptors expressing desire to participate in the program again was high while only 2 individuals reported reservations.

DISCUSSION

There are concerns whether the number of residencies in primary care is adequate to meet the nation's needs[11,12,13,14,15]. However, a more limiting factor in educating an adequate number of primary care physicians is the declining number of applicants to primary care residency[16]. The specialty maldistribution, exemplified by an excessive number of specialists and corresponding paucity of generalists, is getting worse[17].

The externship rotation at the University of Arizona was an elective rotation which carries no credit. Therefore, it is a screening tool for students interested in community and primary care medicine. The fact that 22 students out of 88 representing 25% of the class elected to participate in this rotation is a good indicator of the high interest in community medicine at the preclinical level. Medical education is gradually moving form the hospital to the community setting[18]. It was estimated that even by 1986, 121 of the 127 US medical schools required clerkship with some form of ambulatory primary care[19]. In family medicine, community preceptorship is an integral part of undergraduate training. It is a curricular strategy as an attempt to interest medical students in primary care. It has gained popularity in most family medicine departments throughout the United States. The preceptorships are offered as a clinical experience to students in their junior years [20-23]. Alternatively, they may be offered as an elective to preclinical students[24,25].

Students and preceptors enjoyed all aspects of their rotations and most preceptors were willing to participate again in future rotations. An important issue which surfaced from this survey is the feedback, since 8 out the 22 students reported that preceptor feedback was not helpful to them. Since preceptors acted as a role model for medical students, it may be important to encourage as many preceptors as possible to enroll in faculty development programs to improve their teaching skills. Several authors have found the preceptorship to be a positive influence on selection of family practice as a career[9,10]. It is however, important to follow-up all students who elected to take the externship during their third or fourth year in medical school. This cohort of students should be encouraged to participate in more community activities during the rest of their medical school years. Several incentives should be available for those students including scholarships for further rotations in primary care, and a special incentive for a career in primary care.

Personal experiences, such as the impact of faculty role models during the medical school years, are likely to have a major influence on the student's decision. The timing of our preceptorship is important since Harris and Bluhm[26] found that their preceptorships for junior and senior medical students had little effect on career choices. Whereas Bissonette and Lenkie[27] noted that preceptorship placement in the clinical years comes at a time when most students have made career decisions. Another important goal of a pre-clinical preceptorship is to expose students to a community oriented approach to patient care. We suggest that the community focus of the externship could be strengthened.

In conclusion, the externship experience at AHEC at the University of Arizona is an addition to the literature on the value of a preceptorship program in influencing career choice in medical students. There is a need for preceptors to enroll in a faculty development program, and to stress the importance of this rotation as a screening tool in the pre-clinical years which help directing resourses toward a more receptive subgroup of students.

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ANTIBIOTICS IN URINARY TRACT INFECTIONS

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Bacteriology

- *E coli* is still responsible for 80% of urinary tract infections.
- *Staph saprophyticus* is the second most common causative organism, particularly in young women.
- *Chlamydia trachomatis* can cause dysuria, urgency and frequency accompanied by pyuria and sterile routine bacterial culture; it is likely to be sexually transmitted.
- With recurrent infection, more resistant strains of gram-negative organisms (*Klebsiella, Enterobacter, Pseudomonas, Proteus*) or gram-positive organisms (*Enterococcus faecalis, Staphylococcus aureus*) may be found.

Diagnosis

- A major revision in the diagnostic criteria for symptomatic urinary tract infection in the community has been abandonment of the 10^5 colony-forming units (CFU) of pathogens per ml of urine. The figure of 10^2 CFU/ml is now recommended as providing optimal sensitivity and specificity for clinical decision making.
- A count of 10 or more white blood cells/mm^3 is used as criterion for infection.
- A positive nitrite reading on reagent stick examination is useful, but false-negatives occur.
- The recommendation to always culture urine before initiating antibiotic therapy has given way to doing it only in patients who fail to respond to initial therapy; cultures are mandatory for suspected acute pyelonephritis or in complicated settings of infection as shown in Table 1.
- Differentiating complicated from uncomplicated infection is a serious concern in patients with acute pyelonephritis. Imaging studies are indicated for those conditions in Table 1.

Table 1. Complicated Urinary Tract Infection

Childhood urinary tract infection
Diabetes mellitus
Elevated creatinine level
History of urinary calculi
Neurologic bladder dysfunction
Persistent haematuria
Previous genitourinary surgery
Prolonged fever despite initiation of antibiotic therapy
Relapsing infection
Urea-splitting or unusual organism

Acute uncomplicated infection

The clinical features are dysuria, urgency and frequency but no fever and no back pain. These infections are most common in women in their childbearing years.

Antibiotic use

- Oral amoxycillin, ampicillin, co-trimoxazole, nalidixic acid, nitrofurantoin, or trimethoprim have been recommended although the choice will depend on local patterns of bacterial resistance. Alternatives when resistance is prevalent include amoxycillin with clavulanic acid, oral cephalosporins or quinolones such as ciprofloxacin; it should be noted that *Staph saprophyticus* is uniformly resistant to nalidixic acid.

- Standard treatment schedules have been for 7 days.

- Single-dose regimens can also be effective for patients with the following predictors of success: youth, low colony counts (less than 105 CFU/ml), short duration of symptoms and absence of haematuria. Commonly used regimens for single dose regimens are amoxycillin 3g, trimethoprim 400mg, co-trimoxazole 2 double-strength tablets.

Acute pyelonephritis

The clinical features are fever and costovertebral tenderness, usually accompanied by frequency, urgency and dysuria. Leucocytosis is usually present and urinalysis reveals pyuria and bacteriuria. Culture and sensitivity is mandatory.

Antibiotic use

- Initial therapy may need to be parenteral and broad-spectrum. A variety of individual or combination antimicrobials are acceptable: Beta-lactam antibiotic and aminoglycoside; flouroquinolones; third generation cephalosporins; trimethoprim-sulphamethoxazole. Ampicillin and amoxycillin are often excluded on the basis of high E coli resistance, and resistance to trimethoprim-sulfamethoxazole is increasing.

- Parenteral therapy should be continued for 24 hours after the temperature normalises, and oral agents can then be initiated to complete a 14-day course.

Asymptomatic bacteriuria

Asymptomatic bacteriuria is defined as reproducible growth of at least 10^5 CFU of the same species of bacteria per ml of urine. Since diagnosis is by culture, organism sensitivities should be obtained as a guide to safe, cost-effective therapy.

Antibiotic use

- Asymptomatic bacteriuria should be treated in the following groups of patients:
  - pregnant women
  - diabetes mellitus
  - children younger than 4 years.

- The significance of asymptomatic bacteriuria in old age is disputed, but most consider treatment to be unnecessary.

Indwelling catheters

Catheter-related bladder infections are common. They may respond to localised treatment with bladder washouts. Sterile, closed drainage system with the collecting bag positioned below the level of the bladder are the mainstays of prevention.

Antibiotic use

- Systematic antibiotic prophylaxis is not recommended because it promotes the development of resistant organisms.

- While the catheter is in place, antibiotic use should be reserved for symptomatic infection.

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CASE STUDY:
A YOUNG WOMAN WITH ABDOMINAL PAIN

L H Lim, MBBS, FCFP (S'pore)

Part 1

A 24 year old single female psychologist suddenly developed pronounced left iliac fossa pain in the morning whilst at work. The pain lasted for a short while, and had eased by the time the patient was seen by her family physician. There was no history of fever, nausea, vomiting or diarrhoea. She had taken her normal breakfast.

Q1. What differential diagnosis would you consider?

Q2. What further history would you take to help you come to a diagnosis?

Q3. What other areas would you examine?

Q4. What investigations, if any, would you do at this stage?

Part 2

The patient was given mefenamic acid for the pain, and a day's sick leave. She slept the whole afternoon and was awakened in the evening by another episode of severe left-sided abdominal pain. Again, there was no fever, nausea, vomiting or diarrhoea. She was then seen at the A & E department of a private hospital at around 9.00 p.m. The duty doctor found her general condition to be satisfactory, and noted some tenderness in the left iliac fossa. There was no associated rebound tenderness or guarding.

Q5. In view of the new developments, what would your revised differential diagnosis be?

Q6. How would you manage the patient then?

Part 3

A pelvic ultrasound scan was done the next morning. The patient was then referred to the gynaecologist, who performed a laparotomy the same day. What is the most likely final diagnosis?

* *For the ultrasound and laparotomy findings, please turn to page 54.*

ANSWERS

Ultrasound of pelvis

Results

Uterus retroverted, normal in size with uniformechogenecity. No focal nodule is identified.

The right ovary is normal in size and echopattern. The left ovary is not visualised. Just above the urinary bladder and uterus is a large cystic mass. This measures 10.9 x 9.2 x 8.9cm in dimension. The margin is fairly smooth, although a solid echogenic nodule is seen along the posterior wall.

Comments

There is a cystic mass probably arising from the left ovary.

Gynaecological opinion

At the time of examination by the gynaecologist, she was pain-free and her abdomen was soft and non-tender.

Laparotomy findings

- 30 ml of bloodstained peritoneal fluid.
- There was a single 10 cm diameter, left ovarian cyst, with two twists in the ovarian and the infundibulo-pelvic ligaments. The blood supply did not appear to have been compromised. A few spots of endometriosis were noted at the back of her uterus.
- Frozen section analysis showed benign mucinous cystadenoma.

WORLD HEALTH ORGANIZATION PUBLICATIONS

NEW BOOK ANNOUNCEMENT

Cancer Pain Relief

With a Guide to Opioid Availability
Second edition

1996, vi + 63 pages (available in English; French and Spanish in preparation)
ISBN 92 4 154482 1

This book is the second edition of a guide which introduced a simple, yet highly effective method for the relief of cancer pain. Thoroughly revised and updated, the new edition further refines the WHO method, which advocates the use of a small number of relatively inexpensive drugs, including morphine. Revisions draw on experiences with millions of patients around the world as well as new knowledge about the specific pain syndromes unique to cancer. Completely new are chapters describing the international system by which morphine and other opioids are made available for medical purposes.

The book has two parts. Part one provides a practical guide to the relief of cancer pain, concentrating on drug treatment as the mainstay of pain management. A brief explanation of the physiological and psychological causes of cancer pain is followed by a nine-step procedure for the evaluation of pain, including the questions that should be asked and the investigations that should be ordered. The principles of treatment are described in the third section, which includes a tabular list of 11 basic drugs and 18 alternatives. The next section, on the use of analgesics, explains the WHO method of cancer pain relief: "by the mouth", "by the clock", "by the ladder", "for the individual", and with "attention to detail".

The most extensive section sets out detailed guidelines for the selection and prescribing of non-opioid analgesics, opioid analgesics, drugs for neuropathic pain, and adjuvant drugs for the treatment of adverse effects, the enhancement of pain relief, and the management of concomitant psychological disturbances. Information ranges from explanations of how specific drugs work, through the precautions to take in the presence of certain disorders, to a list of factors that influence the effectiveness of opioids. Concerning the use of opioids, readers are reminded that psychological dependence does not occur in cancer patients and that the only "correct" dose of morphine is the one that relieves the pain.

Part two provides a guide to opioid availability. A discussion of the reasons why opioids continue to be underprescribed or difficult to obtain is followed by an explanation of the Single Convention on Narcotic Drugs. Emphasis is placed on the steps, within the terms of this agreement, that must be taken to make morphine and other opioids available for the treatment of pain, without compromising measures to prevent the diversion and misuse of these drugs. Part two concludes with guidelines for the regulation of health professionals, including general criteria that can be used to develop regulations for the dispensing of opioids by physicians, nurses, and pharmacists.

WORLD HEALTH ORGANIZATION PUBLICATIONS

NEW BOOK ANNOUNCEMENT

WHO Model Prescribing Information

Drugs Used in Sexually Transmitted Diseases and HIV Infection

1995, 97 pages (available in English, French and Spanish in preparation)
ISBN 92 4 140105 2

This book provides a practical guide to the use of drugs in the management of sexually transmitted diseases and diseases associated with HIV infection. Addressed to clinicians, especially in developing countries, the book aims to guide the selection and prescribing of drugs in line with the latest knowledge about efficacy, safety, and costs. Information responds to both the dramatic global increase in the incidence of these diseases and the spread of resistance to readily available antimicrobials.

The book has two parts. The first part summarizes the state-of-the-art in drug management of sexually transmitted diseases. Diseases covered include gonorrhoea, chlamydial infections, vaginitis, pelvic inflammatory disease, syphilis, genital herpes, chancroid, granuloma inguinale, genital warts, and HIV infection, AIDS, and associated infections. For each disease, information includes a description of clinical features relevant to diagnosis and management, advice on the need for microbiological confirmation, first-choice drugs and alternatives, guidelines for treating patients and their partners, alerts to special precautions, and advice on what to do if relapse occurs. The most extensive section, on HIV infection and AIDS, discusses the efficacy of drugs used to treat AIDS and AIDS-related complex, and describes the typical clinical course of 13 common opportunistic and other infections, emphasizing opportunities for drug management.

The second half of the book provides model prescribing information for some 22 essential drugs used in the treatment of sexually transmitted diseases and diseases associated with HIV infection. Information on each drug includes uses, dosage and administration, contraindications and precautions, use in pregnancy, adverse effects, drug interactions, and advice on storage. Drugs whose high cost precludes availability in many countries are not included.

Since it is often difficult to make an accurate diagnosis when a patient first presents for treatment, even in sophisticated facilities, the book concludes with a series of flow charts for the symptomatic management of 10 commonly encountered syndromes.

The book is part of a series of WHO publications intended to provide up-to-date and independent clinical information on essential drugs. Recommendations are the product of a consultative process involving internationally accredited experts, WHO's Expert Advisory Panel on Drug Evaluation, selected members of the WHO Expert Advisory Panel on Venereal Diseases, Treponematoses, and Neisseria Infections, and several nongovernmental organizations in official relations with WHO.

GUIDELINES FOR AUTHORS
THE SINGAPORE FAMILY PHYSICIAN

Authors are invited to submit material for publication in the Singapore Family Physician on the understanding that the work is original and that it has not been submitted or published elsewhere.

The following types of articles may be suitable for publication: case reports, original research work, audits of patient care, protocols for patient or practice management and review articles.

PRESENTATION OF THE MANUSCRIPT

The whole paper

* Normally the text should not exceed 2000 words and the number of illustrations should not exceed eight.

  Type throughout in upper and lower case, using double spacing, with three centimetre margins all round. Number every page on the upper right hand corner, beginning with the title page as

  1. Make all necessary corrections before submitting the final typescript.
     Headings and subheadings may be used in the text. Indicate the former by capitals, the latter in upper and lower case underlined.

     Arrange the manuscript in this order: (1) title page, (2) summary, (3) text, (4) references (5) tables, and (6) illustrations.

* Send three copies of all elements of the article: summary, text, references, tables and illustrations. The author should retain a personal copy.

The title page

* The title should be short and clear.

* Include on the title page first name, qualifications, present appointments, type and place of practice of each contributor.

* Include name, address and telephone number of the author to whom correspondence should be sent.

* Insert at the bottom: name and address of institution from which the work originated.

The summary

* The summary should describe why the article was written and give the main argument or findings.

* Limit words as follows: 100 words for major articles; 50 words for case reports.

* Add at end of summary: an alphabet listing of up to 8 keywords which are useful for article indexing and retrieval.

The text

The text should have the following sequence:

* Introduction: State clearly the purpose of the article.

* Materials and methods: Describe the selection of the subjects clearly. Give references to established methods, including statistical methods; provide references and brief descriptions of methods that have been published but are not well known. Describe new or substantially modified methods, giving reasons for using them and evaluate their limitations. Include numbers of observations and the statistical significance of the findings where appropriate.

  Drugs must be referred to generically; all the usual trade names may be included in parentheses. Dosages should be quoted in metric units.

  Laboratory values should be in SI units with traditional unit in parentheses.

  Do not use patient's names, initials or hospital numbers.

* Results: Present results in logical sequence in the text, tables and illustrations.