



Double Helical

September 2017

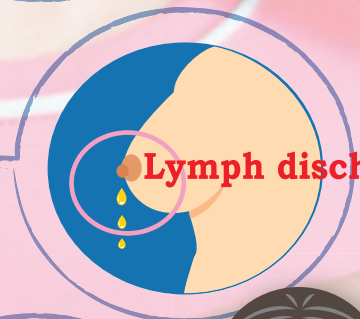
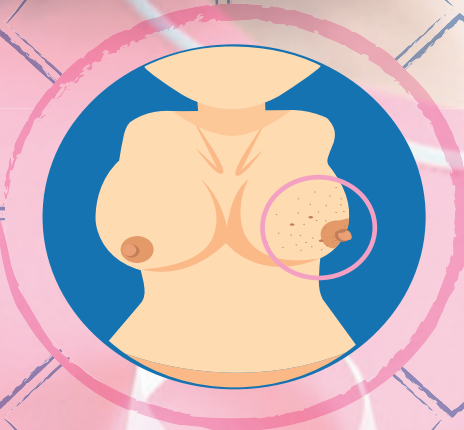
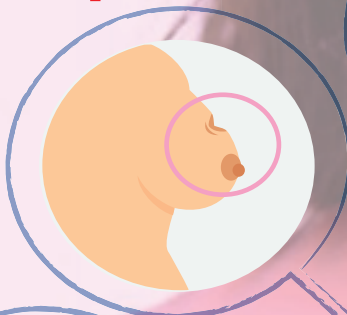
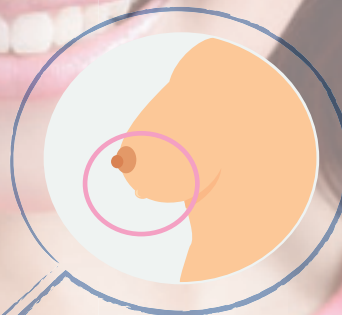
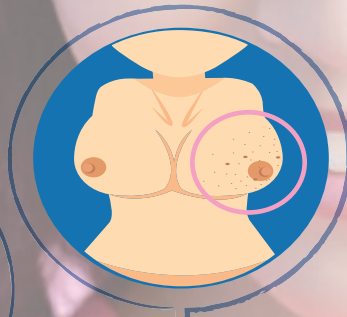
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Texture change

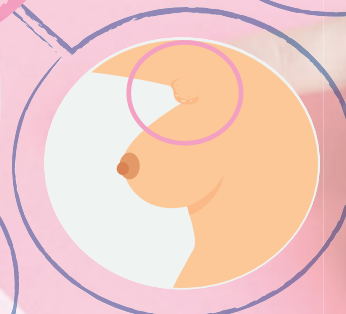
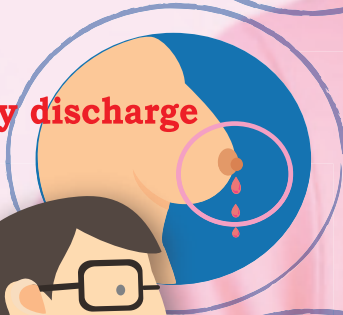
Visible lump

Dimpled or depressed skin

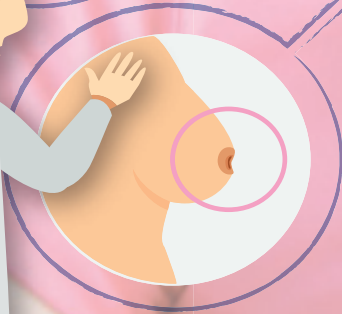


Lymph discharge

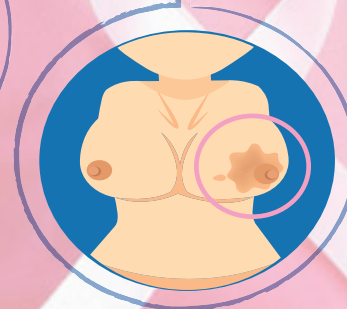
Bloody discharge



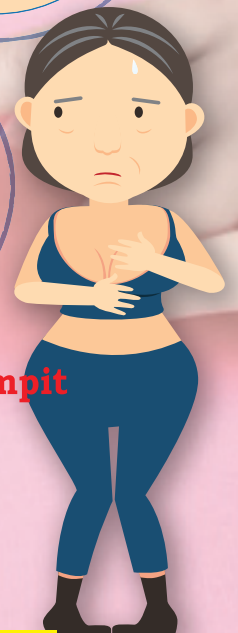
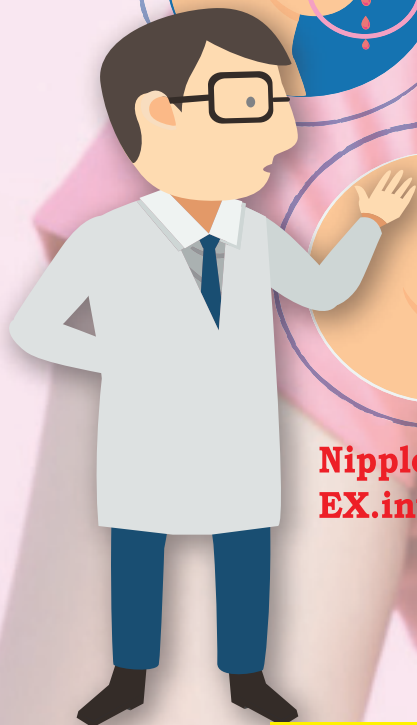
Lumps in the armpit



Nipple change
EX.inversion



Color change



BEST WAY TO BEAT BREAST CANCER

Our panel of specialist doctors provides an exclusive insight into the latest procedures and techniques for the prevention, screening, diagnosis and treatment of breast cancer

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Milk: Scary Side-Effects

Comprehensive, Exclusive Coverage on Breast Cancer

Dear readers,
Thank you for your continuous support and encouragement that has enabled us to bring about successive improvement in our presentation of the issues confronting the health and well-being of people. We have also been highlighting all the challenges before the healthcare sector. Further, to acknowledge the extraordinary achievements of outstanding doctors, medical institutions and contributions of allied professionals, we also organize national and state level awards pan-India.

This time we are organizing Double Helical State Health Awards for Haryana, Punjab and Himachal Pradesh chapter at a glittering ceremony to be held in Chandigarh on 6th November 2017. We humbly seek your support and blessings to make the event a success for the further advancement of this noble profession and welfare of the suffering humanity.

In keeping with our mission to regularly update you with the latest health news and views, you will read comprehensive and authentic coverage of health issues in the current issue. As part of the cover story, this time we are covering Breast Cancer which is a serious illness that affects woman of every age, educational level, and social and economic background. With rapidly increasing incidence, breast cancer has emerged as a major killer in India with lack of awareness, screening, early detection and appropriate treatment compounding the problem. Breast cancer is a word that generates dread in the minds of women throughout the world. With the rising incidence, this fear has risen exponentially. However, with the growth of modern medicine, the therapeutic armamentarium

available to doctors to prevent and treat this disease has too grown simultaneously.

Breast cancer is the fifth most common cause of death worldwide. The first four are lung cancer, stomach cancer, liver cancer, and colon cancer. In 2005, breast cancer caused 502,000 deaths (7% of cancer deaths; almost 1% of all deaths) in the world. Breast cancer is the most common cancer among women worldwide. It is a non-existent entity for a majority of population till a near and dear one suffers from it. As healthcare is low on priority, even in major cities, screening is an 'alien' word for most people. So naturally, this results in most people seeking medical help only when symptomatic, and on an average, most 'symptomatic' cancers reach stage 2B and beyond (significant numbers in stages 3 and 4). Due to all these factors, Indian breast cancer patients do not tend to survive as long as their western counterparts.

Dynamics of breast cancer management are rapidly evolving. Trials are ongoing throughout the world in the field of breast cancer related to its prevention, screening, diagnosis and treatments. Continuously new techniques are being defined and validated all aimed at improving ultimate patient outcomes in terms of disease control and rehabilitation. The advantage of a more interconnected world is that all the latest innovations in the world in the field of cancers in general and breast cancer in particular are available to us in India. In keeping with all these latest innovations, Double Helical's panel of specialist doctors provides an exclusive insight into the latest procedures and techniques for prevention, screening, diagnosis and

treatment of breast cancer, in the form of our cover story this month. The present issue also carries another special story, which is on the rising problem of infertility. Couples may find it difficult to conceive naturally due to different reasons including increasing stress levels, diet imbalance and lifestyle disorders. However, they need not lose heart as Assisted Reproductive Technology (ART) offers various solutions such as Intrauterine Insemination, (IUI) In Vitro Fertilization (IVF), Third Party Reproduction and Intracytoplasmic sperm injection (ICSI).

As per a recent study, out of the 2,562 people who participated in it from nine Indian cities, nearly 46 percent were found infertile. Results from another parallel survey conducted by 100 infertility specialists showed that nearly 63 percent of the infertile couples belonged to the child-bearing age (31-40). As people lead lives at a hectic pace, the problem of infertility has assumed alarming proportions in urban India causing unimaginable stress in the lives of couples. The country has come a long way from the 1970s when family planning drives were the prime focus of the government. We have now come to a point where infertility has become a cause of sleepless nights to childless couples. It is not impossible to avoid infertility if couples follow natural rhythm of life without allowing stress to compound the bane of infertility.

There are many more informative and thought-provoking stories, based on intensive research and analysis. So, happy reading to all of you!

Warm regards,
Amresh K Tiwary,
Editor-in-Chief

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Towards Health for All

The aim of Universal Health Coverage is not to provide free healthcare to entire population but to make sure that people can avail accessible and affordable quality health services. The government will do well to build upon the public infrastructure already available, augment it with private capacity, and judiciously implement the government-sponsored health insurance schemes

By Dr Gridhar Gyani

Universal Health Coverage (UHC) aims to provide accessible, affordable and appropriate health services for all the citizens in any part of the country, regardless of the socio-economic status/class to which an individual belongs. It offers financial protection to an individual during illness thereby reducing the out of pocket expenditure while ensuring quality healthcare for all.

Most of the nations, which have implemented UHC, spend between 5-12% of GDP on health. In our case although government spending is about 1%, we should not forget that private sector has put in 4% and that makes it healthy 5%. This suggests that if public and private sectors join hands, it should be possible to have UHC in our country. As per the 12th Five year Plan (2012-2017), India is committed to provide UHC for all. The NDA government had

announced to launch National Health Assurance Mission but has not been able to do, as the scheme is envisaged to cost over one trillion rupees.

In the backdrop of above, it will be interesting to examine how some of the states have already implemented partial UHC by way of government-sponsored health insurance schemes (GSHISs). Some of the innovative features common to all these schemes include giving patients the choice to visit any

States operating with Govt. Insurance for Health: 2015-16

S. No	State	Health budget (in Cr)	Per capita spend of Health Budget (in Cr)	Amount of Health Budget spend on Insurance schemes
1	Andhra Pradesh	5728	0.07	796 Cr
2	Telangana	4932		650 Cr
3	Tamil Nadu	8254	0.12	781 Cr
4	Karnataka	6107	0.10	110 Cr+ 140 C
5	Gujarat	7776	0.13	300 Cr
6	Maharashtra	8960	0.07	300 Cr
7	Rajasthan	6063	0.08	375 Cr+70 Cr

public or private provider empanelled by the government. In most schemes transactions are fully cashless, requiring no payment to be made by the patient to the hospital. These schemes target low-income groups, make impressive use of information and communication technology, and use pre-agreed package rates for payment. These schemes as such use PPP model as win-win formula for government, private health sector and above all the populations.

The World Bank report: 'Government sponsored Health Insurance in India: Are you covered?' says that these schemes were introducing explicit entitlements, improving accountability, and leveraging private capacity, particularly with an aim of reaching the poor. The report had provided figure of 300 million populations, which was covered under these schemes by end of year 2010 and had extrapolated that by 2015, this figure will touch 630-million i.e. 50% of population would get covered under these schemes.

The first such scheme under the name AAROGYASRI was started in the year 2007 by the then Chief Minister of Andhra Pradesh YS Rajshekhar Reddy. The scheme continues to run in divided states under the same name in Telangana and under the new name NT Rama Rao Vaidya Scheme in AP.

The scheme provides financial protection to families living below the poverty line for the treatment of serious ailments requiring hospitalization and

surgery through an identified network of healthcare providers.

All transactions are cashless for covered procedures. A BPL beneficiary can go to any hospital either public or private and come out without making any payment to the hospital for the procedures covered under the scheme.

Andhra Pradesh and Telangana have managed to cover as much as 70% of their population under the health insurance umbrella, providing cover up to Rs 2 lakh. Other states such as Tamil Nadu, Karnataka, Gujarat, Maharashtra and of late Rajasthan have similar health insurance schemes with coverage ranging from 30-50% of their population. The schemes are run directly by respective state governments through trusts except in case of Rajasthan, where scheme has been recently rolled out through 'New India Assurance Company' with budgetary allocation of Rs 375-crore and expected to benefit 65% of the state's population.

Table-I shows seven states, which have government insurance schemes covering BPL and in some cases APL (Above Poverty Line) population. These states spend on the average 5% of their total budget on health. States like AP and Telangana allocate about 12% of their health budget on their insurance schemes, with actual amounts as Rs 800-crore and 650 crore respectively, whereas TN allocates little over 9% of health budget (780 crores) on the insurance schemes. These states are

role model in demonstrating how to cover their majority of venerable population (near UHC) to provide quality healthcare through network of empanelled private and public hospitals. In contrast, Table-II shows some of large states like UP, Bihar, MP and WB, which provide on the average only about 3% of their budget on healthcare which is simply inadequate to operate health insurance schemes.

The states in Table-I providing government health insurance schemes, account for 40% of country's population. Similarly, other 4-states in Table-II, not providing any insurance also account for 40% of country's population.

Central Government Health Insurance Schemes: Rashtriya Swasthya Bima Yojana (RSBY), launched in year 2008 provides health cover to BPL households pan India up to Rs 30,000 for most diseases that require hospitalization. It empowers BPL beneficiaries to choose between public or private hospitals. The scheme is IT enabled as beneficiaries are issued with biometric enabled smart card, with portability across India. The scheme has already issued 40-million smart cards with estimated coverage of 200-million populations. Now the government has plans to replace this with 'National Health Protection Scheme' with enhanced cover of Rs 1lakh

Then there are schemes run by the government of India for various segments of their employees. These

States not operating any Govt. Insurance for Health: 2015-16

S. No	State	Health Budget (in Cr)	Amount of Health Budget Spend per person (in Cr)	Amount of Health Budget spend on Insurance schemes
1	Uttar Pradesh	7350	0.03	NA
2	Bihar	4971	0.05	NA
3	Madhya Pradesh	4740	0.06	NA
4	West Bengal	2588	0.03	NA

include Central Government Health Scheme(CGHS) catering to central government employees, pensioners and their dependents. Then there is Ex-Servicemen Contributory Health Scheme (ECHS) covering retired defense personnel and their families. Other noteworthy central scheme is Employee State Insurance Scheme (ESIS), which is tailored to provide health protection to worker population and their dependents. The three schemes roughly cover 100-million population.

Road Map & Way Out: Going by the above, it is evident that more than 50% population has definitely some or other kind of cover for health services. This includes 40-70% population of seven states which have state government insurance schemes and these states represent 40% of national population. Then we have RSBY, which cover about 200-million populations. Another 100-million populations gets covered under various central government health schemes. We also need to include some percentage of populations, which get covered under private insurance and employer insurance schemes. This is a big positive, against the general belief that majority Indian populations was burdened with out of pocket expenses.

It is to be realized that UHC is not about providing FREE healthcare to entire population but to make sure that populations get health services, which are available, accessible and are affordable. It is equally important that health services conform to safety protocols. In a developing country like India, the immediate struggle is always about ROTI, KAPDA & MAKAAAN.


Education & Healthcare until recently were not considered as priorities. After implementing Right to Education, the obvious focus has shifted to Health and hence the need for UHC. Considering the fact that India still cannot afford to have bigger share of GDP towards healthcare, we can begin with consolidating and expanding of existing success models rather than thinking of nationwide new model. This can come through planned & focused interventions as follows;

1-We need to encourage and cater for some extra budgetary allocation for states so as to enable them to launch schemes for BPL/ APL populations like ones in seven states. This would mean that states have about 8-10 lakhs per capita in the budget for health. This would enable states to contribute 8-10% of health budget to execute government insurance schemes for BPL/APL populations. If required, certain APL category of populations can be covered for part insurance and rest coming through co-payment, a practice in vague in many developed nations.

2-Government can simultaneously strengthen RSBY by extending its reach among those states, which do not have state run insurance schemes. Government may also progressively expand cover from present limit of Rs 30,000 to Rs 100,000. Populations will not mind raising the contribution from Rs 30 to Rs 100. 3-Government needs to be open in roping private sector in all UHC related efforts. We need to treat all private facilities as providers of national health. Presently there exists a kind of trust deficit between the two. Let us not forget that some of the best state run insurance schemes in AP, TN &Telangana

are based on government buying health services from private empaneled hospitals. Even the World Bank report quoted above suggests a balanced approach, building upon the public infrastructure already available, augmenting it with accessible private capacity, and utilizing the lessons learned from the GSHISs.

4-Benefit from GSHISs is largely confined to urban populations for the simple reason that majority of tertiary care hospitals are confined to tier-I and tier-II towns. For rural populations, the healthcare although is available but not accessible more so during emergencies. The Community Health Centers (CHCs) which are 30-bedded secondary care government hospitals located at TALUK level are ill equipped in most cases. It will be worthwhile if private sector could be invited to operate some of the CHCs with immovable fixtures remaining with government and movable including all manpower coming from private sector. Private sector is ready to undertake this within the government earmarked budget.

5-Finally for long term sustenance of UHC, it is necessary that we rationalize the way reimbursements are made to private sector under various government schemes. Rates of many critical medical procedures are found to be illogical, which directly and indirectly affects patient safety. We need to incentivize quality by linking payment to the clinical outcomes and patient satisfaction, the practice prevalent in most developed nations. 

The Author is Director General, Association of Healthcare Provider, India

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Options for Childless

Couples

Couples may find it difficult to conceive naturally due to different reasons including increasing stress levels, diet imbalance and lifestyle disorders. However, they need not lose heart as ART (Assisted Reproductive Technology) offers various solutions such as Intrauterine Insemination, (IUI) In Vitro Fertilization (IVF), Third Party Reproduction and Intracytoplasmic sperm injection (ICSI)

BY AMRESH KUMAR TIWARY

As per a recent study, out of the 2,562 people who participated in it from nine Indian cities, nearly 46 percent were found infertile. Results from another parallel survey conducted by 100 infertility specialists showed that nearly 63 percent of the infertile couples belonged to the child-bearing age (31-40).

As people lead lives at a hectic pace, the problem of infertility has assumed alarming proportions in urban India causing unimaginable stress in the lives of couples. The country has come a long way from the 1970s when family planning drives were the prime focus of the government. We have now come to a point where infertility has become a cause of sleepless nights to couples.

Frequent rounds of infertility centres have become inevitable for several couples driven by the desire to carry forward their lineage! With increasing incidence, an estimated 30 million couples in the country suffer from infertility. Today, the number of Indian couples turning to artificial methods to conceive has gone up considerably.



How to Avoid Infertility

BY DR MANISHA YADAV

Infertility is defined as difficulty in conceiving or becoming pregnant, despite having regular sex without contraception for two years in a row. The time a couple takes to conceive could vary from days to months. Also, earlier infertility was largely seen as only 'a female problem' with women easily becoming the target of social scorn.

However, such a theory no more exists and the time when women were solely battling the blame for being barren has become a part of the bygone era! There have been enough research revelations that have attributed the male for the cause of infertility and there is a general realization that implicating a woman with prejudice would only result in robbing the root cause of the issue. Now, one in every 5 men between the age group 18 to 25 is found to suffer from abnormal sperm count – one of the main cause of infertility.

Approximately 40% of fertility in couples can be attributed to male sub fertility. Intracytoplasmic sperm injection (ICSI) has raised hopes of these couples. This method of treating predominantly male-factor infertility has been a breakthrough, and it has established itself as the preferred method of treatment in the field of assisted reproduction.

According to experts, assistance can be given to both men and women

depending on the cause of infertility. Infertility management involves detailed investigations to reach a logical diagnosis and then specific treatment.

With the problem having become widespread, what are the reasons one may ask? Irregular and low sperm count, hampered sperm delivery and mobility of sperm are prominent causes of infertility in men. Some other medical reasons such as obesity and lifestyle disorders that includes diet imbalance, addiction to smoking or alcoholism, sedentary existence, or mental and emotional stress contribute to poor sperm count.

Polycystic ovary disease (PCOD), a condition characterized by excess production of hormones and lack of ovulation coupled with hectic lifestyle and job stress lead to conception problem amongst women. Primary ovarian insufficiency (POI) is another cause of ovulation problems. POI occurs when a woman's ovaries stop working normally before she is 40. Other than the above changing lifestyle patterns, strenuous work schedules and stressful surroundings are some major reasons responsible for tilting the scale towards the inability to conceive. With an increase in stress and fatigue men & women often suffer from a steady decrease in the libido which has lately become an issue of concern for many.

Having said that all is not grim. It is prudent to adhere to certain

precautionary measures on a day-to-day basis. The general preventive measures such as maintaining weight, avoiding cigarettes, alcohol, reducing stress, increasing intake of nutritious diet are of vital importance.

High testicular temperature is increasingly attributed as a cause for male infertility. Scientific studies have indicated that prolonged use of mobile phones can significantly affect male infertility. Exposure to any type of intense and prolonged radiation is known to harm sperm production. Although ovaries in women are protected in the interior of their body, testis are located outside, not for aesthetic reasons, but for functional ones. Testicular temperature should be lower than the body temperature and anything distorting this may harm male fertility.

Thus, it would be wiser for men to wear loose underwear and pants and have frequent breaks when working in the sitting position continuously. Resting laptop computers on lap raises the scrotum's temperature, say researchers and hence it is better to avoid using mini computers on laps literally. Though physical exercises are imperative, great caution is required especially when it comes to specific sports where testis is not properly protected in men. Testicular injuries must always be treated without any delay lest it may result in long-term consequences on fertility.



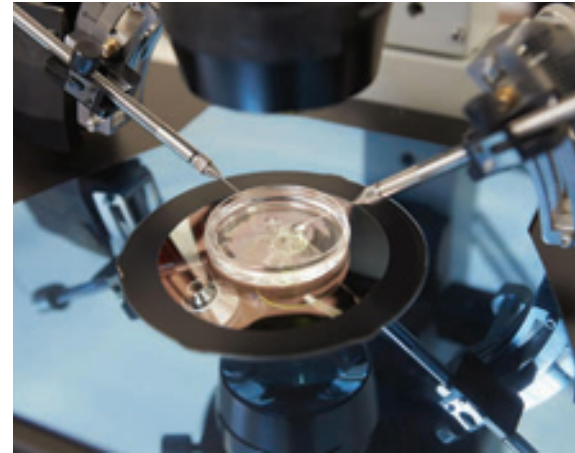
Another issue of concern is the declining libido among urban couples which has emerged as one of the main causes that has come to engulf couples living in the cities. Hectic schedules, poor work life balance, constant tension and increase in travel time leading to low levels of libido and less sexual activity among couples comes across as the biggest hindrance in conceiving nowadays. As stress levels are usually high among urban couples, poor eating habits and increase in medical conditions such as diabetes lead to lack of quality and quantity of sperms and eggs. Thus habits such as smoking, tobacco consumption, drinking frequently, unhealthy food habits and no exercise have to be immediately done away with.

It could also be shocking to know that products like furniture polish, all-purpose cleaners, bug sprays, bathroom cleaners and room deodorizers may contain chemicals that could diminish conception by 33%. Organic, non-toxic alternatives are anytime a better option. Paint thinners, household glues and oil

paints can be toxic and negatively affect fertility increasing risk for miscarriage when pregnant. If a 'sniff test' indicates strong and offensive smell it's only better to avoid them. Women should be wary of paraben, a preservative found in most of the cosmetics, from shampoo to moisturizers to, lipsticks. Parabens belong to a group called xenoestrogens, or false estrogens that could induce infertility.

Serving full fat dairy products a day could help fertility. Cow's milk, especially that which is milked when the animal is pregnant is rich in fertility enhancing hormones. Microwaved food could be quick but plastic needs to be avoided. Hormones leach more when unhealthy plastics are hot and wet. And finally, a good sleep is most ideal as 80 per cent of ovulation occurs between midnight and 4 a.m. Interrupted sleep could weaken immunity, disrupt reproductive hormone levels and hinder ovulation.

(The author is a medical practitioner)



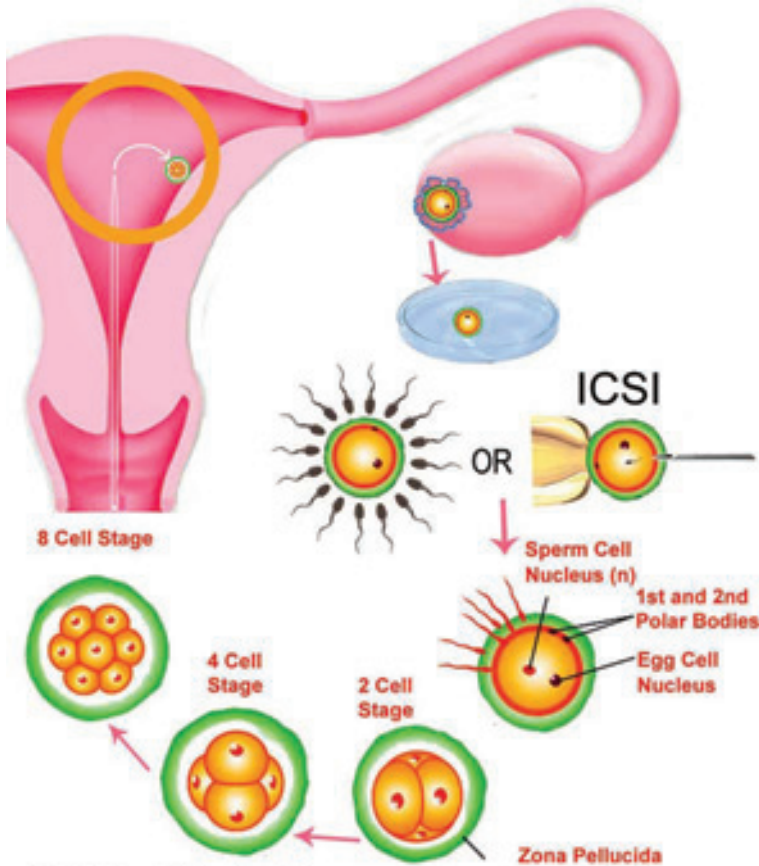
However, to avoid infertility is not impossible at all and all that is required is pursuit of proper lifestyle. But before we delve deep into the problem, it is important to understand the gravity of infertility. Every human being wishes to procreate and historically, infertility has been like a curse for any individual affected by it. Couples may find it difficult to conceive naturally due to different reasons. The ART (Assisted Reproductive Technology) consists of a comprehensive programme that is offered to such couples.

Infertility centres these days provide comprehensive infertility management/ART Programme to patients. The various forms of treatments like Intrauterine Insemination, (IUI) In Vitro Fertilization (IVF), Third Party Reproduction and Intracytoplasmic sperm injection (ICSI) are in vogue these days.

ICSI, pronounced "eeksee" or "icksy", is an in vitro fertilization procedure in which a single sperm is injected directly into an egg. The technique was developed by Gianpiero Palermo around 1991 in Brussels. Today it has become the treatment of choice for men with weak sperms that cannot travel themselves into the egg.

When can ICSI be performed?

Men with obstruction in their passages can father a child by using their own sperms that have been extracted by a surgeon. ICSI can also be offered to patients of previous IVF failures due to failed fertilization and patients with unexplained infertility. ICSI is different



credits: <http://www.ihrvf.net/7p=949>

In Vitro Fertilization (IVF) is a process by which an egg is fertilized with sperm outside the body.

Ovarian Induction: The process involves injecting hormones to stimulate a woman's ovaries to produce multiple eggs.

Follicular Study: By tracking the growth of the follicles through successive USG scans after ovarian induction, we can find out the no of mature eggs and Pick Up date.

Pick Up: These eggs are retrieved from the ovaries and fertilized with sperms in a culture medium in a laboratory.

Embryo Transfer: The fertilized eggs are cultured for 2 - 6 days in a growth medium and then transferred to the patient's uterus.

IVF has revolutionised the treatment of Infertility. More than 5 million IVF babies are born all over the world.



from conventional insemination since we clean away the follicle cells from around the eggs and an embryologist chooses the sperm to be injected. A small number of eggs do not tolerate the injection procedure and you can expect that about 5% of eggs die as a direct result of ICSI. However, fertilization rates, embryo quality and pregnancy rates are the same as for couples who do not have ICSI.

How is ICSI performed?

The process involves the injection of a single sperm within the ooplasm of the oocyte. Following the first ICSI birth in 1992, thousands of babies have been born around the world. Sperms for ICSI can be obtained from ejaculation, even when only few are present, or through surgical retrieval from epididymis or testis.

Microinjection is normally performed under a specialized microscope with the aid of a micromanipulator which allows

small movements under high magnification. The scientist/embryologist sits on the ICSI station, looks either directly into the microscope or at a monitor that magnifies the image and then injects the egg by moving two manipulators that look and function like joysticks. He holds the oocyte with one hand and injects through the other.

IVF

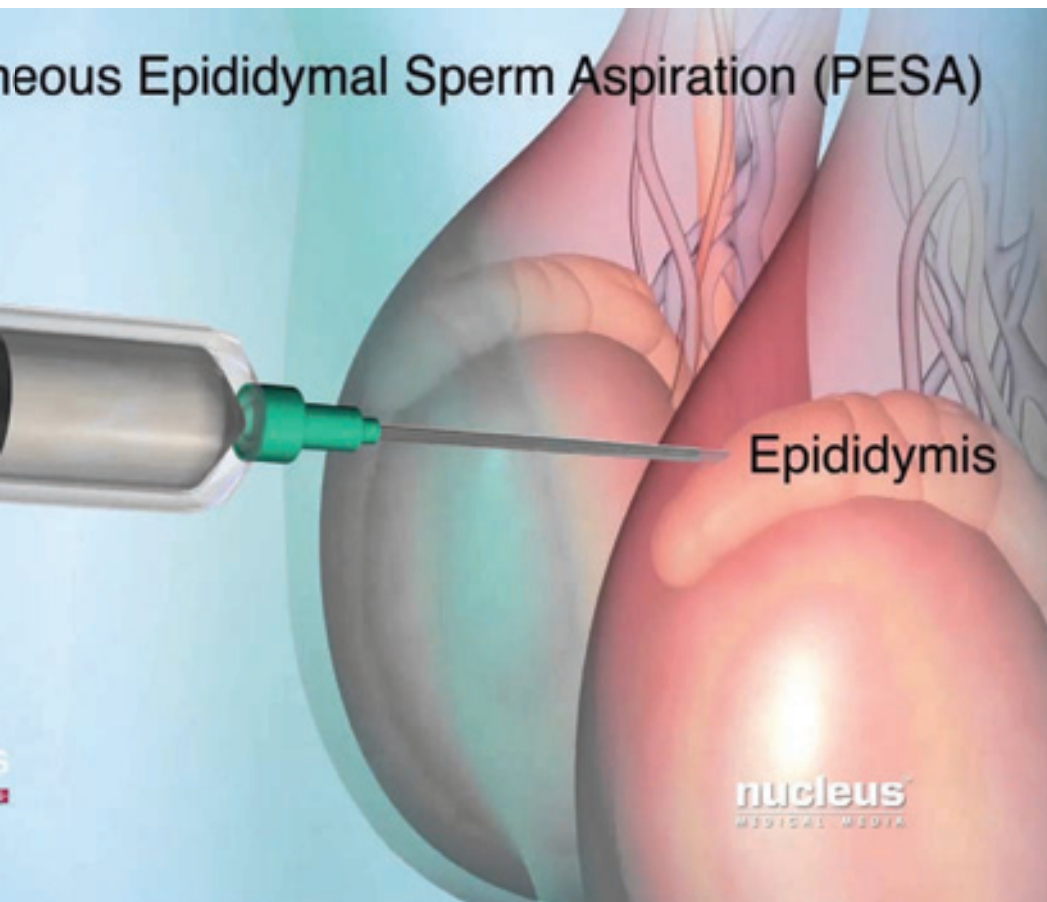
Reproduction is the process wherein there is fusion of the male and female gametes resulting in the exchange of genetic material, thus forming a new individual with an entirely different genotype.

Mammals reproduce through sexual reproduction but technology now allows mammals to reproduce "asexually" through the process of in vitro fertilization. In this technique, the entire process of fertilization takes place outside a woman's body. This involves extracting a woman's eggs, fertilizing the

eggs in the laboratory with sperm, and then transferring the resulting embryo(s) into the woman's uterus through the cervix (embryo transfer) where it can develop. Most couples transfer two embryos; however, more may be transferred in certain cases. IVF is the most common form of ART and it is often the treatment of choice for a woman with blocked, severely damaged, or absent fallopian tubes.

Evaluation and Preparation of a Couple

Proper evaluation of infertile couple before IVF is very important for success of IVF and prevention of complications. Any ART procedure should be preceded by traditional fertility workup & at this stage it should be decided whether ART should be instituted, postponed for other treatment modalities or refused to the couple. Once the patient has been selected to undergo ART treatment, thorough testing of patient should be



undertaken to correct any problems which may lead to IVF failure. At this stage, it should also be decided whether specific procedure such as egg, sperm or embryo donation is required.

Third party reproduction

Third party reproduction refers to the use of oocytes, sperm, embryos or uterus that have been provided to a couple/single individual (called intended parents) by a third person (donor) in order to help them/him or her to become a parent.

According to the present Indian guidelines on ART drafted by the ICMR, all donors except the surrogate need to be anonymous to the commissioning couples. The ICMR guidelines also state that this activity of supplying various gametes and surrogates will not be carried out by the IVF centre but separate entities called ART Banks. All the legal issues are also the responsibility of these banks. Once the requirement is

fulfilled, the medical fitness of the donor is assessed. After fulfilling the various formalities, the couple and their donor/surrogate is taken into the third party programme.

Recurrent Pregnancy Loss Programme

There is nothing more painful than losing a pregnancy repeatedly! It is not only devastating for the patient but also the treating doctor! RPL is defined as a situation where a woman has lost three or more than three pregnancies. In fact, RPL may be caused by chronic infections like genital tuberculosis! We also discovered that majority of recurrent failures whether at implantation or later pregnancy is due to an impaired blood circulation within the pelvis especially the uterus. The cause for this may vary.


The doctors carry out tests to rule out the cause of RPL and accordingly treat the patient. In case the patient has a genetic cause, the patient and her

husband are informed regarding the defect and counseled regarding future implications. Endocrinal causes like PCOS can also be the reason and need to be tackled by taking insulin lowering medication. There is no need to go through extensive testing after a single pregnancy loss. This could have happened by chance and one should not worry about it.

Male Infertility Programme

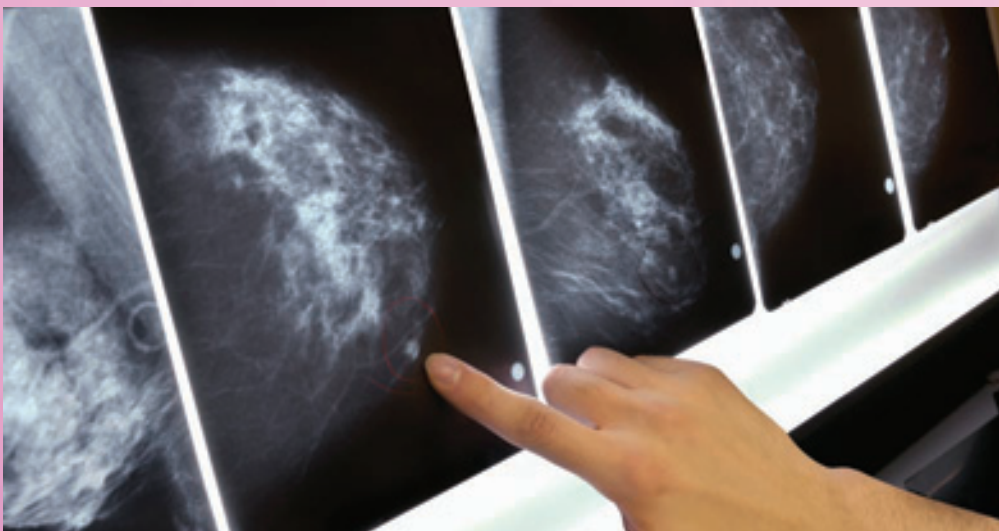
Ever since the human race evolved on the earth, it was the female who had been seen as responsible for procreation. So, if anything was amiss, the woman was supposed to be at fault. All research focused around the development of medication and technology in female infertility. While such innovations improved success in female infertility, no attention was given to the male counterpart. This was also because infertility was the realm of the gynaecologist! There were no special doctors for males with problems. In developing countries like India, another reason was a complete denial by the males in accepting themselves to be the cause of infertility!

However, the last century saw rapid advances in the management of the infertile male both in diagnostics and treatment. The WHO gave guidelines for a proper semen examination and based on that treatment was determined.

Today, male infertility programme involves not only the standard testing procedures like semen analysis but also special tests to determine the fertilizing potential and quality of the sperm. This is called the DNA Fragmentation test. In patients who are azoospermic on testing, testicular fine needle aspiration is undertaken. If this too does not show sperms in the sample, doctors proceed to a testicular biopsy. The sample is checked for sperms and if positive, it is frozen or cryopreserved till the wife is readied for ICSI. Men who have mild male factor infertility, can be offered IUI but those that have weak sperms are treated by either IVF or ICSI and recently Intracytoplasmic morphologically selected sperm injection (IMSI). 

Best Way to Beat Breast Cancer

With rapidly increasing incidence, breast cancer has emerged as a major killer in India with lack of awareness, screening, early detection and appropriate treatment compounding the menace. For the benefit of suffering humanity, **Double Helical's expert panel of specialist doctors** from **Action Cancer Hospital, New Delhi** provides an exclusive insight into the latest procedures and techniques with regard to prevention, screening, diagnosis and treatment of breast cancer in sync with the international innovations





Breast cancer is a word that generates dread in the minds of women throughout the world. With the rising incidence, this fear has risen exponentially. However, with the growth of modern medicine, the therapeutic armamentarium available to doctors to prevent and treat this disease has too grown simultaneously.

Breast cancer is the fifth most common cause of death due to cancer worldwide. The first four are lung cancer, stomach cancer, liver cancer, and colon cancer. In 2005, breast cancer caused 502,000 deaths (7% of cancer deaths; almost 1% of all deaths) in the world. Breast cancer is the most common cancer among women worldwide.

In India, more and more numbers of patients being diagnosed with breast cancer are found to be in the younger age groups (in their thirties and forties). But 25 years ago, out of every 100 breast cancer patients, 2% were in 20 to 30 years age group, 7% were in 30 to 40 and so on. 69% of the patients were above 50 years of age. Presently, 4% are in 20 to 30 years age group, 16% are in 30 to 40, 28% are in 40 to 50 age group. So, almost 48% patients are below 50. An increasing numbers of patients are in the 25 to 40 years of age, and this definitely is a very disturbing trend. Breast cancer is now the most common cancer in most cities in India, and 2nd most common in the rural areas. Breast cancer accounts for 25% to 32% of all cancers among women in all these cities. This implies, practically, one fourth (or even approaching one thirds) of all female cancer cases pertain to breast cancer.

The overall 5-year survival for breast cancer has increased from 75% in 1970s to almost 89% presently. This means that, out of every 100 women with breast cancer in the US, 89 women are likely to survive for at least 5 years. There are barely any similar statistics for India available, but a rough estimate from the available data



Dr Rajesh Jain, Surgical Oncology



Dr Ishan Mohan, Surgical Oncology

is that, this figure is not even more than 60%. The most important reason is lack of awareness about breast cancer and screening of the same; more than 50% patients of breast cancer are reported in stages 3 and 4, so, outcome is not as good as earlier stages despite aggressiveness of the treatment. The western nations have achieved a steadily improving survival rate mainly because of screening of breast cancer.

Breast cancer is a non-existent entity for a majority of population till a near and dear one suffers from it. Healthcare is low on priority and even in major cities, screening is also an 'alien' word for most people. So naturally, this results in most people presenting only when symptomatic, and on an average, most 'symptomatic' cancers reach stage 2B and beyond (significant numbers in stages 3 and 4). So, Indian breast cancer patients do not tend to survive as long as their western counterparts.

In the West, majority of breast cancers (read more than 75%) are reported in stages 1 and 2, resulting in good survival; and there is an ever increasing numbers of patients presenting with mammography detected cancer with no symptoms. India can achieve this goal only with aggressive promotion of screening and



Dr. Sanjeev Sehgal, Hon. Sr. Consultant

awareness and proper treatment.

Cancers in the young, tend to be more aggressive. Many of these cancers are HER2 positive and ER/PR negative, or HER2/ER/PR all three negative, and they have a worse prognosis than those who have ER/PR positive tumours. So, all the more reason to catch these cancers early, since chances of long survival decrease fast with increasing stage of these tumours.

Assessment of all this data shows that with its rapidly increasing incidence, breast cancer is a major



Dr Pranjal Kulshreshtha, Surgical Oncology



Dr. Arunava Chakladar, Anaesthesiology



Dr. Minal Rastogi, Anaesthesiologist

public health hazard with multiple physical, social and economic effects and we need to evolve new techniques in the aspects of breast cancer prevention, screening, diagnosis and treatment to counter this threat.

Dynamics of breast cancer management is a very rapidly evolving field. Trials are ongoing throughout the world in the field of breast cancer related to its prevention, screening, diagnosis and treatments. Continuously new techniques are being defined and validated all aimed at improving ultimate patient

outcomes in terms of disease control and rehabilitation. The advantage of a more interconnected world is that all the latest innovations in the world in the field of cancers in general and breast cancer in particular are available to us in India.

The ongoing developments and recommendations in the field of breast cancer are outlined below-

BREAST CANCER PREVENTION

Prevention as the term implies aims to prevent the disease from occurring in the first place by removing or reducing the exposure to causative agents. The most important factor in the causation of breast cancer is the exposure of breast tissue to estrogen. The basic paradigm in breast cancer prevention is to lower the exposure of breast tissue to estrogen made by the body.

Decreasing the length of time a woman's breast tissue is exposed to estrogen helps prevent breast cancer.

Exposure to estrogen is reduced in the following ways:

Early pregnancy: Estrogen levels are lower during pregnancy. Women who have a full-term pregnancy before age 20 have a lower risk of breast cancer than women who have not had children or who give birth to their first child

after age 35.

Breast-feeding: Estrogen levels may remain lower while a woman is breast-feeding. Women who breastfed have a lower risk of breast cancer than women who have had children but did not breastfeed.

Estrogen-only hormone therapy after hysterectomy

Hormone therapy with estrogen only may be given to women who have had a hysterectomy. In these women, estrogen-only therapy after menopause may decrease the risk of breast cancer.

Use of chemoprevention (use drugs which reduce the risk of breast cancer) - Selective estrogen receptor modulators

Tamoxifen and raloxifene belong to the family of drugs called selective estrogen receptor modulators (SERMs). SERMs act like estrogen on some tissues in the body, but block the effect of estrogen on other tissues.

Treatment with tamoxifen lowers the risk of estrogen receptor-positive (ER-positive) breast cancer and ductal carcinoma in situ in premenopausal and postmenopausal women at high risk. Treatment with raloxifene also lowers the risk of breast cancer in postmenopausal women. With either drug, the reduced risk lasts for several years or longer after treatment is stopped. Women younger than 50 years who have a high risk of breast cancer may benefit the most from taking tamoxifen. The risk of having these problems decreases after tamoxifen is stopped. Talk with your doctor about the risks and benefits of taking this drug.

In postmenopausal women with osteoporosis (decreased bone density), raloxifene lowers the risk of breast cancer for women who have a high or low risk of breast cancer. Other SERMs are being studied in clinical trials.

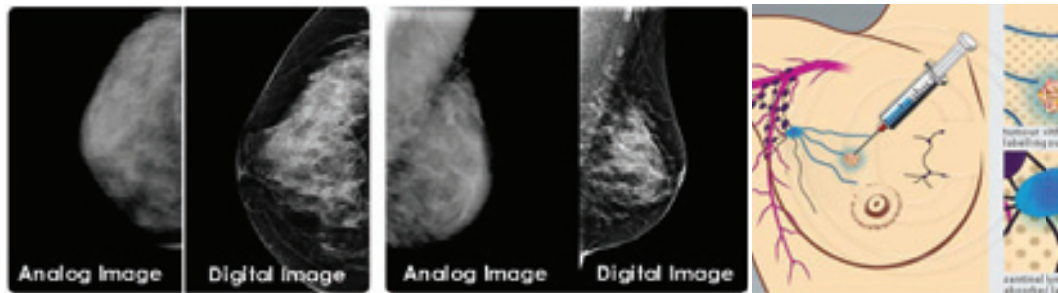
Aromatase inhibitors and inactivators

Aromatase inhibitors (anastrozole, letrozole) and inactivators (exemestane) lower the risk of recurrence and of new breast cancers in women who have a history of breast cancer. Aromatase inhibitors also decrease the risk of breast cancer in women with the following conditions:

Postmenopausal women with a personal history of breast cancer.

Women with no personal history of breast cancer who are 60 years and older, have a history of ductal carcinoma in situ with mastectomy, or have a high risk of breast cancer based on the Gail model tool (a tool used to estimate the risk of breast cancer).

In women with an increased risk of breast cancer, taking aromatase inhibitors decreases the amount of estrogen made by the body. Before menopause, estrogen is made by the ovaries and other tissues in a woman's body, including the brain, fat tissue, and skin. After menopause, the ovaries stop making estrogen, but the other tissues do not. Aromatase inhibitors block the action of an enzyme called aromatase, which is used to make all of the body's estrogen. Aromatase inactivators stop the enzyme from working.



Risk-reducing surgeries

Some women who have a high risk of breast cancer may choose to have a prophylactic mastectomy (the removal of both breasts when there are no signs of cancer). The ones who are most commonly offered these surgeries are those who are BRCA gene mutation carriers or those with a very strong family history. Such patients can be offered simultaneous breast reconstruction with highly successful cosmetic outcomes. The best and most high profile example of this is Angelina Jolie who chose to have a risk reducing bilateral mastectomy after being diagnosed as being BRCA gene mutation positive. However, it is very important to have a cancer risk assessment and counseling about the different ways to prevent breast cancer before making

this decision.

Ovarian ablation

The ovaries make most of the estrogen that is made by the body. Treatments that stop or lower the amount of estrogen made by the ovaries include surgery to remove the ovaries, radiation therapy, or taking certain drugs. This is called ovarian ablation.

Premenopausal women who have a high risk of breast cancer due to certain changes in the BRCA1 and BRCA2 genes may choose to have a risk-reducing oophorectomy (the removal of both ovaries when there are no signs of cancer). This decreases the amount of estrogen made by the body and lowers the risk of breast cancer. Risk-reducing oophorectomy also lowers the risk of breast cancer

in normal premenopausal women and in women with an increased risk of breast cancer due to radiation to the chest. However again, it is very important to have a cancer risk assessment and counseling before making this decision. The sudden drop in estrogen levels may cause the symptoms of menopause to begin. These include hot flashes, trouble sleeping, anxiety, and depression. Long-term effects include decreased sex drive, vaginal dryness, and decreased bone density.

Need for exercise

Women who exercise four or more hours a week have a lower risk of breast cancer. The effect of exercise on breast cancer risk may be greatest in premenopausal women who have normal or low body weight.

Screening

Screening is a process to identify the breast cancer cases in the general population before they become symptomatic.

Three tests are used by health care providers to screen for breast cancer:

Mammogram

Mammography is the most common screening test for breast cancer. A mammogram is an x-ray of the breast. This test may find tumors that are too small to feel. A mammogram may also find ductal carcinoma in situ (DCIS). In DCIS, there are abnormal cells in the lining of a breast duct, which may become invasive cancer in some women.

The following may affect whether a mammogram is able to detect (find) breast cancer:

1. The size of the tumour.
2. How dense the breast tissue is.
3. The skill of the radiologist.
4. The quality of the mammogram machine
5. Women aged 40 to 74 years who have screening mammograms have a lower chance of dying from breast cancer than women
6. who do not have screening mammograms.

The field of mammography has been revolutionized by the advent of digital mammography. In digital mammogram the images can be captured and stored directly onto a computer. However, because digital images are viewed on a computer, they can be lightened or darkened, and certain sections can be enlarged and looked at more closely and results in a much higher sensitivity and specificity. This makes digital mammography better than film mammography for most women especially in women -

Premenopausal or peri-menopausal

1. Under age 50
2. Have dense breast tissue

Most leading cancer institutes now have digital mammography machines.

MRI (magnetic resonance imaging) in women with a high risk of breast cancer

MRI is a procedure that uses a magnet, radio waves, and a computer to make a series of detailed pictures of areas inside the body. This procedure is also called nuclear magnetic resonance imaging (NMRI). MRI does not use any x-rays.

MRI is used as a screening test for women who have one or more of the following:

Certain gene changes, such as in the BRCA1 or BRCA2 genes.

A family history (first degree relative, such as a mother, daughter or sister) with breast cancer.

Certain genetic syndromes, such as Li-Fraumeni or Cowden syndrome.

MRI finds breast cancer more often than mammograms do, but has a slightly lower specificity.

Tissue Diagnosis

Standard methods for acquiring tissue diagnosis for breast cancer have been a FNAC (Fine needle aspiration cytology and a core (needle) biopsy. However, with the advent of advanced radiological techniques which can now detect impalpable asymptomatic lesions these methods fall short. This shortfall has been made up by the advent of image guided core needle biopsy (CNB) and vacuum assisted biopsy (VAB).

Imaging-guided CNB

Due to tissue heterogeneity in breast lesions, the reliability of needle biopsy depends on accurate collection of lesion samples, and the ability of these samples to represent the lesions are critical for the pathologist to make the correct diagnosis. The blind nature of

CNB requires multiple biopsies to be performed, and is associated with a certain probability of underestimated and misdiagnosed results. Hence, sampling accuracy is essential for the success of this procedure. Ultrasound- or mammography-guided CNB is now performed for non-palpable breast tumors or breast calcification and achieves much higher accuracy.

Vacuum-assisted biopsy (VAB)

Vacuum-assisted biopsy (VAB) is a new imaging-guided biopsy approach introduced after fine needle aspiration cytology and core needle biopsy (CNB). This technique can completely resect small breast lesions and provide adequate, continuous tissue samples for pathological diagnosis via a single procedure while minimizing injury to breast tissues and maintaining the shape, it has been widely used for the early diagnosis of breast cancer and excision of benign lesions. VAB can be carried out by using the following guidance technologies-

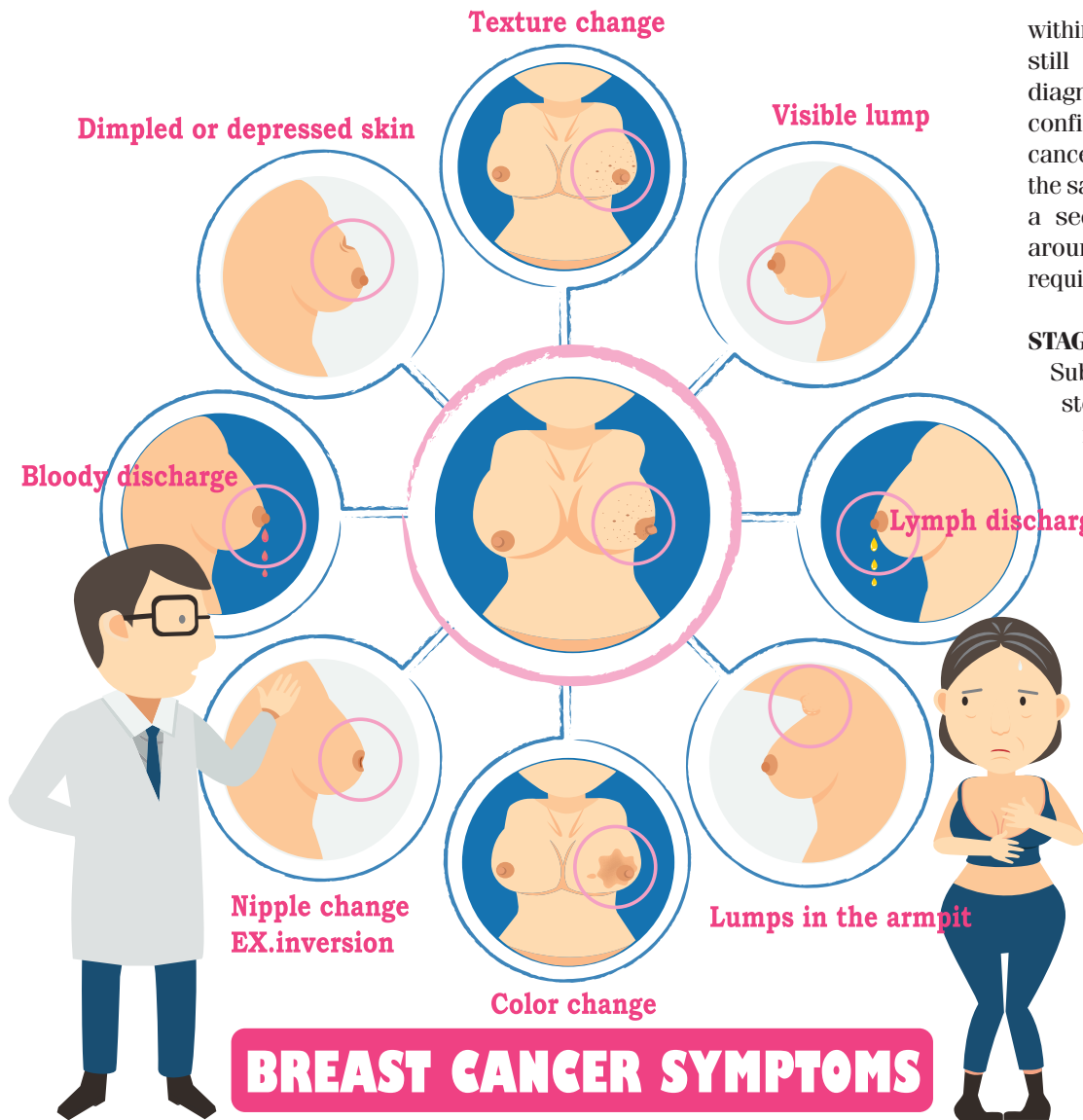
Stereotactic X-ray

This technology is mainly used for non-palpable lesions that are not detectable by ultrasound. Clusters of micro calcifications, structural distortion, small echogenic nodules and radial scars are the common manifestations of such lesions on a plain film. This easy-to-operate approach enables safe and precise positioning, and is particularly sensitive for micro calcifications.

High frequency ultrasound

This non-radioactive, real-time guiding approach is mainly used for the diagnosis of ultrasound-visible BI-RADS 3-5 breast lesions and axillary involvement, which has certain advantages in the patient comfort, operating time, and cost. It has become the most accurate and preferred guidance modality for minimally invasive breast biopsy.

Breast MRI



within 15 minutes while the patient is still under anesthesia and get a diagnosis. In case of a report confirming cancer, the complete cancer surgery can be performed in the same sitting obviating the need for a second surgery and a delay of around 1 week as was previously required.

STAGING WORK UP

Subsequent to diagnosis, the next step in breast cancer management is adequate staging of the disease so as to guide the treatment plan. The standard staging tests have been a chest x-ray, ultrasound of the abdomen/CECT chest and abdomen and a bone scan. The advent of PET CT now provides us with a single investigative modality with a higher diagnostic sensitivity and specificity. A PET CT scans the whole body for assessing cancer spread and can identify disease at sites which may have been missed with other tests. It is now rapidly gaining acceptance as the standard staging tool for breast cancer.

PET CT

PET/CT is a nuclear medicine technique which combines a positron emission tomography (PET) scanner and an x-ray computed tomography (CT) scanner, to acquire sequential images from both devices in the same session, which are combined into a single superposed (co-registered) image. Thus, functional imaging obtained by PET, which depicts the spatial distribution of metabolic or biochemical activity in the body can be more precisely aligned or correlated with anatomic imaging obtained by CT scanning. Two-and three-dimensional image reconstruction may be rendered as a function of a common software and control system.

This is mainly used to display suspicious malignant lesions that are only visible to MRI and undetectable by X-ray, ultrasound or other testing methods. Additionally, it can be used to exclude the presence of malignancy in the case of suspected benign disease based on prior MRI examination (37). Compared with 1T and 1.5T MRI, 3T MRI has a higher sensitivity for breast cancer.

Accuracy of VAB

Suitable for a wide range of applications, VAB is able to obtain sufficient and continuous histological

specimens, allowing higher diagnostic accuracy and specificity, and is thus considered to be an ideal alternative to surgical biopsy.

Frozen section

In a proportion of cases of breast lumps, diagnosis cannot be made regarding its nature even after multiple FNAC or biopsies. In such cases of diagnostic dilemmas, the advent of highly accurate frozen section facility at oncological centres has been a boon for patients. A frozen section allows the surgeon to remove the lump and to get the biopsy report

PET-CT has revolutionized medical diagnosis in many fields, by adding precision of anatomic localization to functional imaging, which was previously lacking from pure PET imaging. For example, many diagnostic imaging procedures in oncology, surgical planning, radiation therapy and cancer staging have been changing rapidly under the influence of PET-CT availability, and centres have been gradually abandoning conventional PET devices and substituting them by PET-CTs. Although the combined/hybrid device is considerably more expensive, it has the advantage of providing both functions as stand-alone examinations, being, in fact, two devices in one.

The algorithm of management of breast cancer like other cancers follows the basic steps of diagnosis followed by staging work up followed by treatment planning and the actual treatment.

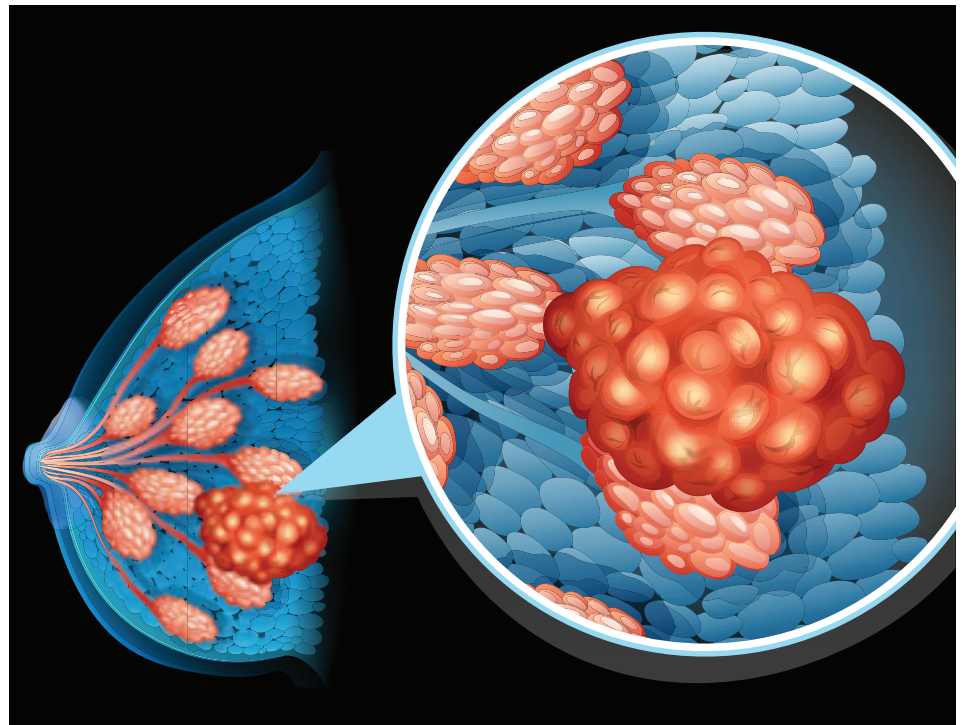
For early breast cancer, the staging work up includes only an x-ray of chest while for advanced breast cancers, a CECT of the chest and abdomen and a bone scan are recommended. Over the past few years, PET CT has emerged as the preferred staging tool for many cancers. In breast cancer too, PET CT is fast emerging as the preferred staging method for advanced breast cancers due to multiple advantages.

SURGICAL MANAGEMENT OF BREAST CANCER

Breast Conservation surgery (BCS)

The field of surgery has rapidly evolved for breast cancer. Prior to the late 19th century, breast cancer was regarded as a terminal disease with no treatment options available. In the late 19th century when Halsted carried out the first surgical resections for breast cancer it involved performing a radical mastectomy. This laid down the basis for the surgical treatment of this disease. Halstedian mastectomy while effective was a very mutilating surgery.

Over the years techniques were modified with emphasis on less



morbid procedures. This involved the advent of less mutilating modified radical mastectomies. However, it still entailed removal of the entire breast with its attendant physical and psychological costs. Thus trials were begun to evaluate the efficacy of breast conservation techniques. These entailed the removal of the lump along with the axillary lymph nodes thus preserving the remainder of the

breast. Multiple trials have shown that BCS is as safe as a conventional mastectomy in terms of overall survival with a lower psychological morbidity.

BCS can now be safely offered to majority of breast cancer patients.

Sentinel node biopsy

The surgery of breast cancer has conventionally involved axillary

Cancer Patients needn't live with pain

BY DR G N GOYAL

Early detection is the key to the cure of cancer. It is heartening to note that the efforts of government, media, hospitals, healthcare institutions, centres, and doctors all are geared towards educating public for early detection of the dreaded disease.

But unfortunately data tells us that today around 70% of cancer patients reach at stage 4 (incurable cancer) either at the time of diagnosis or even while taking the best possible treatment. We are not paying adequate attention to the lack of awareness and early screening that exists about cancer in the country.

Palliative care is what is required at this advanced stage. Pain management is the most important part of palliative care. Research has shown that palliative care & pain management provided by pain & palliative specialist is most effective in improving quality of life of the patient and mitigating the suffering of patients.

So, the most acute problem in these advanced-stage cancer patients is unbearable pain. With the help of modern medicines and advanced techniques, a majority of these patients can get adequate pain relief.

Problem

Big myth in the minds of patients – Cancer hai to dard to hoga hi. Advanced/Incurable cancer ho gaya to ab to dard mai rehna hi padega (If there is cancer, pain will inevitably happen. In the case of advanced/incurable cancer, one will have to live with pain).

Patients need to be made aware and



educated. Though patients keep running for cancer cure treatment, they don't expect pain relief as a goal in itself. Doctors, in general, do not focus on mitigating pain.

Pain management experts are not easily available. Probably Action Cancer Hospital (ACH) is the only hospital in private sector all over north India, which has a dedicated pain management department and experts. Specialized pain medicines are not easily available.

Pain Management Treatment

1. Specialized medicines like morphine, fentanyl, buprenorphine etc.
2. Advanced techniques known as MIPI (Minimally Invasive Pain Relief Intervention) These techniques stop the passage of pain by attacking pain sensation carrying nerves of cancer area or main passage nerves in spine

with the help of needle like instruments & RF Ablation and some special medicines. And without any surgery or incision.

3. Latest technique of injection of medical cement for spine bone cancers not only controls pain and cancer but also prevent bones from fracture or collapse.
4. Revolutionary & state-of-the-art pain relief implants, known as pacemaker of spine.

Pain Is Treatable At Any Or At Every Stage Of Cancer. Now Advanced Cancer Does'nt Mean Unavoidable Pain. We Can Offer A Pain-Free Journey For Cancer Patients.

(The author is Interventional Pain Management Specialist and Senior Consultant, Spine-Pain & Cancer Pain at Shri Balaji Action Medical Institute and Action Cancer Hospital, New Delhi)

BREAST CANCER AWARENESS

NUMBERS AND FACTS



1 in 8 women will be diagnosed with breast cancer



Every 2 minutes a case of breast cancer is diagnosed



Breast cancer is the most common cancer for women in USA



Every 13 minutes a woman dies of breast cancer in USA

HOW TO REDUCE RISK



Do regular exercise



Don't smoke



Drink less alcohol



Do an annual mammogram

THERE IS A HOPE



2.9 million female survivors live in USA



If breast cancer found early, confined to breast, the 5-year survival rate is 99%

dissection which entails removal of the axillary lymph nodes which provides both prognostic information as well as therapeutic benefit. However, axillary dissection while being the gold standard for axillary staging is associated with significant morbidity in terms of lymphedema, shoulder stiffness and dysfunction. Further, it has been seen that of all patients who undergo axillary dissection only 30% actually harbour disease in the lymph nodes. Hence 70% of patients undergo axillary dissection with its side effects without any therapeutic benefit. Sentinel node biopsy has now emerged as a safe alternative to axillary dissection with a better side effect profile.

Sentinel node biopsy is based on the concept that lymphatic drainage from the breast first drains to a sentinel node and then subsequently drains to the second echelon nodes. Thus identification and removal and

assessment of the sentinel node can provide information about the status of the axillary lymph nodes. A surgeon injects a radioactive substance, a blue dye, or both near the tumour to locate the position of the sentinel lymph node. The surgeon then uses a device that detects radioactivity to find the sentinel node or looks for lymph nodes that are stained with the blue dye. Once the sentinel lymph node is located, the surgeon makes a small incision (about 1/2 inch) in the overlying skin and removes the node.

The sentinel node is then checked for the presence of cancer cells by a pathologist.

A negative SLNB result suggests that cancer has not developed the ability to spread to nearby lymph nodes or other organs. A positive SLNB result indicates that cancer is present in the sentinel lymph node and may be present in other nearby lymph nodes and, possibly, other organs.

Axillary dissection can thus be restricted to those who actually need it. A sentinel node biopsy has been found to be equivalent to conventional axillary dissection with much lower incidence of side effects like arm swelling (lymphedema), shoulder stiffness and dysfunction.

Breast Reconstruction

Both a mastectomy and a breast conservation surgery lead to both physical and psychological effects on the patient due to loss/ deformity of breast tissue. This aspect can now be tackled with development of new and highly effective breast reconstruction techniques. Microvascular free flaps are now being used for complete breast reconstruction following a mastectomy. These can be performed simultaneously with the primary surgery or a second surgery later on. Microvascular free flaps use the patient's own tissues which are

harvested and transplanted to the chest wall. Free flaps offer nearly perfect aesthetic outcome for the patients and are a boon for breast cancer patients. Free flaps commonly used for breast reconstruction are a free DIEP, free LD, free ALT and a free SIEP flap.

Oncoplastic techniques have also been developed for cosmetically reconstructing the breast after a breast conservation surgery. These involve reshaping and remodeling of the patient's own tissues for achieving optimum reconstructive outcome.

The development of advanced reconstructive options is a boon for patients of breast cancer who can now no longer need to worry about their body image post-surgery.

Chemoport

A large proportion of patients need chemotherapy as a part of treatment of breast cancer. Chemotherapy involves infusion of the chemo drugs through the veins. Most of these drugs require prolonged infusion and are highly toxic and lead to severe thrombophlebitis (painful arm swelling). Further, in breast cancer patients, the arm on the affected side due to cancer is often not available for cannulation due to risk of lymphedema. Thus venous access is often troublesome in breast cancer patients undergoing chemotherapy which becomes a source of considerable anxiety. This can now be overcome by the availability of chemoports for infusion of chemotherapy. A port is a small medical appliance that is installed beneath the skin. A catheter connects the port to a vein. The port is usually inserted in the upper chest (known as a "chest port"), just below the clavicle or collar bone, leaving the patient's hands free. Under the skin, the port has a septum through which drugs can be injected and blood samples can be drawn many times, usually with much less discomfort for the patient than a more typical "needle stick". A patient is thus spared the trauma of repeated needle sticks and

thrombophlebitis. Availability of chemoports has now reduced the physical and psychological trauma associated with chemotherapy to a large extent.

RADIOTHERAPY

Radiotherapy is part of treatment for a large proportion of breast cancer patients. Radiotherapy uses radiation, such as x-rays, gamma rays, electron beams or protons, to kill cancer cells or damage them so they cannot grow or multiply. It is a localized treatment, which means it generally affects the part of the body where the radiation is targeted. However, most conventional radiotherapy techniques are associated with scatter of the radiotherapy waves to other adjoining body parts which leads to potentially deleterious effects on normal body tissues. In breast cancer, old techniques of radiotherapy were associated with significant toxicity to the lungs and the heart. These have now been overcome by IGRT.

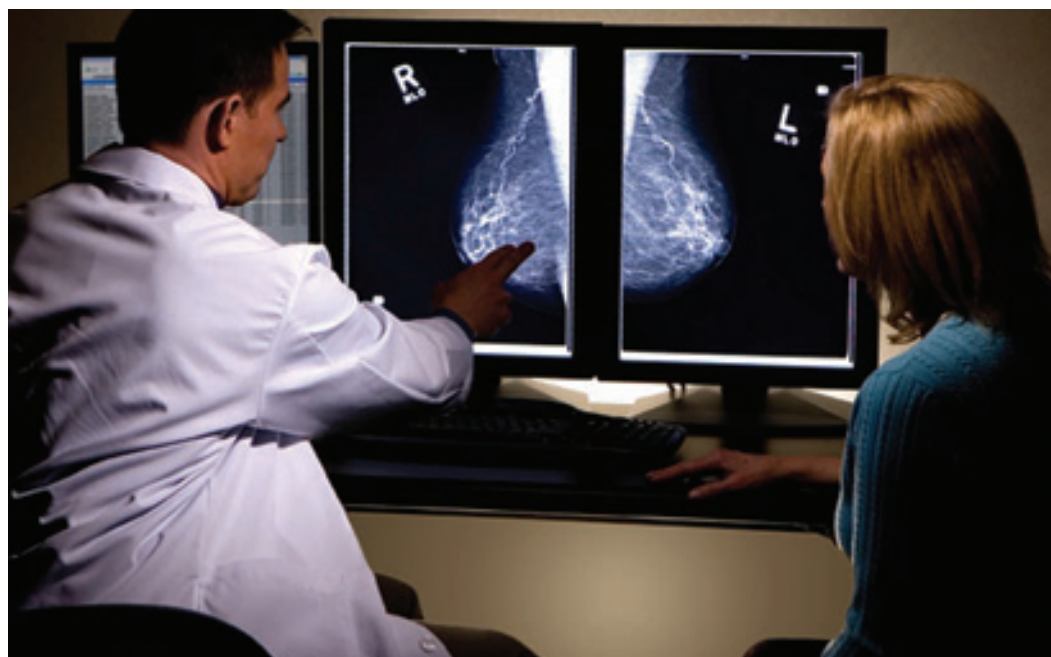
IGRT/IMRT

IGRT (Image guided radiotherapy) and IMRT (Intensity modulated radiotherapy) are two recently developed techniques of delivering radiotherapy. In these, the

radiation planning and delivery is done with the aid of computer simulation which helps in delivering a high dose to the target tissue with minimal scatter and exposure of adjoining body tissues. These techniques have thus greatly reduced the side effects and toxicity associated with radiotherapy while maintaining and enhancing the therapeutic benefit. In breast cancer, application of these two techniques has reduced the cardiovascular(heart) and pulmonary (lung) toxicity. IMRT and IGRT are now fast becoming the standard of care for delivering RT to many organ sites including for breast cancer.

ACCELERATED PARTIAL BREAST IRRADIATION (APBI)

One of the drawbacks of conventional radiotherapy is the prolonged duration of treatment (5 weeks in case of breast cancer) and the need for daily visits to the hospital. This has been associated with logistical issues for many patients and contributed to the reluctance associated with taking radiotherapy even when it is clearly beneficial. This problem can now be addressed with the developing field of APBI (Accelerated partial breast irradiation). In APBI a special machine is used to



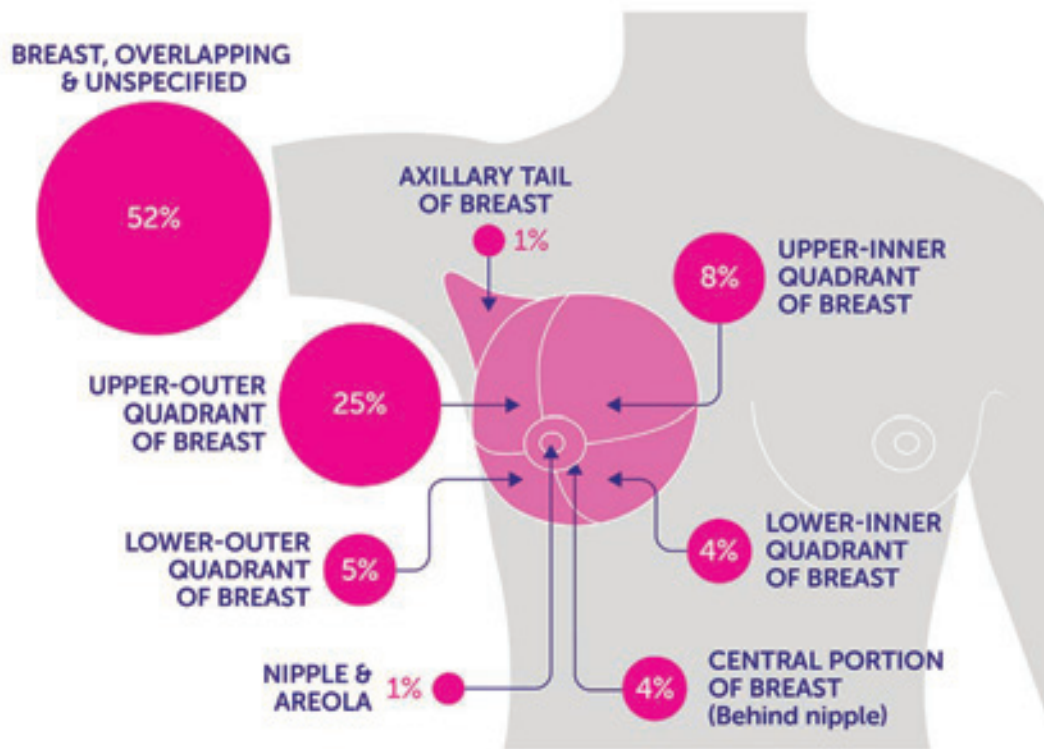
give a high dose of radiotherapy to the patient in the OT only during surgery. Thus the entire treatment of surgery and radiotherapy is completed in a single sitting only. This obviates the need for prolonged OPD visits. APBI has been studied in multiple trials and has been found to be effective for patients with early stage breast cancer undergoing breast conservation surgery. APBI is a thing to look out in the future in the field of breast cancer management.

TARGETED THERAPY

The standard systemic therapy for breast cancer has been chemotherapy. While chemotherapy has definitely improved the outcomes in both early and advanced breast cancer, it is also associated with significant short as well as long term morbidity. This is due to the fact that standard chemotherapy drugs are toxic molecules and exert their effect by killing the rapidly dividing cells. Generally the fastest dividing cells are the cancer cells and are the ones most affected by the chemo drugs. However, cells at normal body sites and other body tissues like hair, mucosal linings like mouth and intestines etc are also rapidly dividing and hence get affected by the chemotherapy drugs because of non-specific nature of their action leading to side effects like hair fall, mouth ulcers, diarrhea etc.

Targeted therapies have now been developed to tackle these problems associated with systemic therapies. Basically, the concept of targeted therapy involves the development of molecules that target specific molecules or pathways that are unique to the cancer cells and kill them. These drugs, therefore, selectively target the cancer cells without affecting the other normal body tissues. Therefore, these drugs have much lower side effects than standard chemotherapy. Herceptin (trastuzumab) is the most commonly used targeted therapy in breast cancer and has greatly benefited patients of both early and advanced breast cancer. Other

INVASIVE BREAST CANCER CASES: PERCENTAGE DISTRIBUTION BY ANATOMICAL SITE




LET'S BEAT CANCER SOONER
cruk.org/cancerstats



targeted therapy molecules being used in breast cancer are lapatinib, pertuzumab and neratinib. The development of targeted therapies has improved survival while at the same time lowering the side effects of treatment.

ADVENT OF DEDICATED BREAST CANCER UNITS

Of all the developments in healthcare, one of the most impactful feature has been the advent of specialized medicine. Specialized medicine involves the setting up of dedicated units which are designed to tackle specific disease or groups of diseases. In cancer management, this involves setting up of organ specific cancer units. Specialized breast cancer units are the norm leading

cancer centres throughout the world and is being rapidly emulated in India. Such units comprise of a team of dedicated professionals including cancer surgeons, medical oncologists, radiation oncologists, pathologists, radiologists, nurses, other paramedical staff and physiotherapists whose sole aim is to provide the holistic care for the breast cancer patient. The results in terms of quality of care like accurate early diagnosis, standardized investigation, work up protocol based word class treatment, post therapy care and patient outcomes like overall patient survival are significantly higher with such dedicated units as compared to treatment in general centres. The development of such specialized teams and units is going to be the norm in the future. 

Oncological Options

Riding on technological options, cancer surgery has evolved significantly in recent years, making a qualitative difference in the lives of patients

BY ABHIGYAN/ABHINAV

With the advancement of latest technology, surgery in cancer remains the most effective of all options available for cancer treatment. In fact, surgery has a part to play at all stages from the diagnosis to palliation. Cancer surgery is a highly specialised branch requiring years of intense training, a multidisciplinary team and good paramedical backup. Considered to be the most effective of all options available for cancer treatment, minimally invasive surgery is in increasing demand these days.

Cancer is a group of several hundred entities that can begin almost anywhere in the body. It happens when normal cells in the body change from their native state and grow uncontrollably. These cells may form a mass called a tumour. A tumour can be either malignant (cancerous, meaning it can spread to other parts of the body) or benign (noncancerous). However, some cancers do not form solid tumours. These are called haematological malignancies. These include leukaemia, most types of lymphoma and myeloma (cancer of the plasma cells in the bone marrow, the spongy tissue inside of bones).

Types of surgery

Diagnostic: For most types of cancer,

biopsy is the only way to make a definitive diagnosis. During a surgical biopsy, the surgeon makes a cut in the skin and removes some or all of the suspicious tissue. There are two main types of surgical biopsies. An incisional biopsy is the removal of a piece of the suspicious area for examination. An excisional biopsy is the removal of the entire suspicious area, such as an unusual mole or a lump.

After a biopsy, the tissue removed is examined under a microscope by a pathologist. A pathologist is a doctor who specialises in interpreting laboratory tests and evaluating cells, tissues, and organs to diagnose disease. The pathologist provides a pathology report to the surgeon or oncologist, who makes the diagnosis.

Staging: Staging surgery is performed to find out the size of the tumour and if or where it has spread. This often includes removing some lymph nodes, which are tiny, bean-shaped organs that help fight infection, near the cancer to find out if it has spread there. Together with the physical examination, biopsy, and results of laboratory and imaging tests, this surgery helps the doctor decide which kind of treatment is best and predict the patient's prognosis, that is, the chance of recovery.

Curative or primary surgery: The most common type of cancer surgery is the removal of the tumour and some



of the tissue surrounding the tumour. The tissue surrounding the tumour is called the margin. Tumour removal may be the only treatment, or it may be combined with chemotherapy, radiation therapy, or other treatments, which may be given before or after surgery.

Conventional surgery requires large cuts, called incisions, through skin, muscle, and sometimes bone. However, in some situations, surgeons can use surgical techniques that are less invasive, which may speed up recovery and reduce pain afterwards.

Debulking: When the complete removal of a tumour is not possible or might cause excessive damage to the body, surgery is used to remove as much of the tumour as possible. Other treatments, such as radiation therapy or chemotherapy may sometimes also



be used to shrink the remaining cancer.

Palliation: Palliative surgery is used to relieve side effects caused by a tumour. It plays an important role in improving quality of life for patients with advanced cancer or widespread disease. Surgery may be used to help relieve pain or restore physical function if a tumour presses on a nerve or the spinal cord, blocks the bowel or intestines, or creates pressure or blockage elsewhere in the body. Surgery may be used to help stop bleeding. Certain cancers are more likely to cause bleeding because they occur in areas with a high concentration of blood vessels, such as the uterus, or organs in which the tumours are fragile and can easily bleed when food and waste products pass through, such as the esophagus, stomach, and bowel. In addition,

bleeding may be a side effect of some drugs used to treat cancer. When surgery is needed to stop bleeding, a common technique is suture ligation, which involves tying blood vessels using surgical thread. Surgery may be used to insert a feeding tube or tubes that deliver medications. If the cancer or cancer treatment has made it difficult to eat, a feeding tube may be inserted directly into the stomach or intestine through the abdominal wall. Or a tube may be inserted into a vein to deliver pain medication or chemotherapy. Surgery may be used to prevent broken bones. Bones weakened by cancer or cancer treatment can break easily and often heal slowly. Inserting a metal rod may help prevent fractures of weak bones and relieve pain during healing.

Reconstruction: After primary cancer surgery, surgery may be an option to restore the body's appearance or function. This is called reconstructive or plastic surgery. Reconstructive surgery may be done at the same time as surgery to remove the tumour. Or, it may be done later after a person has healed or received additional treatment. Examples of reconstructive surgery include breast reconstruction after a mastectomy and surgery to restore a person's appearance and function after surgery to the head and neck area.

Prevention: Some surgery is performed to reduce the risk of developing cancer. For example, doctors often recommend the removal of precancerous polyps in the colon to prevent colon cancer. In addition, women with a strong family history of



breast or ovarian cancers or known mutations to the BRCA1 and BRCA2 breast and ovarian cancer genes may decide to have a mastectomy, which is the removal of the breast, or an oophorectomy, which is the removal of the ovaries, to lower the risk of developing breast or ovarian cancer in the future.

Types of minimally invasive surgery

As mentioned above, conventional surgery often requires large incisions. However, in some situations, surgery can be performed through one or more small incisions, which typically results in shorter recovery times and less pain afterwards. Below are some examples of minimally invasive procedures and surgeries:

Laparoscopic surgery: The doctor performs surgery through small

incisions in the skin using a thin, lighted tube with a camera. For example, a laparoscopy refers to a minimally invasive surgery of the abdomen, and mediastinoscopy and thoracoscopy are terms used when the same type of procedure is performed in the chest.

Laser surgery: The doctor uses a narrow beam of high-intensity light to remove cancerous tissue.

Cryosurgery: The doctor uses liquid nitrogen to freeze and kill abnormal cells.

Mohs micrographic surgery also called microscopically controlled surgery: The dermatologist shaves off a skin cancer, one layer at a time, until all cells in a layer appear to be normal cells when viewed under a microscope.

Robotic Surgery: This is the latest in minimally invasive techniques of cancer

surgery in which the operating surgeon uses a robotic system to perform the surgery. The surgeon is sitting comfortably on the console at some distance while the robot is performing the operation based on the instructions of the surgeon. This system has several advantages like better magnification, degrees of movement, 3D vision and faster rehabilitation. However, the steep cost is the limiting factor.

Endoscopy: The doctor inserts a thin, flexible tube with a light and camera on the tip, called an endoscope, into an opening of the body (such as the mouth, rectum, or vagina) to examine the internal organs. During an endoscopic procedure, it is possible to remove samples of potentially abnormal tissue for further examination.




Role of Surgery

Surgery is the removal of the tumour and surrounding tissue during an operation. A doctor who specialises in surgical treatment of cancer is called a surgical oncologist. Surgery is the oldest type of cancer therapy and remains an effective treatment for many types of cancer today. The goals of surgery vary. It is often used to remove all or some of the cancerous tissue after diagnosis. However, it can also be used to diagnose cancer, find out where the cancer is located, whether it has spread, and whether it is affecting the functions of other organs in the body. In addition, surgery can be helpful to restore the body's appearance or function or to relieve side effects.

The location where you have surgery

depends on the extent of the surgery and how much recovery is needed. Surgery may be performed in a doctor's office, clinic, surgical centre, or hospital. Outpatient surgery means that you do not need to stay overnight in the hospital before or after surgery. Inpatient surgery means that you do need to stay in the hospital overnight or longer to recover after the surgery.

The diagnosis of cancer begins when a person reports any unusual symptoms. After discussing a person's medical history and his or her symptoms, the doctor will perform various tests to find out the cause of the ailment. However, many times a person with cancer has no symptoms. Sometimes a doctor diagnoses cancer after a cancer screening test in an otherwise healthy person. Examples of

screening tests include a colonoscopy, a mammogram, and a pap test. The results of these tests may necessitate additional tests to confirm or disprove the result of the screening test. Less often, cancer is diagnosed when a person undergoes a medical test for another reason. For most cancers, a biopsy is the only way to make a definitive diagnosis. A biopsy is the removal of a small amount of tissue for further study. The cancer treatment options that the doctor recommends depends on the type and stage of cancer, possible side effects, and the patient's preferences and overall health. In cancer care, different doctors often work together to create a patient's overall treatment plan that combines different types of treatment. This calls for a multidisciplinary team..



Noted Cine Star and MP Chandigarh, Smt. Kirron Kher recently released the brochure of Dhawans Nature Cure

Natural Cure for Diabetes

You need not be on insulin therapy along with oral medication for your entire life. You can get rid of this debilitating disease by following a three-pronged strategy of a micronutrient rich diet, herbal food supplements and regular exercise

DR HARMOHAN DHAWAN



on the occasion of its 3 years of successful completion

Of all the lifestyle diseases, diabetes & obesity are twins and spreading like an epidemic the world over. Decades of countless scientific studies and research over the years have emphatically proved that proper nutrition is many times more effective than most drugs and pills at reversing, curing and eliminating disease. Nutrition is such a potent weapon with which you can not only prevent but can control other lifestyle diseases like high blood pressure, constipation, acidity, thyroid, arthritis, heart disease, stroke, kidney disease (nephritis), hair loss, dandruff, various cancers like breast cancer, colon cancer, prostate cancer etc. Recently, doctors in the United States including Dr Neal Barnard, President Physician's Committee for Responsible Medicine, a team of doctors at the International

Council for Truth in Medicine, Dr Joel Fuhrman, and many others through their scientific researches have established that we can achieve optimal health without any medication.

Naturopathy is a science and a way of life rooted in the underlying belief that the body has an innate amazing ability to heal itself. It treats the cause of the disease rather than the symptoms. The industrially produced synthetic drugs are all chemicals and all of them have side effects. Allopathy does "control" the symptoms of the disease but not the cause of it. It rather suppresses the disease and one has to live a diseased life with the help of various synthetic drugs.

Diabetes is a chronic medical condition, which, if not controlled, can lead to serious health complications such as blindness, kidney damage, nerve damage (neuropathy), impotency, various cardiovascular diseases and

even foot amputation. According to International Diabetes Federation (IDF), there are 69 million people with diabetes in India, the second highest number in the world after China which has 109 million people with diabetes. At this rate, India may become the diabetes world capital by 2035. Every 10 seconds a person dies of diabetes related complications & every 10 seconds, 2 people are diagnosed of diabetes. The numbers of diabetes deaths have doubled over the last 11 years. In 2015, 3,46,000 people died of diabetes in India.


We, at Dhawan's Nature Cure (A not-for-profit organization), after 8 years of extensive research & trials, have successfully treated hundreds of diabetic patients who were on insulin therapy along with oral medication. High dosage insulin has side effects. Insulin results in weight gain & excess weight requires



more insulin. So, more weight requires more insulin which results in further increase of weight. The patient is trapped in this vicious circle of excess weight and insulin. Besides the increase in the body weight, the insulin hardens the arteries. It has been observed that 80% of the diabetic patients who are on insulin therapy die of heart attack.

Depending upon the metabolism of the patients, we took them off insulin within 3-20 days and all oral medications within six months. All of them are

leading a happy healthy life now. While treating the patients, we adopt a three-pronged strategy of a micronutrient rich diet, herbal food supplements & exercise. Our body needs energy at regular intervals and we must eat six meals of small portion in the whole day. We design the menu of individual patient specifying what, when & how much to eat. We recommend the foods that are the richest in nutrients and low in calories. We lay emphasis in lots of raw vegetables (salads) cooked green

vegetables & soups. Eat as much as you like. Fruits, Nuts, seeds and pulses are the healthy foods which are an important part of the Dhawan's eating plan that meets all the nutritional requirement of the body. To achieve quick results, we advise patients to avoid animal, processed products, refined foods and minimal of cooking. 

(The author is an eminent Naturopathist and Ex Union Civil Aviation Minister, Govt. of India)

Let the **flowers bloom**

Several barriers exist for rehabilitating children afflicted with hearing loss. It is pertinent to review the current scenario of morbidities in Indian children and suggest possible interventions to help them develop communication and behavioural skills, improve social interaction; memory, comprehension and vocabulary enrichment; emotional development, academic performance, speech perception and production

BY DR A K AGARWAL

Education of children with hearing impairment in India began over a hundred years ago. After Independence, improvement was noticed with the establishment of many new schools in the 1950s and many programs based on the new technology were introduced in the 1960s. The sixties saw the establishment of the All India Institute of Speech and Hearing in Mysore where arrangements were made for the facilities for diagnosis of hearing impairment in infants and young children. At present, over 500 special schools for the hearing impaired children exist in the country.

The government owns and administers some schools whereas the NGOs run many others. Most of the schools, still residential, admit children aged 5 years and above who spend the entire school year in the hostels; they go home only during summer vacation. Provision of vocational courses and sheltered workshops facilitates spending almost the entire lifetime of some students in these schools. Two colleges for the Deaf, one in Chennai, Tamil Nadu affiliated to the University of Madras and another in Valakam, Kerala conduct degree courses in Commerce and Art subjects; a third program is run under the Indira Gandhi National Open University, New Delhi. But it's a fact that educating children with multiple disabilities is a difficult task. In India training programs to train



teachers to help children who are 'deaf-blind' has only recently begun.

Globally, over 5 percent of the world's population (more than 360 million population), suffers from disabling hearing loss, according to new global estimates on prevalence released by the World Health Organization (WHO) on International Ear Care Day. Of the total, 91 percent of these are adults and 9 percent are children.

Disabling hearing loss refers to hearing loss greater than 40 decibels (dB) in the better hearing ear in adults and a hearing loss greater than 30 dB in the better hearing ear in children. The majority of people with disabling hearing loss live in low- and middle-income countries. The prevalence of disabling hearing loss in children is greatest in South Asia, Asia Pacific and Sub-Saharan Africa.

Overall prevalence of disabling

hearing loss in children all over the world is 1.7 percent. A person who is not able to hear as well as someone with normal hearing – hearing thresholds of 25 dB or better in both ears – is said to have hearing loss. Prevalence of hearing loss in South Asia in paediatric age group is 2.4 percent.

Prevalence of disabling hearing loss among men and women in South Asia are 9.5 percent and 7 percent, and in South Asian children, it is 2.4 percent. Approx. 0.5-5 of every 1000 infants are born with or develop in early childhood disabling hearing loss. The prevalence of disabling hearing loss increases with age, i.e. prevalence in children is 1.7 percent, in adults aged 15 years or more, it is around 7 percent, rapidly increasing to almost one in three in adults older than 65 years. In most regions, prevalence in children decreases linearly as parent's literacy rate increases. In adults 65 years and older, prevalence decreases exponentially as income increases

CONSEQUENCES OF HEARING IMPAIRMENT

Consequences of hearing impairment depend on the ear/s involved, the degree and the type of hearing loss and the age of onset. Due to distortion of sounds, differentiation of environmental sounds, including speech, is difficult; making sounds louder does not improve the clarity or quality of sound. Similarly,

recruitment, which is an abnormal growth in loudness, a characteristic of damage to the inner ear, makes it difficult to tolerate loud sounds. For children with hearing impairment, congenital or acquired before development of speech and language, normal speech development is interfered with. With unilateral hearing impairment also, there is difficulty in localizing sound, reduced speech discrimination.

Consequences include inability to interpret speech sounds, often producing a reduced ability to communicate, delay in language acquisition, economic and educational disadvantage, social isolation and stigmatization. Communication and behavioural skills are influenced by a child's ability to hear. Hearing loss affects a child's social interaction; memory, comprehension and vocabulary development; emotional development, academic performance, speech perception and production. Children suffer from self-described feelings of isolation, exclusion, embarrassment, annoyance, confusion and helplessness. Barriers for seeking ear care services like social stigma related to diseases, lack of awareness, shortage of human resources, quacks treating wrongly, late identification of the problems, etc. need to be managed effectively. Hence, it is pertinent to review the current scenario of resultant morbidities in Indian children and suggest possible interventions to fight against all odds.

Fifty percent of hearing loss is preventable through public health actions. Therefore through appropriate public health measures, current burden of ear morbidities can be halved. Therefore for this, we need to know the strengths and weaknesses of our health care system.

PUBLIC HEALTH MEASURES

From time to time, public and private sector enterprises plan at both, small and large scale to help people with hearing impairment. But still, the services available and implementation status of actions to combat ear

disorders is in naïve stage.

In 2006, the WHO released a new set of training manuals aimed at equipping healthcare workers in developing countries with simple and cost-effective methods to reduce deafness and hearing problems through actions at the primary level of healthcare. The Primary Ear and Hearing Care Training Resources address the urgent need for action to prevent and manage ear diseases and hearing impairment. They are designed to be useful to a wide range of people, from village health workers to more experienced healthcare personnel. The manuals can also be used to help communities understand common causes of deafness and hearing impairment and ways to prevent and/or treat the conditions. Vaccination against childhood diseases that can cause hearing impairment, good ear hygiene, appropriate use of medication, and avoidance of excessive noise are examples of simple ways of preventing deafness and hearing impairment.

We need to make constructive efforts towards early diagnosis and treatment of hearing disorders. The issues in early identification to be addressed are (i) population/location of screening, (ii) technique/tools for screening, (iii) human resources for screening, (iv) cost, (v) challenges in screening, and (vi) intervention for the identified.

Few projects have been started with the aim of early diagnosis and treatment of hearing disorders. Under the Project of Prevention of Deafness undertaken at All India Institute of Speech and Hearing, Mysore, funded by the Ministry of Health and Family Welfare, Government of India, Yathiraj et al. (2002) reported screening of 28,750 infants over a period of five years.

The Ministry of Health and Family Welfare, Government of India in 2006, launched the pilot phase of the National Programme in Prevention and Control of Deafness. One of the objectives is early identification, diagnosis and treatment of hearing loss. The services/facilities available for early intervention in the country are covered under the following: (i) Medical intervention, (ii)

Aids, appliances and cochlear implant, and (iii) Auditory and speech-language training.

REHABILITATION

The earlier the parent/family accept the fact of impairment and follow a well-planned rehabilitation program under professional supervision, the better are the chances for the child and the family to lead a more normal life. Parental attitudes towards disability include inter alia acceptance, rejection, indifference and overprotection. Some parents work towards the development of the child, but feel the need to shelter and protect because of the disability. Overprotection denies the child the opportunity to achieve his potential in various areas of development.

Rehabilitation of persons with disabilities has gained momentum in India during the last decade with several states as well as the Union Government launching programs for their benefit. Community Based Rehabilitation and Integrated Child Development schemes are two major thrust areas in this endeavour.

On account of the multi dimensional facets of hearing impairment, R&D activities call for in-depth studies, both inter and multi-disciplinary. This calls for synchronized development in the core discipline as well as in allied disciplines. Achievements in technology, bio-technology, information technology, and digital technology have ushered in developments in accessibility to digital programmable hearing aids, cochlear implant surgery, and related rehabilitation technology and auditory genetic diagnosis. Exploration of indigenous technology and techniques is crucial to bring benefits of technological advances within the reach of the economically weakest among the disabled to meet their needs, whether for identification/diagnosis or habitation/rehabilitation. 

(The author is an eminent ENT Surgeon, Professor of Excellence and Medical Advisor, Apollo Hospital, NewDelhi)



Don't worry, be happy!

You should not allow stress to take control of your life, rather you should be happy at the level of physical, mental, emotional and spiritual wellbeing.

BY PRASHANT SOLOMON

Here's a little song I wrote.. You might want to sing it note for note, don't worry.. be happy!' This is the opening line of the famous song by Bobby McFerrin back in the 1980s called 'Don't worry, be happy.' Now more than ever, people should heed the words of this song.

The times we live in are stressful indeed, but when stress begins to control us, it can lead to fatal consequences. We have all heard about the things that are bad for us – smoking, drinking, obesity, etc. but the real killer is stress. The bad news is that we live in a world full of stress.

But the good news is that stress can be managed. When we realise this, we can take control of our lives and overcome the stress. How?

'Don't worry, be happy!'

Happiness is a hidden gem that often remains hidden. But yet, the irony is that it can be achieved rather easily if we change our approach and attitude

towards life.

Always remember that worrying never solves anything. If there is something that is in our control, we can control it. If not in our control, then worrying will not make any difference. So in either case, don't worry!

There are many ways that we can make adjustments in our lives – physically, mentally, emotionally and spiritually that can lead to us being happy.

Physically

Let's start with breathing. Breathing is something that we all do without really noticing it. As you read this article, you are breathing. Notice it. Feel the air coming through your nostrils, feel it going into your lungs and be aware of it as it is exhaled. Simply focusing on your breathing is relaxing and regularly doing this is perhaps the easiest form of meditation. It reduces stress and will make you more centred in your thoughts.

Exercising is also a great way to reduce stress and make you happy. One can start with taking a daily walk for minimum 30 minutes. While you are doing this, try to think of something

pleasant or funny. Try not to think about work or other stresses while walking. Going to a gym and exercising is also great and remember that you can start with lighter exercises. The feeling you get after exercising is the reward itself. Generally, one feels very relaxed and happier after a workout.

Mentally

Browse the Internet and read something that interests you. There is a whole world of information and knowledge that is waiting to be discovered. Read something online or watch some interesting videos on YouTube. Watch something funny on TV. Humour is a great stress reliever and puts things into perspective. Life is not meant to be always serious and humour is a great way to remind yourself about the balance needed in life.

Read books. Take out the time to read a good book. It will teach you something and at the same time, it will transport your mind into another world of sorts. Imagination and wonder is a great way to be happy and reduce stress.

Writing is also a great way to relieve stress. This doesn't necessarily mean





that you have to write an article or a book (although that would be great) even just jotting down your thoughts in a notebook or writing a diary is a great way to let out vented up stress and energy and express yourself. You never know what comes out of you when you write. Every bestseller began with a single word.

Emotionally

In our daily relationships, there are good days and bad days. Sometimes we have fights, arguments, and disagreements with people whom we love. Sometimes we suffer from breakups, separation or divorce. These situations can lead to major emotional trauma and stress. But the good news is – don't worry be happy! Believe it or not, you are the only one person responsible for your own happiness. We tend to become emotionally dependent on others. We have this feeling that we can only be happy if we are with so and so. Be it a spouse, a friend, a child, a parent, a sibling, etc. But this is false. This is only a mental construct. We are the only ones responsible for our own happiness. In order to do this, we must become friends with our selves. We must love ourselves. This is not a selfish kind of

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love. It is not saying that we don't love others, but it is saying that we love ourselves just as we love others. So, in case there is a breakup or an argument or a fight, etc. we will also be content with having our own self to keep us company. This might seem funny, but try it. If you are alone or feeling lonely, talk to yourself and not just random babbling, but have an actual conversation with yourself. Trust me, in time you will feel the stress and loneliness melt away and happiness will flow towards you.

Watching a nice movie, play or reading a good book can also lead to an emotional charge that will not only entertain you, but also teach you some new perspective about life. It will help

you to get rid of emotional stress.

Spiritually

'We are not human beings having a spiritual experience. We are spiritual beings having a human experience.'
– Pierre Teilhard De Chardin

We are spiritual beings currently on planet earth to learn, explore and grow. The sooner we realise this, the soon happiness will come.

Meditation and charity are great ways to develop spiritually and as this happens, stress is bound to be relieved and happiness is sure to come.

Meditating increases our awareness and leads to a state of bliss that relaxes us and decreases stress and also gives us a glimpse into a larger peaceful world of energy and love. There is a field of spiritual energy that surrounds us and binds us. Meditation helps us gain access to this field. Soon we realise that we are on a spiritual journey and the only thing we take with us back to our spiritual home after we leave our bodies is our thoughts, feelings and karma. Not one paisa or square millimetre of land! If we only strive for material things, we are wasting our time. Material things are important, but as a means to an end and not the end itself.

In the end, all is good.

So once again, don't worry, be happy! 🙏



Scary Side-Effects

Milk is a complete food during infancy when the lactose (sugar) contained in it can be digested. As you grow up, this undigested sugar and other not-so-useful properties in milk may give rise to a host of health complications

DR HARMOHAN DHAWAN

All powerful animals on earth such as elephant, lion, tiger and horses etc. do not drink milk after weaning. If you put a bucket full of milk in front of a cow, she will sniff at it but won't drink milk. Humans are the only species on earth who drink another mammal's milk, past their infancy.

Human bodies are not designed to drink the milk of other mammals. Dr Bejaman Spock, America's leading authority on child care, was one of the first to warn the world against the dangers of consuming milk. The sugar in the milk is called lactose. There is an enzyme called lactase, which is produced in the small intestines that digests the lactose in the milk. Mother Nature is great and an architect of perfect engineering. When the child is 4 to 5 years of age, the production of lactase stops, what does this signify? It's a warning by Mother Nature that the child should not be given milk and he should be put on solid food as in the absence of lactase, you cannot assimilate the sugar in the milk.

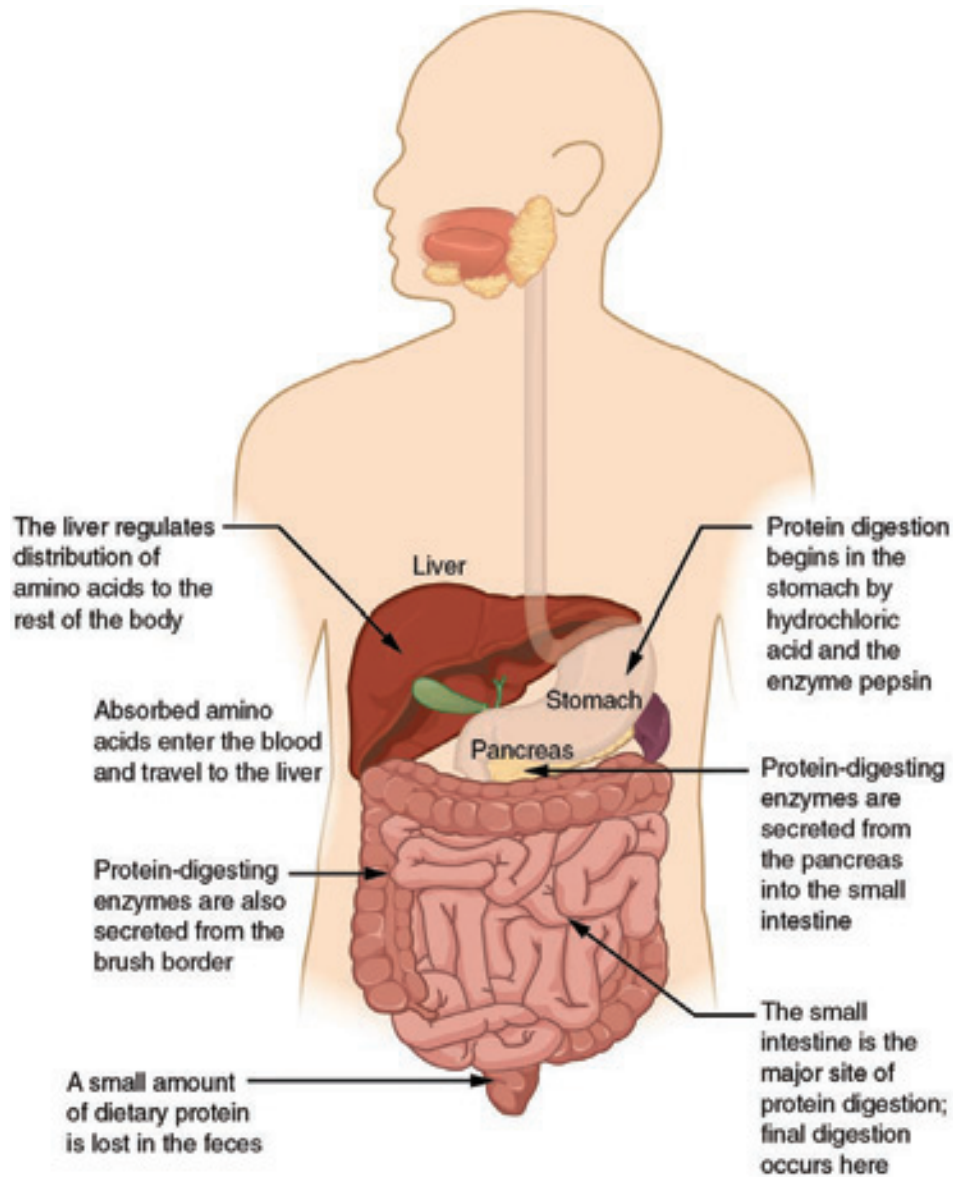
According to a World Health Organization (WHO) report, 75% of the world population has lactose intolerance meaning by that they cannot digest milk.

Milk is no good for health but fat free yogurt and the butter milk can be consumed. You may ask how come when the milk is bad, butter milk and yogurt can be consumed? The reason is when the yogurt is made the bacteria that make yogurt produces lactase which in turn can digest the lactose of the milk.

Now let us have a look at the nutritional values and composition of the milk.

It is clear from the table above that the milk has four main nutrients i.e. fat, sugar, protein and calcium. We will analyze each of them to show how "GOOD" they are and their effect on your body.

Milk Fat When we drink a glass of milk (250 ml) we consume 9gms of fat which by any standard, is on the higher



side. To meet the requirements of the health conscious people, the dairy industry has come out with low fat and fat free milk in the market.

But where this skimmed away fat go? Certainly it's not thrown in the sea. The dairy industry uses this fat to make various milk products. When you go to the supermarket you buy fat free milk and invariably you pick up butter, cheese and ice creams also. You are happy that you have bought fat free milk but not withstanding that in the process you are bringing back home the very fat which had been removed. You may be surprised that the milk gives us about 49% of the calories from its fat. You are satisfied that the 2% milk is much lower in fat. It's deceptive and

misleading. The 2% figure is with reference to fat content of the milk by weight.

Nutritionist considers the percentage that comes from the fat only and keeping in mind that of the 250ml of milk 220gms is the water content which has no calories. In the final analysis a 2% fat milk still give us 35% calories from fat itself.

It is serious health concern when we look at the type of fat that milk contains. A glass of milk contains 9gms of fat and the most of it, 6gms is bad one - the saturated fat, which is linked to insulin resistance and raises the cholesterol level.

Sugar (Lactose) Surprisingly, health conscious people avoid sodas and other



THE NUTRITIONAL VALUE PER 1 GLASS (250ML) OF MILK.

CONSTITUENTS	UNITS	VALUE
ENERGY	KCAL.	165
WATER	GM.	219.5
PROTEIN	GM.	8
SUGAR (LACTOSE)	GM.	12
CHOLESTEROL	MG.	35
CALCIUM	MG.	282
TOTAL FAT	GM.	9
SATURATED	GM.	6
MONO- UNSATURATED	GM.	2.75
POLYUNSATURATED	GM.	0.25

sugary drinks because of their sugar content, and not milk. You must be pleased that you are drinking a fat free milk which will have no health problems. But you must know that a glass of milk still carries 12gms of sugar which is quite high. Just imagine a person drinking 2-3 glass of milk and the amount of sugar he is pouring into his system. About 55% of the calories in the fat free milk come from lactose.

When you were a baby you used to drink your mother's milk which is a complete food. The sugar in the milk was digested by an enzyme called lactase which was produced in your small intestines; as you have grown up now the enzyme has dissipated. Now when you drink cow's milk, the sugar in the milk cannot be digested because there is no lactase in your intestines. This undigested sugar is passed on to the lower intestinal tract where bacteria ferment the sugar causing gas, cramp,

diarrhea, constipation and host of other health complications.

Dairy Proteins Protein is made up of small molecules called amino acids. There are about 20 amino acids (8 essentials and 12 non essentials) of these which make the body organs. Our body needs protein to build and repair body tissues.

The animal protein is hard on the delicate kidney tissues whereas plant proteins are free from the risk of kidney stones. Animal protein is called casein which is a glue used in the manufacturing of wooden furniture. Animal protein appears to accelerate the loss of various kidney functions in diabetes.

According to Dr. T. Colin Campbell, "the association between the intake of animal protein and fracture rates appears to be as strong as the association between cigarette, smoking and lung cancer".

Calcium Milk and calcium are synonymous for most of the people. The general belief is that the calcium in milk builds strong bones and infact protects against fractures later in life. The nurses' health study conducted by the Harvard University on the 72,337 women for about 18 years concluded that the women who drank 3 glass of milk a day had the same risk of hip fracture compared to those who never drank it.

Researchers have further established that the absorption of calcium from milk is only 34% where as calcium absorption from plant is 64%. The protein leaches the calcium which pass through the kidneys and into the urine and in the process ends up in your urinary tract, where it can cause stones. After all how much calcium our body needs. According to Indian Council of Medical Research (ICMR), after bracket "recommended dietary

allowance for Indians” is 400mg per day which we can easily get it from plant sources like green leafy, vegetable and beans etc. According to Dr Neal Barnard, President of the Physicians Committee for Responsible Medicine, “Milk, in particular, is poor insurance against bone fracture. The healthiest calcium sources are green leafy vegetables and legumes. You can get enough calcium from these plant sources.”

The Dairy Lobby

Scores of research studies the world over have well documented that milk can cause diarrhoea, cramps, bloating, gas, gastrointestinal bleeding, iron-deficiency anemia, skin rashes, atherosclerosis, and acne. It has also been linked to insulin dependent diabetes, rheumatoid arthritis, infertility, and leukemia. Milk and refined sugar make two of the largest contributions to food induced ill health. Milk also contains powerful growth hormones, viruses, a host of deadly chemical and biological bacterial agents, bovine proteins that cause allergies, insecticides, antibiotics; all this can trigger the growth of cancer and contributes to today’s problem of obese children.

The dairy lobby indulges in false propaganda to ensure its profits. It benefits directly from the exaggerated support prices the government shells out for this “health food.” The government pays over a billion dollars a year for surplus butter. A General Accounting Office (GAO) study concluded that a reduction in the government price support system would have netted consumers savings of \$10.4 billion from 1986 to 2001. The United State Department of Agriculture (USDA) pays inflated prices to purchase dairy products for women, infants, and children (WIC) and federal school lunch programs. The milk lobby has intruded its way into the highest echelons of power. Staffers under Richard Nixon were indicted for accepting \$300,000 from the dairy lobby for making milk part of the school lunch program. Dr.



Robert Cohen of the Dairy Education Board, a nonprofit organization dedicated to exposing the milk lobby, contends that the dramatic 52 percent rise in asthma deaths among minority kids in New York coincided with the surplus milk, cheese, and butter pumped into them under the USDA’s free school lunch and breakfast giveaway programs.

Various risk factors and their effects on human body

- Fifty years ago, an average cow produced 2000 pounds of milk per year. Today, the milk yield is 50,000 pounds, thanks to antibiotics, drugs, hormones and artificial insemination.
- Milk has no fiber and complex carbohydrate but loaded with fat and cholesterol which can lead to heart diseases, prostate cancer and diabetes etc.
- Milk consumption leads to lots of mucous build up and other health problems like asthma and congestion etc.
- Both clinical and population studies

in the United States have shown that people who drink milk were prone to bone fractures as compared to those who didn’t drink milk at all.

- American Association of Paediatrics stated that 60% of the ear infections in children less than 6 years of age are milk induced.
- Milk consumption is the number one cause of iron deficiency anemia.
- Raw milk contains bovine leukemia virus which causes human leukemia.
- Milk contains powerful growth hormones and viruses.
- It contains bovine protein that causes allergies.
- Milk is carcinogenic. It contains a factor called IGF-I. All cancers show that when IGF-I rises in the body, one gets cancer.
- Cow’s milk has a pH between 6.4 and 6.8, making it slightly acidic whereas human body is alkaline; the pH is regulated within a narrow range of 7.35 to 7.45. 🇮🇳

(The author is Naturopathologist and Ex-Union Civil Aviation Minister, Govt of India)

Deadly 'D' Deficiency

In India, deficiency of vitamin D is prevalent in all age groups in the lower as well as upper socio-economic classes, but it is more particularly found in women, infants, toddlers, children and adolescent girls

BY DR SUNEELA GARG/DR WARISHA



As you enjoy soaking up the sun during winters, your thoughts may turn to Vitamin D because you probably know it has something to do with the sunlight. But do you know the crucial importance of this compound in life?

Vitamin D was classified as a vitamin in the early 20th century and in the second half of the 20th century as a prohormone. Vitamin D has been traditionally known as “anti-ricketic factor” or “sunshine vitamin”. Vitamin D is a secosteroid with an endocrine mechanism of action which is sequentially synthesized in humans in the skin, liver and kidneys. Vitamin D is synthesized in sufficient amounts by most vertebrates on adequate exposure of the skin to sunlight UVB rays (280–320 nm).

The term “vitamin D” refers to compounds vitamin D3 (cholecalciferol) or vitamin D2 (ergocalciferol). Vitamin D3 is derived from 7-dehydrocholesterol by ultraviolet irradiation of the skin. Vitamin D3 is also found in animal food sources e.g., fatty fish (e.g., salmon, mackerel and tuna) cod liver oil, milk, etc. Vitamin D2 is found in vegetable sources like sun-exposed yeast and mushrooms. Notably, most dietary sources are not sufficiently rich in their

vitamin D content. Vitamin D (both forms D3 or D2) is a prohormone which requires two hydroxylations to finally attain its biologically active form [1, 25(OH) 2D].

The first hydroxylation occurs in the liver, at position C25 to form 25-hydroxyvitamin D, also known as 25(OH)D or calcidiol while the second hydroxylation occurs at position C1^a to form 1,25(OH)2D, also known as calcitriol. 1,25(OH)2D is further released in the blood, where it binds to vitamin D binding protein (DBP) and reaches out to its target tissues to exert various endocrine functions through the vitamin D receptor (VDR). 1, 25(OH) 2D is also produced in several extrarenal tissues for its paracrine and autocrine functions. Most cells in the body have VDR and can also produce 1, 25(OH)2D. 1,25(OH)2D is capable of regulating a wide variety of genes that have important functions in cell regulation, growth and differentiation.

Vitamin D deficiency is a pandemic, yet it is an underdiagnosed and undertreated public health problem. With more recent evidences of the role of Vitamin D in extra skeletal conditions like various NCDs (non communicable diseases) and its role in predisposition to TB, with India being the highest contributor to both of these conditions,

there is a dire need to identify the magnitude of vitamin D deficiency and to educate and develop programmes focussing on recommendations of Vitamin D supplementation. In the 1940s, 100 IU of vitamin D/day was considered sufficient to prevent overt skeletal deformities associated with rickets. Regulatory agencies in the US and Europe later increased the dose two-fold and recommended that 200 IU of vitamin D/day be required to satisfy the requirement for children.

It was assumed that the same was true for adults. In the 1970s, clinical assays were developed for 25(OH) D in the serum to determine the normal range. Blood was collected from healthy adults who were presumed to be vitamin D sufficient and the mean \pm two standard deviations was used as the normal range (10-55 ng/mL) at that time. In 1998, healthy adults with a blood level of 25(OH) D between 11 and 25 ng/mL were considered to be vitamin D sufficient. Furthermore on giving Vitamin D supplements and measuring PTH levels, it was observed that PTH levels began to plateau when 25(OH) D levels were between 30 to 40 ng/ml. Based on all these data, it has been suggested that vitamin D deficiency be defined as 25(OH) D < 20 ng/mL and vitamin D insufficiency as 21-29 ng/mL



and 30 to 100 ng/ml are considered to be vitamin D sufficient. It was also seen that the calcium absorptive performance of the gut is a function of 25OHD status of an individual and appears to achieve its peak ability at this level. A classification given by Lips to define vitamin D deficiency is as follows: mild hypovitaminosis D: 10–20 ng/ml, moderate hypovitaminosis D: 5-10 ng/ml, and severe hypovitaminosis D: less than 5 ng/ml.

Vitamin D deficiency is widespread in individuals irrespective of their age, gender, race and geography. As we know Vitamin D is photosynthesized in the skin on exposure to UVB rays, sun exposure alone ought to suffice for vitamin D sufficiency. However, vitamin D deficiency is widely prevalent despite plentiful sunshine even in tropical countries like India. India is located between 80N and 37. 60N latitude with optimum levels of sunshine, still Vitamin D deficiency is on the rise as a major public health problem.

Vitamin D status in India is grim not

only in the lower but also in the upper socioeconomic classes. Studies conducted in different parts of the country have documented a widespread prevalence of deficiency of vitamin D in all age groups including toddlers, school children, pregnant women and their neonates and adult male and females. Vitamin D deficiency occurs in children when the mother is vitamin D deficient. A community-based study in different regions of Delhi and NCR documented the prevalence of VDD (levels below 14ng/ml) amongst children as 82.9 %. Studies on pregnant mothers from southern and northern states of India have reported high vitamin D deficiency levels with values ranging from 67% to 96%. During pregnancy sufficient Vitamin D levels are needed to address the growing demand of calcium to the foetus, for foetal growth, development of nervous system, lung maturation and foetal immune system function.

Deficiency of vitamin D is also linked to development of diabetes and pre-eclampsia during pregnancy.



Furthermore a study was conducted to determine the vitamin D status of lactating mothers and it was documented that the serum 25(OH) D levels < 10 ng/ml were found in 47.8% of the mothers. During pregnancy and lactation, calcium from the maternal skeleton is mobilized, with a rise in bone turnover and a reduction in bone mass. Amongst adult male and females residing in both rural and urban areas, the prevalence of VDD estimated in urban population was 62% in male subjects and 75% in female subjects, while the prevalence of Vitamin D deficiency was slightly lower in rural area as 44% in males and 70% in females.

This indicates that the prevalence of VDD was more in females as compared to male subjects in both rural and urban areas. A study conducted amongst female subjects of nursing college and other postgraduate courses with the mean age 21 years revealed that the mean serum 25-hydroxy- vitamin D (25(OH) D) of the subjects was 9.3 ± 3.37 ng/ml at baseline, and none of them

had sufficient vitamin D levels (≥ 30 ng/ml). In the elderly age group, people are prone to develop Vitamin D deficiency because of various risk factors like decreased dietary intake, diminished sunlight exposure, reduced skin thickness, impaired intestinal absorption and impaired hydroxylation in liver and kidneys.

A study carried out amongst elderly with the mean age of 58 years showed a high prevalence amongst them. It was also reported that vitamin D deficiency < 20 ng/ml was present in 91.2% and Vitamin D insufficiency <30 ng/ml in 6.8% subjects. A study conducted amongst postmenopausal women to evaluate their dietary calcium and vitamin D status documented that, 18% subjects had normal 25(OH)D levels (> 20 ng/ml), 52% subjects had 25(OH)D insufficiency (10-20 ng/ml), and 30% subjects had 25(OH)D deficiency (< 10 ng/ml). It is observed that there is low BMD (bone mineral density) among postmenopausal women, however various studies conducted have reported a high prevalence of low BMD among younger age groups too and hence a rising concern .

Many factors influence the production of vitamin D3. In the skin, in general, the cutaneous production of vitamin D declines with age. An alteration in the zenith angle (angular distance between sun and object directly underneath) of the sun caused by a change in latitude, season of the year, or time of day dramatically influences the skin's production of vitamin D3. A reduction in every one degree of angle leads to increase in vitamin D by 0.285 units [previtamin D3 and vitamin D3 formed(Y) = 20.466 - 0.285 X zenith angle]. Attenuating factors such as clothing, duration of exposure to sunlight (intense heat in tropics preventing people from sun exposure), type of skin (proportionately high melanin in equatorial regions), pollution (e.g., Asian brown cloud phenomenon), and increasing indoor lifestyle have all been blamed, for this now recognized widespread problem. The Food and Agricultural Organization (FAO)/World

Health Organization (WHO) Expert Consultation states that the most physiologically relevant and efficient way of acquiring vitamin D, in most locations in the world around the equator (between latitudes 420 N and 420 S) is to synthesize it endogenously from skin from 7-dehydro-cholesterol present in the subcutaneous fat by minimum of 45 minutes of skin exposure (without sunscreen) of the arms and face to midday sun. It has been concluded from the experimental data that exposure of the body in a bathing suit (almost 100% of body surface area) to sunlight causes slight pinkness of the skin [1minimal erythema dose (MED)] is equivalent to ingesting approximately 20,000 IU of vitamin D orally.

Therefore, exposure of 6% of the body to 1 MED is equivalent to taking about 600 and 1,000 IU of vitamin D. For Caucasian skin (type 2 or 3), exposing face, arms and legs for a period equal to 25% of the time that it would take to cause 1 MED that is for two-to three-times a week can satisfy the body's vitamin D requirement while minimizing sun damage ("Holick's rule"). Compared to Caucasians, Asians have darker skin (type 4 or 5) and, therefore, with the same amount of MED, they would require greater duration of exposure than their light skinned counterparts to synthesize comparable amount of vitamin D3. Vitamin D synthesized in the skin lasts two times longer in the body compared to supplemental/ingested dose. The time required to obtain recommended UV dose for adequate vitamin D synthesis is "1 standard vitamin D dose" (SDD). Throughout the year 1 SDD for skin type V (Asians) at 11.5 0N is 10 - 15 minutes, and at 29 0N is 10-45 minutes at solar noon, with longer duration in winter. Clouds, aerosols and thick ozone can reduce vitamin D synthesis and force "vitamin D winter" even at equator. The 25OHD levels in South Indian subjects are relatively higher compared with the subjects from North India indicating a strong inverse correlation between the 25 OHD levels and latitude clearly proving the effectiveness of equatorial



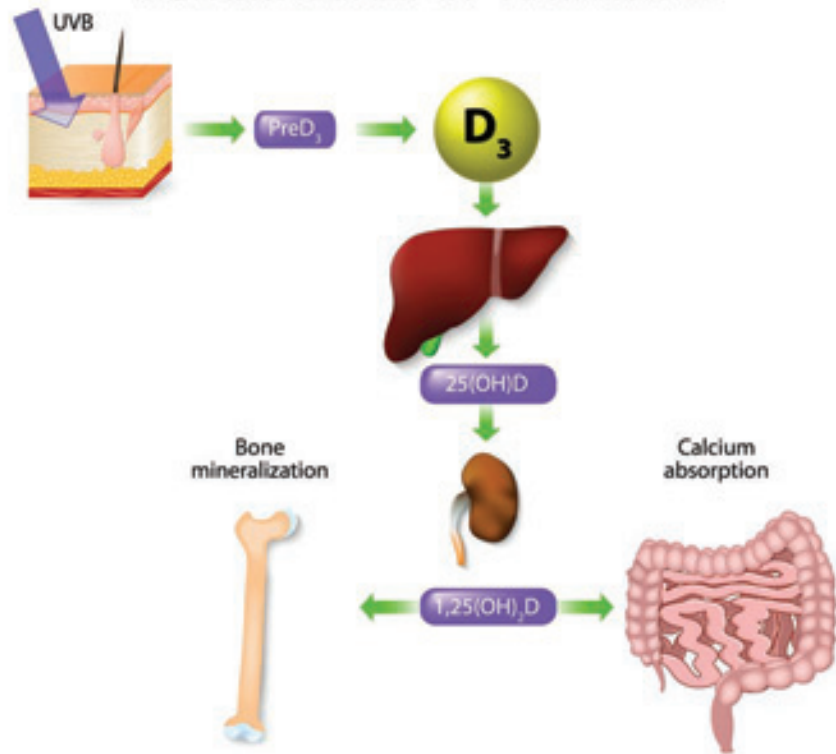
closeness (smaller zenith angle) to natural Vitamin D synthesis. It has also been found that Vitamin D deficiency is highly prevalent among Muslim women due the tradition of burkha or the parda system leading to their decreased or very little exposure to sunshine.

The undying desire of most Indian women to attain a fairer skin complexion instantly extinguishes any desire for sun exposure, and a person's primary focus is on finding ways to avoid the sun, at all costs. Not to mention the pace of urbanisation in Indian cities, building of high storey buildings overcrowding, high population density and loss of spaces in neighbourhood has limited the sun exposure and outdoor activities. Vitamin D rich foods are mostly of animal origin, while a majority of Indian population is vegetarian.

Milk is the only animal origin source available for vegetarians but milk fortified with vitamin D is not readily available in India. Indian diet is also low in calcium and high in phytate content which further adds to this deficiency. Indians in general adhere to traditional cooking styles and practices, slow cooking is widely practised. This culinary practice, however, is ill-advised bearing in mind the thermal instability of vitamin D as it is degraded at temperatures above 200 °C. Its thermal stability is inversely related to temperature and time. Cooking gas flame reaches temperature above 1900 °C and coal stove heat reaches 300–700 °C. Baking is done mostly above 175 °C but the temperature in the food does not reach such high temperatures, therefore stability of vitamin D during baking is well within acceptable range.

Pertaining shallow and deep-frying method of cooking is also very popular in India, most cooking fats and oils have smoke points above 180 °C leading to thermal degradation of vitamin D. Pressure cooking temperatures vary depending on the pressure withstood by the cooker used and may range from 100 °C to 120 °C. Short-time (as short as possible) pressure cooking is definitely advisable to retain at least some of the essential nutrients in cooked food,

Metabolism of vitamin D



including vitamin D. Studies have also reported the association of high caffeine intake with increased risk of low bone mineral density, osteoporosis, and osteoporotic fractures in middle-aged women. This situation is further exacerbated in women with low calcium intake. Low dietary calcium converts 25OHD to polar metabolites in the liver and leads to secondary 25 OHD deficiency. Also, low calcium intake increases parathyroid hormone (PTH) which increases conversion of 25OHD to 1, 25-dihydroxyvitamin D.

In addition, 1,25-dihydroxyvitamin D induces its own destruction by increasing 24-hydroxylase. This probably explains the low 25OHD concentrations in persons on a high-phytate or a low-calcium diet underlining the importance of dietary calcium for not only maintaining good bone health but in interpretation of 25OHD levels and subsequent therapy. Hence calcium supplementation should be an integral part of vitamin D supplementation therapy in India. As per ICMR guidelines of 2010 for RDA (recommended dietary allowances) (mg/day) of calcium for

children 1-9 years of age is 600; children 10-18 years age is 800 (both genders); adults (men and women) is 600; and for pregnant and lactating women is 1200 and that of Vitamin D is 400 IU or 10µg/day.

NON CALCEMIC EFFECTS OF VITAMIN D DEFICIENCY:

The association of living at upper and lower latitudes (i.e., above or below the 35th parallels of latitude) with increased risk of dying from cancer, type1 diabetes, multiple sclerosis and hypertension has been documented. It is also recognized that every tissue and cell in the body including immune, brain, colon, prostate, and breast cells, among many others, has a vitamin D receptor (VDR). Studies have revealed that upwards of 2000 genes are either directly or indirectly regulated by 1, 25(OH) 2D. Initially, it was thought that increasing your vitamin D intake or exposure to sunlight raised your blood levels of 25(OH) D, which resulted in increased blood levels of 1, 25(OH) 2D, which in turn could interact with a wide variety of genes in a multitude of cells and organs to maintain



cells and organ health, thereby reducing risk of chronic diseases. However, the conundrum was that the kidneys only produced a finite amount of 1, 25(OH) 2D that was tightly regulated by the serum calcium, phosphorus and PTH levels in the circulation.

The realization that many tissues and cells in the body including among others the skin, breast, prostate, brain, and activated macrophages have an enzymatic process that is identical to the kidneys converting 25(OH) D to 1, 25(OH) 2D, provided new insight as to how vitamin D could have all of the other health benefits not related to calcium and bone mineralisation. When a monocyte/ macrophage is stimulated through its toll-like receptor 2/1 (TLR2/1) by an infective agent such as *Mycobacterium tuberculosis* (TB), or its lipopolysaccharide (LPS) the signal upregulates the expression of vitamin D receptor (VDR) and the 25-hydroxyvitamin D-1-hydroxylase (1-OHase). 25(OH) D levels > 30 ng/ml provides adequate substrate for the 1-OHase to convert it to 1, 25(OH) 2D. 1,25(OH)2D returns to the nucleus


where it increases the expression of cathelicidin (CD) which is a peptide capable of promoting innate immunity and inducing the destruction of infective agents such as TB. It is also likely that the 1,25(OH)2D produced in the monocytes/macrophage is released to act locally on activated T (AT) and activated B (AB) lymphocytes which regulate cytokine and immunoglobulin synthesis respectively.

When 25(OH) D levels are \approx 30 ng/ml, it reduces risk of many common cancers. It is believed that the local production of 1,25(OH)2D in the breast, colon, prostate, and other cells regulates a variety of genes that control proliferation including p21 and p27 as well as genes that inhibit angiogenesis and induced apoptosis. Once 1, 25(OH) 2D completes the task of maintaining normal cellular proliferation and differentiation, the 24-OHase enhances the metabolism of 1, 25(OH) 2D to calcitroic acid which is biologically inert. The production of 1, 25(OH) 2D in the kidney enters the circulation and is able to downregulate renin production in the kidney and to stimulate insulin secretion in the β -islet cells of the pancreas. Vitamin D receptors have also be identified in adipose tissue and it being a fat soluble vitamin, its deficiency is seen in individuals with obesity. Owing to these extraskelatal functions of Vitamin D, Vitamin D deficiency has been linked to development of TB, otitis media, influenza, asthma, type 1 and 2 diabetes mellitus, cancers viz breast , ovarian, prostate, colorectal, esophageal and pancreatic cancers and autoimmune diseases. In DM, studies have shown that vitamin D deficiency further aggravates the sugar levels thereby leading to poor glycaemic control. Such patients suffer from irritable bowel syndrome,

Crohn's disease and other malabsorption syndromes also have low vitamin D levels due to impaired intestinal motility and poor absorption from intestine. Vitamin D deficiency is also seen in cases of Primary Biliary cirrhosis and other cholestaic syndromes. Vitamin D deficiency is also

a cofactor in chemotherapy induced mucocutaneous toxicity and dysgeusia hence supplementation of vitamin D3 will be beneficial in patients undergoing chemotherapy. Vitamin D has also been shown to have relationship to depression. Seasonal affective mood disorder (SAD) due to decreased daylight in winters have been benefitted with supplementation of Vitamin D which has led to the belief that normal neurotransmitters function also depends on adequate levels of Vitamin D synthesis in the body.

Owing to its multiple implications on health, it is clear that Indians need more Vitamin D irrespective of their geographic location. There is urgent need to prioritize development of national level programs to make available, quality-regulated and affordable vitamin D supplements and vitamin D fortified foods to the Indian population. There are also no clear cut recommendations in the Indian scenario for the supplementation doses of Vitamin D. Very importantly; the government needs to implement measures to educate the Indian population about the current status of vitamin D in India and also the modes to attain vitamin D sufficiency.

Food fortification seems a better strategy than supplementation as there has been no consensus yet to the standard dose regimen for Vitamin D supplements and excess intake may also lead to toxicity. More vulnerable groups required to be targeted i.e. women (both pregnant and non-pregnant, breastfeeding mothers), infants, toddlers, children and adolescent girls as these are the most neglected groups especially in terms of malnutrition. Vitamin D sufficiency in women of reproductive age would at the very least result in improved women's health, improved outcome of childbirth and birth of infants who may have a better chance of a healthy existence from the beginning of their lives. 

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Connecting millions to healthcare

With growing burden of non-communicable diseases (NCDs) in India, harnessing mHealth technology as a preventive strategy has tremendous potential to address the risk factors
BY DR MALVIKA SHARMA/DR BRATATI BANERJEE/DR SUNEELA GARG





There is hardly a gathering where medical profession is not being discussed with negative overtones. Not a day passes when the media does not draw attention to some event which serves to continue to multiply the trust deficit between public and medical professionals.

There is no doubt that mobile phones have permeated the daily lifestyle of people in an unimaginable way nowadays. Globally, India has the second-largest mobile phone user base in the world with over 900 million users. In 2011 alone, 142 million new mobile cellular subscriptions were added in India. Moreover, the mobile companies have been marketing low-priced phones.

The mobile tariffs in India have also become among the lowest in the world. There has been an unequivocal boom in the telecommunication sector in India in terms of sheer number as well as geographical penetrance. As a result, people residing in remote rural areas of the country have access to a mobile phone, and many of its capabilities. The rural tele-density in India (which is an indicator of telecom penetration in the country) increased from 5.89% in 2007 to 37.52% in 2011. Similarly the urban tele-density increased from 48.10% to 167.46% during the same period.

This boom in the telecommunication sector has provided public health officials with a golden opportunity to reach out to millions of people at a

fraction of the cost. The WHO Global Observatory for eHealth (GOe) defines mHealth or mobile health as “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices. mHealth involves the use and capitalization on a mobile phone’s core utility of voice and short messaging service (SMS) as well as more complex functionalities and applications including general packet radio service (GPRS), third and fourth generation mobile telecommunications (3G and 4G systems), global positioning system (GPS), and Bluetooth technology”.

Worldwide, mobile phones are being commonly used in Human

Immunodeficiency Virus (HIV)/Acquired Immuno Deficiency Syndrome (AIDS), maternal and newborn health, malaria and tuberculosis control. mHealth is being used in many forms in health related programs in India as well. Prime example of use of mHealth technology in India is the Mother and Child Tracking System (MCTS) which has been in operation since 2009. Its objective is to track each pregnant woman from the time of registration up to delivery, including postnatal care, and the child from the time of its birth to the end of the immunisation period. Sending mobile based SMS to beneficiaries to alert them regarding services due to them, or services which have become overdue are examples of how mHealth is utilized in MCTS.

mHealth has also been utilized for health promotion and awareness generation during the 2015 and 2016 outbreak of dengue and chikungunya in Delhi. SMS capabilities were utilized by the municipal authorities and government of Delhi to spread awareness about control of mosquito breeding, various preventive aspects of the diseases and avenues for seeking help. Another example of effective use of mobile technology in India is using SMS to communicate with the 3.2 million Central Government Health Services (CGHS) beneficiaries spread across India.

With growing burden of non-communicable diseases (NCDs) in India, it is time to explore the possible utility of mHealth technology as a preventive strategy. NCDs accounted for 53% of the deaths and 44% of DALYs (disability-adjusted life years) in India in 2004, and it is predicted that they will be responsible for almost three-quarters of all deaths in India by 2030. In low-resource settings, health-care costs for cardiovascular diseases, cancers, diabetes or chronic lung diseases can quickly drain household resources, driving families into poverty. The exorbitant costs of NCDs, including often lengthy and expensive treatment and loss of breadwinners, are forcing



millions of people into poverty annually and stifling development of the nation. Morbidity and mortality due to chronic disease is largely preventable through counselling, risk factor modification, and medication adherence, but implementation of these interventions is difficult in resource-limited settings through conventional means. Harnessing mHealth technology can potentially be used to effectively address this glaring lacuna in the health delivery system.

Four common modifiable behavioural risk factors are associated with increased risk of NCDs. These are tobacco use, physical inactivity, unhealthy diet and harmful alcohol use. These behaviours lead to four key metabolic or physiological changes that increase the risk of NCDs: raised blood pressure, overweight and obesity, hyperglycemia and hyperlipidemia. Due to the common risk factor pool of many NCDs and the high prevalence of these risk factors in the community, health






messages need to be provided to large populations. One of the major advantages of mHealth interventions in this case is the fact that it can be delivered to a large number of individuals in a relatively shorter time.

Randomised control trials utilizing mHealth technology (SMS, phone calls and software applications) have been conducted in developed countries like Germany, USA, UK and Sweden. These studies have found such interventions to be particularly promising in controlling risk factors such as smoking and alcohol use. Diet and physical activity were also found to be improved using mHealth interventions in such trials. However, almost all of the studies have been conducted in subjects who already had diseases such as diabetes or hypertension or were obese. Evidence of effectiveness of such interventions in the general population is severely lacking.

Most of the research on utility of mHealth in management of NCDs have been related to medication adherence and self-care practices. Results of such studies are also encouraging and suggest avenues for effective rolling out of mHealth interventions for better patient management.

Though there are many advantages of mHealth, it is not free from barriers and challenges. There is currently a lack of evidence regarding the use of mHealth for NCDs, especially from developing countries and very little is known about the practice, effectiveness

and acceptability of mHealth applications for control of NCDs in such countries. Some issues which need further research include the types of communication to be used in mHealth interventions, outcomes of such interventions, uptake of mHealth by the consumers, extent of willingness to share personal information, additional yield of mHealth based information to the current mode of health information generation, and the amount of behavioural change mHealth can bring in.

It has also been realized that outcomes of mHealth interventions need to be measurable in terms of a more objective and accepted measure of health intervention performance such as cost per disability adjusted life year (DALY) averted. Another limitation is the operational issues involved in implementation of mHealth interventions. Scaling up of numerous mHealth pilot studies to the national level and properly engaging healthcare workers and communities in the process remains a big challenge. Implementing a universally acceptable system in a culturally diverse country like India, with different levels of technical competency, different languages, and different levels of social, economic, and scientific development is, indeed, a great challenge. 

(The authors are from Department of Community Medicine, Maulana Azad Medical College, New Delhi)



WHO Deliberates on Sound and Hearing Loss

The World Health Organization (WHO) recently organized the 2nd Stakeholders' meeting for its programme on prevention of deafness and hearing loss. The meeting followed the adoption of the World Health Assembly resolution on prevention of deafness and hearing loss. It highlighted the need for global action on hearing loss, using a



multi-stakeholder approach built upon the synergies and actions identified by partners during the 1st Stakeholders' meeting held in July 2016.

The stakeholders' meeting was organized with the main objectives such as the World Health Assembly Resolution on hearing loss including development of the World Report on hearing, share WHO's current activities and actions in the field of hearing, discuss strategies for global action for hearing loss and review impact and organization of the World Hearing Day.

The meeting was opened by **Dr Etienne Krug, Director of Department for Management of Noncommunicable Diseases, Disability, Violence and Injury Prevention, WHO**. Dr Krug welcomed the participants and congratulated them on the passing of the first resolution on hearing in 20 years. He emphasized the need for strengthening collaboration, prevention efforts and discussion of next steps following this resolution.

After brief introductions, **Lady Jean Wilson, Founder Trustee of Hearing Conservation Council** gave a history of the evolution of global ear and hearing care. She described the journey from initial efforts in the mid-1980s to

adoption of this year's resolution.

"To secure this resolution, it has been described as reaching a summit, but it's but a foothill on the rugged mountain if we are one day to attain universal access to ear and hearing care", Wilson said.

Dr Shelly Chadha, Technical Officer, Prevention of Deafness and Hearing Loss, WHO, emphasized the need for even greater advocacy and multi-stakeholder action to ensure implementation of the newly adopted resolution. She briefly summarized the function of WHO and outlined the contents of the resolution. She explained the relevance of global action for ear and hearing care around the world in terms of awareness-raising, political advocacy, and public health action. Dr Chadha identified four strategic areas of WHO's work to implement the resolution: evidence-based advocacy; data; technical support; and the Make Listening Safe initiative.

Dr Alarcos Cieza, Coordinator of the Prevention of Blindness and Deafness, Disability and Rehabilitation Unit presented the four meeting objectives: (1) discussion of consequences and actions following the resolution, (2) dialogue about global

alliance on hearing loss, (3) initial brainstorming on first world report on hearing, (4) review feedback of World Hearing Day.


Conclusions and next steps:

- A global alliance and world report are needed to move forward global action for hearing loss.
- 'Education for all', 'data for hearing loss', the 'World Health Assembly resolution' and the proposed 'World Report on hearing' are the strongest drivers of change.
- The world report on

hearing should address the increasing prevalence and impact of hearing loss, and focus on evidence-based strategies to prevent and address this issue.

- The World Hearing Day campaign is a key advocacy initiative that supports global efforts in this field. WHO's materials and concepts though mostly considered effective, need to be updated in accordance with feedback received.
- The issue of global alliance and its host institution needs to be carefully considered and discussed among partners, who can propose a suitable option, based on their collective opinions.

Next steps:

- Meeting report and materials to be circulated to participants.
- Discussion will continue among groups of stakeholders regarding the objectives and actions of a global alliance.
- WHO will initiate implementation of the world report and seek financial resources.
- WHO will continue to compile and analyse the user views and opinions in order to make adjustments and improve effectiveness of the World Hearing Day campaign. 



Health Ministry launches two new contraceptives

The Ministry of Health and Family Welfare has launched two new contraceptives, an injectable contraceptive MPA under the 'Antara' programme and a contraceptive pill 'Chhaya' in the public health system to expand the basket of contraceptive choices to meet the emerging needs of couples.

The contraceptives which are available for free in medical colleges and district hospitals at present, have so far been launched in 10 states that includes Maharashtra, Uttar Pradesh, Madhya Pradesh, Rajasthan, Karnataka, Haryana, West Bengal, Odisha, Delhi and Goa. The contraceptives are safe and highly effective, the 'Antara' injectable being effective for three months and the 'Chhaya' pill for one week, and will help meet the changing needs of couples and help women plan and space their pregnancies. Training of healthcare practitioners from all the states has been

completed as well, with a pool of state and district level doctors and staff nurses being trained to support the roll-out.

To help improve the supply and distribution of contraceptives, the Ministry had recently launched a new software, Family Planning Logistics Management Information System (FP-LMIS), designed to provide robust information on the demand and distribution of contraceptives to health facilities and ASHAs.

In addition, Mission Parivar Vikas, a central family planning initiative, has also been launched by the Ministry. The key strategic focus of this initiative is on improving access to contraceptives through delivering assured services, ensuring commodity security and accelerating access to high quality family planning services.

• The mission is being implemented in 146 high focus districts with the highest total fertility rates in the country. These

districts are in the seven high focus, high Total Fertility Rates (TFR) states of Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Jharkhand, Chhattisgarh and Assam, which constitute 44% of the country's population.

• The main objective of the Mission Parivar Vikas family planning initiative is to bring down the Total Fertility Rate to 2.1 by the year 2025.

The Ministry of Health and Family Welfare, through its sustained family planning efforts, aims to achieve its goal of increasing modern contraceptive usage and ensure that 74% of the demand for modern contraceptives is satisfied by 2020, with continued emphasis on delivering assured services, generating demand and bridging supply gaps. The Ministry's focus remains on increasing awareness and demand through a holistic communications campaign that has simultaneously been rolled out across all states of India. 



Promoting Wholesome Health

The need for organs transplant can be minimised by a synergy of the evidence-based science of modern medicine with the complementary and time honoured art of drug-free modalities of various alternate or traditional systems of health. This integration restores the disturbed 'internal milieu' of the individual to initiate one's own natural inherent healing that leads to elimination of all sickness and restores positive health and total wellness

BY DR R K TULI

India has launched a very important organ donation and transplant programme at national level under the aegis of the National Organ and Tissue Transplant Organization (NOTTO), set up under Directorate General of Health Services, Union Ministry of Health and Family Welfare.

The importance of this programme is based on the medical belief that organ transplant is essentially the only treatment for end stage failure of kidney, liver and heart, or tissue replacement in case of cornea and heart valves damage, etc. Each organ transplant requires either donation by a blood related donor or a tissue matching cadaver. There is a serious shortage on both of these counts

worldwide. After an aggressive national campaign for one year, we could record a mere 700 cadaver donations in last one year!

Kidney transplantation is by far the most frequently carried out organ transplant globally. NOTTO estimates the need for 100,000 cornea; 250,000 kidney; 80,000 liver and 50,000 heart transplants, respectively, in the country every year. The possibility to meet this requirement in near future appears highly remote if we observe the global history of organ and tissue transplantation over the past 25 years.

LIMITATIONS OF AVAILABLE TECHNOLOGY: The success of organ donation programme lies on the

underlying dictum, "If we are prepared to receive a transplant should we need one, then we should be ready to give." But the ground reality is very different if we are to learn from the National Programme for Control of Blindness launched since 1976, which deals with much easier, simpler, cheaper and easily reversible 'Errors of Refraction' correctable by providing mere glasses; and 'cataract' in which vision can be restored by a simple five minute surgery at a very small cost. But, unfortunately, the number of blind persons in India has increased from 12 million 10 years ago to currently over 18 million - showing an increase of 50% more in just the last decade.

The largest eye bank in Asia at LV Prasad Eye Institute of Hyderabad's Ramayamma International Eye Bank leads the world record to have harvested over 36,000 donor corneas, but transplanted a mere 20,000 of them to needy patients in past 25 years.

The projected need of 250,000 kidney transplants every year appears utopian when the Indian transplant registry reveals the total number of such transplants carried out in our country in last 25 years (1991 to 2015) is just 20,952. The maximum number of kidney transplants carried out in the whole country was about 3000 last year. No current figures are available on actual number of liver or heart transplants, etc., from the registry.

Even in the USA, where 800,000 people suffer from NYHA Class IV advance heart failure, only 2000 transplants could be conducted in the whole country last year, which is out of the figure of 3500 heart transplants carried out in the whole world.

We should take appropriate stock of limitations of the scope of any such programme based exclusively on sophisticated modern surgery and medical care, and also for simple lack of its accessibility, availability and affordability. We have to seriously think and plan right at this stage to overcome challenges of this very important national organ and tissue transplant campaign. At this stage, in comparison, we appear to be more realistic in our aspiration to reach the Mars, even though at the expense of hunger, backwardness, illiteracy and poor health of the people in our country.

OBJECTIVE OF THIS STORY: Our objective is to explore simple, accessible, affordable, at the same time easily reproducible lessons learnt from 'EUREKA' stories of a few which inspire us to explore further so that we can complement the NOTTO vital project to save lives of those suffering from irreversible organ damage and, also, overcome its inherent shortcomings. These stories teach us



that the need for organs transplant can be minimised by successful reversal of damage of various organs by an optimum synergy of drug-free modalities of recognised systems of health, termed holistic medicine, and go a long way to achieve 'Health For All' in the country. The greatest advantage is that this therapy does not involve any donor, or the sophisticated surgical technology and expensive medication available only to the few exclusive institutions in the country.

EUREKA-1

Dr Deepak Chandra is a 1964 batch alumnus of Armed Forces Medical College, Pune. He is a very popular Family Physician in Kanpur. His Clinic was shut down for three years during his sickness, but it bounced back to its old glory as soon as he resumed work in year 1998, after regaining his health. He continues to enjoy drug-free wellness to live life fully nearly 20 years after recovery. His status of health, today, is certainly a record

better than any liver transplant recipient anywhere in the world!

Dr Deepak Chandra writes, "I've been given a second life by holistic medicine therapy! In the year 1997, I had slipped into Hepatic Coma & Total Renal Shut Down following Chronic Progressive Multi-Virus Hepatitis. The attending specialists at AIIMS gave up on me and I was discharged from the ICU! At this critical stage my family sought the services of renowned holistic medicine physician Dr R.K. Tuli. Due to his sincere and vigorous support, my health gradually improved and I finally regained normal kidney and liver functions. What's amazing is that the universally incurable Hepatitis 'B' & 'C' antigens and the entire virus load got eliminated from my body. At the end of one year of holistic medicine therapy, my health had bounced back to be better than in previous ten years. I was able to resume my medical practice which was shut down due to my sickness. I have maintained good health ever since, and I find myself

fully healthy. Also, all my medical parameters including virus-free status have continuously maintained within normal limits ever since.”

EUREKA-2

Manoj Sohi from Haridwar District endorses, “I had been suffering from uncontrolled blood pressure leading to kidney problem (HTN + CKD – ESRD + Renal Lithiasis + Anemia) with poor health, for last one year. The doctors advised me to undergo dialysis and kidney transplant. But, ever since I came to Dr Tuli, it was a great experience. My mental, physical and emotional health started improving immediately, the blood pressure was controlled, and by 3-4 months of treatment at the SOHAM Clinic, my water retention is all gone, my hemoglobin has improved from 7.2 to 12.0 gms, as the kidney functions have improved a lot. I feel proud to share that my total health has improved from a grade of 2/10 to 10/10 now. Dr Tuli is a God for me.”

EUREKA - 3

Colonel B. K. Chathli joined 31st Course of Indian Military Academy in the year 1963, and was commissioned into the premium GORKHA RIFLES. He rendered exemplary service in both the 1965 & 1971 wars, and always volunteered to serve upfront in the most challenging terrains throughout his career to earn highest accolades and respect from all. Having recovered his health fully, at the age of 73 years, he continues to serve the society with equal zeal in various capacities.

The decorated veteran Colonel B.K. Chathli likes to share, “In the year 2004, I was diagnosed to suffer from Ch. Renal Failure-ESRD. In 2005, I was put on dialysis three times in a week. Doctors told my daughter that I need kidney transplant. But, her boss Ms. Prema Sagar recommended that I consult Dr Tuli at the SOHAM clinic. With great suspicion and reservation, making sure that the holistic therapy in no way interfered with my ongoing medical treatment, I started it here. Today, 11 years later and at the age of 76 years, as I visit this clinic for my wife’s



The NOTTO dream of ‘OrganTransplant For ALL’ should concurrently explore to complement the potential of simple, drug-free, easily accessible and affordable model of Holistic MediCare ‘like solar power to existing energy network in the country’ that promises highly reproducible reversal of organ damage **Dr. R. K Tuli**

treatment, I feel proud in writing that with his healing touch, I got fully cured in nearly four months. Annual medical check-up confirms that both my kidneys have remained fully functional, and I’ve lived my life fully ever since. I pray to God for Dr Tuli’s greater success to cure all others like me.”


It’s a highly reproducible phenomenon, as elucidated and endorsed by other beneficiaries of this therapy, thus qualifying the need for its scientific validation. The management of each patient has been much simpler, easier, healthier, at a fraction of cost, and displays certainly far superior and lasting results restoring highest quality of life compared to progressive morbidity and eventual mortality in conventional treatments.

WHAT’S HOLISTIC MEDICINE: Holistic Medicine is the wholesome approach to health where each individual is treated as a whole ‘body, mind & spirit’ by a synergy of the evidence based science of modern medicine with the complementary and highly reproducible time honoured art

of drug-free modalities of the various officially recognised alternate or traditional systems of health to restore the disturbed ‘internal milieu’ of the individual to initiate one’s own natural inherent healing that leads to elimination of all sickness and to restore positive health and total wellness.

CONCLUSION: Let’s be closer to ground reality and prepare better in projecting this huge and very noble programme, lest it meet the fate of WHO-UNICEF sponsored global programme “Health For All By 2000 A.D.”

As a specialist in holistic medicine and a global pioneer in promoting this all-inclusive and comprehensive approach to health, I would like to say, “If we were to learn a lesson and be wise, we should concurrently expand our vision and be guided by our National Health Policy as well as the Prime Minister’s SKILL INDIA programme, to complement conventional medical care with the easily accessible simple potential of the all-inclusive integrated, non-conflicting drug-free modalities of recognised traditional or complementary alternate systems of health, termed as holistic medicine.”

Holistic medicine been found to be very efficient to arrest and help in reversal of the damage to sick organs even in end-stage organ disease. Therefore, we must tap its potential for reversal, restoration and rejuvenation of sick persons. It can significantly reduce the gap in need of essential transplants. We may have limited example of its scope at this stage, but it has the potential of a “eureka” possibility through large scale scientific studies to make a unique global beginning to ensure Health for All. 

(The author is Visiting Professor, Indira Gandhi Technological and Medical Sciences University and Chief Consultant Holistic Medicine SOHAM The Clinic for Holistic MediCARE & CURE, New Delhi)

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