

Homi Bhabha Birth Centenary Year  
30 October 2008-30th October 2009



अंशदायी स्वास्थ्य सेवा स्कीम  
CONTRIBUTORY HEALTH SERVICES SCHEME



भारत सरकार  
Government of India  
भाभा परमाणु अनुसंधान केंद्र  
BHABHA ATOMIC RESEARCH CENTRE  
अणुशक्तिनगर, मुंबई - 400 094.  
Anushaktinagar, Mumbai - 400 094.

## New immunization schedule for Paediatric population in BARC Hospital

Age	Regular Vaccines	*Optional vaccines
Birth	BCG	
	OPV-0	None
	Hep-B-1	
6 wk	DPT-1	
	OPV-1	PCV-7
	Hep-B-2	IPV+OPV
	Hib-1	
10 wk	DPT-2	PCV-7
	OPV-2	IPV+OPV
	Hib-2	
14 wk	DPT-3	PCV-7
	OPV-3	IPV+OPV
	Hib-3	
	Hep-B-3	
9 month	Measles	None
15 month	MMR-1	IPV+OPV Booster
	DPT booster-1	PCV-7 Booster
	OPV booster-1	
	Hib booster	
2 yr	None	Typhoid
		Varicella
		Hepatitis -A
5 yr	MMR-2	
	DPT booster-2	None
	OPV booster-2	
10 yr	Tdap	HPV
15 yr	Td	None

**Abbreviations:** IPV-Injectable Polio vaccine, PCV-7 Valent Pneumococcal conjugate vaccine  
 HPV- Human Papilloma Virus Vaccine, Hib- Hemophilus influenza -b vaccine  
 MMR-Measles Mumps Rubella Vaccine, Tdap-DPT booster(acellular pertussis),  
 Td-Tetanus+Diphtheria(small dose) toxoid

BCG, OPV, DPT, Measles, MMR and Hepatitis-B vaccines are provided by BARC Hospital

\*Optional vaccines can be given after one-to-one discussion with parents.



# Pulse

**BARC HOSPITAL NEWSLETTER**

Volume 10

Jan. 2009

**Editorial Board**  
Dr. Amrita Misri - Chief Editor  
Dr. Chitra Bongirwar  
Dr. Hemant Haldavnekar  
Dr. Santoshi Prabhu  
Dr. Yogesh Shejul



Protective hands taking care of Life.

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## Author guidelines for contribution to PULSE

Certain guidelines for authors are recommended for inclusion of articles in PULSE.

It is essential to uniformly follow, as far as possible, a format for the submitted articles, which is broadly enumerated below:

1. Choice of topic / title to be governed by its relevance to the Medical Division's scope of work.
2. The importance / critical application of the subject.
3. Historical background (In brief).
4. Theoretical aspect (In brief) to facilitate understanding.
5. Present status with respect to Medical Division.
6. Interface with other disciplines, if any.
7. Specific contribution by the unit.
8. Enhancement / upgradation / future plans.
9. Conclusion.

Case reports of practical interest to clinicians are also invited for publication.

The information / details taken from various text books, magazines, journals, Internet should be duly acknowledged in the references.

Articles should be sent as Microsoft Word documents in both hard as well as soft copy forms to:

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The cover page showing protective hands around a sapling with coins at its root, is a metaphor for several aspects that this issue intends to address. It signifies the investment made by Dr. Homi Bhabha in Life and in the medical set up of our institution, primarily the CHSS, for its employees and various beneficiaries. More importantly, it is symbolic of the theme of this issue – 'Preventive Medicine'.

Firstly the effective 'Preventive Medicine', it is imperative for the medical fraternity to focus on doctor- to patient communication. The emphasis must be on listening to the patient – his / her medical history. This is elemental in alleviating the number of ailments presented by a patient that are largely psychosomatic. Secondly, communication and mutual understanding also ensures that the patients do not request for a list of so called non invasive investigations and that they are not subjected to the same, by medical professionals.

The judicious use of the medical resources at hand and minimizing the battery of investigations, stand to benefit not only the institution, but the patients as well. In one of the articles on Radiation and Imaging, Table –4 clearly explains that CT Scan exposes a person to a much higher dose of radiation as compared to conventional radiography. This reminds me of an incident where a patient had walked in, in one of the clinics for general check up and had asked for a whole body CT Scan. It is in these situations, that communication plays a lead role.

In this issue, the articles on screening and prevention of various malignancies have been simplified from the point of view of beneficiaries. I hope that going through these articles would prove beneficial to them. This

also applies to the article on prevention of cardiovascular diseases.

The most important group of patients which needs to be focused upon, is the adolescents. For prevention of psychiatric disorders in later life, care has to start from the period of adolescence. There are no easy ways to read a young adolescents feelings. Parents have to develop their own "antenna", so that they can pick up the signals. Parents need to deal positively with negatives. For example to an adolescent who has come home late, uncontrolled venting of angry feelings can cause real problems for both, the parent and the adolescent. The parent, instead of direct questioning needs to talk about the behaviour which is bothering and explain why it is so. There is also a need to explain, how one would like it to change. In short, one needs to communicate and give a solution.

I recall, as a student, years ago, teaching curriculum involved emphasis on proper communication and healthy lifestyle. After so many years, with explosion of knowledge all around, the fundamentals remain the same. I feel, this issue of 'Pulse' would appeal to the readers.

(Dr. Amrita Misri)

*P.S. "Pulse" is in the process of change. Any suggestions from the readers are most welcome*



Walkathon in Anushaktinagar as a part of Annual Day Celebration of Medical Division (January 2008)



## PREVENTIVE CARDIOLOGY

**Dr. Yogesh Shejul**

Medical Officer

Department of Medicine

### Introduction

In this era of 'modern medicine', enormous amounts of money, energy and expertise is devoted to 'therapeutic interventions'. However the more easily available option of 'preventive interventions' has always taken a back seat. This article is an effort to illustrate the long overdue swing from treatment toward prevention of coronary heart disease.

Coronary Heart Disease (CHD) is the leading cause of death all over the world. Coronary heart disease undermines health, reduces life expectancy and causes enormous suffering, disability, and economic burden. However, much of this burden could be lessened if there was a systematic application preventing the onset and progression of this condition. By addressing the underlying causes of Coronary heart disease and by improving the systems to detect and treat early-stage disease when interventions are most effective, significant reductions in disability and premature mortality could be achieved.

Compelling data from epidemiological studies and randomized clinical trials have also shown that Coronary heart disease is largely preventable.

### Current Scenario in India

Incidence of Cardiovascular diseases (CVD) may increase from 2.9 crores in 2000 to 6.4 crores in 2015 and the number of deaths from CVD will also more than double. Most of this increase will occur on account of coronary heart disease.

Data also suggests that although the prevalence rates of CVD in rural populations remains lower than that in urban populations, they will continue to increase, reaching to around 13.5% of the rural population, in

the age group of 60–69 years by 2015. The prevalence rates among younger adults (age group of 40 years and above) are also likely to increase; and the prevalence rates among women will keep pace with those of men across all age groups.

### Objectives

Our objectives should be to:

- stimulate substantial improvements in primary prevention and early detection;
- increase public awareness about healthy lifestyles;
- urge for legislative action that results in more funding for and access to primary prevention programs and research; and
- reconsider to the concept of periodic medical checkup as an effective platform for prevention, early detection and treatment.

### Risk Factors

Coronary Heart disease has multifactorial etiology with a number of potentially modifiable risk factors. The classical Framingham risk factors age, sex, smoking, blood pressure, total cholesterol and HDL have proven to be consistent risk factors in every population studied.

### Primary Prevention

The term primary prevention refers to interventions that aim to prevent CHD events in people who have no evidence of CHD.

Primary prevention should focus on efforts toward:

- reducing tobacco use;

- reducing obesity;
- improving nutrition and
- increasing physical activity.

### Tobacco Active smoking

Smoking is strongly and dose dependently associated with CHD. Tobacco use is the single largest preventable cause of disease and premature death. The great majority of deaths from tobacco could be prevented by reducing the initiation of tobacco use by children and adolescents and by encouraging the cessation of tobacco use among adults.

Nearly 20% of all deaths from cardiovascular disease are attributed to tobacco use. Among people who quit smoking, the risk of death from coronary heart disease is 50% lower than that of people who continue to smoke after one year of abstinence. Much is known about strategies that can prevent the initiation of tobacco use among young people and promote its successful cessation. Despite this, vigorous advocacy is needed to create and sustain effective tobacco-control programs. Comprehensive tobacco-control programs include restrictions on advertising and promotion of tobacco, increase in excise taxes, measures to reduce access to tobacco by minors, education and counter-advertising, clean air laws and readily available treatment for tobacco dependence. Counseling by medical caregivers can profoundly increase smokers' motivation to stop using tobacco. Advice from a physician to stop smoking should be accompanied by informed guidance in the use of prescription and nonprescription nicotine-replacement products and other pharmacological and behavioral therapies. A "teachable moment" may occur during hospitalization for ischemic heart disease or other morbidity, potentially related to smoking. However, counseling and pharmacological interventions are currently underutilized. Further training of individual clinicians and changes in health systems are needed to ensure that appropriate treatment for tobacco dependence is both required and rewarded.

### Passive Smoking

Several systematic reviews and observational studies provide evidence that exposure to environmental tobacco smoke is associated with CHD events. Individuals who have never smoked have an estimated 30% increased relative risk of CHD if they live with a smoker ( $p < 0.001$ ). The excess risk from smoking one cigarette per day is 39%, similar to the risk to a non smoker staying with a smoker. Reversal of the effect would reduce the risk of CHD by about as much as taking aspirin or by what many people could achieve through dietary change. Other systematic reviews highlight the increased risk of CHD events through exposure to environmental tobacco smoke at workplace or at home.

### Overweight and Obesity

These categories were defined by the World Health Organization as representing a Body Mass Index (BMI) (calculated as body weight in kilograms divided by height in meters squared) of 25.0 to 29.9 for overweight and  $>30$  for obesity (corresponding ideal BMI for Indians is 18 – 23). The percentage of overweight children and adolescents has also increased dramatically since the late 1980s. The trends among children will influence future adult rates, because individuals who become overweight as children or adolescents are more likely to be overweight or obese as adults.

Excess body weight is an independent risk factor for cardiovascular diseases and gives rise to other risk factors such as hypertension, dyslipidemia and type 2 diabetes.

Modest weight loss and increase in physical activity have been demonstrated to reduce cardiovascular risk factors such as hypertension, dyslipidemia and type 2 diabetes. With the aid of mathematical modeling, it has been estimated that a sustained 10% weight loss among obese individuals would reduce the expected lifetime incidence of coronary heart disease by 12 to 38 cases per 1000.

Individuals with metabolic syndrome have a higher risk for development of CHD. Asians have a genetic



predisposition to the syndrome. The American Heart Association / National, Heart, Lung and Blood Institute and International Diabetic Federation define metabolic syndrome as any three of the following:

- Increased waist circumference (> 90 cm for Asian men: > 80 cm in Asian women), indicating central obesity;
- Elevated triglycerides (> 1.7 mmol/L),
- Decreased HDL (< 1.03 mmol/L for men, < 1.29 mmol/L for women);
- Blood pressure above 130/85 or active treatment for hypertension; and
- Fasting plasma glucose above 5.6 mmol/L or active treatment for hyperglycemia.

Action to prevent or reverse excess weight gain will prevent or sometimes even reverse the metabolic abnormalities and hypertension.

## Nutrition

Dietary patterns that emphasize consumption of whole-grain foods, legumes, vegetables and fruits and those that limit red meat, full-fat dairy products and foods and beverages high in added sugars, are associated with decreased risk for a variety of chronic diseases including CHD.

It is difficult to obtain randomized, controlled data on the long-term effects of nutritional components or even patterns, but there is good evidence that following a healthful eating plan can reduce several of the recognized risk factors for cardiovascular diseases. Although it is rarely possible to define with precision the contribution of single nutrients (with notable exceptions, such as sodium), good evidence indicates that a nutritionally balanced diet plays an important role in maintaining healthy weight and can have a favorable impact on blood pressure and plasma lipids. Sodium restriction combined with increased consumption of fiber, fruit, vegetables and calcium was more effective than sodium restriction alone in reducing hypertension in the Dietary Approaches to

Stop Hypertension (DASH) study.

## Fat intake

Reduction of fat, in particular, saturated fat is one of the pillars of dietary advice to prevent CHD. Modifying the composition rather than the amount of fat in the diet may be a more effective strategy. There is no current evidence of benefit from omega 3 fatty acids, although confidence intervals do not exclude either a moderate benefit or harm.

## Salt Intake

According to the recommendations adults should not consume more than 6 grams of salt per day (approximately equivalent to one teaspoon). People with Hypertension should be advised to reduce their salt intake as much as possible to then lower blood pressure.

## Antioxidant vitamin supplementation

Antioxidant vitamin supplementation is not recommended for either prevention or treatment of CHD.

More detailed and longer studies are required before giving any recommendations about folate supplementation, stanol esters and plant sterols, nuts and soya intake in diet.

## Physical activity

Prospective epidemiological studies of occupational and leisure-time physical activity have consistently documented a reduced incidence of coronary artery disease in the more physically active and fit individuals. Conversely, physical inactivity has been recognized as an important risk factor for cardiovascular disease. Although it interacts with other risk factors, e.g., by increasing the tendency to overweight, its effect is independent of other risk factors. Although the beneficial effect of exercise is "dose related," increasing with duration and amount of energy expended, increasing physical activity even by a

## Guidelines for Cardiovascular Health Promotion in All Children and Adolescents

Health Promotion Goals	Recommendations
	Diet
An overall healthy eating pattern	Assess diet at every visit.
Appropriate body weight	Match energy intake with energy needs for normal growth and development.
Desirable lipid profile	Make appropriate changes to maintain a healthy weight and achieve weight loss when indicated.
Desirable blood pressure	Advocate consumption of a variety of fruits, vegetables, whole grains, dairy products, fish, legumes, poultry and lean meat.
	Fat intake is unrestricted prior to 2 years of age. After age 2, limit foods high in saturated fats (<10% of calories per day), cholesterol (<300 mg per day) and <i>trans</i> -fatty acids.
	Limit salt intake to <6 g per day.
	Limit intake of sugar.
	Smoking
No new initiation of cigarette smoking	Question tobacco use by parents at every visit.
No exposure to environmental tobacco smoke	Question tobacco use by children at every visit starting at age 10.
Complete cessation for those who smoke	Provide clear, strong, informed and personalized counseling against initiation of smoking.
	Advise avoidance of second-hand smoke at home, with friends, at school or at work.
	Physical Activity
Be physically active every day	Assess physical activity at every visit.
Reduce sedentary time (e.g. television watching, computer, video games or time on the phone)	Advise young people to participate in at least 60 minutes of moderate to vigorous physical activity every day.

	Physical activity should be fun for children and adolescents.
	For adolescents, resistance training (10 to 15 repetitions at moderate intensity) can be combined with aerobic activity in an overall activity program.
	Sedentary time should be limited. For example, limit television time to at the most 2 hours per day.

modest amount of 30 minutes for at least 5 days a week has been documented to reduce risk for cardiovascular events. Because this exercise can be moderate in effort and can be broken up into smaller time periods, it is within the reach of nearly everyone. However, creating the habit of seeking more exercise in our increasingly sedentary population will be challenging and will require a concerted, ongoing effort.

Physical activity of at least moderate intensity (which makes a person slightly out of breath) is recommended for the entire population (unless contraindicated by condition). Physical activity should include occupational and/or leisure time activity and incorporate accumulated bouts of moderate intensity activities such as brisk walking. Those who are moderately active and are able to increase their activity should be encouraged to do so. Activity can be increased through a combination of changes to intensity, duration or frequency. All patients irrespective of their health, fitness or activity level, should be encouraged to increase activity levels gradually.

### Secondary Prevention

Important evidence from clinical trials is available that further supports and broadens the merits of aggressive risk-reduction therapies for patients with established coronary heart disease. This growing body of evidence confirms that aggressive comprehensive risk factor management improves survival, reduces recurrent events and the need for interventional

procedures and improves the quality of life for these patients.

The following individuals should have an assessment for cardiovascular risk factors every 5 years:

- All adults aged 40 years or above individuals at any age with a first degree relative who has premature CHD or familial dyslipidemia.

Secondary prevention aims to prevent further events in people who already have developed clinical evidence of CHD. Screening for risk or early manifestations of disease can reduce incidence and mortality through recommendations for altered lifestyles, pharmacological interventions or earlier treatment of the disease itself.

### Hypertension

Elevated blood pressure is associated with a 2 to 3 times higher risk of developing congestive heart failure. The relationship between BP and risk of CVD events is continuous, consistent, and independent of other risk factors. The higher the BP, the greater is the chance of developing CHD. For individuals 40–70 years of age, each increment of 20 mmHg in systolic BP (SBP) or 10 mmHg in diastolic BP (DBP) doubles the risk of CVD across the entire BP range from 115/75 to 185/115 mmHg. The prevalence of hypertension is increasing, and an estimated 30% of those with hypertension are unaware that they have it. Only about 34% are on medication and have well-controlled blood pressure; 25% are on medication but have inadequate blood pressure control. Blood pressure is easily assessed in the office, and panoply of medications can provide excellent control. As a



preventive measure, blood pressure control is critical and must be addressed more effectively.

- In persons older than 50 years, systolic blood pressure greater than 140 mmHg is a much more important cardiovascular disease (CVD) risk factor, than diastolic blood pressure.
- The risk of CVD beginning at 115/75 mmHg doubles with each increment of 20/10 mmHg; individuals who are normotensive at age 55 have a 90 percent lifetime risk for developing hypertension.
- Individuals with a systolic blood pressure of 120–139 mmHg or a diastolic blood pressure of 80–89 mmHg should be considered as prehypertensive and require health-promoting lifestyle modifications to prevent CVD.
- Thiazide-type diuretics should be used in drug treatment for most patients with uncomplicated hypertension, either alone or combined with drugs from other classes. Certain high-risk conditions are compelling indications for the initial use of other antihypertensive drug classes (angiotensin converting enzyme inhibitors, angiotensin receptor blockers, beta-blockers, calcium channel blockers).
- Most patients with hypertension will require two or more antihypertensive medications to achieve goal blood pressure (<140/90 mmHg, or <130/80 mmHg for patients with diabetes or chronic kidney disease).
- If blood pressure is >20/10 mmHg above goal blood pressure, consideration should be given to initiating therapy with two agents, one of which usually should be a thiazide-type diuretic.
- The most effective therapy prescribed by the most careful clinician will control hypertension only if patients are motivated. Motivation improves when patients have positive experiences with, and trust in the clinician. Empathy builds trust and is a potent motivator.

## Dyslipidemia

Elevated cholesterol levels have long been recognized as an important independent risk factor for coronary artery disease. Equally important, for individuals who would meet the criteria for lipid-modifying treatment, set out by the Third Report of the Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults, less than 50% are actually receiving treatment. This is true even for those who are at highest risk—those who have symptomatic coronary heart disease. An additional problem is that of compliance: Half of those prescribed lipid-lowering drugs stop taking them after six months. Here, attention must be paid not only to screening for this important risk factor but also to increasing compliance with lipid-lowering regimens.

Low-Density Lipoprotein Cholesterol (LDL-C) should be <100 mg/dL for all patients with CHD. It is reasonable to treat to LDL-C <70 mg/dL in such patients. When the <70-mg/dL target is chosen, it may be prudent to increase statin therapy in a graded fashion, to determine a patient's response and tolerance. Furthermore, if it is not possible to attain LDL-C <70 mg/dL because of a high baseline LDL-C, it generally is possible to achieve LDL-C reductions of >50% with either statins or LDL-C-lowering drug combinations.

Use of medications: Antiplatelet agents, Anti coagulants, Beta blockers, ACE inhibitors, Angiotensin receptor blockers, Aldosterone blockers

AHA/ACC Secondary Prevention for Patients with Coronary and Other Vascular Disease\*

	INTERVENTION RECOMMENDATIONS
SMOKING:	<ul style="list-style-type: none"> <li>• Ask about tobacco use status at every visit.</li> </ul>
Goal	<ul style="list-style-type: none"> <li>• Advise every tobacco user to quit.</li> </ul>
Complete cessation.	<ul style="list-style-type: none"> <li>• Assess the tobacco user's willingness to quit.</li> </ul>
No exposure to environmental tobacco smoke.	<ul style="list-style-type: none"> <li>• Assist by counseling and developing a plan for quitting.</li> </ul>
	<ul style="list-style-type: none"> <li>• Arrange follow-up, referral to special programs, or pharmacotherapy (including nicotine replacement and bupropion).</li> </ul>
	<ul style="list-style-type: none"> <li>• Urge avoidance of exposure to environmental tobacco smoke at work and home.</li> </ul>
BLOOD PRESSURE CONTROL:	For all patients:
Goal	<ul style="list-style-type: none"> <li>• Initiate or maintain lifestyle modification—weight control; increased physical activity; alcohol moderation; sodium reduction; and emphasis on increased consumption of fresh fruits, vegetables, and low-fat dairy products.</li> </ul>
<140/90 mm Hg	
or	
<130/80 mm Hg if patient has diabetes or chronic kidney disease	
	For patients with blood pressure 140/90 mm Hg (or 130/80 mm Hg for individuals with chronic kidney disease or diabetes):
	<ul style="list-style-type: none"> <li>• As tolerated, add blood pressure medication, treating initially with <math>\beta</math>-blockers and/or ACE inhibitors, with addition of other drugs such as thiazides as needed to achieve goal blood pressure.</li> </ul>
LIPID MANAGEMENT:	For all patients:
Goal	<ul style="list-style-type: none"> <li>• Start dietary therapy. Reduce intake of saturated fats (to &lt;7% of total calories), <i>trans</i>-fatty acids and cholesterol (to &lt;200 mg/d).</li> <li>• Adding plant stanol/sterols (2 g/d) and viscous fiber (&gt;10 g/d) will further lower LDL-C.</li> <li>• Promote daily physical activity and weight management.</li> <li>• Encourage increased consumption of omega-3 fatty acids in the form of fish or in capsule form (1 g/d) for risk reduction. For treatment of elevated triglycerides, higher doses are usually necessary for risk reduction.</li> </ul>
LDL-C <100 mg/dL	
If triglycerides are 200 mg/dL, non-HDL-C should be <130 mg/dL	
	For lipid management:



	<p>Assess fasting lipid profile in all patients and within 24 hours of hospitalization for those with an acute cardiovascular or coronary event. For hospitalized patients, initiate lipid-lowering medication as recommended below before discharge according to the following schedule:</p> <ul style="list-style-type: none"> <li>• LDL-C should be &lt;100 mg/dL and</li> <li>• Further reduction of LDL-C to &lt;70 mg/dL is reasonable.</li> <li>• If baseline LDL-C is 100 mg/dL, initiate LDL-lowering drug therapy.</li> <li>• If on-treatment LDL-C is 100 mg/dL, intensify LDL-lowering drug therapy (may require LDL-lowering drug combination).</li> <li>• If baseline LDL-C is 70 to 100 mg/dL, it is reasonable to treat to LDL-C &lt;70 mg/dL.</li> <li>• If triglycerides are 200 to 499 mg/dL, non-HDL-C should be &lt;130 mg/dL.</li> <li>• Further reduction of non-HDL-C to &lt;100 mg/dL is reasonable.</li> <li>• Therapeutic options to reduce non-HDL-C are: <ul style="list-style-type: none"> <li>More intense LDL-C-lowering therapy , or</li> <li>Niacin (after LDL-C-lowering therapy) , or</li> <li>Fibrate therapy (after LDL-C-lowering therapy)</li> </ul> </li> <li>• If triglycerides are 500 mg/dL, therapeutic options to prevent pancreatitis are fibrate or niacin before LDL-lowering therapy; and treat LDL-C to goal after triglyceride-lowering therapy. Achieve non-HDL-C &lt;130 mg/dL if possible.</li> </ul>
PHYSICAL ACTIVITY:	<ul style="list-style-type: none"> <li>• For all patients, assess risk with a physical activity history and/or an exercise test, to guide prescription.</li> </ul>
Goal	<ul style="list-style-type: none"> <li>• For all patients, encourage 30 to 60 minutes of moderate-intensity aerobic activity, such as brisk walking, on most, preferably all days of the week, supplemented by an increase in daily lifestyle activities (e.g., walking breaks at work, gardening, household work).</li> </ul>
30 minutes, 7 days per week (minimum 5 days per week)	<ul style="list-style-type: none"> <li>• Encourage resistance training 2 days per week.</li> </ul>
WEIGHT MANAGEMENT:	<ul style="list-style-type: none"> <li>• Advise medically supervised programs for high-risk patients (e.g. recent acute coronary syndrome or revascularization, heart failure).</li> <li>• Assess body mass index and/or waist circumference on each visit and consistently encourage weight maintenance/reduction through</li> </ul>



Goal	an appropriate balance of physical activity, caloric intake and formal behavioral programs when indicated to maintain/achieve a
Body mass index: 18.5 to 24.9 kg/m <sup>2</sup>	body mass index between 18.5 and 24.9 kg/m <sup>2</sup> .
Waist circumference: men <40 inches, women <35 inches	<ul style="list-style-type: none"> <li>• If waist circumference (measured horizontally at the iliac crest) is 35 inches in women and 40 inches in men, initiate lifestyle changes and consider treatment strategies for metabolic syndrome as indicated.</li> <li>• The initial goal of weight loss therapy should be to reduce body weight by approximately 10% from baseline. With success, further weight loss can be attempted if indicated through further assessment.</li> </ul>

	<b>INTERVENTION RECOMMENDATIONS</b>
DIABETES MANAGEMENT:	<ul style="list-style-type: none"> <li>• Initiate lifestyle and pharmacotherapy to achieve near-normal HbA<sub>1c</sub>.</li> <li>• Begin vigorous modification of other risk factors (e.g. physical activity, weight management, blood pressure control, and cholesterol management as recommended above).</li> <li>• Coordinate diabetic care with patient's primary care physician or endocrinologist.</li> </ul>
Goal HbA <sub>1c</sub> <7%	<ul style="list-style-type: none"> <li>• Start aspirin 75 to 162 mg/d and continue indefinitely in all patients unless contraindicated.</li> </ul> <p>For patients undergoing coronary artery bypass grafting, aspirin should be started within 48 hours after surgery to reduce saphenous vein graft closure. Dosing regimens ranging from 100 to 325 mg/d appear to be efficacious. Doses higher than 162 mg/d can be continued for up to 1 year.</p> <ul style="list-style-type: none"> <li>• Start and continue clopidogrel 75 mg/d in combination with aspirin for up to 12 months in patients after acute coronary syndrome or percutaneous coronary intervention with stent placement (1 month for bare metal stent, 3 months for sirolimus-eluting stent and 6 months for paclitaxel-eluting stent).</li> </ul> <p>Patients who have undergone percutaneous coronary intervention with stent placement should initially receive higher-dose aspirin at 325 mg/d for 1 month for bare metal stent, 3 months for sirolimus-eluting stent and 6 months for paclitaxel-eluting stent.</p>
ANTIPLATELET AGENTS/ ANTICOAGULANTS:	

RENIN-ANGIOTENSIN-  
ALDOSTERONE SYSTEM  
BLOCKERS:

- Manage warfarin to international normalized ratio=2.0 to 3.0 for paroxysmal or chronic atrial fibrillation or flutter and in post-myocardial infarction patients when clinically indicated (eg, atrial fibrillation, left ventricular thrombus).
- Use of warfarin in conjunction with aspirin and/or clopidogrel is associated with increased risk of bleeding and should be monitored closely.

ACE inhibitors:

- Start and continue indefinitely in all patients with left ventricular ejection fraction 40% and in those with hypertension, diabetes, or chronic kidney disease, unless contraindicated.
- Consider for all other patients.
- Among lower-risk patients with normal left ventricular ejection fraction in whom cardiovascular risk factors are well controlled and revascularization has been performed, use of ACE inhibitors may be considered optional.

Angiotensin receptor blockers:

- Use in patients who are intolerant of ACE inhibitors and have heart failure or have had a myocardial infarction with left ventricular ejection fraction 40%.
- Consider in other patients who are ACE inhibitor intolerant.
- Consider use in combination with ACE inhibitors in systolic-dysfunction heart failure.

Aldosterone blockade:

- Use in post-myocardial infarction patients, without significant renal dysfunction<sup>77</sup> or hyperkalemia, who are already receiving therapeutic doses of an ACE inhibitor and  $\beta$ -blocker, have a left ventricular ejection fraction 40%, and have either diabetes or heart failure.

$\beta$ -BLOCKERS:

- Start and continue indefinitely in all patients who have had myocardial infarction, acute coronary syndrome, or left ventricular dysfunction with or without heart failure symptoms, unless contraindicated.

Consider chronic therapy for all other patients with coronary or other vascular disease or diabetes unless contraindicated.

INFLUENZA VACCINATION:

Patients with cardiovascular disease should have an influenza vaccination.



\*Patients covered by these guidelines include those with established coronary and other atherosclerotic vascular disease, including peripheral arterial disease, atherosclerotic aortic disease and carotid artery disease. Treatment of patients whose only manifestation of cardiovascular risk is diabetes will be the topic of a separate AHA scientific statement. ACE indicates angiotensin-converting enzyme.

Non-HDL-C=total cholesterol minus HDL-C.

Pregnant and lactating women should limit their intake of fish to minimize exposure to methylmercury.

When LDL-lowering medications are used, obtain at least a 30% to 40% reduction in LDL-C levels. If LDL-C <70 mg/dL is the chosen target, consider drug titration to achieve this level to minimize side effects and cost. When LDL-C <70 mg/dL is not achievable because of high baseline LDL-C levels, it generally is possible to achieve reductions of >50% in LDL-C levels by either statins or LDL-C-lowering drug combinations.

|| Standard dose of statin with ezetimibe, bile acid sequestrant, or niacin.

The combination of high-dose statin+fibrate can increase risk for severe myopathy. Statin doses should be kept relatively low with this combination. Dietary supplement niacin must not be used as a substitute for prescription niacin.

Patients with very high triglycerides should not consume alcohol. The use of bile acid sequestrant is relatively contraindicated when triglycerides are >200 mg/dL.

\*\*Creatinine should be <2.5 mg/dL in men and <2.0 mg/dL in women.

Potassium should be <5.0 mEq/L.

### Additional reading

- Preventing cancer, cerebrovascular disease and diabetes. *Circulation* 2004; 109:3244-3255.
- American heart association guidelines for primary prevention of atherosclerotic coronary vascular disease beginning in the childhood. *Circulation* 2003; 107:1562.
- Joint British society's guidelines on prevention of cerebrovascular disease in clinical practice. Dec. 2005; Vol. 91, Suppl.V



## PREVENTIVE MEASURES IN GYNAECOLOGICAL MALIGNANCY: THE CHALLENGING TASK

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### Introduction

As a modern society we have trouble dealing with cancer. Think of gonorrhoea or AIDS as an illness, they are fairly straightforward. Our society attaches a great deal of meaning and judgment to cancer as a sickness. Cancer as an illness is a disease about which very little is actually known. It is therefore a sickness around which an enormous number of myths and stories have evolved. We use cancer everyday as a cultural metaphor for something evil, out of control or mysterious.

Gilda Radner once said "Cancer is about the most unfunny thing in the world. Feeling not safe in your body is terrifying and certainly the wish to undo bad news is strong. Cancer is not just an uncontrollable proliferation of abnormal cells; it happens not only in your cells but in your life. Cancer becomes a part of your biography."

Its right time when we all take a vow to prevent the disease as far as practicable, optimally using the resources available and educating the society as a whole to deal with the problem.

### What is screening?

Screening is looking for cancer before a person has any symptoms. This can help detect cancer at an early stage. When abnormal tissue or cancer is found early, it may be easier to treat. By the time symptoms appear, cancer may have begun to spread.

Scientists are trying to better understand the etiology of cancer. This information helps doctors recommend the screening tests in particular groups of people.

It is important to remember that the doctor does not necessarily think that one has cancer if he or she suggests a screening test. Screening tests are done when one has no cancer symptoms.

If a screening test result is abnormal, there is requirement for some more tests to find out if one has cancer. These are called diagnostic tests.

### Prevention

"The only way to keep your health is to eat what you don't want, drink what you don't like, and do what you'd druthers not." .....Mark Twain.

To prevent new cancers, scientists look at risk factors and protective factors. Anything that increases one's chance of developing cancer is called a cancer risk factor; anything that decreases the chance of developing cancer is called a cancer protective factor.

Some risk factors for cancer can be avoided, but many cannot. For example, both smoking and inheriting certain genes are risk factors for some types of cancer, but only smoking can be avoided. Regular exercise and a healthy diet may be protective factors for some types of cancer. Avoiding risk factors and increasing protective factors may lower the risk but it does not mean that one will not get cancer.

Different ways to prevent cancer are being studied, including:

- Changing lifestyle or eating habits.
- Avoiding things known to cause cancer.
- Taking medicines to treat a precancerous condition or to keep cancer from starting.

## Introduction to female reproductive tract malignancies:

When we discuss the different malignancies of the female reproductive tract we mainly focus on cervical, ovarian and endometrial malignancies (Fig-1). Although vulval, fallopian tube and other smooth muscle sarcoma are prevalent, their incidences are very less and there is no role of screening or preventive measures. So in this topic we will discuss the three specific common malignancies.

### Cervical cancer

Cancer of the uterine cervix is a leading cause of mortality and morbidity among women worldwide. In developing countries it is the most common gynecological cancer

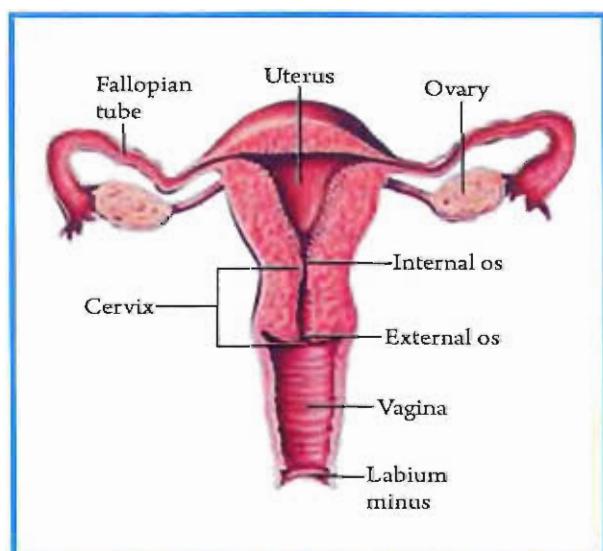


Fig.1: Female reproductive system

and one of the leading causes of cancer deaths amongst women. Nearly 400,000 new cases of cervical cancer are diagnosed annually worldwide and 80% of these are diagnosed in the developing countries.

There are 1.7 million prevalent cases in the developing world and as many as 5-13 million women have precancerous lesions. As the female population in the developing countries continues to rise with an increase in life expectancy, the proportion of older women will also necessarily rise. It is expected that the number of

cases of cancer of the cervix will rise further in the years to come.

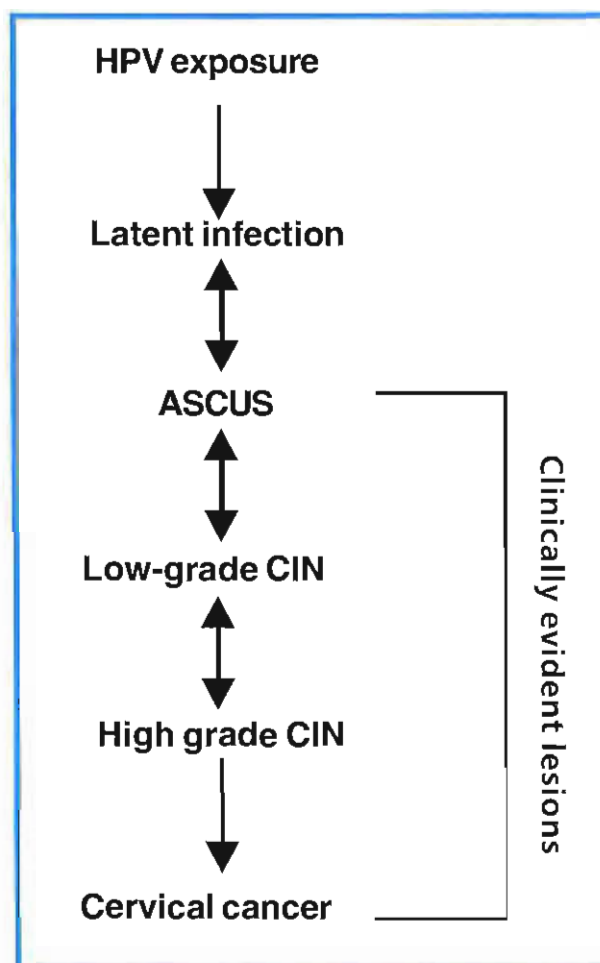


Fig.2: Cervical Intraepithelial Neoplasia

### Natural history of cervical carcinoma

The natural history of cervical cancer represents a stepwise progression from a histologically normal cervix to frank invasive cancer (Fig.2). Cervical Intraepithelial Neoplasia (CIN), also known as cervical dysplasia, is the potentially premalignant transformation and abnormal growth (dysplasia) of squamous cells on the surface of the cervix.

Most cases of CIN remain stable, or are eliminated by the host's immune system without intervention.



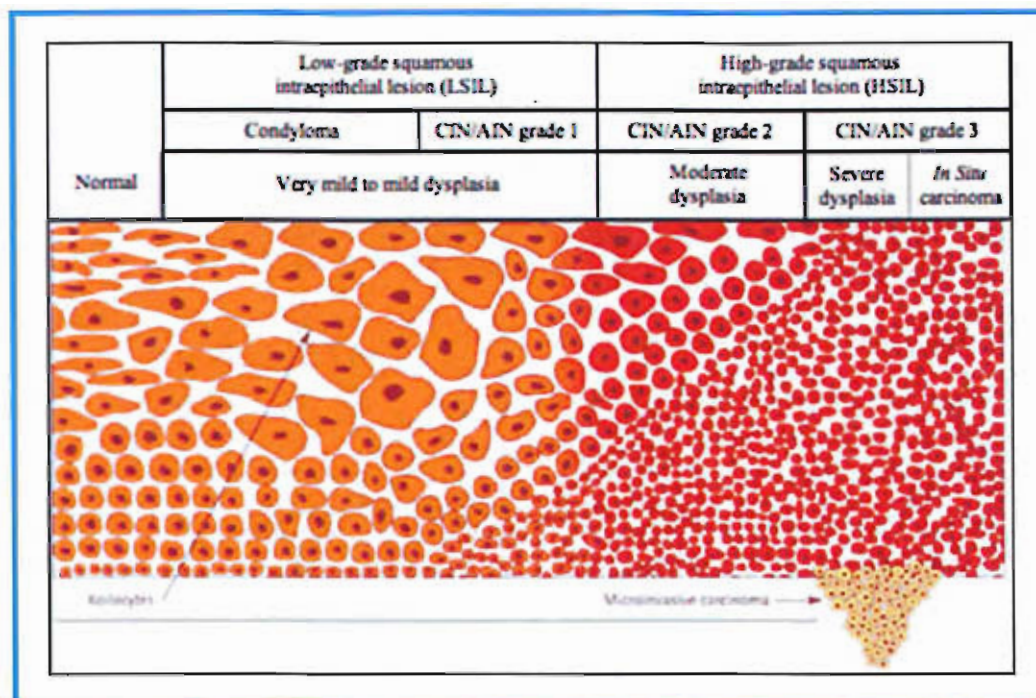


Fig.3: Schematic Representation of SIL

However, a small percentage of cases progress to become cervical cancer, usually cervical Squamous Cell Carcinoma (SCC), if left untreated. The major cause of CIN is chronic infection of the cervix with the sexually transmitted Human PapillomaVirus (HPV), especially the high-risk HPV types 16 or 18. Over 100 types of HPV have been identified. About a dozen of these types appear to cause cervical dysplasia and may lead to the development of cervical cancer. Other types cause warts.

The earliest microscopic change corresponding to CIN is dysplasia of the epithelial or surface lining of the cervix, which is essentially undetectable by the woman. Cellular changes associated with HPV infection, such as koilocytes, are also commonly seen in CIN. CIN is usually discovered by a screening test, the Papanicolaou or "Pap" smear. The purpose of this test is to detect the changes early, before then progression to invasive carcinoma, and is easier to cure. An abnormal Pap smear may lead to a recommendation for colposcopy of the cervix, during which the cervix is examined under magnification. A biopsy is taken of any abnormal appearing areas. Cervical dysplasia can be diagnosed by biopsy.

As shown in Fig.3. with increasing severity of SIL of

the cervix, the proportion of the epithelium replaced by immature cells with large nuclear-cytoplasmic ratio increases. Invasive cancer probably arises from one or more foci of High-grade Squamous Intraepithelial Lesions (HSIL), which is depicted in the drawing by epithelial cells crossing the basement membrane. All epithelial cells sit on a basement membrane and below the basement membrane are connective tissue, blood vessels, nerves and the muscles. Cancer arises when abnormal HSIL cells develop additional genetic changes, which then turns them into cancer cells that have the ability to invade across the basement membrane into normal tissues.

### Why is screening for cervical cancer effective?

An ideal screening test is one that is minimally invasive, easy to perform, acceptable to the subject, cost-effective and efficacious in diagnosing the disease process in its preinvasive or early invasive state when the disease process is more easily treatable and curable. In all probability cervical cancer is the only gynecological cancer that satisfies the well recognized WHO criteria for implementation of a screening program :

- Existence of well defined premalignant lesions.
- Long latent period in which premalignant change or occult cancers can be detected and effectively treated thereby altering the natural history of the disease.
- A clearly defined viral etiology which could be incorporated as a marker in mass screening program.
- Easy and direct access of the uterine cervix for examination and sampling.
- Effective treatments available for the premalignant changes.

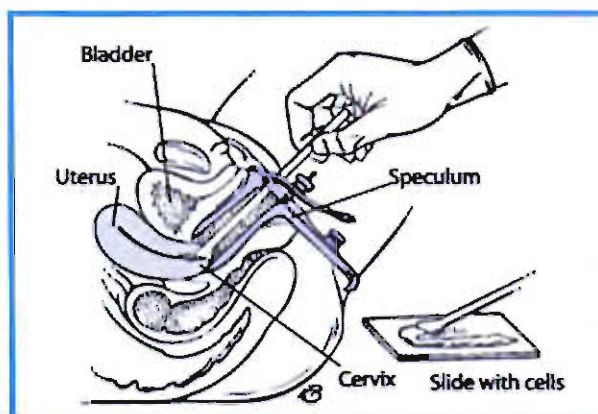


Fig.4: Taking a sample of cells

### Screening for cervical carcinoma

Following its introduction by Papanicolaou in 1927, exfoliative cervicovaginal cytology has been extensively investigated and used as a screening test for cervical cancer. Over the years it has been found that this test has well recognized limitations. A better understanding of the natural history of cervical cancer and also increasing evidence for the putative role of the human papilloma virus (HPV) in its causation, has now prompted investigators to find viable alternatives to conventional exfoliative cytology.

A variety of screening tests have therefore been developed, in an attempt to overcome the innate limitations of conventional cytology. These are currently under evaluation and it is hoped that they may improve upon the accuracy of conventional screening cytology.

Screening techniques for cervical cancer include:

- Conventional exfoliative cervicovaginal cytology i.e. the cervical (Pap) smear
- Fluid sampling techniques with automated thin layer preparation (liquid based cytology)
- Automated cervical screening techniques
- HPV testing
- Polar probe
- Laser-induced fluorescence
- Visual inspection of cervix after applying Lugol's iodine (VILI) or acetic acid (VIA).
- Speculoscopy
- Cervicography.

### Exfoliative cytology (conventional Pap smear)

Exfoliative cervicovaginal cytology has been regarded as the gold standard for cervical cancer screening programs. The standard technique for Pap smear collection is to sample the portio vaginalis of the cervix and the endocervical canal using a cervical spatula and endocervical brush. The collected sample is smeared on a slide and then fixed immediately with cytology fixative. Most clinicians are concerned with reducing sampling errors by focusing on the technique of smear acquisition and eliminating drying artifacts through rapid fixation.

There are various problems associated with conventional cytology:

- Incorrect and inadequate sampling in 5-10% of cases
- Only upto 20% of harvested cells are transferred on to the slide leading to a reduction in the sensitivity of the test
- Mean sensitivity of only 55-60%
- Reported false negative rates varying from 25 to 50%
- Reported false positive rates varying from 15 to 20%
- Interobserver variation in the interpretation of cytological abnormality making reporting subjective and poorly reproducible.

Owing to these problems, several techniques have been recently developed in an attempt to automate



the various steps of Pap smear preparation and processing, in order to try and improve the sensitivity and specificity of conventional cervical cytology.

### Fluid sampling techniques with automated thin layer

#### Preparation

Recently, liquid-based cytological technologies have been developed and have gained popularity, because in preliminary studies the use of such techniques was associated with a reduction in the incidence of inadequate cervical smears. Two such techniques that have been extensively tested are ThinPrep and Autocyte. These fluid sampling devices have been approved by the US-FDA. A special sampling device is used for sampling the cervix in the usual manner as in the traditional Pap smear. The sampling device is then directly placed in a vial containing a special preservative with additional hemolytic and mucolytic agents.

Comparisons of the conventional Pap smear with thin layer fluid preparations have shown a marked improvement in the adequacy of the specimen as evidenced by a more even distribution of cells and reduction in cellular debris and RBCs.

This in turn leads to a decrease in the incidence of false positive diagnosis of cytological atypia and an excellent correlation with the detection of squamous abnormalities.

#### Automated screening technology

The effectiveness of any cervical cancer screening program that relies on cervical cytology is the quality control of the cytological review of Pap smears. This is essential for reducing the false positives and false negatives that invariably result from inter- and intraobserver variation. Automated screening techniques have recently been developed, that can not only perform this quality control rescreening but also can be used for primary screening of cervical smears.

### HPV-DNA Testing

The etiopathological role of HPV in the development of cervical cancer has been proved beyond doubt. HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 59 and 68 are known to be frequently associated with HSIL and invasive cancers of the cervix. Testing for the presence of HPV-DNA in the cervical cells, is thus a potentially useful screening method, which could be incorporated in cervical cancer screening programs. There are various techniques available for HPV-DNA testing of which Southern Blot hybridization is regarded as a laboratory gold standard. This is, however, unsuitable for clinical use as it is laborious, tedious and requires fresh tissue each times.

#### The Bethesda system and current status of HPV-DNA testing

The Bethesda system for the classification and reporting of abnormal cervical cytology was initially developed in 1988. This was recently revised in 2001 during the Annual Meeting of the American Society for Colposcopy and Cervical Pathology (ASCCP). New guidelines were also developed for the evaluation and management of women with abnormal cervical cytology.

Although the Bethesda system was originally designed to identify all precancerous lesions of the cervix, the focus has now shifted towards facilitating the detection and treatment of high grade cervical intraepithelial lesions (HSIL). This is based on the understanding that most of the low grade lesions (LSIL) especially in young women, are associated with self-limiting HPV infections. Following the development of HPV-DNA testing, this approach has been extensively evaluated for its putative role in the triage and treatment of women with abnormal cervical cytology. This test is currently being used as an adjunct to the conventional Pap smear in the follow-up of patients with ASCUS.

#### (Atypical squamous cell of undetermined significance) abnormalities

Since the majority of such patients are asymptomatic and most of these lowgrade lesions (LSIL) either regress spontaneously or do not progress, the clinical meaning

and implication of this test is not fully understood. It has been suggested that in women with ASCUS abnormalities, this test will help to separate those with a true infection needing colposcopy, from those with reactive changes. The test also helps to identify those patients who require aggressive follow-up.

### Low cost screening strategies for cervical cancer

The screening strategies mentioned above though applicable to the developed world may not be cost effective enough for widespread application in the third world countries. Currently, cervical cytology is widely regarded as the gold standard for cervical cancer



Fig. 5: Visual Inspection of the Cervix with Acetic acid

screening in all developed countries. It is however not feasible to implement a systematic cytology-based screening programme in a country like India. There is therefore a need to develop low-cost screening strategies for cervical cancer. This will necessarily involve the use of very simple techniques that can be easily taught to and practiced by paramedical personnel in rural areas. Such techniques will need to be cost-effective while retaining adequate sensitivity and specificity, to perform as practical screening techniques.

### Visual inspection of the cervix with acetic acid (VIA)

Visual inspection of the cervix both unmagnified and magnified has been shown to be effective in reducing the morbidity associated with cervical cancer. The technique is very simple and consists of an examination of the cervix after acetic acid application. After obtaining the clinical history and performing a general examination, the cervix is exposed using a bivalve speculum. A 4% dilute solution of acetic acid is then applied to the cervix and any excess liquid is aspirated from the posterior vaginal fornix. The cervix is inspected after two minutes. Lesions which stain acetowhite are regarded as positive for VIA. Those with dull white plaques and faint borders are considered low grade VIA while those with sharp borders are considered high grade VIA. The test is regarded as being negative if no acetowhite lesions are detected.

Studies have shown that VIA is a reliable, sensitive and cost-effective alternative to conventional Pap smear testing, particularly in low resource settings.

### Speculoscopy

Speculoscopy involves inspection of the cervix following the application of 5% acetic acid with chemiluminiscent light and a low power magnification (4x – 6x). Published data on speculoscopy appears to suggest that

the results with this test are not convincing.

### Cervicography

Cervicography involves taking photographs of the cervix using a special camera following the application of 5% acetic acid during a routine pelvic examination and Pap smear collection. The photographs are then developed and the slide is projected on a 2x2 meter screen and read by an expert in colposcopy. In areas of the world where screening programs are not in place, this technique could possibly have an impact.



## Investigational strategies for cervical cancer screening

Polar probe, Laser-induced fluorescence, Computer imaging To date, there is paucity of data to support and recommend this technique outside of a research protocol.

## Recommendations for screening programme:

Any practical screening program must incorporate public health awareness to address what is truly a public health problem. Local policy makers, clinicians, cytopathologists, women's groups and health administrators must join hands to develop a program that suits available health resources and medical infrastructure. The following key components will need to be considered while developing a national screening program –

- Age at primary screening
- Screening frequency
- Selection of an appropriate screening test
- Approach to the management of an abnormal screening result. It may be worthwhile to keep the following recommendations of the United States Preventive Services Task Force (USPSTF) in mind while considering the above mentioned issues:
  - All women who are sexually active should be offered screening
  - Screening is recommended every 3 years
  - Screening is not recommended in women more than 65 years, provided they have been regularly screened before and are not at a high risk for cervical cancer
  - Current evidence is not conclusive to recommend the use of newer technologies
  - Current evidence is insufficient to recommend the use of routine HPV testing for screening for cervical cancer.

## Preventive measures in cervical malignancy

- Human Papilloma virus Vaccine to prevent HPV infection

- Cigarette Smoking
- Reproductive Behavior
- Dietary Factors

## Human Papillomavirus

Epidemiologic studies to evaluate risk factors for the development of Squamous Intraepithelial Lesions (SIL) and cervical malignancy demonstrate conclusively a sexual mode of transmission of a carcinogen. It is now widely accepted that human papillomavirus (HPV) is the primary etiologic infectious agent. Other sexually transmitted factors, including herpes simplex virus 2, may play a cocausative role. The finding of HPV viral DNA integrated in most cellular genomes of invasive cervical carcinomas supports epidemiologic data linking this agent to cervical cancer; however, direct causation has not been demonstrated. More than 80 distinct types of HPV have been identified, approximately 30 of which infect the human genital tract. HPV types 16 and 18 are most often associated with invasive disease.

Barrier methods of contraception are associated with a reduced incidence of SIL presumptively secondary to protection from sexually transmitted diseases.

## Vaccine to prevent HPV infection

A vaccine to prevent HPV infection with oncogenic-type viruses has the potential to reduce the incidence of cervical cancer. A vaccine against HPV-16 using empty-viral capsids called virus-like particles was developed and tested for efficacy in preventing persistent infection with HPV-16. Now Gardasil (quadrivalent vaccine) is approved by FDA which is preventive for HPV 6, 11, 16, 18.

The type-specific vaccines, if successful in preventing invasive cancer, will offer protection for only a subset of cases, the proportion of which will vary worldwide.

## Cigarette Smoking

Cigarette smoking by women is associated with an increased risk for squamous cell carcinoma. This risk increases with longer duration and intensity of smoking and may be present with exposure to environmental

tobacco smoke, being as high as four times that of women who are nonsmokers and are not exposed to environmental smoking.

### Reproductive Behavior

High parity has long been recognized as a risk factor for cervical cancer, but the relation of parity to HPV infection was uncertain. The number of full-term pregnancies was associated with increased risk, regardless of age at first pregnancy. This finding was also true if analyses were limited to patients with high-risk HPV infections for seven or more pregnancies versus no pregnancies.

Long-term use of oral contraceptives has also been known to be associated with cervical cancer, but its relation to HPV infection was also uncertain. Compared with women who have never used oral contraceptives, those who have used them for fewer than 5 years did not have an increased risk of cervical cancer.

### Dietary Factors

There is an association between intake of some micronutrients and lower risk of cervical cancer, but results are conflicting and difficult to control for other risk factors. Oral folate as a chemopreventive agent has shown no protective effect.

### Ovarian malignancy screening and prevention

Ovarian cancer is the fourth leading cause of cancer death in women in the world including both developed and developing country. It is estimated that 26,800 new cases will be diagnosed and 14,200 women will die of ovarian cancer in USA alone.

Ovarian cancer has a prevalence of 50/100,000 and an annual incidence rate of 14/100,000. Despite advances in treatment and attempts at early diagnosis, long-term survival is bleak, with only 46% of Caucasian patients surviving for five years. Most patients with epithelial ovarian cancer, the predominant form, are asymptomatic in early-stage disease and usually present with stage III or IV disease. Their five-year survival is less than 25%.

The minority of patients discovered with early-stage disease have a five-year survival rate of 80%-90%.

In the absence of a family history of ovarian cancer, lifetime risk of ovarian cancer is 1/70. Risk factors include familial cancer syndromes; family history; nulliparity; advancing age; obesity; personal history of breast, endometrial or colorectal cancer; fewer pregnancies; or older age (>35 years) at first pregnancy. However, 95% of all ovarian cancers occur in women without risk factors.

Techniques that may be used for ovarian cancer screening include:

- 1 History and bimanual examination,
- 2 Ultrasonography (transabdominal, transvaginal, and color flow Doppler imaging),
- 3 Serum tumor markers.

Bimanual examination involves insertion of one or two examiner fingers into the vaginal vault with simultaneous palpation of the lower abdomen to characterize the size and shape of the uterus and adnexa; a recto-vaginal examination may also be included.

Ultrasonography involves the use of sound waves to delineate internal structures; transducers may be placed on the abdomen or in the vagina and other imaging modalities, such as color flow, may enhance visualization.

Biochemical markers include CA 125 and other antigens that are usually increased (nonspecifically) in ovarian cancer.

Genetic or molecular biomarkers have only been recently discovered; currently their use in screening is limited to research purposes. When an abnormality is detected with one modality, others are frequently employed to assist in diagnosis; however, laparoscopy or laparotomy, is required for definitive diagnosis.

### Evidence of effectiveness of the screening methods

Sensitivity of pelvic examination for detection of ovarian cancer is unknown; however, it is thought to be quite



low due to the anatomic location of the ovary. Cancers detected by pelvic examination are often far advanced. Ultrasound is widely used for diagnostic testing for pelvic masses, but is limited in its usefulness as a screening tool, by high rates of false-positive results and low positive predictive value. Because transvaginal ultrasound provides a higher level of detail than transabdominal ultrasound, it maintains a higher sensitivity and allows a higher specificity for ovarian cancer. However Color flow Doppler imaging in combination with transvaginal ultrasonography, improves specificity and ability to discriminate benign and malignant tumors, but its value in screening is unknown.

Biochemical markers, particularly CA 125, are useful in monitoring patients with ovarian cancer and have been suggested for screening, either alone or in combination with ultrasound. Although CA 125 is detectable in 80% of epithelial ovarian cancers, it is elevated in less than half. Molecular biomarkers, such as BRCA1, a genetic marker for familial breast/ovarian cancer syndrome, may be useful in certain cases for detection of those at particularly high risk of ovarian cancer; however, use is still experimental.

### Recommendations and rationale:

With a high mortality and survival advantage from early-stage detection and treatment, ovarian cancer is a potential candidate for population-based screening. However, because of its low prevalence, even with relatively high sensitivity and specificity estimates for proposed screening tests, predictive value of a positive test is too low.

The American College of Preventive Medicine does not currently recommend routine pelvic exams for the detection of ovarian cancer (although pelvic examinations may be performed for diagnostic purposes) or the use of CA 125 or ultrasound to screen asymptomatic women. These same recommendations apply to women with either none or one first degree relative with ovarian cancer.

Screening of women with familial cancer syndrome may be appropriate, due to their elevated risk of cancer, but direct evidence of effectiveness is lacking. Clinicians should therefore take a thorough family history regarding

breast, ovarian and other cancers, and women at high risk should be counseled about the benefits and risks of ovarian cancer screening.

## OVARIAN CANCER PREVENTION

### Protective Factors

Factors associated with a decreased risk of ovarian cancer include:

- 1 using oral contraceptives,
- 2 having and breastfeeding children,
- 3 having a bilateral tubal ligation or hysterectomy,
- 4 having a prophylactic oophorectomy.

#### Oral contraceptives

Multiple studies have consistently demonstrated a decrease in ovarian cancer risk in women who take oral contraceptives. The protective association increases with the duration of oral contraceptive use and persists up to 25 years after discontinuing oral contraceptives. This reduced risk was present among both nulliparous and parous women. A protective association between oral contraceptives and risk of ovarian cancer has been observed in most studies among women who carry a mutation in *BRCA1* and *BRCA2* genes.

#### Tubal sterilization

There is a decrease in the risk of ovarian cancer among women who underwent tubal sterilization after adjusting the data for oral contraceptive use, parity and other ovarian cancer risk factors.

#### Prophylactic oophorectomy

Prophylactic oophorectomy is a potential option to reduce the risk of developing ovarian cancer for women at high risk. One group for whom this option is considered is women who have an inherited susceptibility to ovarian cancer such as women who have mutations in *BRCA1*, *BRCA2* or hereditary nonpolyposis colon cancer (HNPCC)-associated genes. These women have a lifetime risk much higher than the general population, in the range of 20% to 60%. Prophylactic surgery,

however, is not 100% effective. Case reports and case series have reported the occurrence of peritoneal carcinomatosis following oophorectomy.

### Nonhereditary Factors Associated with an Increased Risk of Ovarian Cancer

#### Hormone replacement therapy/hormone therapy

Postmenopausal use of HRT, also called hormone therapy (HT), is associated with an increased risk of developing ovarian cancer. The risk may vary by use of estrogen replacement therapy (ERT), or estrogen-progestin replacement therapy (EPRT). Use of estrogen-only therapy for more than 10 years was associated with an increased risk.

#### Infertility treatment

There is an association between fertility, drug use and invasive ovarian cancer. The use of fertility drugs was associated with an increased risk of ovarian cancer, primarily in women who did not have a subsequent pregnancy.

#### Talc exposure

A cohort study among nurses did not observe a risk of ovarian cancer associated with perineal talc use.

#### Height, weight and dietary factors

Obesity is associated with an increased mortality from ovarian cancer. In cohort studies, height and Body Mass Index (BMI), including high BMI during adolescence, were associated with an increased risk of ovarian cancer, suggesting a role for diet and nutrition during the adolescent period.

Associations with specific dietary factors and ovarian cancer are not consistent among observational studies.

### Screening and prevention and endometrial cancer

### General Information About Endometrial Cancer

The endometrium is the innermost lining of the uterus.

Endometrial cancer is a disease in which malignant (cancer) cells form in the tissues of the endometrium. Cancer of the endometrium is different from cancer of the muscle of the uterus, which is called uterine sarcoma. In India endometrial cancer is the third most common invasive cancer of the female reproductive system. Endometrial cancer occurs more often in white women than in black women. When endometrial cancer is diagnosed in black women, it is usually more advanced and less likely to be cured.

#### Endometrial Cancer Screening

- Endometrial cancer is usually found early.
- There is no standard or routine screening test for endometrial cancer.
- Tests that may detect (find) endometrial cancer are being studied:
  - Pap test
  - Transvaginal ultrasound
  - Endometrial sampling

Endometrial cancer is usually found early.

Endometrial cancer usually causes symptoms (such as vaginal bleeding) and is found at an early stage, when there is a good chance of recovery.

#### There is no standard or routine screening test for endometrial cancer.

Screening for endometrial cancer is under study and there are screening clinical trials taking place in many parts of the world, but with no fool proof conclusion to date.

#### Tests that may detect endometrial cancer are being studied:

## Pap test

Pap tests are not used to screen for endometrial cancer; however, Pap test results sometimes show signs of an abnormal endometrium (lining of the uterus). Follow-up tests may detect endometrial cancer. The procedure has already been discussed earlier.

## Transvaginal ultrasound

TransVaginal Ultrasound (TVU) is a procedure used to examine the vagina, uterus, fallopian tubes and bladder. It is also called endovaginal ultrasound. An ultrasound transducer (probe) is inserted into the vagina and used to bounce high-energy sound waves (ultrasound) off internal tissues or organs and make echoes. TVU is commonly used to examine women who have abnormal vaginal bleeding. For women who have or are at risk for hereditary non-polyposis colon cancer, experts suggest yearly screening with transvaginal ultrasound, beginning as early as age 25.

## Endometrial sampling

Endometrial sampling is the removal of tissue from the endometrium by inserting a brush, curette or thin, flexible tube through the cervix and into the uterus. The tool is used to gently scrape a small amount of tissue from the endometrium and then remove the tissue samples. A pathologist views the tissue under a microscope to look for cancer cells. This test is commonly used to examine women who have abnormal vaginal bleeding.

## Endometrial Cancer Prevention

The following risk factors may increase the risk of endometrial cancer:

- Estrogen
- Tamoxifen
- Inherited risk
- Polycystic ovary syndrome
- Body fat

The following protective factors may decrease the risk of endometrial cancer:

- Combination oral contraceptives
- Physical activity

- Pregnancy and breast-feeding
- Diet

The following *risk factors* may increase the risk of endometrial cancer:

## Estrogen

Estrogen can affect the growth of some cancers, including endometrial cancer. A woman's risk of developing endometrial cancer is increased by being exposed to estrogen in the following ways:

- Estrogen-only hormone replacement therapy: Estrogen may be given to replace the estrogen no longer produced by the ovaries in postmenopausal women or women whose ovaries have been removed. This is called hormone replacement therapy (HRT), or hormone therapy (HT). The use of hormone replacement therapy that contains only estrogen increases the risk of endometrial cancer. For this reason, estrogen therapy alone is usually prescribed only for women who do not have a uterus. When estrogen is combined with progestin (another hormone), it is called combination estrogen - progestin replacement therapy. For postmenopausal women, taking estrogen in combination with progestin does not increase the risk of endometrial cancer.
- Early menstruation: Beginning to have menstrual periods at an early age increases the number of years the body is exposed to estrogen and increases a woman's risk of endometrial cancer.
- Late menopause: Women who reach menopause at an older age are exposed to estrogen for a longer time and have an increased risk of endometrial cancer.
- Never being pregnant: Because estrogen levels are lower during pregnancy, women who have never been pregnant are exposed to estrogen for a longer time than women who have been pregnant. This increases the risk of endometrial cancer.

## Tamoxifen

Tamoxifen is one of a group of drugs called selective



estrogen receptor modulators, or SERMs. Tamoxifen acts like estrogen on some tissues in the body, such as the uterus, but blocks the effects of estrogen on other tissues, such as the breast. When tamoxifen is used to prevent breast cancer in women who are at high risk for the disease, it increases the risk of endometrial cancer. This risk is greater in postmenopausal women.

Raloxifene is a SERM that is used to prevent bone weakness in postmenopausal women. It does not have estrogen-like effects on the uterus and has not been shown to increase the risk of endometrial cancer.

### Inherited risk

Hereditary NonPolyposis Colon Cancer (HNPCC) syndrome is an inherited disorder caused by changes in certain genes. Women who have HNPCC syndrome have a much higher risk of developing endometrial cancer than women who do not have HNPCC syndrome.

### Polycystic ovary syndrome

Women who have polycystic ovary syndrome (a disorder of the hormones made by the ovaries) have an increased risk of endometrial cancer.

### Body fat

Obesity increases the risk of endometrial cancer. This may be because obesity is related to other risk factors such as estrogen levels, polycystic ovary syndrome, lack of physical activity and a diet that is high in saturated fats.

**The following protective factors may decrease the risk of endometrial cancer:**

### Combination oral contraceptives

Taking contraceptives that combine estrogen and progestin (combination oral contraceptives) decreases the risk of endometrial cancer. The protective effect of combination oral contraceptives increases with the length of time they are used, and can last for many years after oral contraceptive use has been stopped.

### Physical activity

Physical activity may lower the risk of endometrial cancer.

### Pregnancy and breast-feeding

Estrogen levels are lower during pregnancy and when breast-feeding. Being pregnant and/or breast-feeding may lower the risk of endometrial cancer.

### Diet

A diet low in saturated fats and high in fruits and vegetables may lower the risk of endometrial cancer. The risk may also be lowered when soy-based foods are a regular part of the diet.

### Conclusion:

Malignancies of the genital tract is the leading cause of morbidity and mortality in female. The effect is more pronounced in developing countries due to various reasons. Treatment of all these malignancies are also very costly with very high indirect cost to the family and the community as a whole. In this context it is always prudent to adopt definitive preventive measures to decrease the incidence of genital cancer and execute standard screening methods for early detection .

That is why we are here today — Eleanor Roosevelt said “It’s better to light a candle than curse the darkness” So lets get out the matches and make this a success!!!!!!!!!!!!

### Additional reading:

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- 2 Screening and management of cervical dysplasia. Current status and future aspects-COG-Vol-48, No.-1, March-2005
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- 4 Update on endometrial cancer- COG-Vol-39-No.-3, September-1996
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- 6 WHO Website
- 7 NIH website

## PREVENTIVE SURGICAL ONCOLOGY

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It is estimated that there are approximately 2 to 2.5 million cases of cancer in India at any given point of time and there are 7,00,000 new cancer patients diagnosed every year in India. National Cancer Registry Programme gives an alarming picture of one in 8 Indians having a cumulative risk of developing cancer in a lifetime of 75 years. The most common cancers are Tobacco related cancers - around 3,00,000 cases each year, cancer of the Cervix Uteri - around 1,00,000 cases each year and Breast cancer - around 80,000 cases each year. Also gastrointestinal cancers are on the rise in India, competing with the western world.

### Why preventive oncology is important

Preventive oncology is to raise awareness and concern about cancer and affirming the prevention and curability of cancers if detected early. As the level of cancer awareness rises, the health seeking behaviour towards early detection will increase and consequently the cancer load in the country will begin to decline. This article gives a brief account about preventing some of the common and largely preventable cancers in India.

### CANCERS OF THE ORAL CAVITY

Squamous cell cancers of the oral cavity are strongly associated with tobacco consumption. Consuming tobacco in any form (smoking, chewing, using tobacco powder on gums) are all equally harmful. Chronic irritation of the inner lining of the mouth is known to produce cancers of the mouth. This includes consumption of excessive amounts of spices, sharp tooth or any other factor which cause long standing irritation. Quitting tobacco in all forms and careful maintenance of oral and dental hygiene can prevent a large proportion of oral cancers.

### ESOPHAGUS AND STOMACH

#### Quit Tobacco:

Squamous cell cancer of the oesophagus is strongly associated with tobacco use. Studies have shown that avoiding tobacco decreases the risk of developing oesophageal cancer. This may be the single most important thing to prevent oesophageal cancer and to improve overall health. Cigarette smoke also contains carcinogens that can damage the DNA that regulates cell growth and can lead to cancer. It is also a leading cause of gastroesophageal reflux. Tobacco consumption in any form is also associated with many other cancers, like mouth and lung cancers. Since oral cavity is the most common site for cancers in India, quitting tobacco can bring a major change in cancer incidence. One should consult a doctor about the best ways to quit tobacco.

#### Limit alcohol consumption:

Many oesophageal squamous cell carcinomas and adenocarcinoma result from heavy alcohol consumption over a period of years. Abstaining from alcohol or drinking in moderation helps. No more than one drink daily for women or two drinks daily for men can greatly reduce the risk of this type of oesophageal cancer. Excessive intake of alcohol raises one's risks for cancers of the breast, mouth, pharynx and oesophagus. When combined with smoking, these risks skyrocket. It also raises risks for stomach, liver and colon cancers.

#### Diet:

A diet with plenty of green and yellow fruits and vegetables and cruciferous vegetables (such as cabbage, broccoli and cauliflower) may lower the risk of developing squamous cell cancer of the

oesophagus. One should aim for at least five fruits and vegetables daily. Whole-grain foods should be chosen over processed or refined grain products. Consumption of amount of red meat and processed meats should be limited.

### Nonsteroidal Anti-Inflammatory Drugs (NSAIDs):

Some studies have shown that the use of NSAIDs (such as aspirin and other drugs that reduce fever, swelling, pain and redness) is associated with a reduced risk of developing both squamous cell cancer and adenocarcinoma of the oesophagus. Use of NSAIDs, however, increases the risk of bleeding in the stomach and intestines and kidney damage. So these drugs should be used under medical supervision and with caution.

### Helicobacter Pylori Infection and Gastric Atrophy:

Helicobacter Pylori is an organism found widely in the water and food in our country. Consumption of contaminated food and water can lead to infection with H. Pylori. Infection with the Helicobacter pylori bacteria causes inflammation and ulcers in the stomach lining, which may lead to a condition called 'gastric atrophy' (cells that line the stomach are destroyed). This condition may increase the risk of developing cancer of the oesophagus and stomach.

### 'Gastric Reflux' and 'Barrett Oesophagus':

When the junction of the oesophagus and the stomach is 'loose', the stomach contents flow back into the lower section of the oesophagus. This may irritate the oesophagus and over time, cause 'Barrett oesophagus'. Barrett oesophagus is a condition in which the cells lining the lower part of the oesophagus have changed or been replaced with abnormal cells that could lead to adenocarcinoma of the oesophagus. It is not known if surgery or other medical treatment to stop gastric reflux can prevent oesophageal cancers. Severe or frequent heartburn should not be ignored. The doctor can recommend

medications and lifestyle changes that can help prevent gastric reflux. Sometimes drugs that inhibit acid formation may provide relief from heart burn. One may also be helped by waiting at least two to three hours after eating before lying down or exercising and by elevating the head of the bed.

### Maintain a healthy weight:

Being significantly overweight (obese) increases the risk of oesophageal cancer as well as the risk of other serious health problems, such as diabetes, cardiovascular disease and stroke. Slow and steady weight loss of half to one kg per week is considered the safest way to lose weight and keep it off. In many cases, weight reduction can be achieved by committing to eating a healthier diet, exercising and changing unhealthy behaviours.

Although it's not possible to prevent all cases of oesophageal cancer, these lifestyle changes can greatly reduce the risk.

### Fiber fights cancer colon:

In 1970, British physician Dennis Burkitt observed that a high-fiber diet reduces diseases of the digestive tract. He observed that in countries where diets are high in fiber (that is, plant-based diets), there were fewer cases of colon cancer. Around the world, this has proven true. The highest fiber intakes are found in non industrialized nations where meat is scarce and plant foods fill the menu. Animal products contain no fiber. The U.S. and other Western nations whose diets are based animal products have the highest rates of colon cancer.

Not only are vegetables low in fat and high in fiber, they also contain many cancer-fighting substances. Carotenoids, the pigment that gives fruits and vegetables their dark colors, have been shown to help prevent cancer. Beta-carotene, present in dark green and yellow vegetables, helps protect against lung cancer and may help prevent cancers of the bladder, mouth, larynx, esophagus, breast and other sites.

Vegetables such as cabbage, broccoli, kale, turnips, cauliflower and Brussels sprouts contain flavones and



indoles which are thought to have anti-cancer activities.

Vitamin C, found in citrus fruits and many vegetables, may lower risks for cancers of the oesophagus and stomach. Vitamin C acts as an antioxidant, neutralizing cancer-causing chemicals that form in the body. It also blocks the conversion of nitrates to cancer-causing nitrosamines in the stomach. Selenium is found in whole grains and has the same antioxidant effects as vitamin C and beta-carotene. Vitamin E also has this effect. Caution is advised in supplementing selenium, which is toxic in large doses.

While no one is certain also how exactly fibre protects against digestive tract disorders, there are several possibilities. By definition, fibre cannot be digested by humans early in the digestive process. It moves food more quickly through the intestines, helping to eliminate carcinogens. It also draws water into the digestive tract. The water and fibre make faecal matter bulkier, so carcinogens are diluted. Bile acids are secreted into the intestine to help digest fat; there, bacteria can change the acids into chemicals that promote colon cancer. Fibre may bind with these bile acids and evict them from the intestines. Also; bacteria in the colon ferment the fibre creating a more acidic environment which may make bile acids less toxic. In the U.S., the average daily fibre intake is 10 to 20 grams per day. Experts recommend 30 to 40 grams per day. The best sources of fibre are whole grains, beans, peas, lentils, vegetables and fruits. Foods that are closest to their natural state, unrefined and unpeeled, are highest in fibre.

Some factors that suggest a high risk for colonic cancers are polyps in the colon, history of colonic cancer in the family and diseases like 'ulcerative colitis'. Individuals with these conditions are to be screened regularly for presence of cancer in their large intestines. Any change in the consistency, color or frequency of stools has to be reported to the doctor immediately. The stool test for blood is required as a screening test. Screening for cancers is done when an individual is perfectly healthy and shows no signs and symptoms. This is the time when cancer can get picked up at an early stage. Colonoscopy is an investigation where the entire large intestine can be

seen through a long flexible fiberoptic endoscope. This is a quick outpatient procedure reserved for high risk patients and is routinely performed at BARC hospital.

## BREAST CANCER PREVENTION

It starts with ones own health habits such as staying physically active, limiting alcohol and eating right.

Can healthy eating and regular exercise really contribute to breast cancer prevention? So far, the evidence says yes. What's more, if one combines these risk-reducing habits with limiting the exposure to substances that promote the disease, one will be benefited even more.

When it comes to breast cancer prevention, the risks that can't be controlled are age and genetic makeup. Research has shown that 5%-10% of breast cancers are associated with mutations (defects) in two genes known as breast cancer-associated (BRCA) genes, BRCA1 and BRCA2. These genes function to prevent abnormal cell growth that could lead to cancer. Every cell in the body has two BRCA1 or BRCA2 genes so when these genes are defective; one is at a high risk for developing breast cancer. Apart from genetic predisposition which cannot be altered, there are many factors which can be controlled.

Among the easiest things to control are diet, drink and physical activity of the individual. Here are some strategies that may help to decrease the risk of breast cancer:

### Limit alcohol:

A strong link exists between alcohol consumption and breast cancer. The type of alcohol consumed, wine, beer or mixed drinks seem to make no difference. To help protect against breast cancer, limit alcohol to less than one drink a day or avoid alcohol completely.

### Maintain a healthy weight:

There's a clear link between obesity, weighing more than is appropriate for the age and height and breast

cancer. This is especially true if there is weight gain later in life, particularly after menopause. Excess fatty tissue is a source of circulating estrogen in the body. The breast cancer risk is linked to the amount of estrogen the person is exposed to during her lifetime.

### Stay physically active:

Regular exercise can help to maintain a healthy weight and, as a consequence, may aid in lowering the risk of breast cancer. One should aim for at least 30 minutes of exercise on most days of the week. If one hasn't been particularly active in the past, should start exercise program slowly and gradually work up to a greater intensity. Weight-bearing exercises such as walking, jogging or aerobics have the added benefit of keeping the bones strong.

### Fat increases cancer risks:

Fat has many effects within the body. It increases hormone production and thus raises breast cancer risks. It also stimulates the production of bile acids which have been linked to colon cancer. The average diet in the United States is about 37 percent fat. The National Cancer Institute suggests that people lower that percentage down to 30 percent; however, studies have shown that fat intake should be well below 30 percent to have an anti-cancer affect. 10 to 15 percent is more likely to be helpful.

Results from the most definitive study of dietary fat and breast cancer risk to date suggest a slight decrease in risk of invasive breast cancer for women who eat a low-fat diet. The effect is modest at best. However, by reducing the amount of fat in the diet, may decrease the risk of other diseases, such as diabetes, cardiovascular disease and stroke. A low-fat diet may protect against breast cancer in another way if it helps to maintain a healthy weight.

### Hormone Therapy:

Women with menopausal symptoms, should have proper screening prior to starting hormone replacement therapy.

### Pesticides and antibiotics:

Breast cancer incidence may be linked to both pesticide exposure and overuse of antibiotics. The molecular structure of some pesticides closely resembles that of estrogen. This means they may attach to estrogen receptor sites in the body. The research is not conclusive. Until further studies are conducted and more is known about these possible links, one should be aware of how these substances might counterbalance the efforts at breast cancer prevention.

### Do what one can:

In addition to lifestyle changes, one should be vigilant about early detection of breast cancer. If any breast changes are noticed, such as a new lump or skin changes, medical evaluation should be done.

The biggest misconception about mammography is that "it picks up every breast cancer." In fact, mammography misses at least 10 percent of breast cancers. So if a lump is felt and doesn't show up on a mammogram, it should be further evaluated.

Are some women at higher risk for breast cancers than others?

Yes, some women are genetically predisposed to having breast cancer. This means if any women relatives from ones natural family have breast cancer, one is likely to be at a greater risk. Other risk factors are late first pregnancy or no pregnancy. Breast feeding the child is known to prevent breast cancers in mothers. These factors can be controlled by promoting breast feeding.

### High-quality early detection:

Every woman needs to practice early detection measures. High risk women should be especially watchful. The goal is to find breast cancer as early as possible, when it is most treatable.

All women over age 20 should perform breast self-examination monthly. Those over age 40 should also have annual breast examinations by their doctors.

Those younger than 40 years can have breast examinations by their doctors every three years.

For women who are at high risk of breast cancer some additional procedures are recommended:

Ultrasound can be used as a screening test along with mammography in woman at increased risk. Ultrasound can be used in a woman of any age to further evaluate a breast thickening or lump. If the age is less than 30, the doctor may recommend ultrasound before mammography to examine a persistent area of concern. As noted above, however, mammography is still important. Consulting the doctor about developing a specialized program for early detection that meets individual needs and gives peace of mind.

For women with higher than normal risk, a good program would include monthly breast self-examination and twice-yearly focused physician examination. Any palpable changes in the breasts require further evaluation with mammography and ultrasound.

### How to perform breast self-examination:

Breast self-examination is best performed when hormone levels of the breast are at their lowest. This typically occurs seven to ten days after the start of a menstrual cycle (or three days after a period). At that point, the fluid retention of the breast and the cellular proliferation are lowest. An ideal setting in which to conduct the exam is the bath or shower.

With the hand and breast wet with soap, begin with the fingers flat together and work sweeping from the outer part to the center of the breast. It helps to mentally divide the area to be examined into quadrants and work around the quadrants sequentially. The upper outer quadrant should be mentally extended into the armpit along the chest wall. This area should be carefully included in the examination.

The process is repeated in the same sequence with the fingers moving in a fluttering motion. These different motions, flat fingered stroking and fluttering

fingertips, allow detection of somewhat different tissue abnormalities.

This examination by feeling the breast (palpation) should be accompanied by a brief visual exam. With the arms at the side looking in a mirror, note the symmetry. Then raise the arms slowly overhead, checking for any areas of pulling in of the skin or visible lumps or distortion.

The entire examination process can be done in a few minutes' time.

Any detected change from the usual appearance or feel should be reported to the doctor. If there are any areas of concern that can be felt (palpable) and the mammogram does not show an abnormality, then a specialized breast ultrasound or MRI (Magnetic resonance imaging) can be extremely helpful.

For women who are concerned that they have lumpy breasts and can't make any sense of their exam, it is best to do a careful exam after a physician's examination. This serves as the baseline for normal "lumps." The exam should be repeated several days in a row so that the findings are clearly recalled. Subsequently, if a new or progressive change develops, it is much more likely to be detected. The aim is to maintain an appropriate degree of alertness without creating continuous anxiety.

Majority of the cancers can be prevented by appropriate diet and lifestyle changes. In situations where genetic tendency puts an individual at a higher risk, a more vigilant approach for prevention and early detection should be undertaken

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## PREVENTION OF PSYCHIATRIC DISORDERS AND PROMOTION OF MENTAL HEALTH

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The disabilities associated with chronic mental illness are major social, economic and public health problems.

Preventive psychiatry is part of public psychiatry. The goal of prevention is to decrease the delay in onset of psychiatric illness, limit the duration and minimize residual disability of mental disorders.

### Mental health education programs:

Parent training in child development and education programs to deal with alcohol and drug abuse help prevent the behavioral and educational problems in children, adolescents and young adults.

Provide genetic counseling for parents at high risk for chromosomal abnormalities in order to prevent the unwitting conception of compromised infants.

Prevention programs providing parental guidance about Dos and Donts in pregnancy and improving perinatal care help to decrease incidence of mental retardation and cognitive disorders in children - e.g. - Advice about improved nutrition and abstinence from alcohol and other substance use during pregnancy.

Efforts at competence building and enriched day care programs for disadvantaged children help to reduce emotional disturbances in children.

Providing anticipatory guidance and counseling to prepare for expected stressful life events such as bereavement, marital separation, divorce, traumas and group disasters.

### Other prevention strategies:

The development and use of social support systems to reduce the effects of stress on those at high risk e.g widows, single parents or providing foster care for children whose parents are invalid to look after them.

Modification of laws regarding divorce, adoption and child abuse is needed so as to provide healthy environment for child development.

Enrichment of institutional settings of infants, children and older people are important to prevent disorders occurring in these groups.

Modify certain risk factors for mental disorders that appear to be associated with low socioeconomic status. Efforts to reduce the spread of certain sexually transmitted diseases e.g. AIDS and syphilis that can lead to mental disorders help to a great extent in prevention.

Early identification and prompt treatment of illness prevents or reduces later disability.

Residual defects and disabilities can be helped out by rehabilitation programmes aiming to reach the highest feasible level of functioning.

### Promoting mental health at individual level:

There are practices and principles which are helpful in promoting mental health at individual level. Some of these are :

Knowing the factors in the external situation which can be changed to fit one's needs better. Learning to accept without resentment the ones that cannot be changed.

Improving one's competence to handle situations like learning to converse easily, if one feels awkward in social situations. Developing vocational competence if one fears that he/she may lose the job or may not be promoted.

Acknowledging and accepting one's emotions, admitting fear when in serious danger, helps to keep the fear from becoming intolerable. Much mental illness seems to grow due to person's inability to accept the sexual desires, hostilities or other motives as he has learned that are degrading or morally wrong.

Keeping busy in constructive work that one feels is valuable. This is one of the best routes to feel a sense of achievement, adequacy and self-esteem. When this source of satisfaction is removed, as in old age, the individual is ought to develop feelings of discouragement, depression and worthlessness. Even in real emergency situation, keeping busy can help combat depression or allay fear.

### Cultivating a sense of humor:

The ability to see the humor in a situation especially about oneself has saved many an awkward moment in social life. Laughter can go far to sweep away annoyance, worry, jealousy, and even timidity and fear.

### Sharing responsibilities and participating in social activities:

All of us need companionship and we thrive on the satisfaction of being valued as a contributing member of a group.

### Reinterpreting situations:

Often our frustrations are the product not only of faulty evaluations on our part; but our self-images too are often distorted. Re-evaluation in the light of

reality may be difficult and may require the help of a friend or a counselor.

There are limitations to self-help. Emotional problems sometimes could affect our judgment.

### Seek help:

With serious emotional difficulties the individual should not hesitate to seek professional aid.

### General health Measures:

The physically healthy individual is less susceptible to disease than is one who is in poor physical condition. Similarly the healthy individual is better able to withstand psychological stresses and strains than one who is ill. Good Physical health is therefore important to good mental health.

## PATIENT COMMUNICATION

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Medical Officer

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and

**Dr. Chitra Bongirwar**

Medical Officer

Deonar (E) Dispensary

*"The relationship a physician establishes with a Patient during a clinical encounter is the heart of medicine"- Ronald M. Epstein (Journal of Family Practice, Oct. 1993).*

### Introduction

The domain of medical profession entails continuous and perpetual interaction between medical practitioners and patients. It has been stated that difficulties in the effective delivery of health care can often arise, from problems in communication between patient and doctor rather than from any failing in the technical aspects of medical care<sup>1</sup>. Hence, accurate diagnosis of the ailment is attributed to the efficacy of communication between the two entities. Moreover, the doctor-patient relationship is in itself therapeutic; a successful consultation with a trusted and respected practitioner will therefore have beneficial effects irrespective of any other given<sup>2</sup> therapy.

### Essence of good inter communication

The age old practice followed in medical profession, which involves patient's defiance of doctor's recommendations, has undergone a radical change with ordinances like Consumer Protection Act and Right to Information Act coming to the fore. There is a general awareness among the populace about their rights and hence doctor's recommendations are often rightfully being questioned and challenged by patients during the course of their treatment. Today's end users of the CHSS are highly educated professionals in their

own respective fields and have become knowledgeable about health matters which have been greatly aided by the advent of internet revolution and pervasiveness of mass media into their lives. The entire patient communication depends on the rapport a doctor is able to establish with the patient.

### Barriers to communication

The factors which impede a normal communication can be categorized into:

- a. The doctor factors
- b. The patient factors

#### The Doctor factors

1. Authoritarian or dismissive attitude
2. Hurried approach
3. Use of medical words and jargon
4. Inability to speak the native language of the patient and
5. Lack of appropriate professional knowledge and competence.

#### The Patient factors

1. Submissive attitude,
2. Anxiety, leading to unclear presentation of complaints,
3. Misconceptions and myths about their illness,
4. Unrealistic expectations,
5. Demanding approach to treatment and
6. Medical complications impairing normal communication.



## Roadmap to Effective Communication:

### Doctor's Perspective

#### 1. Gathering information

This phase involves a thorough comprehension of the patient's complaints by virtue of listening to patient's description, his/her perception of the ailment and his/her body language. However, this phase involves the following challenges:

- Research has shown that patients are interrupted by their doctors after patients have spoken for an average of 18 seconds<sup>3</sup> and this leaves them dissatisfied and can also have a bearing on the outcome of diagnosis and treatment<sup>4</sup>. This can be resolved by allowing the patient to speak uninterrupted for at least 2 minutes.
- In our setting we often see patients jump from one complaint to another or wander off from the essence of his/her problems. Here the doctor has to use his/her clinical acumen to separate the important complaints from the trivial ones.

Study indicates that in almost 80% of the cases two minutes of listening is enough to comprehend the patient's woes<sup>5</sup>.

Hence, it can be concluded that the key to successful Information Gathering phase is effective listening on the doctor's part. This can be achieved in the following ways<sup>6</sup>:

- a. Open ended questioning
- b. The use of an open-to-closed cone of questioning to progressively narrow the focus of the narrative
- c. Facilitation (e.g., "Tell me more about your pain").
- d. Clarification (e.g., "When you say dizziness do you mean that you feel the room spinning?")
- e. Checking (e.g., "If I heard you correctly, this episode began Monday evening and has worsened over the past two days, is that correct?"); and
- f. Surveying for new problems (e.g., asking "What else bothers you?").

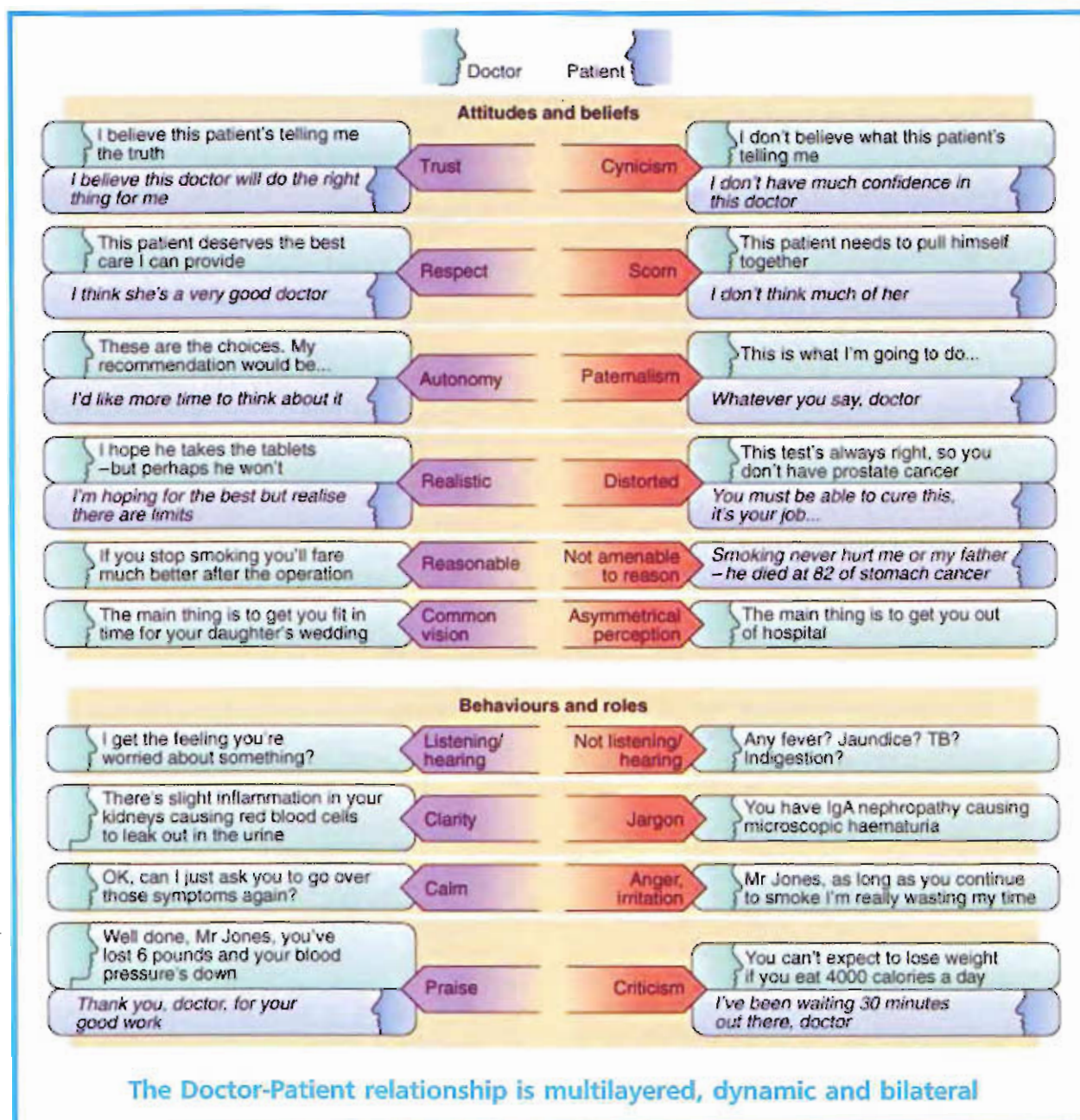
## Other additional important aspects

- It is necessary that intermittent eye contact is maintained with the patient. Continuous staring will unnerve him. On the other hand if you are immersed in writing notes or working on your computer, the patient will get irritated and may feel that you have not given him/her full attention. Lack of eye contact can also be perceived by the patient as a sign of deception<sup>7</sup>.
- The facial expressions of doctors are carefully scrutinized by patients; this information is believed to deeply impact the patients trust in their doctors<sup>8</sup>.
- A warm tone of voice is an important element for conducive and a favorable patient-doctor interaction. The doctor should be careful not to be judgmental because this will scare the patient and close down communication<sup>1</sup>.
- Touch is very relevant in medical context. Despite advancements in technology there are certain procedures, like checking the patient's pulse, checking the body temperature etc., (which are generally performed manually), further fortify the rapport between patient and doctor and hence should be carried out in all its sincerity. To touch and be touched is part of the process of staying well or getting well<sup>9</sup>.
- At times patients may evade answers to questions concerning their personal habits like smoking and alcohol consumption. In such cases doctors might need to get this information from friends or close relatives of the patient.

#### 2. Providing information

Ideally doctor needs to give concise and relevant information to the patient about his/her illness in a simple and lucid language instead of elaborative description using medical jargon.

Whenever a patient comes to a doctor, whether he is a patient suffering from chronic illness or an acute illness, there is apprehension and anxiety. This is more so with patients who have been recently diagnosed with a new illness. It is absolutely important for doctors to understand that while they may feel it is just another case of hypertension or diabetes, for the



*From Davidson's principles and practice of Medicine (20<sup>th</sup> edition). Original portrait from Royal College of General Practitioners.*

patient it is a frightening experience. He/She needs reassurance and empathy. It is always desirable that such patients are given more time and are explained in such a manner that they are able to understand their illness, its treatment and prognosis of the disease. This will ensure compliance and help allay many fears in the patient's mind.

To be honest and truthful while providing information to the patients is of utmost importance. Hiding information about error committed on the part of the doctor leads to patients viewing the doctor as uncaring<sup>10</sup>.



## Patient's perspective

Till now, we have emphasized on the doctor's role in communication. It is almost equally important on part of the patients to be aware of the following points:

1. Doctors can provide limited time and to expect prolonged consultations is unrealistic and at the same time also unjust to the patients who are in queue. A well organized patient can present his complaints in a concise manner and will try to avoid issues which have already been discussed in detail in earlier visits.
2. Patient should not be afraid to get things clarified and should try to completely understand the treatment part. They should understand about the drug dosages and about the tests to be performed before next follow up etc.
3. Medicine is not an exact science. If one patient gets relief with drug X in two days it is equally possible that another patient may not respond at all to drug X for similar complaints. There are various factors at play (genetic, physiological, environmental etc.) that have a certain impact on any given treatment. While evidence based medicine is striving to standardize treatment and guidelines, it is a known fact that a particular disease may have varying presentations and a single symptom or sign can point to a myriad of illnesses. This is just to indicate to the patients that if they believe their doctor has tried his / her level best with full conviction and dedication and if some inevitable complications occur, they should understand the limitations.

## Conclusion

Communication skills are not yet a part of medical curriculum. The need for introducing medical students to good communication skills is being increasingly recognized and is being incorporated into medical education<sup>1,11</sup>. As doctors become more and more technologically-driven, the human touch is being diminished from the practice of medicine. More importance is given to tests and reports. The patient

is feels alienated and the doctor feels overwhelmed with the explosion in medical science and technology. Good patient communication can help a great deal in improving and reinforcing the patient-doctor bond. Strengthening one's communication skills takes time and effort. If the doctor and patient can communicate well and can work in symphony, a highly effective clinical outcome can be accomplished.

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"Listening means awareness, openness to learning something new about another person. Interrupting, even for clarification, can seem to be rude, but listening with the intent to learn is an approach to a different type of conversation."

- Elizabeth Debold,  
Co author *Mother-Daughter Revolution*



## RADIATION AND IMAGING

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### Introduction

All living organisms are exposed to radiation from natural sources. An average yearly effective dose from natural background amounts to about 2.5 mSv (may vary considerably in different areas).

Use of radiation in techniques like diagnostic radiology, nuclear medicine and radiation therapy has evolved to be of great help to mankind. However, ionizing radiation, while providing many benefits, is also capable of causing potential harm. At such times, good judgement is required to weigh the benefit against the potential risk. This requires knowledge of radiation risks and the typical doses received by the patient while undergoing radiological procedures.

### Procedures using radiation

Diagnostic radiological procedures (plain film radiography, fluoroscopy, computed tomography) have increased the speed of diagnosis. For specific populations, screening procedures like mammography have been of immense use for early diagnosis. Several interventional radiological procedures (e.g. angioplasty) have played an important role in effectively treating life-threatening diseases of the cardiovascular, central nervous and other organ systems.

Nuclear medicine, by making use of radioactive substances (radio-pharmaceuticals), is capable of providing functional information that cannot be otherwise obtained by other investigative modalities and is very valuable in oncology (diagnosis and staging), cardiology, endocrinology, neurology, nephrology, urology and others. It has to be remembered here that radioactive sources continue to emit radiation and that some precautions may have to be taken, especially with patients, who have

been given large therapeutic amounts of radio-nuclides when they are in a hospital and afterwards when they go home (to protect against exposure of the staff, relatives, friends and members of the public).

Radiation therapy makes use of ionizing radiation for treatment of cancer and use of radiotherapy saves millions of lives every year and also substantially reduces suffering even with palliative use. But this highly complex technique requires good cooperation between radiation oncologists, medical physicists and highly qualified technicians as this procedure is often accompanied by adverse side effects, which may result from high dose of the procedure, proximity of sensitive normal tissues to the treatment field or rarely as a result of individual radiation sensitivity.

### Radiation risks

A higher amount of radiation is associated with higher risk and as such, the magnitude of risk from radiation is dose-related. Thus while the risk is small in X-ray and nuclear medicine diagnostics, it is significantly higher in radiation therapy. Trying to reduce the radiation dose may sometimes be counter productive (low exposure not giving enough information due to poor quality of image on the film or cancer getting cured incompletely), and hence optimization is required i.e. avoiding unnecessary (unjustified) examinations and aiming to minimize the putative risk without sacrificing, or unduly limiting the obvious benefits in the prevention, diagnosis and also in effective cure of diseases.

### Effects of radiation

There are two basic categories of biological effects that may be observed in irradiated persons.

Deterministic effects due to cell killing which usually occur early, have a threshold and the severity of effects varies directly with the dose. Clinical examples of such effects are: necrotic changes in skin, necrosis and fibrotic changes in internal organs, acute radiation syndrome after whole body irradiation, cataract and sterility. Large doses (usually >1-2 Gy) are required to produce deterministic changes. Such doses can be received as side effects of radiotherapy or following complex interventional investigations (such as vascular stenting) where long fluoroscopy durations have been used. Malformations induced in the conceptus in the period of organogenesis (100-200 mGy between 3 and 8 weeks) and malformations of the forebrain leading to mental retardation (~ 200 mGy between 8 and 25 weeks of pregnancy), are also due to cell killing and are classified as deterministic effects.

Stochastic or Probabilistic effects due to mutations which may result in cancer and hereditary effects (not yet observed in humans). These effects usually appear late, do not have a threshold and the severity of effects is independent of the dose but have a probability of occurrence that increases with dose. There is a latency period between exposure and the development of malignancies. The minimum latency periods for occurrence of various malignancies are given in Table 1.

## Magnitude of the risk for cancer

Analysis of the epidemiological data of irradiated populations, has been derived from the lifetime risk of radiation-induced cancer for the average person, which is roughly a 5% increase in fatal cancer after a whole body dose of 1 Sv (which is much higher than is observed in most medical procedures).

The high-dose diagnostic medical procedures (such as a CT scan of the abdomen or pelvis) yield an effective dose of about 10 mSv. If there were a large population in which every person had 1 such scan, the theoretical lifetime risk of radiation-induced fatal cancer would be about 1 in 2,000 (0.05%). This can be compared to the normal spontaneous risk of fatal cancer which, in UK, is about 1 in 4 (25%). (In developing countries this risk is about 1 in 10).

If the cumulative radiation dose from medical procedures exceeds 50 mSv, the cancer risk should be carefully considered. Many relatively high - dose diagnostic procedures should be clearly justified and only when this is done, benefit will far outweigh the risk. Unjustified procedures at any dose level should be avoided. In radiotherapy, the risk of second cancers, though present, is small as compared to the urgent necessity to treat the current malignancy effectively.

**Table 1: The minimum latency periods for occurrence of various malignancies**

Cancer	Minimum Latent period
non-CLL leukemia	2 years
Thyroid and Bone	5 years
Most cancers	> 10 years
Prostate Cervix Uterus Lymphomas Chronic lymphatic leukaemia	Not radiation induced

### Typical doses from medical diagnostic procedures:

Table 2 gives the typical effective doses from diagnostic medical exposures in the 1990s (U.K.) and Table 3 enumerates the approximate levels of risk for different procedures.

**Table 2: Effective doses from diagnostic medical exposures in UK**

Data from the National Radiation Protection Board in the U.K.

Diagnostic procedure	Typical effective dose (mSv)
<b>X-ray examinations:</b>	
Limbs and joints (except hip)	< 0.01
Chest (single PA film)	0.02
Skull	0.07
Thoracic spine	0.7
Lumbar spine	1.3
Hip	0.3
Pelvis	0.7
Abdomen	1.0
IVU	2.5
Barium swallow	1.5
Barium meal	3
Barium follow through	3
Barium enema	7
CT head	2.3
CT chest	8
CT abdomen or pelvis	10
-----	
<b>Radionuclide studies:</b>	
Lung ventilation (Xe-133)	0.3
Lung perfusion (Tc-99m)	1
Kidney (Tc-99m)	1
Thyroid (Tc-99m)	1
Bone (Tc-99m)	4
Cardiac gated study(Tc-99m)	6
PET head (F-18 FDG)	5
-----	
Annual natural background	about 2.5



Table 3: Alternative versions (from NRPB, modified)

Broad levels of risk for common x-ray examinations and isotope scans			
X-ray examination (or nuclear medicine isotope scan)	Effective doses (mSv) clustering around a value of:	Equivalent period of natural background radiation	Lifetime additional risk of cancer per examination*
Chest Teeth Arms and legs Hands and feet	0.01	A few days	Negligible risk
Skull Head Neck	0.1	A few weeks	Minimal risk 1 in 1 000 000 to 1 in 100 000
Breast (mammography) Hip Spine Abdomen Pelvis CT scan of head (Lung isotope scan) (Kidney isotope scan)	1.0	A few months to a year	Very low risk 1 in 100 000 to 1 in 10 000
Kidneys and bladder (IVU) Stomach-barium meal Colon - barium enema CT scan of abdomen (Bone isotope scan)	10	A few years	Low risk 1 in 10 000 to 1 in 1 000
* These risk levels represent additions to the normal spontaneous risk of getting cancer			

## Computed Tomography

CT scans expose a person to higher doses as compared to conventional radiography (see Table 4). Spiral (helical) CT exposes a person to doses up to four times higher than that for a conventional CT scan. In helical CT, the patient is continuously moved through the scanner as the source and receptor rotate around the patient. To achieve this, it is necessary to expose the entire thickness of the patient to a greater quantity of x-ray photons. The pitch is the ratio of distance the patient has moved through the scanner per rotation per slice thickness. Usually, the number is between one and two. Higher pitch lowers radiation dose, but at the expense of partial volume effect

(loss of detail). Larger patients receive a relatively higher skin dose in order to penetrate their bodies and smaller patients have a relatively higher dose to internal organs. (Since internal organs are more radiosensitive than skin, smaller patients generally incur a higher effective dose for the same CT settings and, hence, higher long-term cancer risk). Approximate effective dose from CT coronary angiography as compared to other common procedures is tabulated in Table 5.

Coronary CT Angiography (CTA) is becoming popular due to its wider availability, higher spatial resolution, shorter examination time and better patient adherence. Many doctors have started viewing this

**Table 4: Comparison of doses in CT scans and radiography**

CT examination	Effective dose (mSv)	Radiographic examination	Effective dose (mSv)
Head	2	Skull	0.07
Chest	8	Chest PA	0.02
Abdomen	10-20	Abdomen	1.0
Pelvis	10-20	Pelvis	0.7
		Ba swallow	1.5
		Ba enema	7

**Table 5: Comparison of doses from CT coronary angiography as compared to common procedures**

Procedure	Effective dose (mSv)
CT coronary angiography (using helical MDCT)	8 - 30
Low dose axial MDCT with prospective gating	2 - 3
CT coronary angiography (using EBCT)	1 - 2
CT calcium scoring using MDCT	1 - 5
CT calcium scoring using EBCT	1
CT scan of thorax	10
Conventional invasive coronary angiography	2-22but typically 3 - 10
Chest X ray (one posterior-anterior film)	0.02
Annual natural background (worldwide average)	2.4

EBCT - Electron Beam CT, MDCT - Multi-Detector CT

as a non-invasive alternative to conventional invasive coronary angiography, which is a gold standard for assessing the disease of the coronary arteries. In view of this, the American Heart Association (AHA) has issued guidelines about CTA and also about Magnetic Resonance Angiography (MRA) as a modality which does not involve use of ionizing radiation and does not require administration of iodinated contrast material [AHA 2008]. The summary points are:

- CTA or MRA should not be used to screen for coronary artery disease in asymptomatic patients.
- No multivendor data is available for coronary multi-detector CT angiography (MDCT CTA) or for whole-heart coronary MRA. Multivendor and multicenter validations should be performed.
- The symptomatic patient at "intermediate risk" for coronary artery disease is more likely to benefit from noninvasive coronary angiography, after initial risk stratification, including patients with equivocal stress-test results.
- CTA is not recommended for high-risk patients because of radiation dose concerns and usefulness of CTA is uncertain in patients with



pronounced coronary calcifications because of probable reduced accuracy.

- Anomalous coronary arteries can be assessed by both methods (MRA being favoured if available).
- Reports must include technical quality assessment as well as coronary and significant non-cardiac findings.
- More research is encouraged in order to determine the potential of these techniques to detect, characterize and measure atherosclerotic plaque burden and changes.

### How to manage radiation doses without affecting the diagnostic benefit?

1. It is necessary to justify the examination before referring a patient to the radiologist or nuclear medicine physician. An investigation should be considered useful if it helps in strengthening the diagnosis or its outcome is likely to influence the management of patient. Examinations like routine chest x-ray at admission to hospital or routinely prior to minor surgeries in the absence of symptoms, indicating cardiac or pulmonary involvement (or insufficiency) or skull radiography in asymptomatic subjects of accidents would be largely considered unjustified. Exceptions to the above rule are screening of close family members of a patient of sputum-positive tuberculosis or mammography for early detection of breast cancer.
2. Adequate clinical information should be provided while referring the patient to allow the radiologist or nuclear medicine specialist to choose the correct procedure or technique appropriate to the situation.
3. Repetition should be avoided if the investigation has been made recently unless patient's condition demands a review where the disease could have progressed or resolved since the previous investigation or when the data obtained could influence the course of treatment. This is particularly to be followed for radiological procedures that deliver high doses like computed tomography (CT), and particularly



the more recent spiral or multi slice CT as repeated examinations may deliver an effective dose of the order of 100 mSv.

4. Results of the investigations should be recorded properly and communicated to other health-care units in order to avoid duplication.
5. If the cost of the procedure, the waiting time and other organizational difficulties are not an impediment, the possibility of obtaining similar information by means of ultrasound (US) or magnetic resonance imaging (MRI) should be explored.

### Further reading

1. International Commission on Radiological Protection, Recommendations of the International Commission on Radiological Protection, Publication 103, Annals of the ICRP 37 (2-4), Elsevier Publications, Oxford, UK (2007).
2. AHA 2008. AMERICAN HEART ASSOCIATION. Scientific Statement (BLUEMKE et al., Authors), Noninvasive Coronary Artery Imaging. Magnetic Resonance Angiography and Multidetector Computed Tomography: Angiography. A Scientific Statement from the American Heart Association Committee on Cardiovascular Imaging and Intervention of the Council on Cardiovascular Radiology and Intervention, and the Councils on Clinical Cardiology and Cardiovascular Disease in the Young, Circulation 118 (2008). Published online ahead of print June 27.
3. Medical and Dental Patient Issues — Diagnostic X-Ray and CT at <http://www.hps.org/publicinformation/ate/cat5.html>
4. Cardiac CT at [http://rpop.iaea.org/RPOP/RPoP/Content/InformationFor/HealthProfessionals/1\\_Radiology/CardiacCT.htm](http://rpop.iaea.org/RPOP/RPoP/Content/InformationFor/HealthProfessionals/1_Radiology/CardiacCT.htm)

Radiation and your patient: A guide for medical practitioners - A web module produced by Committee 3 of the International Commission on Radiological Protection (ICRP).



## INFECTION CONTROL MEASURES: PREVENTION OF METHICILLIN-RESISTANT STAPH AUREUS INFECTION (MRSA)

Dr Amrita Misri

Convener, Infection Control Committee

MRSA was first isolated in the United States in 1968. By early 1990's, 20-25% of *Staph aureus* isolates were MRSA.

### Resistance has been observed due to

- Plasmid – encoded penicillinases which hydrolyze  $\beta$  lactam rings and prevent the binding of  $\beta$  lactam antibiotic to the penicillin-binding proteins (PBPs)
- Altered Penicillin binding protein (PBP2a) has a low affinity for all  $\beta$  lactam antibiotics, including the semisynthetic penicillins (i.e. penicillinase resistant penicillins such as methicillin) and cephalosporins.

### MRSA can be

- Community acquired (CA-MRSA)
- Hospital acquired (HA-MRSA)

CA-MRSA infection usually presents as skin and soft tissue cellulitis and abscess. Isolates are often bacteriologically different than those found in hospital-acquired infections.

CA – MRSA treatment: Many can be treated with incision and drainage alone. For empiric coverage, Bactrim, Gentamycin, Tetracyclines and Clindamycin

### Current CDC (Centre of Disease Control) Guidelines Surveillance

TIER 1	TIER 2
<ul style="list-style-type: none"> <li>• Standard Lab methods to detect MRSA</li> <li>• Prompt notification of infection controls staff</li> <li>• Store isolates for molecular typing</li> <li>• Prepare susceptibility reports</li> <li>• Monitor incidence trends over time</li> </ul>	<ul style="list-style-type: none"> <li>• Attempt to distinguish colonization vs. infection</li> <li>• Implement active surveillance for patients at risk</li> <li>• Conduct culture surveys</li> <li>• Culture healthcare personnel, if epidemiologic evidence warrants</li> </ul>

### Current CDC Guidelines - Precautions

TIER-1	TIER-2
<ul style="list-style-type: none"> <li>• Standard precautions during all encounters</li> <li>• Contact precautions for colonized/infected patients</li> <li>• No recommendations regarding discontinuation of contact precautions.</li> </ul>	<ul style="list-style-type: none"> <li>• Gown/Gloves before entry into room.</li> <li>• If active cultures are being obtained implement contact precautions until the culture is negative</li> <li>• Single patient rooms.</li> <li>• Assign dedicated staff</li> </ul>

are advised. Fluoroquinolones and Macrolides are not recommended.

Although most CA- MRSA infections are not invasive, more significant infections can occur in the form of necrotizing pneumonia, necrotizing fasciitis, sepsis, osteomyelitis and septic emboli.

### HA-MRSA Infection

20% of all ICU patients are colonized or become colonized with MRSA during the course of their ICU admissions. Studies have revealed that 40% of colonized ICU patients can develop MRSA infections.<sup>1</sup>

MRSA is an increasingly common cause of ventilator-associated pneumonia, surgical site infection and bacteraemia.

In comparison with MSSA (Methicillin Sensitive Staph aureus), MRSA bacteraemia has much higher mortality rate (almost 20 times more).<sup>2</sup>

### Prevention of HA – MRSA Infections

- Notification
- Judicious Antibiotic use
- Surveillance
- Precautions
- Decolonization – Mupirocin  
-Decontamination showers

Our goals in this regard are

- All patients admitted/transferred to ICU setting to be placed in presumptive MRO (Methicillin Resistant Organism) isolation.
- Nasal cultures and cultures of any open wound to be sent at the time of admission.

- Microbiology lab should notify the ICU within 24-48 hrs of screening results.
- If negative, patient is to be removed from isolation. Repeat screen to be performed every 7 days until patient is discharged from the unit.

### Conclusion:

Hand washing Good

MRSA Bad

### Special thanks:

To each one who wash their hands and follow standard precautions/guidelines in the name of infection control.

### References:

1. Theaker C. et. al "MRSA in the critically ill J. Hosp. Infection 2001;48:98-102.
2. Cosgrove SE, et. al. Comparison of mortality associated with methicillin resistant and methicillin susceptible Staph aureus bacteraemia: a meta analysis Clinical Infect.Dis.2003;36:53-9.

## ACHIEVEMENTS / PRESENTATIONS / INVITED TALKS

### Achievements



Dr. Hemant Haldavnekar receiving the Special Contribution Award from Dr. Anil Kakodkar as Dr. S. Banerjee looks on

### Trombay Dispensary

- The Chairman, Atomic Energy Commission presented 'Special Contribution Award 2007' on the Founder's Day to Dr. Hemant Haldavnekar in recognition of his valuable contributions in the field of Nuclear Science and Technology and to the programme of the Department of Atomic Energy. The award consists of a citation, a medal and a cash award of Rs. 50,000.

### Department of Obstetrics and Gynaecology

- Dr. Nigamanand Mishra, Medical Officer, successfully passed the "Diploma in Hospital Administration" conducted by the Tata Institute of Social Sciences, Deonar, Mumbai in September 2008.
- Dr. Rupali Chordiya and Dr. Veena Acharya, the resident medical officers, bagged the 1<sup>st</sup> runner up prize at the Quiz competition, on 'Menopausal Health', at the Symposium on Indian Menopausal Health organized by Indian Menopausal Society, Navi Mumbai Chapter in association with Navi Mumbai Obstetrics & Gynaecological Society and FOGSI Endocrinology Committee on September 21<sup>st</sup>, 2008 held at Mayfair Banquet Hall, Vashi.



## Paper Presentations

### Department of Ophthalmology

- Dr. Rahul Baile presented a paper on 'Role of intravitreal Bevacizumab (Avastine) in various retinal pathologies', at the 6<sup>th</sup> Annual conference of Bombay Ophthalmologists Association, EYE TREK FOCUS 2008 held from September 19-21, 2008 at Mumbai.
- Dr. Shashank Ranade presented a paper on 'Comparative trial to study the accuracy of IOL power calculation by immersion technique of A-scan ultrasonography and IOL Master' at the Annual conference of Maharashtra Ophthalmology Society, MOSCON 2008 on October 16-19, 2008 at Aurangabad.

## Poster Presentations

### Department of Ophthalmology

- Dr. Rahul Baile, Dr. Snehal Nadkarni, Dr. V. Karira, Dr. Shashank Ranade, Dr. Juilee Kelkar and Dr. Meghana Sahasrabudhe presented a poster on 'Morning Glory Disc Anomaly (MGDA) with retained visual acuity - A rare case report' at the 16<sup>th</sup> Annual conference of Bombay Ophthalmologist Association, EYE TREK FOCUS 2008 held from September 19-21, 2008 at Mumbai.

### Department of Pathology

- Dr. R.R. Pillai, Dr. R.K. Kulkarni, Dr. S. Cherian and Dr. U.P. Chaturvedi presented a poster on 'Renal Angiomyolipoma - A case report' at the 29<sup>th</sup> Maharashtra State Chapter Conference of the Indian Association of Pathologists and Microbiologists, MAPCON 2008, held from September 19-21, 2008 at Wardha.

## Invited Talks

- Dr. K.B. Sainis, Director, Biomedical Group, delivered a lecture on 'Recent developments in the search for new Radio-protectors' at the Indo-US workshop on 'Medical Countermeasures for radiation injury - Current and Evolving Technologies' on August 17 -20, 2008 at New Delhi.
- Dr. P.R. Bongirwar, Medical Officer In charge, Trombay and Vashi Industrial Dispensary, delivered a lecture on 'Medical Management of Nuclear and Radiological Emergencies' at the Indo-US workshop on 'Medical Countermeasures for radiation injury - Current and Evolving Technologies' held from August 17 -20, 2008 at New Delhi.

## CMEs conducted at BARC Hospital in the year 2008

DATE	DEPARTMENT	TOPIC
01/02/2008	PHYSIOTHERAPY	Presentation on Isokinetic System
14/03/2008	OPHTHALMOLOGY	Diabetic Eye Disease
28/03/2008	MEDICAL	Acute Renal Failure
11/04/2008	PATHOLOGY	Safe Blood Administration Practices - Clinical Decision & Response Monitoring
25/04/2008	MEDICAL	Pre-operative Cardiac Evaluation
09/05/2008	PAEDIATRIC	UTI- Comprehensive Approach
23/05/2008	SURGICAL	Colorectal Malignancy
13/06/2008	ORTHOPAEDICS	Overview Arthroscopy
11/07/2008	PSYCHIATRY	Psychiatric Perspectives in Epilepsy
18/07/2008	INFECTION CONTROL	Infection control practices in Critical Areas
25/07/2008	E N T	Hearing Impairments & Audiologic Investigations
08/08/2008	ANESTHESIA	Anesthesia at Remote Locations
22/08/2008	RADIOLOGY	What is a CT scanner
26/09/2008	GYNAEC. & OBST	Interesting Cases
10/10/2008	OPHTHALMOLOGY	Thyroid Eye Disease
24/10/2008	DISPENSARY	Bio-Terrorism
07/11/2008	MEDICAL	Current Management of Hepatitis B
28/11/2008	PAEDIATRICS	Dengue Haemorrhagic Fever
12/12/2008	SURGICAL	Approach to cervical lymphadenopathy
26/12/2008	INFECTION CONTROL	Rational use of Antibiotics

### Forth coming event:

09/01/2009	ORTHOPAEDICS	Advances in management of osteoporosis
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Scientific Session of Annual Day Celebration  
Keynote address by Dr. Usha Saraiya on 'Current Perspectives in Women's Health'



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