DIALOGUE

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VACCINES

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EDITORIAL

Dr. Suchitra Kamath

Once Buddha was walking from one town to another with a few of his disciples. While travelling, they happened to pass a lake. As Buddha was thirsty, he told one of his disciples to get water from the lake.

The Disciple obliged and walked up to the lake. When he reached it, he noticed few people washing clothes in the lake, a bullock cart was crossing the lake at that very moment.

The disciple saw that the water had become muddy and foul. He could not possibly take that dirty water for Buddha. So, he returned and told Buddha that the water was dirty and not fit to drink.

A half hour later, Buddha again told the disciple to get water from the same lake. The Disciple was perplexed, but obediently agreed and walked up to the lake. This time, the disciple noticed that water was crystal clean. The mud had settled and it was fit to drink. He collected some water in a pot and took to his master.

Buddha smiled and said," See, what did you do to make the water clean? You did nothing. You just let it be, let the mud settle on its own. You got pure water. Your mind is exactly like that. You do not have to put any effort to calm your mind. It will happen .It is effortless .

This pandemic has tested our physical and mental wellbeing. Greater happiness and calm mind is in fact needed more than ever.

A small study published in the Indian Journal of Psychiatry in May showed that Covid pandemic took a toll on the mental health of doctors. The doctors who participated in this study experienced symptoms of Anxiety, Depression due to long duty hours, Involvement of high risk procedures etc. Besides this, loss of loved ones, isolation, inability to spend time with family, fear to infecting near and dear ones were other complaints.

Also, dealing with unknown disease, uncertainty in line of management, risk of contracting diseases themselves made them very anxious. Helplessness and frustration about unable to do anything for dying patients added toll on health of their minds.

Professor Alex Wood and his team with Jeffrey Froh and Adam Geraghty in a paper published titled "Gratitude and Well being - A review and theoretical integration concluded that gratitude is related to a variety of clinically relevant phenomena including psychopatholoy depression, adaptive personality characteristics, positive social relationships and physical health particularly sleep and stress. A group of 247 people with all signs of anxiety disorders and worrying habits were choosen. They were asked to maintain a daily list of events for which they were grateful right from waking up in the morning. Through controlled, **Gratitude Intervention**, there was marked reduction in dissatisfaction and worry.

Krishna has said to Arjuna that your whole being needs to surrender for gift of peace, happiness and eternal abode. This surrender means deep gratitude towards existence, towards life and all valuable things life has given us.

Researchers are now discovering that a sense of gratefulness has not only profound impact on our physical health but our mental health also.

In this difficult and unusual times, let us all stand by one another in sickness and health and be happy that we have our Doctors community to fall back in hour of need.

Extend your hand of help whenever your fellow Doctor calls you.....

This issue is dedicated to "Vaccines" as we are eagerly awaiting the arrival of vaccine against Corona virus.

PRESIDENT'S ADDRESS

Dr. Sunit Upasani

Hello friends,

IMA Dombivli PATRON Dr. Mangesh Pate, Hon Secretary, Past Presidents, President Elect, Hon Treasurer, all Managing Committee Members and above all my IMA family.

It's a honour and privilege for me to accept the prestigious post of presidency of IMA Dombivli in the 50th year.

Friends take this opportunity to share my mann ki baat with all of you.

In this golden jubilee year of IMA Dombivli ,when I was elected as Vice President, we, as a team had plans for the branch.

I was aware of responsibilities of VP and as per constitution may need to stand in place of President if occasion arises. But though it's a known thing it was like ...EXPECT THE UNEXPECTED.

When due to unprecedented, personal reasons respected Dr Vandana Dhaktode presented her resignation, Presidentship became a reality for me.

So naturally I had lots of trepeditions while accepting the post, but more than that was picking up the mantle of leading IMA DOMBIVLI in this testing times with a great pride.

It was a challenge to accept the post when our entire fraternity was thrown in turmoil which we have never faced before.

But like a proverb we learned in childhood.

"THE MOMENT YOU STOP ACCEPTING CHALLENGES, YOU STOP MOVING FORWARD"

Entire Managing Committee had meetings for coming to solution and here I am accepting the post of President.

Friends, our medical profession is crushed from all sides by Gov, politicians, media, patients and black sheeps of our own fraternity.

Daily we are bombarded with irrational regulations, notifications, capping of treatment and investigations, raised charges of BMW. We are threatened with epidemic act in form of cancellation of registration of our hospital and our registrations.

On one day we are applauded with clapping and lighting diya and on other hand our own covid martyrs were denied claims by government.

We doctors have become like Abhimanyu of Mahabharata caught up in this viscous circle.

But believe me friends, we have to be United to fight this war and our organisation Ima is there to back us and protect us like a mother.

This trouble times and hurdles will be there but we as team are a strong United family who care, trust and respect each other.

Though I will be face of IMA Dombivli for next 6 months it will be a united voice of team who will hold my hand and guide me and take our branch to new heights.

Most imp. task we have now is IMAFEST our 21st Annual Conference and IMA MS Cultural Festival NAVRANG.

IMAFEST will be on 7th and 8th Nov. on virtual platform and Navrang will be from 6th Nov. to 8th Nov. everyday eve on virtual platforms. Details are been shared

I know my all dear IMA members will support our IMAFEST and Navrang and make it grand success as always

Friend, with folded hands I request each IMA member to be active

STRENGTH OF TEAM IS EACH INDIVIDUAL MEMBER & STRENGTH OF MEMBER IS THE TEAM

NO ONE PERSON CAN WHISTLE A SYMPHONY, IT TAKES WHOLE ORCHESTRA TO PLAY.

So dear friends let's all make it a melodious journey in this golden jubilee year.

Thank you all.

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SECRETARY SPEAKS...

Dr. Hemant Patil

Dear members,

Greetings from Desk of Secretary. Friends, we are now actually living in with COVID-19 our companion for last 6 months. After the early gloomy days with lot of uncertainty, anxiety and fear we are moving towards new normal with sound knowledge, courage and positivity. Right from day one our team has been on forefront to fight and keep all our members safe.

Last two months we have conducted various programmes for community awareness, of branch activities. All the subcommittees are performing excellently in the respective fields. Dr Mangesh Pate, our patron has been a guiding light in all difficult situations and his work for fraternity has been acknowledged at national level. With the fantastic serosurveillance study which we had conducted under the able guidance of Dr Archana Pate has been accepted and acknowledged at all the levels.

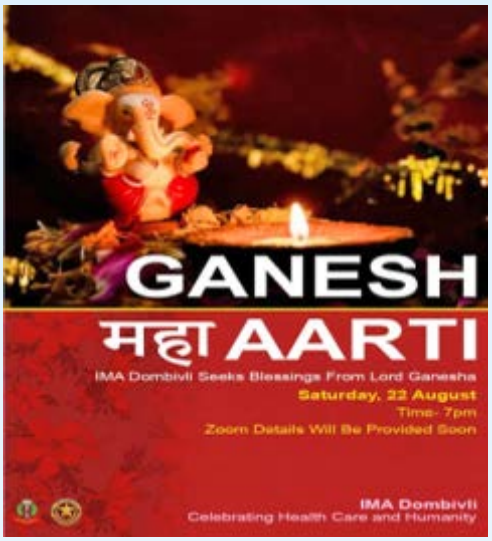
HBI team has been very active in dealing issues with hospitals under active chairperson Dr Meena Pruthi. MPH team is working very hard to raise community awareness an important responsibility of us in pandemic with great support of chairperson Dr Bhakti Lote. Cultural team lead by Dr Niti Upasni is keeping morals up in this difficult time. Our leaders are now representing at national level a real proud moment for our branch. And most importantly our scientific committee always active to update all of us with wonderful lectures by eminent speakers kudos to Dr Archana Pate and team.

As a fraternity we are fighting a battle with our lives at risk but we are imposed with unacceptable regulations time and again from government. IMA has always been protecting it's members by fighting against injustice. Our branch conducted a very large meeting of all hospital owners in Thane district with overwhelming response under the guidance of Dr Mangesh Pate with great leaders as dignitaries against such notifications.

Our branch proudly started in collaboration with KDMC and PLASMA BLOOD BANK first plasma donation centre in Dombivli.

Now our team has been led by new president Dr Sunit Upasni a senior paediatrician and a very experienced IMA member. We will achieve many more accolades under his capable guidance and conquer the challenges ahead. Wishing all of you a very happy and healthy time ahead.

Cultural Committee

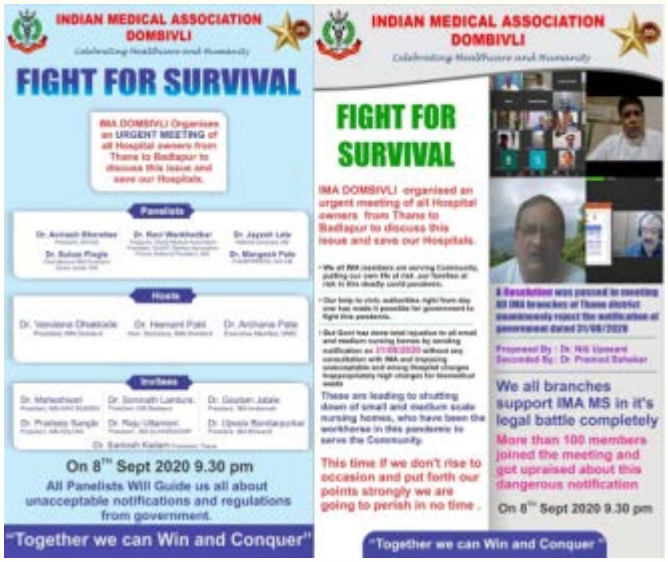


Scientific Committee

Agitation by Burning Registration

Homage to Covid Martyrs

Fighting for Fraternity



THE HISTORY OF IMMUNIZATION

Dr. Nayana Chaudhari
Senior Anaesthesiologist

Since time immemorial, man believed in Prevention rather than Cure. Buddhist monks of early times drank snake venom to gain immunity from snakebite. Epidemics of smallpox were recorded even in BC era. To prevent it, 'inoculation' was practiced in China & India as early as 200 BC. Grinding scabs of smallpox lesion and blowing it into nostrils or scratching material from smallpox lesion and inoculating it into a skin cut of a healthy person were the methods practiced.

Though inoculation was widely practiced, smallpox continued to devastate mankind. In 1796, Edward Jenner , an English Physician achieved a breakthrough, which paved the way for immunization. He observed that milkmaids infected with cowpox were immune to smallpox even during epidemics. He introduced pus from cowpox lesions into a cut in the arm of an 8 year old boy. The boy developed mild fever. 6 weeks later, Jenner exposed him to the variola virus & proved that he was immune.

In 1803, the term vaccination was coined, which was more specific, reliable, safe & effective than variolation. But how vaccines were made & transported in those days is unimaginable in today's era. Vaccines were made in human bodies & humans acted as 'vaccine couriers'. A person was vaccinated & pus from his lesion was used to inoculate another . Using this 'human chain' or 'arm- to- arm supply', the vaccine reached India in1802. It was only in 1980 that smallpox was declared as eradicated from the world.

In the 20th century, there was a lot of research & development in this field. Vaccines are now available against most infections, including those by CMV, HSV etc. The recent application of molecular genetics & genomics, recombitant techniques, newer delivery systems like DNA vaccine, viral vectors, plant vaccines promise a bright future. We might soon have a vaccine against HIV. Scientists are working on therapeutic vaccines against allergies, autoimmune conditions, addictions, etc.

But what humankind DESPERATELY awaits today is the vaccine against COVID-19.

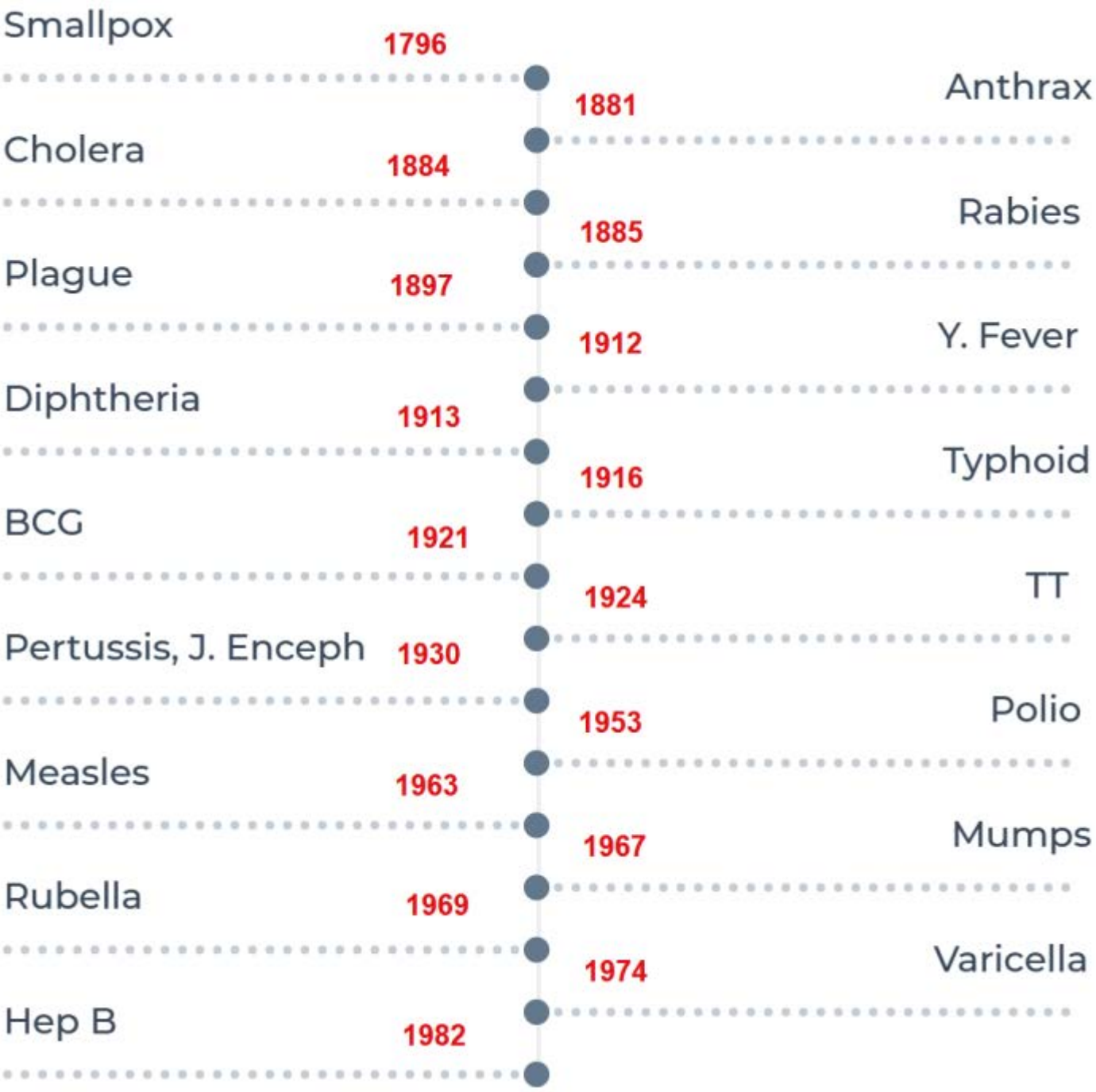
• • •

There are number of licensed vaccines manufactures in India. These manufactures has installed capacity and are licensed for production or marketing of at least one or more vaccine in India.

- BCG Vaccine Laboratories, Guindy
- Institute of India Ltd, Pune
- Pasteur Institute of India, Coonor
- Central Research Laboratory, Kasauli
- Hafficine Biological Product C Ltd., Mumbai
- Human Biologicals and Immunologicals, Hyderabad
- King Institute of Preventive Medicine, Chennai
- Pasteur Institute, Shillong Bio Vaccines, Hyderabad
- Dano Vaccines. Hyderabad
- Bharat Immunologocal and Biologicals Company LW, Bulandshahar
- Panacea Biotech Ltd, Delhi Bio-med (P), Ghaziabad
- Bharat Biotech International (L), Hyderabad
- Sanofi Pasteur India Pvt Ltd., Delhi
- Zydus Cadilla, Ahmedabad
- Chiron Behring Vaccine Lab. Ankleswar, Gujarat
- Sanofi (Aventis) Pasteur, New Delhi

Source : Ref. 45.

Timeline of invention of vaccines



BIOCHEMISTRY OF VACCINES

Dr. Riitu S Chaandel
MBBS, MD Biochemistry

Right fight with the organism with the right tools will definitely lead to survival of mankind, and save time and money

Currently, we all are scared of a nonliving particle one hundredth the diameter of a human hair. Though it's a small virus, there is no specific antiviral drug against it. A vaccine for this virus SARS CoV 2 will be life saving. History proves that vaccination has always been a turning point in the war between microbes and humans. Improved sanitation, wearing masks, using sanitizers and social distancing is helpful, yet vaccines represent the most cost-effective life-saving tool.

The body has its own defence mechanism to fight against the microbes. It includes the lymph nodes, lymphatic vessels, thymus, spleen, Peyer's patches, bone marrow, appendix, tonsils and adenoids. Also in response to any foreign particle entering into the body, antibodies are produced.

Vaccines can be a weakened form of the pathogen (attenuated) or a portion of the microbes' protein structure (nucleotide , viral vector based or subunit particles) or killed form of the same or can be synthesised from nanoparticles. To make the vaccine more effective, Adjuvant is administered along with it. Adjuvants are biochemical preparations like double stranded RNA (dsRNA) or lipopolysaccharide (LPS) or a fatty component of certain bacteria that enhances the potency of vaccine.

"We have now found a highly specific biochemical pathway required for adjuvanticity," says Scripps Research Professor Bruce Beutler. They have shown that LPS and dsRNA create the adjuvant effect by co-stimulating the immune system and inducing the synthesis of type I interferons.

Biochemical Pathway of Adjuvant:

The mechanism on which adjuvant works is molecular "bridge" between innate and adaptive immunity. When an adjuvant is introduced into the bloodstream, it stimulates the innate immune cells like macrophages. Adjuvants bind to receptors on the macrophages, and it in turn stimulates TIR-domain-containing adapter-inducing interferon-□ (Trif). Trif stimulates the maturation of the macrophages by producing type-1 interferons. These type-1 interferons activate other macrophages (paracrine activation), or activate the same macrophage that produced them(autocrine activation). In both situations, the activated macrophages then express "costimulatory" molecules like CD80, CD86, and CD40 that finally activate T-cells of the adaptive immune system.

Biochemical mechanisms in which vaccine works

The basis is that both humoral and cellular immune responses are important for clearing the body off the microbe.

1) Recombinant Virus Vector expresses target protein in cytoplasm of the host cell, and thus act as an endogenous antigen. Major Histocompatibility Complex (MHC) I presents them to the CD8+ Tc cells leading to Cell Mediated Immune response

2) Sub unit vaccine candidate contains major antigenic determinants that produce neutralizing antibodies and T-cell immune responses against infection making it an important target for vaccine development.

3) Nucleotide based vaccine

a) DNA Vaccine

They transcribe and translate in the host cell forming proteins. Inside the cell, DNA vaccines are sensed by a variety of innate immune receptors i.e. STING/TBK1/IRF3 pathways. The formed protein moves to MHC I pathway or is released as an exogenous antigen and are presented by MHC II to the CD4+ TH cells leading to humoral immunity. TH cells also

produce cytokines thus conferring Cell Mediated Immunity.

b) Exogenous mRNA is also immunostimulatory

Cells can sense foreign RNA through Pattern recognition receptors (PRRs) like Toll Like receptor (TLR) TLR3, TLR7 and TLR8 in the endosomes and RIG-I, MDA-5 and PKR in the cytoplasm. This activation of the PRRs by mRNA vaccines produces chemokines and cytokines such as Interleukin-12 and Tumor necrosis factor, thus building the innate immunity.

4) Attenuated vaccines

Attenuated vaccines are produced by Gene deletion of various essential genes. They are efficient in generating a strong cytotoxic T-cell response.

5) Nanoparticles

Designing and building nanoparticles out of proteins and attaching viral molecules in a repetitive array by using computational Biology and Bioinformatics, can lead to production of ideal vaccines.

A computational protein-design algorithm can structure these nanoparticles as the antigen to the immune system. Million variants can be tried on the computer before finding the suitable shape, protein composition, protein sequencing to make the ideal candidate. Nanoparticle candidate vaccines also decreases or wipes off the usage of adjuvant, thereby proving that its self sufficient.

One shot, saves lives

Vaccines reduce mortality, saves lives and improves more lives in turn.

The technological advances can help us move in the right direction. It takes years to produce a vaccine, which might become obsolete as the microbes keep evolving. We just need to ask the right questions in order to progress in this front for developing the best version of the vaccine with the resources that we have.

"Necessity is the mother of all inventions"

Advice given during influenza epidemic of 1918-1919.. still applicable today after over 100 years

Do's and Don't's for Influenza Prevention

(Douglas island News)

- Wear a mask.
- Live a clean, healthy life.
- Keep the pores open - that is bathe frequently.
- Wash your hands before each meal.
- Live in un abundance of fresh air, day and night.
- Keep warm.
- Get plenty of sleep.
- Gargle frequently (and always after having been out) with a solution of salt in water. (Half teaspoon of salt to one glass - eight ounces - of water).
- Report early symptoms to the doctor at once.
- Respect the quarantine regulations.
- Avoid crowds. You can get the influenza only by being near some one who is infected.
- Avoid persons who sneeze or cough.
- Do not neglect your mask.
- Do not disregard the advice of a specialist just be cause you do not understand.
- Do not disregard the rights of a community - obey cheerfully the rules issued by the authorities.
- Do not think you are entitled to special privileges.
- Do not go near other people if you have a cold or fever - you may expose them to the death. See the doctor.
- Do not think it is impossible for you to get or transmit influenza.
- Keep your hands out of your mouth.
- Do not cough or sneeze in the open
- Do not use a public towel or drinking cup.
- Do not visit the sick or handle articles from the sick room.
- DON'T WORRY.

VACCINATION DURING PREGNANCY

Dr Aspi Raimawala
M.D., D.G.O., D.F.P.
Hon. Obst. Gynae. / Incharge, Laparoscopic Steriliation
Training Program EPAI, Mumbai

Pregnancy or motherhood is a momentous occasion in a woman's life. For someone it comes easily and for some it comes with great difficulty. It also brings many questions in the mind of expectant mother like- hope everything will go well. Is my baby going to be alright? What should I do to keep myself and my baby well and healthy?

One such measure is vaccination during pregnancy.

Although pregnant women are not immuno-suppressed in the classic sense, immunologic changes of pregnancy may induce a state of increased susceptibility to certain intracellular pathogens, including viruses, intracellular bacteria and parasites.

Infant immune system does not mature until around 2 to 3 months. Hence they require protection by way of passive immunity from mother when they are in utero. It also provides protection of mother from various diseases. And hence the importance of vaccination during pregnancy.

Types of Vaccine :

There are different types of vaccines available.

1) **Live attenuated vaccine (Attenuated) :**

   In this type a disease causing virus or bacterium is weakened in laboratory so it can not cause disease, though they can stimulate a strong immune response. Examples are MMR, Varicella, Zoster, Yellow fever, Intra nasal influenza, Rotavirus.

2) **Inactivate vaccine (Killed) :**

   This consist of virus particle, Bacteria or other pathogen that is grown in culture and then lose disease producing capacity. They don't provide strong immunity as live vaccine. Examples are Inactivated Polio virus (IPV), Whole cell pertussis, Rabies, and Hepatitis A vaccine.

3) **Toxoid :**

   Produced from toxins that is made harmless to elicit an immune Response against the toxin. Examples are Tetanus, Diphtheria. Here immune response is targeted to toxin instead of whole germ.

4) **Subunit vaccine :**

   Made from fragment of pathogen, typically surface protein which stimulates acquired immunity. Examples are Pertussis , Hepatitis B, Human Papilloma Virus, Haemophilus influenze type b, meningococcal and Pneumococcal.

5) **Conjugate vaccine :**

   It combines weak antigen with a strong antigen as a carrier so immune system has stronger response to weak antigen. Examples are Hib conjugate, Streptococcus pneumoniae and Nisseria meningitides

ROUTE OF ADMINISTRATION:

Oral	: Oral Polio Vaccine Rotavirus vaccine
I/M	: TT, Td, Tdap, Hepatitis B, IPV, Hib.
Sub.Cut	: Measels, Yellow Fever.
Intra Dermal	: BCG. TdVac.(Sr.Institute)

VACCINES WHICH ARE SAFE DURING PREGNANCY:

- TT, Td, Tdap
- Hepatitis A
- Hepatitis B
- Influenza
- Meningococcal
- Rabies
- Yellow Fever(Though live vaccine the risk of disease is considered to outweigh the risk of vaccination during pregnancy)

VACCINES WHICH ARE CONTRAINDICATED DURING PREGNANCY :

- BCG
- MMR (Mumps, Measles, Rubella).: Since last few years MMR is included in routine vaccination schedule for children. Those who

have not received it, should get it in pre conceptional period .When taken, pregnancy should be avoided for a minimum period of three months.

- Varicella (Chicken Pox).
- HPV (Human Papilloma Virus) : If woman becomes pregnant during vaccination, delay remaining doses till delivery and restart schedule after delivery. Lactating women can continue breast feeding. MTP is not required.

Vaccination during Pregnancy.

1) **T:T. :** Contains Tetanus Toxoid. e.g. Inj.TT (Cipla)

   1st dose around 18 to 20 weeks

   2nd dose 4 to 6 weeks after first dose.

2) **Td :** Contains Tetanus Toxoid + Diphtheria Toxoid. e.g.SSI TdVac. (Sr.Inst.)

   As per CDC guidelines :

   1st dose 16 to 18 week

   2nd dose after 4 to 6 weeks of 1st dose.

   As per GO India guidelines :

   1st dose at first ANC visit.

   2nd dose after 4 to 6 weeks of 1st dose.

3) **Tdap :** Contains TT+TD+Acellular Pertusis. e.g. Boostrix (GSK). 0.5 ml Pre filled)

   Given between 27 and 36 weeks of pregnancy. It passes passive Immunity to foetus and decreases risk of Whooping cough in baby of less than 2 months by78% and hospitalization by 91%.

4) **Influenza (Flue Shot) :** Made from inactivated virus hence safe during

   Pregnancy. Safe for both mother and foetus.

   Can be given during any stage of pregnancy but usually given around 22 to 24 weeks or 3 to 4

   Weeks after TT or Td injection. e.g. Vaxi Flu 4 (Zydus Cadila) 0.5 ml Vial

   FluQuadri (Sanofi).

   Nasal spray is contraindicated as it is a live vaccine.

5) **Hepatitis A :** Administration of immune globulin is recommended. Effective in more than 85% in preventing acute hepatitis. e.g. Havrix 1440 IU Injection (GSK Pharma) .

6) **Hepatitis B:** Pregnant women who are at high risk for HBV infection should be immunized. e.g. Those having more than one sex partner in last six months ,been evaluated or treated for an STD, recent or current injection drug use or having HBsAg positive sex parter.

   e.g.(1) Revac-B Plus Adult vaccine(Hepatitis B Vaccine- rDNA-

   20 mcg) Bharat Biotech.

   (2) Shanvac-B (Sanofi)

   (3) Cefvac-B Adult. (Cipla Ltd.)

7) **Rabies :**

   e.g. Zuvirab, Human (2.5IU) - Zuventus Healthcare Ltd.

   Powder for injection in 1 vial.

   Regimen:

1) Five dose regimen is administered on days 0,3,7,14, &28 into Deltoid muscle.
2) Four dose regime as two doses on day 0,one dose on each arm

   And then one dose on each of days 7 and 21 in deltoid muscle

8) **Yellow Fever :** Any live vaccine is contraindicated during pregnancy such as Oral Typhoid. The one live vaccine that is routinely exempt from this is Yellow fever vaccine .The risk of disease is considered to outweigh the risk of vaccination during Pregnancy.

   e.g. : Stamaril (Yellow fever virus, live 1000 IU). - 0.5 ml in 1 Vial.- Sanofi India Ltd.

9) **Meningoccocal :**

   e.g.

(1) Meningitis Act injection (meningoccocal Vaccine GroupA,C,Y,& W-135) Sanofi India Ltd.)

   (2) Quadri Meningo Vaccine- Biomed Pharma.

The above list are the vaccine advocated during pregnancy. But in actual practice routinely used vaccine are TT, Td, Tdap and Flue vaccine.

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IMMUNISATION IN CHILDREN

Dr. Ashwini Acharya
Senior Paediatrician

Vaccination has become a vital part of public health and disease prevention. Diseases that were responsible for significant morbidity and mortality have become controllable due to introduction of vaccines. Vaccination has contributed to increase the life expectancy and improve the quality of life.

The National immunisation schedule is prepared by the Ministry of health and Family Welfare (MoHFW). It makes vaccines available free of cost and delivered through various central and state government agencies. The National Technical Advisory Group on Immunisation (NTAGI) which also has representatives from Indian Academy of Paediatrics meet on annual basis to discuss the technical and policy issues pertaining to the program and advice on the introduction of newer vaccines.

India announced its first immunization policy in 1978 as 'Expanded Programme of Immuisation'and introduced six childhood vaccines- BCG, TT, DPT, DT, polio and typhoid in its. In 1985, the Programme was modified as 'Universal Immunisation Programme (UIP) to be implemented in phases manner to cover all districts in the country, one of the largest health program in the world. Subsequently rota virus, intradermal IPV, pneumococcal (in selected states), Japanese Encephalitis vaccines were also included in the Universal Immunization Programme.

The Indian Academy of Paediatrics (IAP) is an organization which is committed to provide unbiased, rational, ethical, practical yet balanced guidelines to its members on various issues. The recommendations by the IAP are the 'best individual practice schedule' for a given child while the NIS by Government of India is meant for public at large. Therefore these recommendations

National Immunization Schedule (NIS) for Infants, Children and Pregnant Women

Vaccine	When to give	Dose	Route	Site
For Pregnant Women				
TT-1	Early in pregnancy	0.5 ml	Intra-muscular	Upper Arm
TT-2	4 weeks after TT-1*	0.5 ml	Intra-muscular	Upper Arm
TT- Booster	If received 2 TT doses in a pregnancy within the last 3 yrs*	0.5 ml	Intra-muscular	Upper Arm
For Infants				
BCG	At birth or as early as possible till one year of age	0.1ml (0.05ml until 1 month age)	Intra-dermal	Left Upper Arm
Hepatitis B - Birth dose	At birth or as early as possible within 24 hours	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
OPV-0	At birth or as early as possible within the first 15 days	2 drops	Oral	Oral
OPV 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks (OPV can be given till 5 years of age)	2 drops	Oral	Oral
Pentavalent 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks (can be given till one year of age)	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Rotavirus#	At 6 weeks, 10 weeks & 14 weeks (can be given till one year of age)	5 drops	Oral	Oral
IPV	Two fractional dose at 6 and 14 weeks of age	0.1 ml	Intra dermal two fractional dose	Intra-dermal: Right upper arm
Measles /MR 1st Dose$	9 completed months-12 months. (can be given till 5 years of age)	0.5 ml	Sub-cutaneous	Right upper Arm
JE - 1**	9 completed months-12 months.	0.5 ml	Sub-cutaneous	Left upper Arm
Vitamin A (1st dose)	At 9 completed months with measles-Rubella	1 ml (1 lakh IU)	Oral	Oral
For Children				
DPT booster-1	16-24 months	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Measles/ MR 2nd dose $	16-24 months	0.5 ml	Sub-cutaneous	Right upper Arm
OPV Booster	16-24 months	2 drops	Oral	Oral
JE-2	16-24 months	0.5 ml	Sub-cutaneous	Left Upper Arm
Vitamin A*** (2nd to 9th dose)	16-18 months. Then one dose every 6 months up to the age of 5 years.	2 ml (2 lakh IU)	Oral	Oral
DPT Booster-2	5-6 years	0.5 ml.	Intra-muscular	Upper Arm
TT	10 years & 16 years	0.5 ml	Intra-muscular	Upper Arm

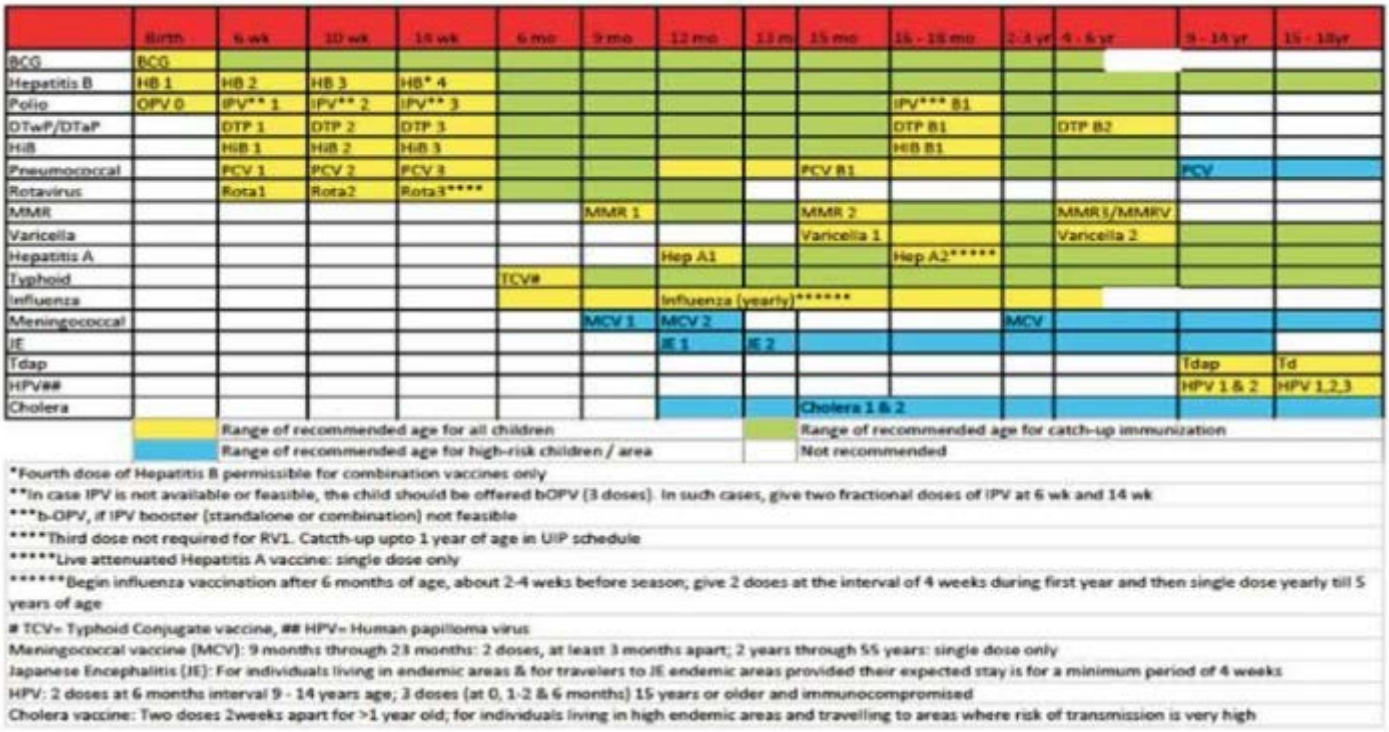
- *Give TT-2 or Booster doses before 36 weeks of pregnancy. However, give these even if more than 36 weeks have passed. Give TT to a woman in labour, if she has not previously received TT.
- **JE Vaccine is introduced in select endemic districts after the campaign.
- *** The 2nd to 9th doses of Vitamin A can be administered to children 1-5 years old during biannual rounds, in collaboration with ICDS.
- #Phased introduction, at present in Andhra Pradesh, Haryana, Himachal Pradesh and Orissa from 2016 & expanded in Madhya Pradesh, Assam, Rajasthan, and Tripura in February 2017 and planned in Tamil Nadu & Uttar Pradesh in 2017.
- $ Phased introduction, at present in five states namely Karnataka, Tamil Nadu, Goa, Lakshadweep and Puducherry. (As of Feb' 2017)

go beyond the National immunisation program and cater primarily to pediatricians in office practice.

VACCINES:

Bacille Calmette Guerin : Childhood TB constitute 15 to 20% of all tuberculosis cases. BCG has

before 90 to 95% of children develop immune response to poliovirus. Birth dose of OPV usually does not lead to Vaccine Associated Paralytic Polio (VAPP). The seroconversion rates of IPV are 90 to 100% after 2 doses given after the age of 2 months. There is better mucosal immunity of OPV and IPV combination schedule as compared to IPV alone.



	Birth	6 wk	10 wk	14 wk	6 mo	9 mo	12 mo	13 m	15 mo	16 - 18 mo	2 - 3 yr	4 - 6 yr	9 - 14 yr	15 - 18yr
BCG	BCG													
Hepatitis B	HB 1	HB 2	HB 3	HB* 4										
Polio	OPV 0	IPV** 1	IPV** 2	IPV** 3						IPV*** B1				
DTwP/DTaP		DTP 1	DTP 2	DTP 3						DTP B1		DTP B2		
HiB		HiB 1	HiB 2	HiB 3						HiB B1				
Pneumococcal		PCV 1	PCV 2	PCV 3					PCV B1				PCV	
Rotavirus		Rota1	Rota2	Rota3****										
MMR						MMR 1			MMR 2			MMR1/MMRV		
Varicella									Varicella 1			Varicella 2		
Hepatitis A							Hep A1			Hep A2*****				
Typhoid					TCV#									
Influenza							Influenza (yearly)******							
Meningococcal						MCV 1	MCV 2				MCV			
JE							JE 1	JE 2						
Tdap													Tdap	Td
HPV##													HPV 1 & 2	HPV 1,2,3
Cholera									Cholera 1 & 2					

Range of recommended age for all children
Range of recommended age for high-risk children / area
Range of recommended age for catch-up immunization
Not recommended

*Fourth dose of Hepatitis B permissible for combination vaccines only
**In case IPV is not available or feasible, the child should be offered bOPV (3 doses). In such cases, give two fractional doses of IPV at 6 wk and 14 wk
***b-OPV, if IPV booster (standalone or combination) not feasible
****Third dose not required for RV1. Catcth-up upto 1 year of age in UIP schedule
*****Live attenuated Hepatitis A vaccine: single dose only
******Begin influenza vaccination after 6 months of age, about 2-4 weks before season; give 2 doses at the interval of 4 weeks during first year and then single dose yearly till 5 years of age
TCV= Typhoid Conjugate vaccine, ## HPV= Human papilloma virus
Meningococcal vaccine (MCV): 9 months through 23 months: 2 doses, at least 3 months apart; 2 years through 55 years: single dose only
Japanese Encephalitis (JE): For individuals living in endemic areas & for travelers to JE endemic areas provided their expected stay is for a minimum period of 4 weeks
HPV: 2 doses at 6 months interval 9 - 14 years age; 3 doses (at 0, 1-2 & 6 months) 15 years or older and immunocompromised
Cholera vaccine: Two doses 2weeks apart for >1 year old; for individuals living in high endemic areas and travelling to areas where risk of transmission is very high

Catch up vaccination: can be given upto 5 years of age.

efficacy of 50 to 80% for prevention of miliary and meninges form of the disease in infants. It provides upto 50% protection against pulmonary tuberculosis in infants. Routine vaccination is done at birth or at first contact. 0.1 ml of vaccine is given intradermally on upper side of left arm.

Oral Polio vaccine: Under UIP all children receive opv at birth, 3 primary doses at 6,10 and 14weeks, at 9 months, 18 months and 41/2years.in 2015, 2 doses of intradermal IPV at the intervals of 4 to 8 weeks was included in the schedule. IAP recommends birth dose of OPV, 3 primary doses of IPV at 6, 10 and 14 weeks, followed by two doses of OPV at 6 and 9 months, and booster dose of IPV at 15 to 18 months and OPV at 5 years. The seroconversion rates after 3 doses of OPV average 65%, and 63% for types I and III respectively. Therefore multiple doses of OPV are necessary

The incidence of VAPP has been estimated at four cases per million birth cohort per year in countries using OPV. The risk of VAPP with the combined OPV and IPV schedule is extremely low. If we adopt an all IPV schedule without the birth dose of OPV, the child may still be at a small risk for VAPP through exposure to the OPV virus through contacts or environment before the child receives its first dose of IPV. Two instead of three doses of IPV can also be used if primary series started at 8 weeks and the interval between the doses is kept at 8 weeks.

IPV catch up schedule: Two doses at 2 months apart followed by booster after 6 months of previous dose till 5 years of age.

In 1995, following the Global polio eradication initiative of WHO (1998), India launched pulse

polio immunisation program which aimed at 100% coverage. Two drops of polio are administered to all children below 5 years during National and Subnational immunisation rounds. India has been free of polio cases including wild polio ones since 2011. On 27th March 2014, WHO declared India polio free country.

DTwP and DTaP Vaccine: Diphtheria, pertussis and whooping cough are three major causes of morbidity and mortality in unimmunised or partially immunised children. National immunisation Program unequivocally endorses the continued use of DTwP (whole cell vaccine) vaccine in EPI because of its proven safety and efficacy. Three primary doses at 6,10 and 14 weeks and two boosters at 15- 18 months and 5 years. DTaP (acellular) is not more efficacious than DTwP but has fewer side effects such as fever, pain and in duration but is expensive. The serious side effects are rare phenomenon even with the whole cell vaccine. The DTwP should be preferred in the primary series as well as booster doses at 18- 24 months and 5 years. DTaP may be used as booster doses if reactogenicity is an issue or if the child develops severe adverse effects following DTwP vaccines or children with neurological disorders. DTap and DTwP vaccines must not be used in children 7 years or older because of increased reactogenicity.

Catch up schedule : In children below 1year, 3 primary doses at 4 weeks interval can be given.

1 to 7 years: 3 doses are given at 0,1 and 6months.

Second childhood booster is not required if the last dose has been given beyond the age of 4 years.

Tdap : It is used to prevent tetanus, diphtheria! And pertussis in adolescents and adults with reduced concentrations of diphtheria and pertussis components. One dose is given to all children aged 11.

Catch up vaccination : children aged 7 to 10 years, if not vaccinated with DTwP/ DTaP, they should receive Tdap, and Td as additional doses.

Children aged 11 to 18 should receive a Tdap followed by Td booster doses every 10 years thereafter.

Measles vaccine: A significant number of cases of measles occur below the age of 12mths, hence completed 9 months of age has been recommended as the appropriate age for measles vaccination in India. If the vaccine is administered within 2 days of exposure it protects against the severity of the disease.

A second dose of MMR is to protect children who failed to seroconvert against primarily mumps and less commonly against Rubella. It is usually given at 15 to 18 months, however can be given at any time 4 to 8 weeks after the first dose.

Catch up vaccination : all school aged children and adolescents should have received 2 doses of MMR vaccine, with minimum interval of 4weeks between the doses.

Hib-Haemophilus influenzae vaccine : The disease burden in India is high and a cause of significant morbidity and mortality. It is administered in combination with DTwP or DTaP at ages of 6, 10, 14 weeks with booster at age 12 through 18 months.

Catch up vaccination is recommended only till 5 years of age. 2 primary doses 4 weeks apart and one booster at 15 months is given between 6 to 12 months. In children above 12- 15 months one primary and one booster at least 8 weeks apart are advised.

Hepatitis B vaccine : Hepatitis B virus causes severe liver disease and hepatocellular carcinoma. The vaccination is effective in preventing chronic hepatitis in 80 to 100% of vaccinated persons. Immunologically 0-1-6 months schedule is widely used but due to operational issues at national level, its usually given with DTP at 6-10 and 14 weeks of age.

Catch up vaccination: 3 doses can be administered as series of 0, 1 and 6 months schedule.

Oral Rota vaccine : Diarrhea is the second leading cause of deaths in under five children. About 25 to 40 percent hospitalized Diarrhea is caused by rotavirus. It was introduced in Universal immunisation Program in 2016. According to the Indian Government's media release Rotavaccine reduces severe diarrhea by 56% during the first year of life with protection continuing into the

second year of life. Both RV1 and RV5 can be be given at 6 weeks, RV1 2 doses 4 weeks apart and RV5 3 doses at 6, 10 and 14 weeks.

Catchup vaccination : Vaccination should not be initiated for infants aged 15 weeks , 0 days or older. The maximum age for the final dose in the series is 8 months 0 days.

Pneumococcal vaccine : Streptococcal pneumoniae is responsible for 15 to 50% of all episodes of community acquired pneumonia, 15 - 50% of all episodes of acute otitis media and significant proportion of bacterial meningitis and bacteremia. It is estimated that 50% of the 2 million deaths due to pneumonia globally every year are attributable to S.Pneumoniae. PCV 10 or PCV13 are recommended at 6, 10 and 14 weeks along with DPT vaccination and booster dose between 12months and 15 months. The immunogenicity and protection rate is slightly better with PCV13.

PCV is not recommended routinely in a healthy child above 5 years.

Pneumo 23 is recommended after completion of 24 mths only in some high risk and immuno-compromised patients .

Catch up vaccination : For children between 6 months to 12 months two doses 4 weeks apart and one booster, for children between 12 to 23 months 2 doses 8 weeks apart and above 24 months only one dose of PCV 13 sufficient but 2 doses of PCV 10 , eight weeks apart.

Typhoid vaccine : Typhoid disease has become endemic in India and is cause for morbidity and mortality. Vi polysaccharide vaccine is cost friendly but gives only 60 percent protection and has to be given every 3 years, 1st dose after the completion of 2 years. Newer Conjugate vaccine has better immunological memory. 2 doses can be given from completion of 6 months of age with minimum gap of 1 year.

Catch up vaccination can be given throughout the adolescent period.

Varicella Vaccine : Chicken pox is a highly contagious viral disease with highest prevalence in children but tend to be more severe in neonates, immunocompromised children and adults. Immunisation can cause a dramatic decline in complications as well as mortality but high cost of the vaccination has prevented it in including the vaccine in Universal Immunisation schedule. The varicella vaccines are licensed for children 12 months and above. The first dose is usually administered at the age of 15 through 18 months and second dose at age of 4 to 6 years. However breakthrough cases are lowering if given 15 months onwards. There are 15% of chances of breakthrough if only one dose is given.

Catch up vaccination : 2 doses with at least 4 weeks gap if there is no evidence of immunity

Hepatitis A vaccine : Viral hepatitis is a cause for major health care burden in India. 2 doses of killed vaccine 6 months apart is licensed after the completion of 1 year of age. It is effective in around 95% of cases and lasts for at least 15 years and more. Single dose of live attenuated H2 strain vaccine is also sufficient for long term protection.

Catch up vaccination : Either of the two vaccines can be used in "catch -up" schedule beyond 2 years of age. For children older than 10 years screening for antibody is recommended as seropositive rates exceed 50%.

Human Papilloma Virus Vaccine : Human Papilloma Virus is an obligatory cause of cervical cancer. Type 16 and 18 are responsible for 70% of invasive cervical cancer globally. Oncogenic HPV stereotypes have been implicated in causation of anal, vulvar, vaginal, penile and oropharyngeal cancers. Nononcogenic HPV stereotypes 6 and 11 are responsible for more than 90% of antigenic warts and most recurrent respiratory papillomatosis . HPV 4 and HPV2 are given in 3 doses for girls above 10 years. HPV4 is given as 0, 2 and 6 months and HPV2 as 0,1,6 months schedule.

Influenza Vaccine : H1N1 2009 virus caused deaths in young children, adolescents and nearly 25 to 30% of the deaths occurred in those without any underlying risk factors. Hence it is recommended yearly in all children with risk factors and also in other children after discussion with parents regarding the benefits and limitations of the vaccine. Tetravalent flu vaccine can be given after completion of 6 months. If the vaccination is given

for the first time in age groups between 6 months to below 9 years two doses are recommended at 4 weeks apart and for children above 9 years single dose is sufficient. 0.25 ml is recommended for children below 36 months and 0.5ml is given for children above 36 months. It is advised to give vaccine just before the rainy season once seasons new vaccine is released.

Japanese Encephalitis vaccine : Inner districts of Maharashtra, West Bengal, Bihar, Karnataka, Tamil Nadu, Andhra Pradesh, Assam, Uttar Pradesh, Manipur, Goa are highly endemic areas in India. The vaccine should be ideally offered to all children residing in endemic areas and those planning to visit endemic areas. Live attenuated SA-14-14-2 vaccine was introduced under UIP in endemic areas. 2 inactivated vaccines are also available. Live attenuated cell culture derived SA-14-14-2 is recommended after 8 months and second dose at 16 to 18 months. Inactivated vaccine is advised after 1 completed year. 2 doses of 0.25 to 0.5 ml (children above 3 years) IM at the interval of 28 days.

Cholera Vaccine : Cholera is a bacterial disease causing severe diarrheaand dehydration and can be fatal if not treated properly. It can be prevented by two doses of killed whole cell Vibrio Cholera vaccine at the gap of 2 weeks . It is recommended for children from endemic areas after completion of 1 year.

Meniningococcal Vaccine : 1.5 to 3.3% of all acute hospital admissions in children in India are due to meningitis. 1.9 percent of those are due to Meningococcal Meningitis, a deadly disease which can cause mortality within 48 hrs. Recommended only for certain high risk groups, during outbreaks and international travellers including students, Haj pilgrims. Quadrivalent and monovalent conjugate vaccines and polysaccharide vaccines are available in India. Conjugate vaccines are preferable due to their immunogenicity and advised after completion of 9months.

Rabies Vaccine : It is a fatal disease, mortality can be reduced by timely vaccination. Purified chick embryo cell vaccine (PCEC), Human diploid cell vaccine (HDCV), purified vero cell rabies vaccine (PVRV) and purified duck embryo vaccines are currently available. It is recommended as postprophylaxis in any significant contact with a warm blooded animal and in those with high risk of rabies exposure. Only modern tissue culture vaccines and IM routes are recommended for both the pre and postexposure prophylaxis in office practice. Domestic rodent (rat) bites do not require postexposure in India.

MTCVs are recommended for all category II and III bites. 1ml IM in anterolateral thigh or deltoid (never in gluteal region) for HDCV, PCEC and PDEV. 0.5ml for PVRV. Intradermal administration not recommended. 0,3,7,14 and 30 with day 0 being the first day of the vaccination. Sixth dose on day 90 is offered to severely debilitated and immunocompromised. Rabies immunoglobulins (RIG) is also recommended in all category III bites. Equine rabies immunoglobulins can be used if human immunoglobulins are not available.

Preexposure prophylaxis : 3 doses are given IM in deltoid/ anterolateral thigh on days 0,7 and 28

For preexposure prophylaxis any point of time after completed pre or post exposure prophylaxis 2 doses are given on days 0 and 3.

Side effects of Immunisation : usually these are minor- low grade fever, fussiness and soreness at the injection site. Some vaccines cause a temporary headache, fatigue or loss of appetite.Rarely they can cause severe allergic reaction or a neurological side effect such as seizure. The risk of a vaccine causing serious harm or death is extremely small. The studies have concluded that there is no connection between immunisation and autism.

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VACCINE REQUIREMENT FOR INTERNATIONAL TRAVEL

Dr. Rujuta Hadaye
Professor,
Dept. of Community Medicine

Dr. Deepika Nandanwar
Assistant Professor,
Dept. of Community Medicine

Nowadays International travel has become a part of life, apart from the brake that COVID has put up to it. With the plan of International travel it is but natural to be concerned about the health aspect of International travel. Emporiatrics is the branch of medicine that deals with the prevention and management of health problems of International travelers. Vaccination is the time tested tool to ensure safety while travelling. There are International Health Regulation guidelines for the same. The detailed country-wise guidelines are available on the website https://wwwnc.cdc.gov/travel. We are trying to summarise what all of us must know about Vaccine requirement of International Travel.

In general vaccines recommended before International Travel are:

Sr. No.	Vaccine	Details, Dose and Schedule
1	Hepatitis A and Hepatitis B- available as combined vaccine	Schedule is 0,1 and 6 months 0.5 ml Intramuscular
2	MMR Vaccine (Measles, Mumps, Rubella)	2 doses at least 28 days apart
3	Td / Tdap (Diptheria, Pertussis and Tetanus)	For adults those who have not received prior vaccination against diphtheria, pertussis and tetanus, three doses of Td vaccine are indicated; two doses are administered at least 4 weeks apart, and the third dose is given 6-12 months after the second dose. The Tdap vaccine can substitute any one of the Td doses.
4	Measles	For >15 years, the dose is 0.5 ml intramuscularly at 0, 1, and 6 months.

Certain countries mentioned below have mandatory requirement:

Sr. No.	Country	Mandatory Vaccine
1	African and South American Countries	Yellow Fever Vaccine- 0.5 ml single dose 10 days before travel, Certificate validity starts after 10 days of vaccination and is life-long valid.
2	Afghanistan, Pakistan, Kenya, Nigeria, Syria, Ethiopia, Cameroon,Somalia	Oral Polio Vaccination- single dose two drops of OPV, to be taken one month prior to travel, certificate valid for one year from date of vaccination.
3	Haj pilgrimage	Meningococcal vaccine- single dose of Quadrivalent ACWY vaccine and proof of vaccination on a valid International Certificate of Vaccination. Vaccine should not be taken more than 5 years before arrival.

The Yellow Fever vaccination is now mandatory for 42 countries in the world. In Mumbai currently there are 6 Yellow fever vaccination centers. These are:

1. Airport Health Organisation, Sahar, Mumbai
2. Port Health Organisation, Colaba, Mumbai
3. Station Health Organisation (Navy), Colaba
4. Grant Medical College & Sir J. J. Groups of Hospital, Byculla, Mumbai
5. Family Welfare Training & Research Centre, Khetwadi, Byculla, Mumbai
6. K. E. M. Hospital and Seth G. S. Medical College, Parel, Mumbai. Out of these the centre at KEM Hospital is run under the aegis of Department of Community Medicine and is functional even in this COVID pandemic. The vaccine is administered every Tuesday and Thursday, (by appointment only) except public holidays from 1.30pm to 3.00 pm. One needs to bring original passport along with him/her. No OPD paper is required. Charges of Rs. 300/- per dose are applicable as per Government of India guidelines. Contact number for Yellow Fever vaccination enquiry is 9869488693, Dr. Deepika Nandanwar, Assistant Nodal Officer, Yellow Fever Vaccination Center, K.E.M Hospital, Parel, Mumbai.

So, Bon Voyage!

I wish to share an interesting incident brought out the greatness of two Legendary Sons of India.

When Dr. Abdul Kalam was the President, he visited Coonoor. On reaching, he came to know that Field Marshall Sam Manekshaw was in the Military Hospital there. Dr. Kalam wanted to visit Sam, which was unscheduled. Arrangements were made. At the bedside, Kalam spent about 15 minutes talking to Sam & enquiring about his health.

Just before leaving Kalam asked Sam "Are you comfortable?" Is there anything I could do? Do you have any grievance or any requirement that would make you more comfortable?

Sam said "Yes Your Excellency, I have one grievance". Shocked with concern & anguish,

Kalam asked him what it was.

Sam replied "Sir, my grievance is that I am not able to get up & salute my most respected President of my beloved country". Kalam held Sam's hand as both were in tears.

(from Internet)

MY PLASTIC FREE JOURNEY

Dr Pratima Kamath

I am retired doctor and was practicing in the field of anaesthesia in south Mumbai till 2008 before I decided to shift to Dubai. Real change in my life was introduced by few friends who were following Zero Waste lifestyle. Today I am passionate about the Zero Waste movement that encourages us to re-evaluate the objects and substances that we use on a daily basis that could increase the amount of trash in the world.

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"You can not get through a single day without having an impact on the world around you. What you do makes a difference and you have to decide what kind of difference you want to make"

- Jane Goodall

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My journey towards a plastic-free life began almost 25 years ago. I witnessed a cow eating food wrapped in a plastic bag that was thrown on the sidewalk, and that was a turning point in my life. My first step towards a plastic-free journey was to use simple homemade paper trash bags instead of the store-bought plastic bags. But, as consumerism monumentally increased in society, I witnessed a rising utilization of plastic products. Almost everything was replaced by this flexible, transparent and non-biodegradable material and slowly but surely, it became one of the most problematic substances in the world. Moreover, during its degradation by natural forces of wind and water, it began to give birth to microplastics, which has already affected the health of millions of animals and humans on the planet.

I shifted to Dubai in 2008 and was very happy to notice that trash segregation bins were available outside bus stops or at shopping complexes. Soon segregation of recyclable household trash became a part of my day to day routine and once a week I would deposit them all in the available recycling centres. However, as days went by this started to become a tedious process and my precious time was spent just segregating trash. Hence, I began researching different types of recyclable trash and how to recycle them efficiently . During this period I was also diagnosed with hypothyroidism and an important aspect of my research was to see if the products I used on a day to day basis were affecting my health. I learnt how my life was surrounded with toxins in the form of personal products, house cleaners, deodorizers and the plastic products we use on a day to day basis. I learnt how a simple plastic water bottle can be a cause of PHTHALATES and BISPHENOL A in my body. What's worse is that I realised some of these toxins are a permanent part of your system. Thus began my journey towards eliminating the toxic and plastic products in my life.

I started re-thinking the whole process and invented my first Waste-Zero kit. My kit not only helped me to stop using plastic products but also solved my issues of trash creation, separation, collection and disposal. The Waste-Zero kit consists of seven different items; a reusable stainless steel water bottle which can even be utilised for coffee or juice; a reusable glass or stainless steel mug for any hot or cold drink which eliminates my need to use a plastic/paper coated with wax cups; a set of reusable cutlery which includes a metal straw to eliminate the use of plastic straws entirely, I also carry a small brush to clean it in case I need to use it again on the same day; A small plate with compartments which can be used while having street food; tiffin to carry home the leftover from restaurants that I have dined at; A sustainable cotton towel eliminating the use of paper towels and foldable shopping bags for any impulsive shopping decisions taken to eliminate the need of using plastic bags. My kit can be modified according to your needs, for example, air travel does not permit steel knives hence you can carry a set of bamboo cutlery and of course during the COVID - 19 pandemic I also include a clean mask in this kit.

The zero-waste lifestyle also moulded me into replacing all my personal care products and to go for eco-friendly homemade products, which not only were toxins free but also didn't come in plastic packaging. I was fortunate enough to have friends who made soaps, shampoo bars and bio enzymes. Bio enzymes was a cost-effective solution to all my cleaners. They are made from the peels of fruits and jaggery and are excellent for cleaning the house, washing your vegetables to remove the harmful fertilizers and pesticide residues and can also be used for gardening and composting. As soon as I shifted my focus on eliminating plastic from my life, I came up with chemical-free DIY options as a replacement. I started picking up my day to day grocery items such as fruits and vegetables from vendors that were ready to give them to me in my produce bags and/or deliver them without using plastic. Kitchen storage became a collection of reused glass containers of store-bought pickles and jams. Teflon coated non-stick pans were replaced by durable cast iron, ceramic or stainless steel pans. Wet waste generated on a daily basis was utilized for composting and bio enzyme, this helped us reduce the use of the trash can and also allowed me to use natural fertilizers for my garden produce.

As I was passionately making all these changes in my life with the support of my family and friends, I took a few steps in spreading awareness. As suggested by my husband, I decided to gift Zero-Waste kits to everyone with a simple message on the hazardous effects of plastic. I resorted to e-vouchers which eliminated whole lengthy procedure of buying, gift wrapping and wondering if gifts will be liked by recipients. I learned to use electronic devices for my notes so the need for plastic stationery, printing, inks and papers disappeared. I started using vegetable-based colours for Art and Painting as I realised commercial paints are filled with chemicals and can generate microplastics.

Plastic has become such a versatile and useful material that is present in almost everything we are using today. Although it was invented to save elephants and turtles it has caused far more problems than solving them. Today, plastic is responsible for the deaths of millions of animals living on land and in the ocean and it has already started to become a health hazard for humans. We need millions of people doing small changes in their day to day life so we can reduce the effect of our trash on our beautiful planet.

WE DO NOT HAVE A PLANet B.

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The Nobel Prize in Physiology or Medicine 2020 was awarded jointly to Harvey J. Alter, Michael Houghton and Charles M. Rice "for the discovery of Hepatitis C virus."

SAVE THE GIRL CHILD - बेटी बचाओ

Dr. (Mrs.) Aruna Pradhan
Senior Gynaecologist
Her article was selected for Essay Competition of Beti Bachao

It's an old saying that

"यत्र नार्यस्तु पूज्यन्ते रमन्ते तत्र देवता ।"

Means where women are respected the GOD dwells there! In olden days in India women were respected, were treated as equals to men.In fact whenever there came the need to destroy evil forces the power was depicted in the form of woman i.e. Durgamata! Because probably the women are mentally strong, multifaceted, intelligent, hardworking & have perseverance!

But today's India is evil, monsterous to women ! Daily we see the headlines about physical abuse, rape, honour killing of women, dowry killings. The woman is treated as sexually weak, unequal, meek, humble entity confined to domestic boundaries, denied the rights of men such as education which gives knowledge leading to financial independence, self respect, individuality as a person. They are considered as social burden, curse. After marriage when newlyweds seek the blessing, they are given blessing as may god bless you with a son. Because it is thought that the son carries forward the family name, but in fact it is the girl who brings grace to two families not only one. But the girls are killed in the womb (foeticide) or killed in infancy (Infanticide).

Everyone wants a good, humble, obedient mother, sister, wife & daughter . **अरे** but they forget that they are all women. A family can't be run with only one partner, man & woman both are needed so why can't both be equals?

There is a Marathi proverb

जिच्या हाती पाळण्याची दोरी, ती जगाते ऊद्धारी !

That female is a foundation stone of the family, as well as the whole world. Because she would raise the future generations by inculcating them with good education, mannerisms, habits etc. So mother is priceless! But the girls are confined to domesticity, denied the rights to education, physically abused, beaten in closed rooms, honour killed, killed for dowry, raped, killed in the womb. This has reversed the ratio of males to females. The number of females has reduced mainly in the states of Kerala & Haryana.

So our government has taken certain good steps to reduce abuse against females, by launching **बेटी बचाओ अभियान**.

Also banned female foeticide by banning sex determination, also launched right to education programme.

So every person in this country has the responsibility to contribute to these programmes by self educating & educate others also to respect women & to let them live their lives as they want to become an independent, individual person! I am my parent's fourth daughter this was in early 1940s me in 1951.But they never treated us four sisters inferiority, never neglected. They gave every opportunity to develop personality, good education to all four of us.

In my practice I tried my level best to persuade many couples against female foeticide. One day one of my sisters came to me telling that one of the patients is crying because her husband & in laws have abandoned her because 3rd daughter was born.I consoled her, encouraged her by citing my own example. Fortunately she was a brave girl. She went to her husband somehow was able to persuade him. Today that infant girl is graduate, serving & happily married.

So the conclusion (bottom line) is **SAVE A GIRL CHILD**

बेटी बचाओ बेटी पढाओ...!

• • •

IMPORTANCE OF MICRO-MOVEMENTS
सुक्ष्म व्यायाम का महत्त्व

Prasanna E. Lapalikar
Yoga Teacher

Yogic Micro-movements are designed to make our human body flexible, toned up before beginning of any yoga practice, such as sun Salutation or Yogaasanas. It works not only at organs, muscular or tissue level, but also at cells. It is a systematic physical activity involving workout with movements in slow motion, sequential manner along with breathing.

Features of Micro-movements and how to perform

1. Every movement is slower, done with a purpose to make our body active, reduce stiffness, warm up and all these movements are done with no pain or minimal risk of injury.
2. Movements involves whole body, but are mainly divided in 5 parts:

a. Neck
b. Shoulder
c. Waist
d. Knees
e. Ankle

3. The three main components of Micro-movements are:

a. Breathing patterns.
b. Concentration at particular point / part of our body.
c. Actual physical movement.

4. Anybody can do, subjective to doctors advice.
5. Very effective warm-up.
6. In some individuals, where in Yogaasan / Sun salutation / Prayanama is not recommended, even in such cases Micro-movements are found to be effective.

Purpose of Micro-movements

1. Slower actions, movements results in warm-up.
2. Improves circulation.
3. Slow movements associated with lesser pain and low risk of injury.

Benefits of Micro-movements

1. Most common symptoms like back pain can be minimized by consistent, safe, and effective and planned practice under supervision (In the initial phase).
2. No preparation time required, even 7 to 10 minutes of workout, a person can feel the change.
3. Can be done once or twice in a day, at home or outside.
4. Removes tightness of muscles.

References:

Micro movements / Sukshma Vyayama, known by yogis and mystics as "The Yoga of The Immortality", originated centuries ago with the great seer and saint Maharishi Kartikeya Ji.

Subsequently, Maharishi Kartikeya Ji initiated Dhirendra Brahmachari into the highly treasured and little-known mysteries of Yoga who propagated this to entire world.

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पातंजल योगदर्शन

डॉ. सौ. अंजली अरुण वैद्य

भारतीय तत्त्वज्ञानाच्या षट्दर्शनातील अत्यंत महत्वाचे दर्शन म्हणजे योग. या योगाचे दोन भाग आहेत.

१) हठयोग – ज्यात शारीरिक स्तरावरील योगाचे मार्गदर्शन आहे.

२) पातंजल योग – ज्यात मानसिक स्तरावरील योगाचे मार्गदर्शन आहे.

पातंजल योगदर्शन महामुनी पतंजली यांनी साधारण ३००० वर्षापूर्वी लिहीले. या व्यतिरिक्तही त्यांचे 'व्याकरणावरील महाभाष्य' व चरक संहितेवर लिहीलेला प्रतिसंस्कारित ग्रंथ असे दोन महान ग्रंथ प्रसिद्ध आहेत.

सांख्यांनुसार लिहिलेले योगशास्त्र द्वैतवादी आहे. पण पातंजल योगशास्त्र हे 'अद्वैतानुकूल' आहे. शिवाय ते सूत्ररुपात लिहिले आहे. पतंजली स्वत: योगाचे महान अभ्यासक व अध्यापक होते. स्वामी विवेकानंदांनी पातंजल योगदर्शनास 'राजयोग' असे नाव दिले आहे.

प्रथम आपण पाहू 'सूत्र' म्हणजे काय? विज्ञानयुगाप्रमाणे सूत्र म्हणजे **formula.** सूत्रात कमीत कमी शब्दात जास्तीत जास्त ज्ञान सामावलेले असते. तत्वज्ञानाचा वा कोणताही गहन विषय सूत्रात मुद्देसूद रीतीने, नेमका, यथार्थ, कोणताही विकल्प राहणार नाही अशा प्रकारे समजावून सांगितलेला असतो. तो सर्व ज्ञानीजनांना मान्य, स्वीकृत असतो.

या ठिकाणी पातंजल योगदर्शनच्या समाधिपाद भागातील सूत्र दोन आपण समजावून घेण्याचा प्रयत्न करणार आहोत.

सूत्र २ – योगश्चित्तवृत्तिनिरोधः

योग म्हणजे चित्तवृत्तिचा निरोध होय.

अन्वय – योगः चित्तवृत्ति निरोधः

योगाबद्दल संपूर्ण माहिती देण्यापूर्वी पतंजलींनी 'योग' या शब्दाची स्पष्ट व्याख्या सांगितली आहे.

या तीन शब्दातील तत्वज्ञानाचा गहन अर्थ समजून घेण्यासाठी आपण एकेका शब्दाचा स्थूल व सुक्ष्म अर्थ समजून घेऊ.

(१) **योग :** योग या शब्दात 'युज्' म्हणजे जुळणे, मीलन पावणे, जोडले जाणे हा धातु आहे. आपले चित्त (त्याचा अर्थ आपण पुढे पाहणार आहोत) बाह्यजगाशी ज्ञानेंद्रियांच्या माध्यमातून जोडले जाते. बाह्य जगातील ज्या ज्या गोष्टींशी आपला संबंध येतो त्या त्या संवेदना आपली ज्ञानेंद्रिये ग्रहण करतात. त्या संवेदना आपल्या बुध्दीपर्यंत पोहचल्यावर त्यावर साधक बाधक विचार होतो. म्हणजेच त्यांचा पृथक्करणात्मक अभ्यास केला जातो. त्यातील निरुपयोगी भाग सोडून देऊन, उपयोगी भाग ज्ञान रुपात स्मृतीरुपी ठसे म्हणून साठविला जातो. पुढील ज्ञानप्राप्तीच्या वेळी त्याचा उपयोग केला जातो. झालेल्या ज्ञानानुसार त्या संवेदनांना काय प्रतिक्रिया द्यावयाची याचाही पूर्ण विचार होऊन बुध्दी कर्मेंद्रियांमार्फत ती प्रतिक्रिया कार्यान्वित करते. हे सर्व काही क्षणात घडत असते.

आपल्याला झालेले ज्ञान व त्यावरील आपली प्रतिक्रिया यांचे निरीक्षण व परीक्षण करुन नियोजनपूर्वक करावयाचा अभ्यास म्हणजे योग. या अभ्यासाचा योगाभ्यासात आपल्याला पाया म्हणून उपयोग होतो.

चित्तवृत्ति – चित्त + वृत्ति. चित्ताची वृत्ती किंवा चित्तात उठणारी वृत्ती.

चित्त – चित्ताला भगवद्गीतेत व उपनिषदात 'अंत:करण' हा शब्द वापरला आहे. आपण जन सामान्य 'चित्त' व 'मन' एकाच अर्थाने वापरतो. चित्त हे प्रकृतीपासून (जड) उत्क्रांत होते. त्यामुळे प्रकृतीचे मूळघटकच चित्ताचे मूळघटक असतात. ते तीन मूळघटक –

१) सत्त्व २) रज ३) तम

चित्ताचे चार भाग आहेत.

१) मन २) बुध्दी ३) स्मृती ४) अहंकार

आपण आधी पाहिल्याप्रमाणे संवेदनांचे व प्रतिक्रियांचे निरीक्षण, परीक्षण, पृथक्करण हा जो अभ्यास केला जातो, तो चित्ताचे मन व बुध्दी हे भाग करतात. या अभ्यासातील उपयुक्त वाटणारा भाग ठशांच्या रुपात पुढील उपयोगासाठी साठविला जातो. त्याला स्मृती म्हणतात.

चौथा भाग अहंकार – अहंकार म्हणजे 'मी पणा', इगो

वृत्ति – म्हणजे मत, कल, भूमिका. नेहमीच्या साध्या भाषेत चित्तवृत्तिचा अर्थ झाला 'मनाचा कल'. पंचज्ञानेंद्रियांच्या माध्यमातून या वृत्ती त्यांच्या नैसर्गिक धर्माप्रमाणे सतत बाहेर धावत असतात. (बहिर्मुख) थोडक्यात

संवेदना – ज्ञान (विचार) – प्रतिक्रिया

Stimulus – Knowledge – Reaction

ज्ञानेंद्रिये – बुध्दी – कर्मेंद्रिये

अशाप्रकारे जागृतावस्थेत आपल्या मनाचा, बुध्दीचा व शरीराचा व्यापार चालु असतो. या व्यापारांचा परिणाम म्हणून आपल्या चित्तात काम,

क्रोध, लोभ, द्वेष, मत्सर, मद हे विकार या नकारात्मक भावना किंवा प्रेम, दया, क्षमा, शांती, आनंद या सकारात्मक भावना निर्माण होतात.

संवेदना – ज्ञान – प्रतिक्रिया यातील संवेदनेचे आकलन प्रत्येक चित्तात वेगवेगळे होऊ शकते. ते चित्तातील मूळ घटक – सत्त्व, रज व तम या गुणांवर आधारित असते. त्यामुळे त्याला दिली जाणारी प्रतिक्रिया ही प्रत्येकाची भिन्न भिन्न असु शकते.

या प्रतिक्रियांचा त्या व्यक्त करण्यापुर्वी अभ्यास करणे, त्या योग्य का अयोग्य आहेत ते ठरविणे व अयोग्य असतील तर त्या बदलणे हे सर्व योगाच्या अभ्यासात अंतर्भुत होते.

ज्या स्मृतींचा ठसा अधिकाधिक खोल होत जातो त्याला संस्कार म्हणतात.

पतंजलीचे सर्वात मोठे योगदान म्हणजे त्यांनी चित्तवृत्तिंचे केलेले पृथक्करण. चित्तवृत्ति पाच प्रकारच्या असतात.

१) प्रमाण – इंद्रियगम्य ज्ञान. त्यांचे तीन उपप्रकार

अ) प्रत्यक्ष – इंद्रियगम्य ज्ञान

ब) अनुमान – ज्ञानावर आधारित तर्क किंवा विचार.

क) आगम – दुसऱ्याकडून मिळालेले ज्ञान.

२) विपर्यय – खोटे ज्ञान.

३) विकल्प – कल्पनेतून झालेले ज्ञान

४) निद्रा – गाढ झोप

५) स्मृती – आठवण

यापैकी पहिल्या तीन चित्तवृत्ति या व्यक्त असतात. चार व पाच या चित्तवृत्ति अव्यक्त असतात.

निरोध: –निरोध या शब्दाचा अर्थ आहे अडविणे, विरोध करणे. निरोधाचे दोन भाग आहेत.

१) नवीन दोष चिकटु न देणे.

२) जुने दोष जे चिकटलेले असतील ते काढून टाकणे.

अशा प्रकारे दोन्ही दोषांचा संपूर्ण विनाश करणे.

आपल्या चित्तवृत्तिंचा सखोल अभ्यास करुन जर त्या स्वत:ला, कुटुंबाला, समाजाला अहितकर होणार असतील तर त्यांना अडविणे, बदलणे. अहितकर वृत्तिंऐवजी हितकर आनंददायक वृत्ति निर्माण करणे या साऱ्या अभ्यासाला निरोध म्हणतात. काही काळ जुने दोष काढून टाकण्यात जाईल. बरोबरीने नवीन दोष चिकटु न देण्याचा अभ्यास चालूच राहील. हा सारा प्रयत्न, अभ्यास योग शिकताना करावयाचा असतो. अर्थात चित्त व योग्य वृत्ती जोडणे म्हणजेच योग.

हा निरोध कसा करावा त्याबद्दल पतंजली म्हणतात

१) **अभ्यास** – दीर्घकाळपर्यंत, सातत्याने, प्रेमाने, श्रध्देने, निरंतर, भक्कम पायावर आधारित केलेला सराव.

२) **वैराग्य** – अनुभवलेल्या, ऐकलेल्या विषयासंबंधीच्या सुखाबद्दल चित्तात आसक्ति, ओढ नसणे. चांगल्या वाईट गुणांबद्दलही चित्तात आसक्ति, कामना नसणे.

आत्मा ही एक शक्ती, उर्जा आहे. या शक्तीचा, उर्जेचा प्रवाह

आत्मा – मन – इंद्रिये – शरीर.

या दिशेने सतत वाहात असतो. आपण जर मनातून शरीराकडे धावणारी शक्ती, उर्जा अडवली तर तिचा प्रवाह अडतो व उलट आत्म्याच्या दिशेने सुरु होतो. आत्म्यात साचू लागतो. जेंव्हा चित्तवृत्तिंचा संपूर्ण निरोध योग्याला पूर्णपणे साध्य होतो तेंव्हा आत्मा स्वस्वरुपी स्थिर होतो. हाच योगमार्गाचा अंतिम परिणाम आहे, ज्याला पतंजली 'कैवल्य' असे म्हणतात.

चित्तात क्षणोक्षणी उठणाऱ्या वृत्तिंपेक्षा 'मी' म्हणजे 'द्रष्टा' हा वेगळा आहे असा अनुभव येणे व तो अनुभव सातत्याने टिकून राहणे, ही अवस्थाच 'कैवल्यप्राप्ती' असे पतंजली म्हणतात.

• • •

PHOTO QUIZ

Dr Ashwini Dharmadhikari

For his research on tuberculosis, this physician received the Nobel Prize in Physiology or Medicine in 1905.

Identify the physician and his work.

He is a South African-American virologist and physician. He was awarded the Nobel Prize in Physiology or Medicine in 1951.

Identify the virologist and the vaccine for which he worked.

He is the Father of Immunology and pioneered the concept of vaccines.

Identify the virologist and the vaccine for which he worked.

He is an American physician, geneticist, and co-recipient of the 1976 Nobel Prize in Physiology or Medicine.

Identify him and his work.

He is a French biologist, microbiologist, and chemist renowned for his discoveries.

Identify the scientist and his work.

This duo contributed towards development of BCG vaccine.

Identify them and the sub-strain used for the vaccine.

His pioneer work on a vaccine has led to a popular campaign which goes by "Do boond jindagi ki…"

Identify the medical researcher and his work.

He was an English physician who personally administered chloroform to Queen Victoria when she gave birth to the last two of her nine children.

Identify him and his work during an epidemic.

Solution to crossword

1W	U	2H	A	N	■	3R	T	P	4C	R	■	■	■	■
H	■	R	■	■	■	■	■	■	A	■	5B	A	T	■
O	■	6C	H	7I	N	8A	■	■	R	■	C	■	■	■
■	9B	T	■	L	■	E	■	■	10P	R	O	N	11E	■
■	■	■	■	6	■	12R	N	A	■	■	R	■	B	■
13F	14F	P	153	■	■	O	■	■	16i	N	O	■	V	■
■	O	■	P	■	■	17S	18U	19N	■	■	N	■	■	■
■	M	■	L	■	20C	O	V	I	D	■	21A	C	E	■
■	I	■	Y	■	■	L	■	T	■	■	■	■	■	■
22E	T	T	■	■	■	■	■	R	■	23H	M	E	24F	■
■	E	■	25C	Y	T	O	K	I	N	E	■	■	I	■
■	■	■	■	■	■	■	■	L	■	P	■	■	V	■
■	26P	R	O	T	E	A	S	E	■	A	■	■	E	■

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