


DEPARTMENT OF BIOMEDICAL SCIENCE

BIOMER 2023

REPRODUCTIVE HEALTH

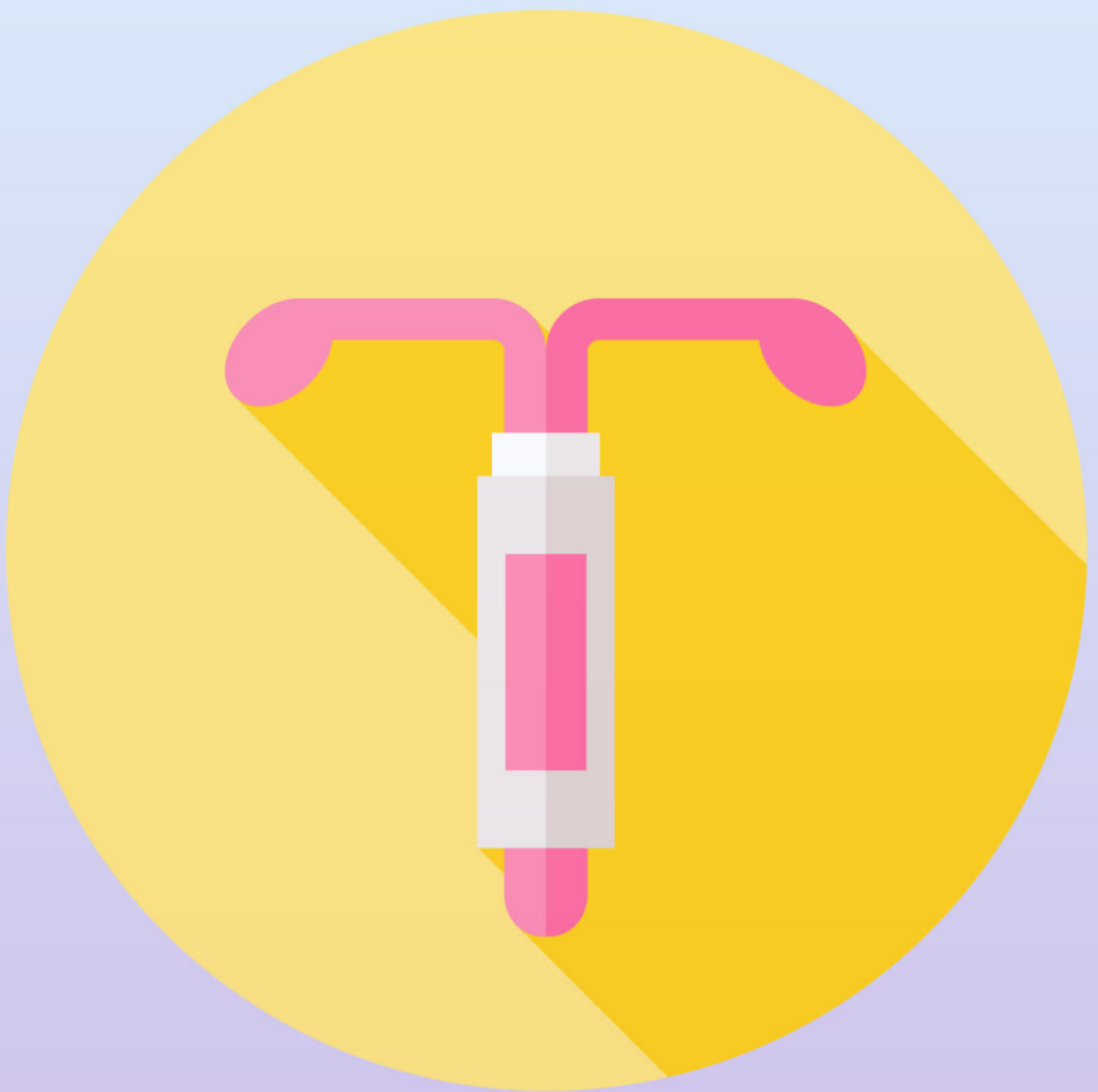


PERIOD POVERTY
CERVICAL CANCER AWARENESS
BREAKING THE TABOO: MALE REPRODUCTIVE HEALTH



SPECIAL THANKS TO ALL THE
STUDENTS, TEACHERS, AND
NON-TEACHING STAFF OF

Department of
Biomedical Science !



BIOMER' 2023

**The Biomedical Science Reporter
Annual Magazine Released by**

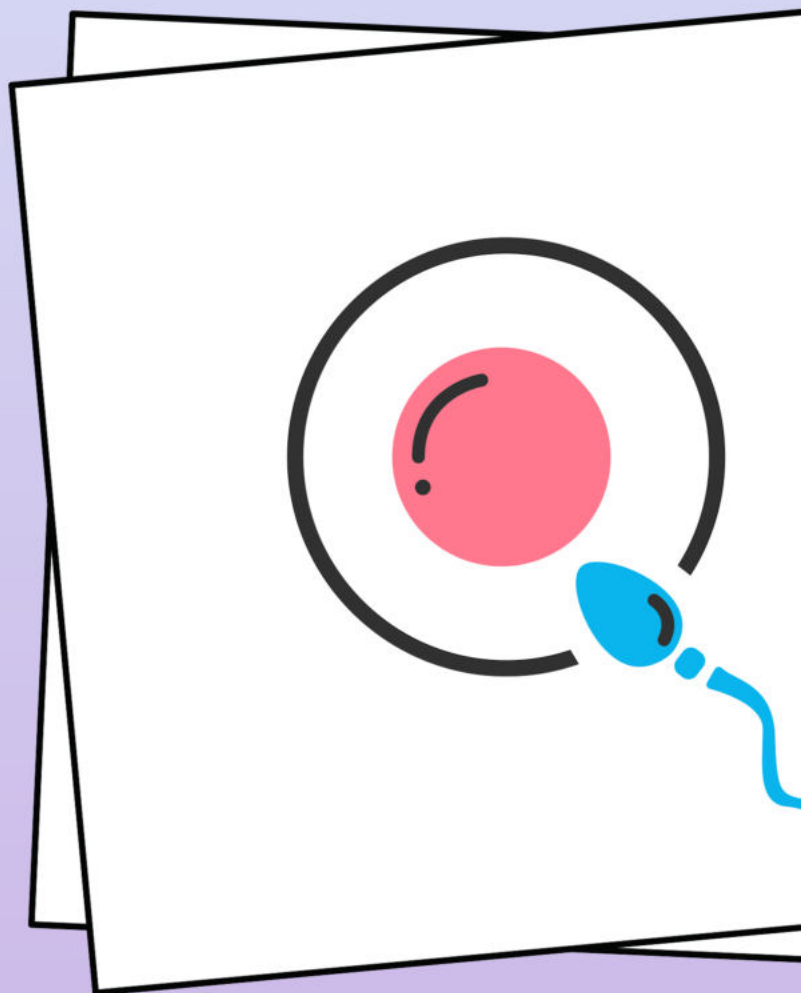
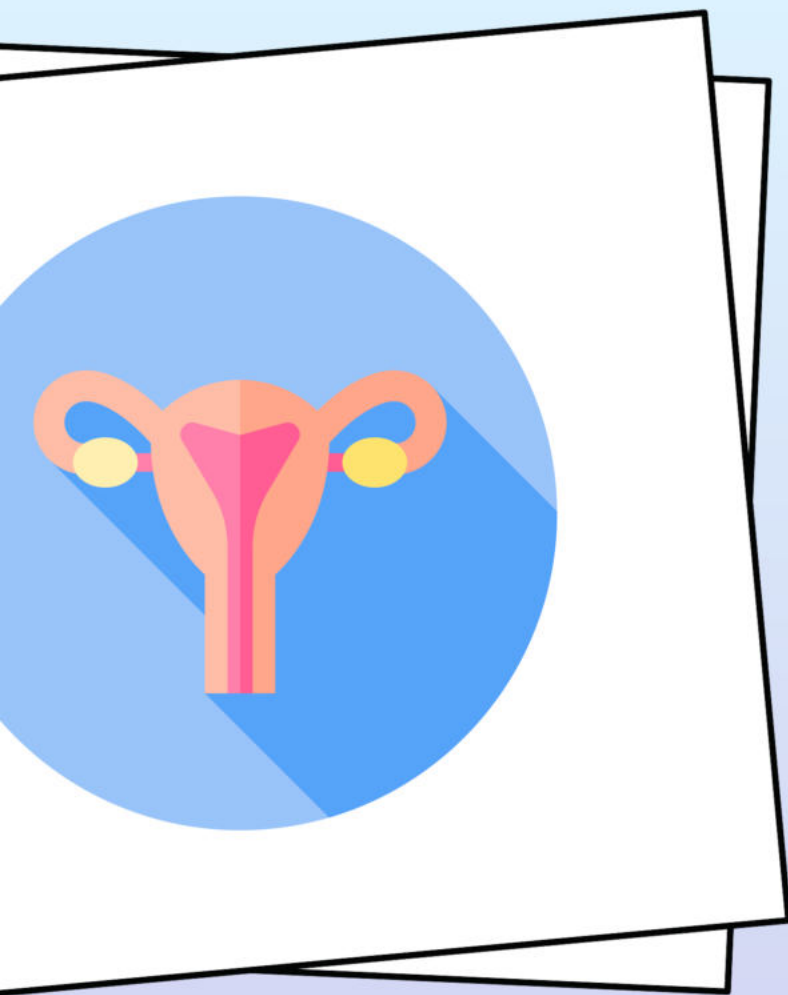
CATHEXIS

**The Student Society of
Department of Biomedical Science**



**ACHARYA NARENDRA DEV COLLEGE
UNIVERSITY OF DELHI**

Govindpuri, Kalkaji,
New Delhi - 110019
Phone : 011-26293224,
Fax: 011-26294540
<https://andcollege.du.ac.in>



Message From Principal's Desk



Students make a significant contribution to the achievements and recognition of any institute. Our college provides a joyful experiential learning system, wherein each child is encouraged to participate wholeheartedly.

I am pleased to know that the Department of Biomedical Science has taken up "Reproductive Health" as the topic for their annual Departmental fest "Cathexis". Good health is a prerequisite to human development.

Reproductive health and conversations around it, are still a taboo in so many ways. I applaud the Department of Biomedical Science for taking up the mantle of speaking upon this topic and assisting in bringing the topic into mainstream via their annual departmental magazine - BioMer'23.

I wish all the students for their successful career and academic pursuits. Be confident enough to touch the heights of success. "With confidence, you have won before you have started."

PROF. RAVI TOTEJA
OFFICIATING PRINCIPAL



Message From Teacher-in-Charge



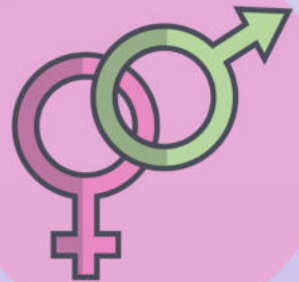
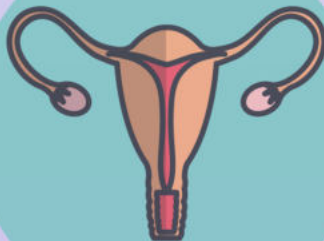
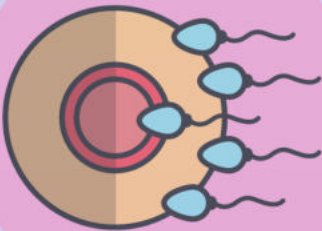
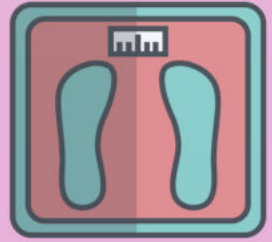
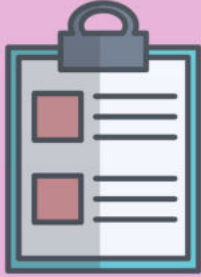
B.Sc. (Hons) Biomedical Science was started as an interdisciplinary course at ANDC, University of Delhi in 1999. The course has been very successful in terms of the career options taken up by the students after graduation over the years. The eternal zeal of the teachers and students in the Department to excel in whatever they do, is evident from the long list of achievements the Department has to its credit. Today we will find Biomedical Science students of ANDC at almost all prestigious institutes of the country and abroad.

Cathexis, the annual festival of students of Biomedical Science, is a major event in the Department. Every year we focus on relevant issues of science and society. This year theme is "Reproductive Health". Talking about reproductive health is an essential step towards sensitising the youth and the members of society and usher them all to be a reproductively healthy society. The department has started with "BMS Alumni Lecture Series", where every year we invite our alumni who are working in different fields to share their knowledge and journey over the years with their junior batches. In continuation of this series, Cathexis'23 celebration will begin with an alumni panel discussion.

Students also bring up an annual magazine, BioMer (Bio Medical Report). The magazine is designed and edited by the students under the guidance of teachers on the theme of Cathexis every year. This gives students, an opportunity not only to explore their scientific writing skills, but also creative skills. I can see that the editorial committee has ensured that BioMer offers a plethora of good reads which touches upon many such topics. I truly appreciate the efforts put in by all the students who have written articles for the BioMer and I also applaud the hard work of all the members of the editorial team and the faculty members involved.

Wishing the students all the success.

DR. ARCHNA PANDEY
TEACHER-IN-CHARGE



CONTENTS

Make-It-Simple- Biology Classes- “The Reproductive System”	1
Lifestyle’s Impact On Reproductive Health	4
Yoga And Reproductive Health	8
Breaking The Taboo: The Importance Of Male Reproductive Health	13
Taking Charge of Your Reproductive Health: Essential Practices For Men And Women	15
Make-It-Simple- Biology Classes- “The Monthly Cycles”	19
Dukh ➡ Dard ➡ Peeda ➡ PMS	22
Period Poverty: The Struggle For Menstrual Equity	25
Alternatives for Menstrual pads	28
Unanswered (Poem)	35
Reproductive Health (Pregnancy)- Related Rights And Laws For Women In India	37
Reproductive Changes Postpartum: How To Help A Mother Cope?	40

Table of

CONTENTS

Comprehensive Sex Education- An Approach To A Better, Healthier Future **44**

Understanding The *Status Quo* Of Reproductive Health Of Sex Workers In India **47**

Clearing The Air: Debunking Common Misconceptions About Sex! **49**

Various Types Of Disorders Related To Reproductive Health **53**

Breast Cancer Biomarkers **59**

Cervical Cancer And Vaccination **63**

Crossword On Reproductive Health **69**

CREATIVE CORNER **70**

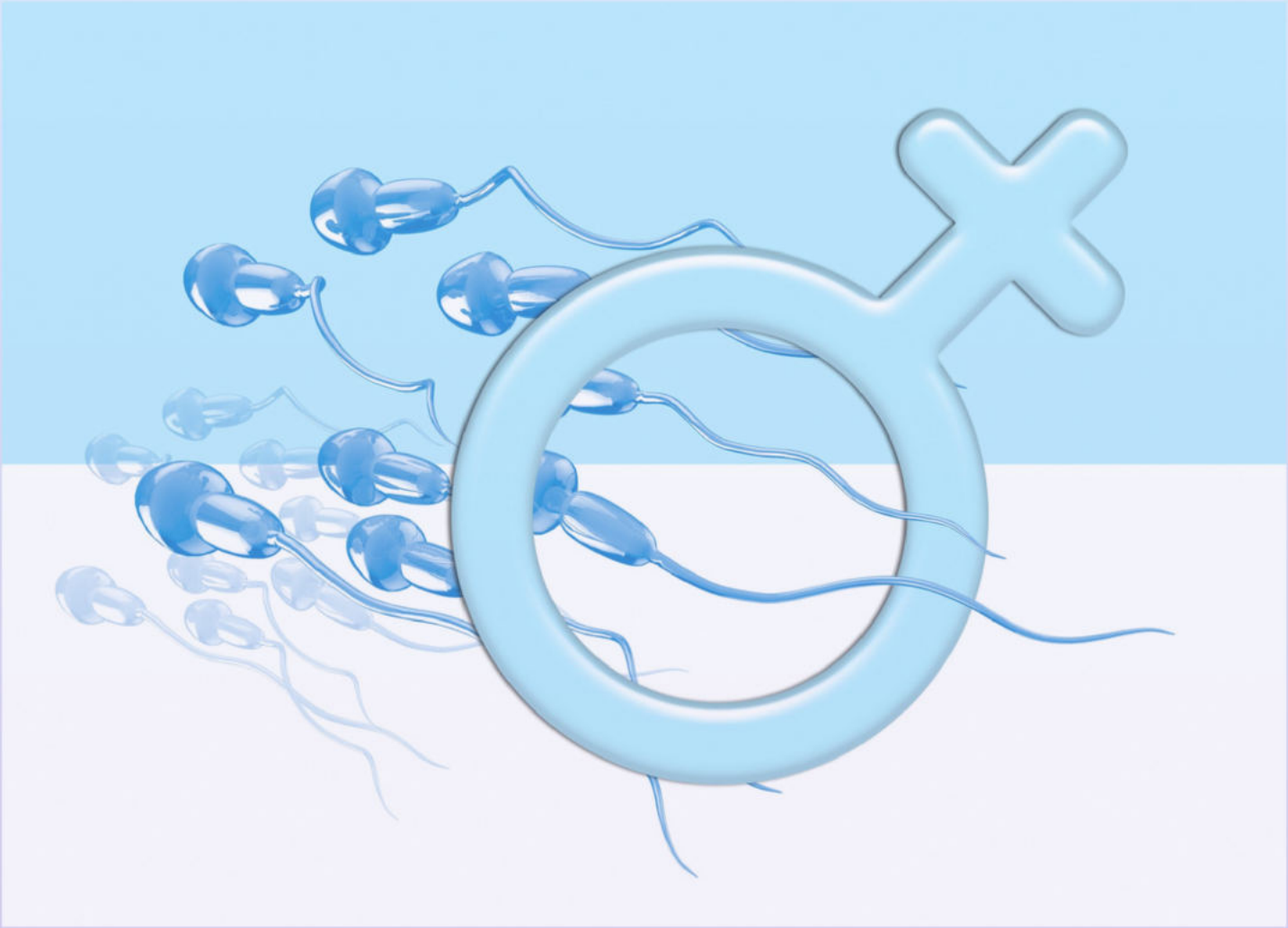


EVENTS 2022

CATHEXIS 2022	82
ANDC CAREER COUNSELLING SERIES	84
BACTERIOPHAGE WORKSHOP	87
FAREWELL BATCH 2019-2022	89
TEACHER'S DAY CELEBRATION	91
FRESHERS	93
NII VISIT OF STUDENTS FROM ANDC, DU FOR NATIONAL SCIENCE DAY-2023	95
ADDITIONAL DEPARTMENTAL ACTIVITIES	97

DISCLAIMER

"The content of this magazine has been contributed by the students of B.Sc. (Hons.) Biomedical Science, Acharya Narendra Dev College, University of Delhi, New Delhi. The contributing students own the responsibility for the originality of articles/ material and if any copyright or plagiarism issue arises, the concerned student would be responsible for that. The college/ Department/ Faculty members do not take any responsibility for any such issue"

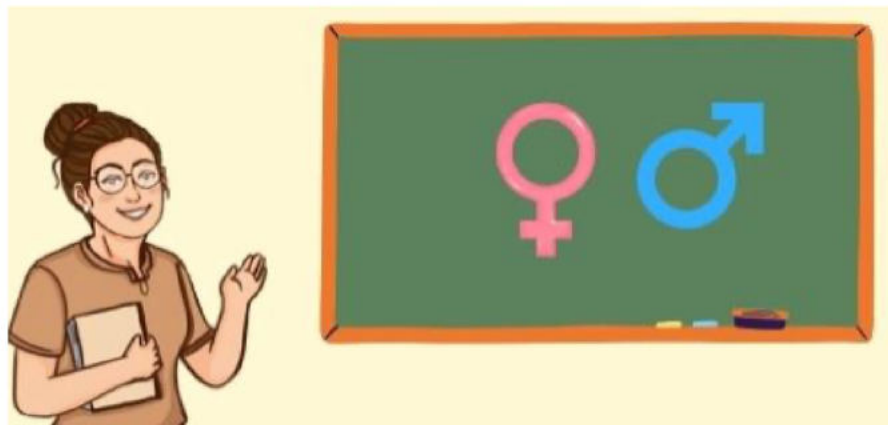


Make-It-Simple- Biology Classes - “The Reproductive System”

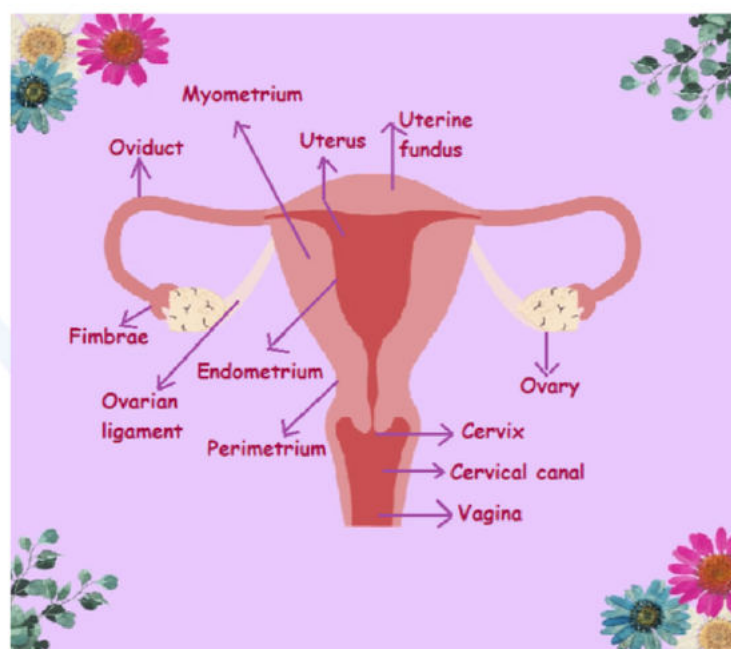
ANAMIKA BINU (III YEAR)

Hello students, today we will study some interesting facts about our reproductive systems.

For today's session, I will be your mentor, and my name is Ms. Margareta.



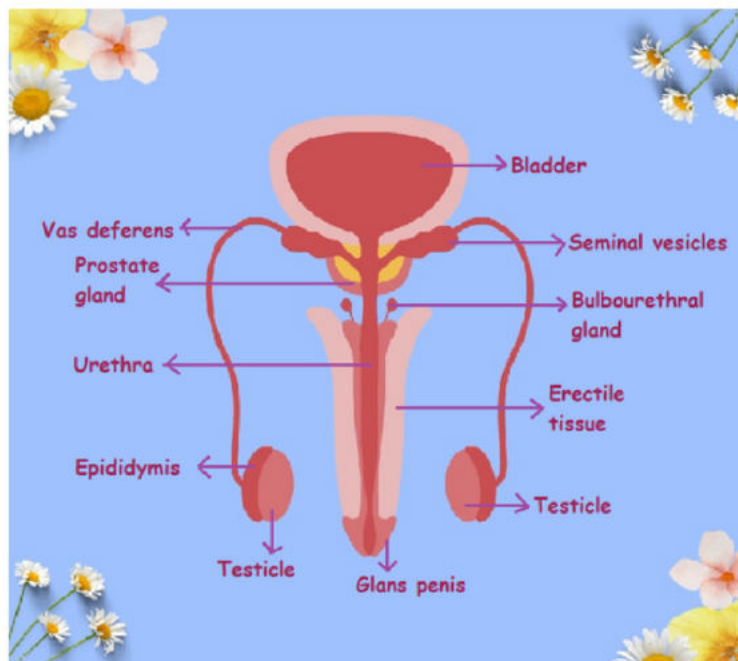
Let us start with the “FEMALE REPRODUCTIVE SYSTEM”



FUN FACTS:

- The fallopian tubes are as wide as a sewing needle only!
- The vagina is self-cleaning. It is totally normal to see discharge, which may be thin or thick, clear or whiteish. This is what your vagina's cleaning attempts have produced.
- In a woman's entire reproductive life, her uterus is all set to be pregnant around 500 times. That also means that you get nearly around 500 periods.
- The two ovaries typically produce eggs alternately; for example, the left ovary might release an egg one month and the right ovary might the following month.
- The birth canal is made up of the cervical canal and the vagina.

Next comes the “**MALE REPRODUCTIVE SYSTEM**”



FUN FACTS:

- The left testicle usually hangs a little lower than the right one. This allows the temperature of one testis to change without that energy being sent to the other testis, as it would if they were adjacent or touching.
- The epididymis is comma-shaped and estimated to be 6 meters (approximately 20 feet) in length.
- In men, the bulbourethral gland is merely pea-sized.
- Eating bell peppers can make the sperm round.
- Sperms contain about 5000 mitochondria per cell, which gives them immense energy to swim toward the egg.
- In men, the urethra forms the common pathway for both sperm and urine.

REFERENCES:-

- 1. <https://www.healthline.com/human-body-maps/male-reproductive-organs-vessels#1>**
- 2. <https://kidshealth.org/en/parents/female-reproductive-system.html>**
- 3. <https://www.cnyfertility.com/fruits-to-increase-sperm-count-and-motility/>**
- 4. https://en.m.wikipedia.org/wiki/Menstrual_cycle**
- 5. <https://www.britannica.com/science/menstrual-cycle>**
- 6. <https://byjus.com/biology/menstrual-cycle/>**

Lifestyle's Impact On Reproductive Health

HIRDAY SEHGAL (III YEAR)

Life is an ever-evolving cycle where people come and go, but it continues with the birth of new life that carries the world forward. Reproduction is a vital aspect of life, where certain traits of parents are passed on to the next generation through genes, the carriers of human characteristics. Genes from both parents create unique children and also make them similar to others in their family. Thus, reproductive health is essential to ensure the continuation of life, encompassing physical, mental, and social well-being related to the reproductive system, processes, and functions. It also involves awareness of sexually transmitted diseases and their prevention.

Humans are complex beings, and their reproductive system is no exception. It is crucial to educate our population about the significance of reproductive health, which is influenced by our lifestyle, eating habits, and thought patterns. Lifestyle factors have a significant impact on reproductive health, either positively or negatively, and can ultimately affect fertility. Therefore, it is imperative to modify lifestyle habits to enhance overall well-being, which is ultimately under one's control. Let's explore how different lifestyle choices can affect our reproductive health.

- Nutrition:

Our dietary habits, including what we eat, when we eat, and how much we eat, have a significant impact on our reproductive health. An imbalanced diet can have negative effects on overall health, including reproductive health. To maintain good health, it is important to have a healthy and varied diet, with certain vitamins and food groups playing a greater role in reproductive health than others.

For men, a diet rich in carbohydrates, fiber, folate, and lycopene can improve semen quality, while low-fat and protein-rich diets are beneficial for male fertility. In women, excessive consumption of animal protein has been shown to have negative effects on ovulatory fertility, but replacing carbohydrates with vegetable protein can be beneficial. Choosing trans fats instead of monounsaturated fats has been linked to a significantly increased risk of ovulatory infertility. In contrast, the use of multivitamins and supplements has shown positive results, with women who consume multivitamins being less likely to experience ovulatory infertility.

- **Obesity:**

Nowadays, obesity is a growing concern, especially among young people. Despite the Healthy People 2010 goal of reducing obesity in the United States to 15%, the rate of adult obesity increased to 35.7% by 2010. This increase in obesity can be attributed to a diet high in energy-rich foods and a lack of physical activity. Obesity has a significant impact on both male and female fertility.

Studies have shown that an increase in body mass index (BMI) is directly related to a decrease in sperm concentration and motility. Overweight men also tend to have increased DNA damage in their sperm. Additionally, there is a direct relationship between obesity and erectile dysfunction, with 95% of men with metabolic syndrome presenting with erectile dysfunction. This is due to the conversion of androgens to estradiol, which is mainly carried out by the aromatase enzyme found in adipose tissue. As adipose tissue increases, so does the availability of aromatase, leading to higher levels of estradiol.

Obese women have a higher rate of miscarriages compared to women with normal weight, with a reported miscarriage rate of 13.6% in obese women compared to 10.7% in women with a normal BMI. It is believed that miscarriage in obese women may not be solely due to the karyotype of the developing fetus, as overweight and obese women under the age of 35 have lower rates of aneuploidy. This suggests that other factors, such as endometrial receptiveness, may be contributing to the increased rate of miscarriage in obese women.

- **Eating disorders and being underweight:**

Malnutrition can have a significant impact on reproductive health. Both undernutrition and overnutrition can lead to infertility and other reproductive problems. As mentioned earlier, obesity is associated with decreased fertility in both men and women. On the other hand, underweight individuals may also face difficulties in conceiving. In men, being underweight can lead to lower sperm concentrations, while in women, it can cause ovarian dysfunction and increase the risk of ovulatory infertility.

Furthermore, eating disorders such as anorexia nervosa and bulimia can also have negative effects on reproductive health. These disorders can disrupt menstrual cycles and decrease fertility. Additionally, they can also cause complications during pregnancy and affect the health of both the mother and the fetus.

It is, therefore important to maintain a healthy weight through a balanced diet and regular exercise to promote optimal reproductive

health. Seeking professional help and support is crucial for individuals who may be struggling with eating disorders or malnutrition.

- Exercise:

It is important to maintain a balance when it comes to exercise and reproductive health. Moderate physical activity is recommended for both men and women, as it helps in improving overall health and reducing stress levels. According to research, men who engage in moderate physical activity at least three times per week for an hour have better sperm parameters than those who engage in more frequent and intense exercise. However, excessive exercise may have a negative impact on sperm motility and concentration. In female athletes, menstrual irregularities and even complete loss of periods (amenorrhea) can occur due to the negative energy balance caused by high levels of exercise and low-calorie intake. This can lead to reduced levels of reproductive hormones such as GnRH, luteinizing hormone (LH) and follicle-stimulating hormone (FSH), which can result in ovulatory dysfunction and infertility. It is important for female athletes to maintain a balance between exercise, calorie intake and overall health to ensure optimal reproductive health. Consulting a healthcare professional or a sports nutritionist can be helpful in developing a personalized plan for maintaining reproductive health while participating in sports or other physical activities.

- Psychological effects

There is a direct connection between mental health and reproductive health. Studies have demonstrated a correlation between increased stress levels and infertility in men. Men who experienced stressful life events were more likely to have sperm concentration, motility, and morphology below WHO standards. Job stress, life events, and social strain have been linked to significant impacts on sperm density, total sperm counts, forward motility, and semen parameters, which may be attributed to stress. Stress and depression are believed to reduce testosterone and luteinizing hormone (LH) pulsing, disrupt gonadal function, and ultimately reduce spermatogenesis. Actively coping with stress, such as being assertive or confrontational, has been found to negatively impact fertility by increasing adrenergic activation, resulting in more vasoconstriction in the testes, which leads to low testosterone levels and decreased spermatogenesis. Although men

are typically hesitant to report their anxiety or sexual stress, the link between anxiety and sexual stress is remarkably strong. Decreased stress levels have been associated with fertility improvements. Physical stress can also impact female fertility. Women who worked more than 32 hours per week had a longer time to conception than those who worked 16 to 32 hours per week. Psychological stress, such as anxiety disorder or depression, affects 30% of women who attend infertility clinics, possibly due in part to infertility diagnosis and treatments. Stress also reduces the chance of fertilization of oocytes.

Conclusion – By making simple lifestyle changes, we can prevent many lifestyle-associated diseases and disorders. Although it may seem challenging, even a small effort towards better health is worthwhile. It's essential to adopt healthy eating habits, incorporate yoga, meditation, and exercise into our daily routine, which can aid in improving our overall health and making our lives more manageable.

7 ways to care for your reproductive and sexual health



REFERENCES:

1. <https://www.who.int/southeastasia/health-topics/reproductive-health#:~:text=Reproductive%20health%20is%20a%20state,to%20its%20functions%20and%20processes.>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3717046/>
3. <https://www.mayoclinic.org/healthy-lifestyle/getting-pregnant/in-depth/female-fertility/art-20045887>
4. <https://myparla.com/health-hub/fertility/sexual-and-reproductive-health/>

Yoga And Reproductive Health

UJJWAL KUMAR (I YEAR)

Hormones are an important regulatory factor, responsible for maintaining reproductive system functions in humans. It is the reason why a person's reproductive health is detrimentally affected by hormonal imbalance. The cause of hormonal imbalance is usually our hectic daily routine, stress, and nutritional deficiency. However, therapies and things like yoga, one of the drug-free medicines, can help us maintain our health by reducing hormonal imbalance and stress.

Yoga is a posture-based physical fitness, stress-relief and relaxation technique, including meditation, through different postures- “Asana” like Pranayama, Suryanamaskar, and other yogic postures. Practicing various asanas such as Matsyaasana, Adho Mukha Svanasana , Bhujangasana, Janu-Shiraasana, Hastpadasana, and Baddha Konasana (butterfly pose); various types of prayers like Bhramari pranayama and Nadi Shodhana pranayama, all the Suryanamaskar steps, and meditation can help to overcome irregular menstrual cycles, boost fertility in both males and females, and prevent different reproductive health concerns such as Polycystic ovary disease, breast cancer, prostate disease, foreskin problems, and male infertility. Regular dhyana, pranayama, and asana practice fosters a positive environment and mindset, which can aid men in preventing sperm loss.

During pregnancy, there are several hormonal changes (such as increased levels of oestrogen, progesterone, and thyroxin, as well as the formation of human chorionic gonadotropin, human placental lactogen, and pregnancy hormone relaxin) that affect both maternal and foetal health. In order to maintain these formations and changes, blood must reach the appropriate organs, and yoga can help by improving blood circulation and oxygenation.

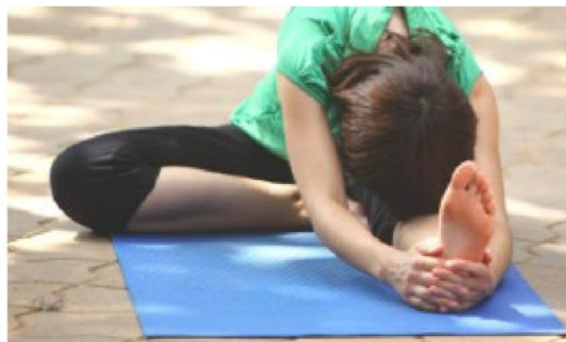
Let us learn about some different asanas.

1.) Matsyaasana - place hands on the floor, palms down. Bring your hand close to your buttocks and lift your chest by putting weight on your elbows. Maintain this position for a few seconds. The abdominal muscles are stimulated by lifting and pulling the back. The body is relieved of menstrual pain by performing this asana.



Matsyaasana

2.) Janu-Shiraasana (head to knee posture) - bring one leg forward and bend the other towards the thigh, attempting to touch the toes. Massage the abdominal organs by putting one leg forward and resting the head on the knee. This yoga posture alleviates menstrual cramps.



Janu-Shiraasana

3.) Dhanurasana (bow pose) - lie on your stomach, fold your knees, take your hands backward, and hold your ankles. This pose focuses entirely on the abdomen, which strengthens the abdominal muscles and reproductive organs while also alleviating menstrual discomfort and constipation.



Dhanurasana

4.) Baddha Konasana (butterfly posture) - sit with an erect spine, bend knees towards the pelvis, and tightly grasp feet with hands. It helps to build muscle and boost fertility.



Baddha Konasana

Suryanamaskar is sequence of 12 powerful asanas that when practiced regularly in the morning can help reduce stress and hormonal imbalance as well as relieve pain.

Steps-

1. Pranamasana - Stand tall with your feet together. In a namaskara mudra, bring the palms together in front of the chest. Maintain this position for a few seconds.

2. Hastuttanasana- Inhale and lift both arms above the head, slightly bending the trunk backward. Maintain this position for a few seconds.

3. Hastpadasana- Bend forward from the waist, keeping your arms by your sides, until your palms touch the floor on both sides of your feet and your forehead touches your knees. Maintain this position for a few seconds.

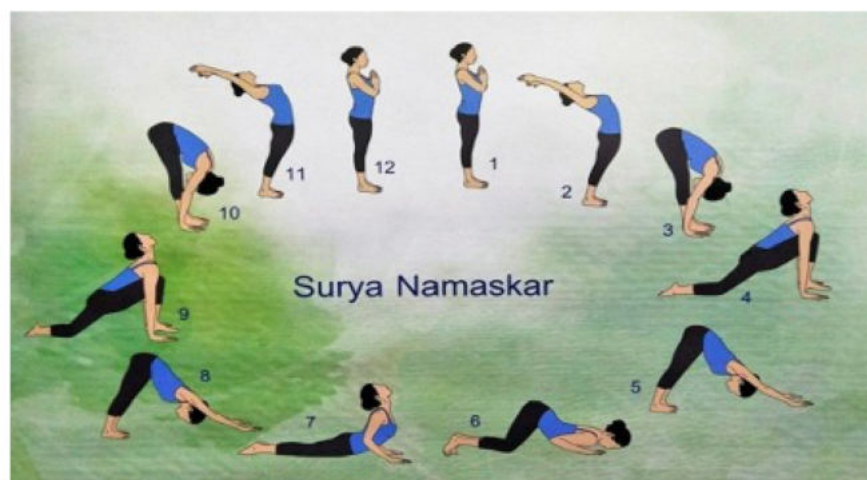
4. Ashwasancharasana- Extend the right leg as far behind you as you can. Bend the left knee and place the left foot between your palms on the ground. Maintain this position for a few seconds.

5. Dandasana- Return the left leg to join the right leg. Raise the buttocks and lower the head between the arms at the same time, forming a triangle with the floor. Try to keep your heels flat on the ground. Maintain this position for a few seconds.

6. Tadasana- With normal breathing, gently lower the knees, chest, and chin to the ground. The floor should be touched by your toes, knees, chest, hands, and chin. The buttocks are maintained. Maintain this position for a few seconds.

7. Bhujangasana- Lower the hips while pushing the chest forward, then lift the trunk until the spine is fully arched and the head is facing up. The lower abdomen and legs remain on the floor. Exhale while raising your torso. Maintain this position for a few seconds. Bhujangasana pulls the stomach inward, resulting in menstrual pain relief, as well as relief from fatigue and stress. Reverse all of the steps starting with Bhujangasana. All of the Suryanamaskar steps help to stretch and open the hips, allowing for an increase in blood flow in the pelvic region.

Steps of Suryanamaskar



Meditation

In meditation, we practice mind concentration on a specific thing, such as the rising sun or the tip of our nose, which helps different parts of the brain and glands work properly or get a boost, which aids in the proper secretion of hormones (such as testosterone, oestrogen, and progesterone) by reducing stress and tension.

Pranayama

Pranayama improves the blood and blood circulation system, which is important for all of the human body's systems. It raises the oxygen level in the blood as well as the flow of blood to the organs (reproductive organs- uterus and testicles or pelvic region) so that the organs function properly.

Blood transports all of the nutrients/elements required by all of the organs in the human body; blood must reach all organs in order for them to function properly and yoga can aid in the proper delivery of blood to all organs by increasing blood circulation.

Therefore to live a healthier life and to improve our reproductive health, we must follow a systematic daily routine that includes yogic practice. "Prevention is better than cure," and yoga is one of the ways to prevent diseases.

REFERENCES:-

1. <https://www.artofliving.org/in-hi/yoga/yoga-for-women/yoga-for-menstrual-cramps>
2. <https://reproductivehealthwellness.com/yoga-boost-fertility/#:~:text=Increase%20blood%20flow%20to%20uterus%20%26%20ovaries&text=Yoga%20may%656920help%20improve%20blood,pelvic%20region%20and%20reproductive%20o>
3. <https://food.ndtv.com/health/matsyasana-the-fish-pose-an-incredible-yoga-posture-for-your-back-issues-1405090>
4. <https://www.artofliving.org/us-en/one-legged-forward-bend-janu-shiradasana>
5. <https://food.ndtv.com/health/matsyasana-the-fish-pose-an-incredible-yoga-posture-for-your-back-issues-1405090>
6. <https://www.artofliving.org/in-en/yoga/yoga-poses/butterfly-pose-badhakonasana>
7. <https://www.dragonfly-yoga.org/blog/a-101-on-sun-salutation-or-the-surya-namaskar>

Breaking the Taboo: The Importance of Male Reproductive Health

HIYASMITA SARMAH (1 YEAR)

Female reproductive health has been a dominant subject throughout history and continues to be of utmost importance today, particularly in the fields of obstetrics and gynaecology. In contrast, male reproductive health has been largely ignored and remains an unexplored and insidious issue. Despite being a critical component of overall health, little attention has been given to male reproductive health, leading to a lack of information on the topic. This has made it a controversial and shameful topic for many males, with society perpetuating the myth that sexual performance determines a man's worth.

While erectile dysfunction is a widely known issue, many people are not aware of the treatments available, such as oral medications that can enhance the effects of nitric oxide and improve blood flow. However, it is important to note that a well-balanced diet, regular exercise, optimal sleep, and a healthy lifestyle can also have a positive impact on male reproductive health. On the other hand, excessive physical exercise can harm male fertility by decreasing testosterone levels, which negatively impacts sperm production.

Male reproductive health is often overlooked, with most discussions of reproductive health focused on menstruation, STDs, and cancer. However, other reproductive issues such as penile disorders, loss of libido, painful or premature ejaculation, and testicular disorders also exist and should be discussed without shame.

Furthermore, more attention and research should be focused on producing/inventing different types of contraception for men. Condoms, which are the most common form of contraception for men, have a failure rate of 2%, and there is a limited choice of other contraception options available.

Society must encourage more awareness about male reproductive health and hold campaigns to promote sperm health. Recent research shows that a man's health can affect the quality of his sperm and, subsequently, impact his children's health. Therefore, paying more attention to men's reproductive health has the potential to improve the lives of future generations. Remember, it takes "TWO" to create life, and both male and female reproductive health is equally important.

REFERENCES:-

1. <https://news.yale.edu/2020/09/15/gynecology-why-mens-reproductive-health-matters>
2. <https://pubmed.ncbi.nlm.nih.gov/?term=%2Bmale%2Breproductive%2Bhealth&filter=simsearch2.ffrft>

Taking Charge of Your Reproductive Health: Essential Practices for Men and Women

DEEPARATI DATTA (III YEAR)

Good reproductive health is essential for overall well-being and quality of life. Reproductive health encompasses a wide range of topics, including but not limited to, contraception, fertility, sexually transmitted infections (STIs), and pregnancy. General practices for good reproductive health are important for both men and women, and they can help prevent or manage reproductive health issues. These practices include regular visits to a healthcare provider, practising safe sex, maintaining a healthy lifestyle, and being aware of one's reproductive health history. In this article, we will discuss some of these general practices in more detail and explain why they are important for good reproductive health.

Maintaining Genital Hygiene

It's no surprise that good hygiene is crucial for excellent reproductive health in all sexes, especially in India's moist and tropical climate where infections are rampant. From Human Papilloma Viruses to pubic lice, infections of all kinds can quickly spread in this environment.

The external genitalia, regardless of gender, is made up of delicate and sensitive tissue that is easily prone to infection. Thus, it is recommended to clean the external genitalia every day with clean soap and water and wear clean underwear.

Smegma - a combination of dead skin cells, sweat, oils, and other secretions that accumulate during the day in the genital areas, should be washed away.

Excess or foul-smelling smegma indicates the need for more frequent cleaning. External cleanliness also contributes to the good health of internal reproductive organs. It is to be noted, however, that organs like vaginas are self-cleansing and do not require a daily cleaning regimen.

Contraception Usage for STI Prevention

Individuals should consult with a physician about the best options for contraception and STI prevention for themselves and their family planning. Monogamy, condom use, and water-based lubricants have all been shown to improve reproductive system health and reduce irritation/allergies. Practices such as smoking, drinking, using prohibited substances, and having unprotected sex have been shown to significantly hinder one's reproductive health.

Maintaining Hormonal Balance

Reproductive health and mental well-being can be greatly impacted by hormonal imbalances, which often occur as a result of natural ageing processes. Both males and females may experience changes in their reproductive systems as they age, leading to decreased hormonal secretions and potential health complications. For postmenopausal women, hormone replacement therapy may be recommended by a medical professional to manage symptoms. Men may also experience issues such as anxiety, depression, prostate enlargement, and urinary difficulties as they age.

Postnatal Healthcare

Childbirth and events before and after it can impact both male and female physical and mental health. The effect on the female reproductive system is definitely significant and requires time and care to recover. Not just women, but men also experience significant changes after the birth of a child, referred to as paternal postnatal depression (PPND). Maternal postnatal depression is well-recognized and has been extensively studied, with symptoms that may include persistent feelings of sadness, anxiety, fatigue, and loss of interest in daily activities. However, research has also shown that paternal postnatal depression is a significant concern, with similar symptoms experienced by fathers who may feel overwhelmed, anxious, and unable to cope with the new responsibilities of parenthood. It is essential for healthcare professionals to recognize and screen for postnatal depression in both mothers and fathers, as early identification and treatment can lead to better outcomes for the entire family.

Monitoring and Early Detection of Reproductive Cancers

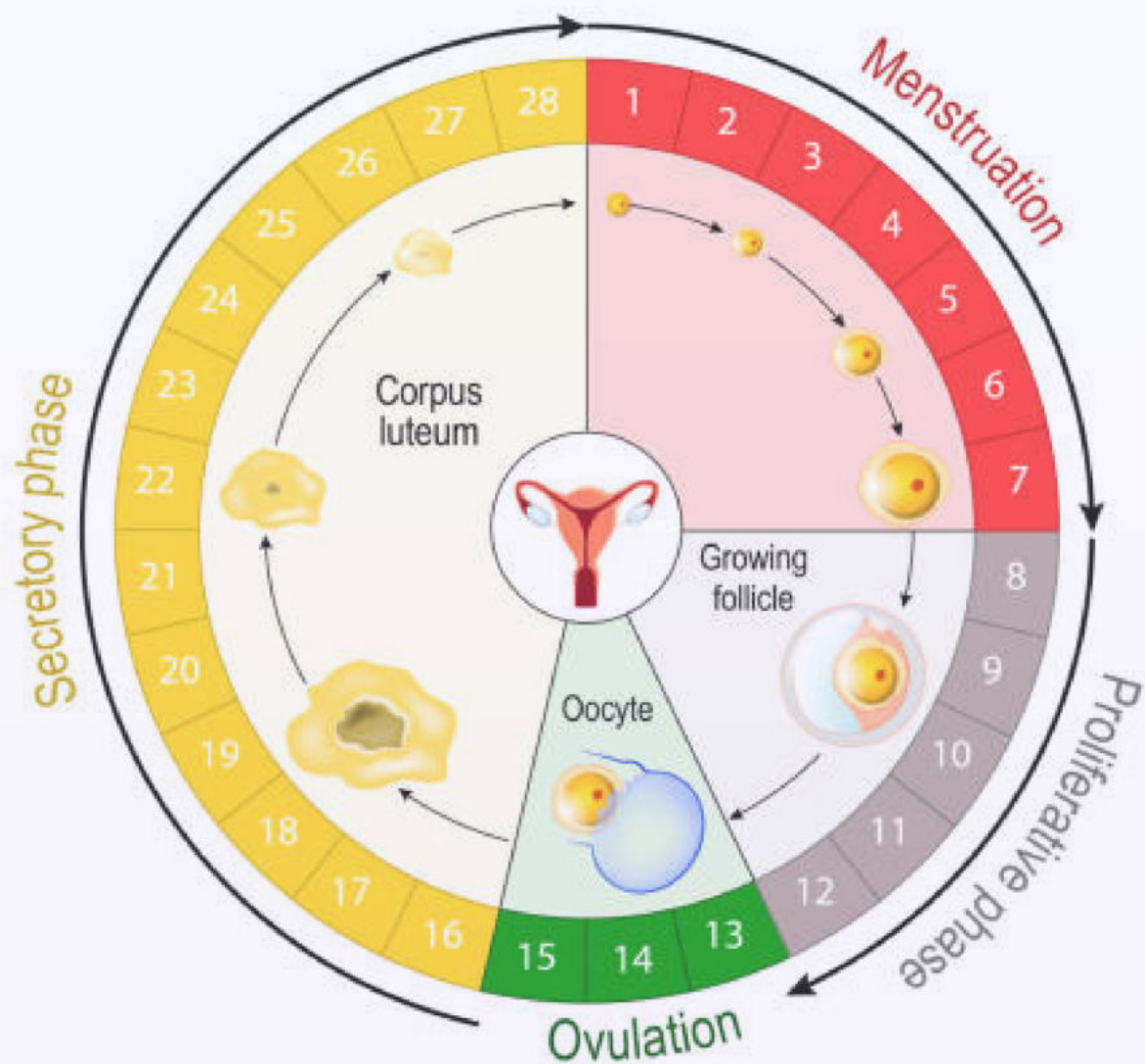
The chances of diseases such as breast, ovary, fallopian tube, and cervical cancer in females, and prostate and testicular cancers in males, should always be monitored so that due medical treatment can begin in time.

Maintaining good reproductive health involves a holistic approach that includes healthy lifestyle habits, proper hygiene, good nutrition, and access to medical care. Being proactive and seeking the assistance and care of a healthcare professional if you experience any unusual changes in your physical or mental well-being can also play a critical role in promoting optimal reproductive health and overall wellness. By prioritizing your reproductive health, you can help ensure a healthier future for yourself and your loved ones.

REFERENCES:-

1. <https://my.clevelandclinic.org/health/diseases/24281-smegma#:~:text=Smegma%20is%20a%20harmless%20combination,with%20soap%20and%20clean%20water>.
2. <https://www.healthdirect.gov.au/penis-care>
3. <https://www.mayoclinic.org/diseases-conditions/pubic-lice-crabs/symptoms-causes/syc-20350300>
4. Abulizi G, Li H, Mijiti P, Abulimiti T, Cai J, Gao J, Meng D, Abula R, Abudereyimu T, Aizezi A, Qiao YL. Risk factors for human papillomavirus infection prevalent among Uyghur women from Xinjiang, China. *Oncotarget*. 2017 Jun 30;8(58):97955-97964. doi: 10.18632/oncotarget.18901. PMID: 29228665; PMCID: PMC5716705.
5. <https://www.cancer.gov/about-cancer/causes-prevention/risk/hormones/reproductive-history-fact-sheet>

Menstrual cycle



Make-It-Simple- Biology Classes- “The Monthly Cycles”

ANAMIKA BINU (III YEAR)



Hello students, it's your mentor Ms Margareta again!

Today we will be learning about an important aspect of female reproductive systems, menstruation. An average human female menstrual cycle lasts for about a month and is a remarkable process that repeats itself multiple times throughout a female's life.

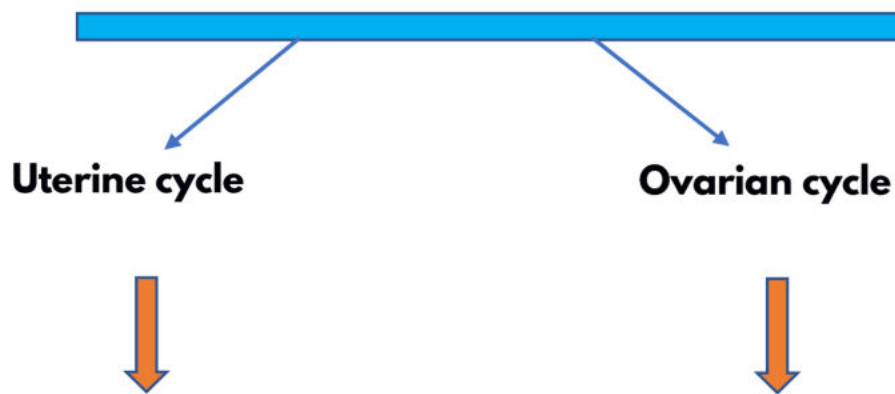
So, today's theme is:

“The Monthly Cycles”

For today's session, I will be your mentor, and my name is Ms Margareta. Let us hear a conversation between two of our students:

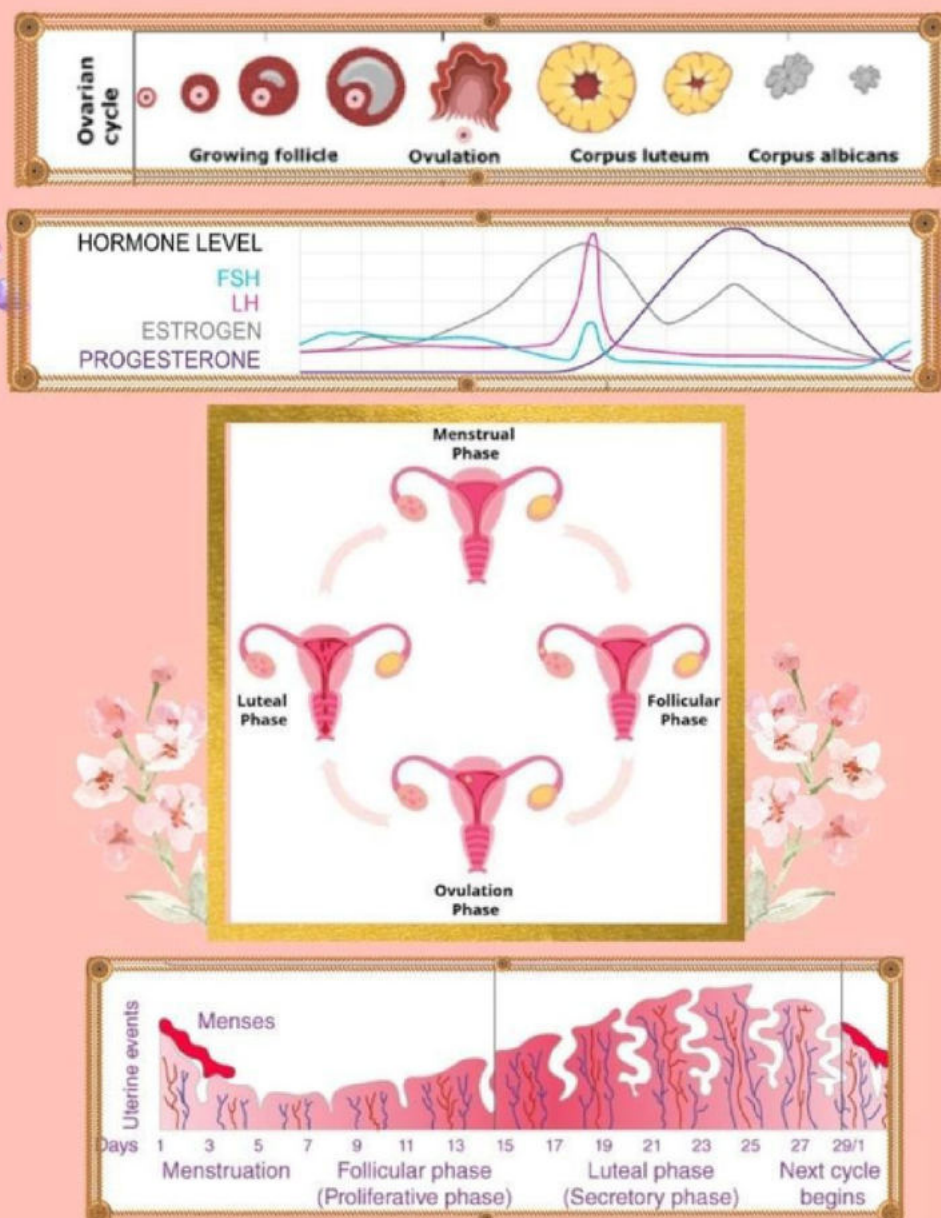


Basically, the menstrual cycle in women is divided into two cycles:



Different changes occurring in the uterus and its linings.

Different changes occurring in the ovary (hormonal).



Menstrual cycle (Day 1-5)

The uterus sheds its soft inner lining and blood vessels, which exit from the vagina as menstrual fluid. Blood loss up to 10-80 ml. Accompanied by abdominal cramps due to contractions of uterine muscles.

*28 days, the duration of a lunar month and menstrual cycle. How cool!

Also called the proliferative phase of the uterine cycle.

Follicular phase (Day 1-13)

Pituitary glands secrete FSH, which stimulates the egg cells to grow. It takes an egg 13 days to reach maturity. While the egg matures, its follicles secrete oestrogen and progesterone, which develop the lining of blood vessels and the endometrium.

Ovulation phase (Day 14)

The pituitary gland secretes LH to release mature egg cells.

The released egg cell is swept into the oviduct by the cilia of the fimbriae.

Also called secretory phase of the uterine cycle.

Luteal phase (Day 15-28)

The egg that is released stays in the fallopian tube for 24 hours.

If the sperm does not fertilise the egg, then the egg cell disintegrates. Progesterone levels fall, and the uterine wall sheds again, starting a new cycle.

Dukh → Dard → Peeda → PMS

ANKITA MALAKAR (III YEAR)



Image source: 7 Comics About Periods That Only Women Would Understand - LifeHack

Ah, the joys of being a woman!

Every month, we get to experience the magical wonderland that is Premenstrual syndrome or as we famously call it-PMS. You might have heard of PMS, but for those who are not familiar, it is definitely not about purchasing more shoes. (Trust me, I wish it was that simple!).

As the name suggests, its a menstrual health condition, that many menstruators experience in the days before their period. It is a time of the month that many dread, and for good reason. The symptoms of premenstrual syndrome can vary from mildly annoying to downright debilitating. From mood swings to cramps to bloating and cyclic mastalgia, PMS is no picnic. But why do menstruators have to go through this every month?

The exact cause of PMS is not known. It is believed that PMS is caused by hormonal imbalances such as progesterone deficiency and excess estrogen. Abrupt changes in these hormone concentrations are linked with breast tenderness, mood swings, nausea, headaches, and bloating. Additionally, serotonin is also thought to be a major player in the emergence of PMS symptoms. Serotonin levels can fluctuate during the menstrual period, which can lead to mood swings, depression, and other PMS-related emotional symptoms.

Molecular biology studies have shown that a decrease in estrogen levels prompt the release of norepinephrine from the hypothalamus, a region of the brain that plays a key role in hormone regulation. This, in turn, can lead to a drop in levels of neurotransmitters such as acetylcholine, dopamine, and serotonin, leading to a range of symptoms including insomnia, fatigue, irritability, and depression.

PMS can have a significant impact on women's quality of life. Imagine feeling as if you are on a rollercoaster ride that never ends—the ups, the downs, and the loop of emotions can be exhausting! It can make it challenging to function normally, whether it is at work, school, or in personal relationships. The physical and emotional symptoms associated with PMS can be challenging to manage.

But the good news is that there are several ways to manage and soothe PMS associated symptom. By exercising regularly (a tried and tested method), eating a healthy diet, and engaging in stress-reducing activities like yoga or meditation, one can improve their overall menstrual well-being and reduce the severity of PMS symptoms. Over-the-counter pain relievers can also be effective in relieving physical symptoms. Seeking support from loved ones or healthcare professionals can also make a significant difference in managing PMS and improving the quality of life. It is important for women to feel empowered to advocate for their health and speak openly about their experiences with PMS.

So, there you have it: PMS can be an emotional rollercoaster ride, but with the right support and self-care, it's possible to manage and even find some silver linings in the midst of it all (just kidding, there are none.) Anyhow, now that you know about PMS, I hope you feel empowered to advocate for female menstrual health and seek help when you need it.

P.S. PMS jokes are not funny, period.

REFERENCES:-

- 1.Premenstrual Syndrome - StatPearls - NCBI Bookshelf (nih.gov)**
- 2.Psychological factors and premenstrual syndrome: A Spanish case-control study - PMC (nih.gov)**
- 3.Premenstrual Syndrome (PMS): Causes, Symptoms, and Treatment (healthline.com)**

Period Poverty: The Struggle for Menstrual Equity

ANKITA MALAKAR (III YEAR)



Image source: www.shona.ie

Imagine this: You're going about your daily routine, and suddenly you feel a familiar trickle. Panic sets in when you realize that you've run out of menstrual products. You ask your friend for help, but she's in the same situation. You rush to the restroom, only to find that the dispenser is empty. You're left with no choice but to use an uncomfortable and unsanitary cloth as you rush back home. It's an unnerving scenario, and unfortunately, it's a common experience for millions of people who menstruate and face the challenge of period poverty.

Period poverty is a global issue that affects countless menstruators worldwide. They are deprived of basic necessities such as sanitary products, education on menstrual hygiene, proper waste management, and clean toilets. It's a human rights issue that is often overlooked, despite its far-reaching impact on the lives and health of those affected. The 2015-2016 National Family Health Survey found that only 36% of 335 million women use sanitary napkins.

Moreover, another study revealed that 71% of girls do not have knowledge of menstruation before their first period, and only a quarter of adolescent girls understand the source of their menstrual bleeding. Girls from rural areas often rely on old clothes, hay, or leaves to manage their periods, putting them at risk of infection and humiliation. Furthermore, the lack of access to clean water, and proper sanitation facilities makes it even more challenging for women to maintain their hygiene during menstruation.

Period poverty isn't only about the lack of menstrual products. It's also about the lack of education and awareness about menstruation. Despite being a natural part of life for half of the world's population, religious dogma frequently shrouds menstruation in secrecy and shame. The lack of education and awareness about menstruation and menstrual hygiene can lead to absenteeism from school, missed opportunities, and a lifetime of shame and stigma.

One of the primary reasons for period poverty is the high cost of menstrual products, particularly in the Western world, where a "pink tax" is imposed on these products, treating them as luxury items and adding an extra financial burden on individuals who cannot afford sanitary products. In such cases, women are more likely to choose buying other necessities, such as food or rent, over menstrual products.

On a positive note, New Zealand and Scotland are doing something remarkable by making menstrual products freely available to everyone! That's right, no more panicking when Aunt Flo comes knocking because these two countries are ensuring that all menstruating individuals have access to the hygiene products they need. It's a significant step forward in promoting menstrual health and hygiene, and it's about time we give it the importance it deserves.

So, what can we do about period poverty? First and foremost, we need to talk about it openly and honestly. We need to break down the taboos and stigmas associated with menstruation and begin having open and honest discussions about what it means to be a menstruating person. Start by spreading the word about period poverty, talk to your friends and family about it, so we can educate and equip all the people who menstruate to manage their periods safely and confidently.

We also need to address the systemic issues that contribute to period poverty. This includes advocating for policies and programs that provide free menstrual products to those in need, as well as ensuring access to clean water and sanitation facilities. It's crucial to recognise that menstruation is a natural and normal part of life, and people who menstruate have the right to manage their periods with dignity and respect. Access to menstrual products is not a privilege; it's a basic human right.

References

- 1. van Eijk AM, Sivakami M, Thakkar MB, et al. Menstrual hygiene management among adolescent girls in India: a systematic review and meta-analysis, BMJ Open 2016;6:e010290; doi: 10.1136/bmjopen-2015-010290**
- 2. Menstrual Hygiene Day Facts: Only 36 percent of the women in India use sanitary pads during their periods (Menstrual Hygiene, ndtv.com)**
- 3. Menstrupedia Blog | Official Blog of Menstrupedia**
- 4. Period Poverty in India — The Pink Project (thepinkprojectca.org)**

Alternatives for Menstrual Pads

ANAGHA, ANSHIKA, HISANA, SRISHTI, VIPASHA (II YEAR)

As per the United Nations' world population statistics, the female population in India accounts for 48.4% of the country's total population. Furthermore, it has been estimated that approximately 432 million sanitary pads are disposed of every month in India, and this number is expected to increase significantly in the future. Women of reproductive age generally use sanitary pads during their menstrual cycles, which adds up to an average of 1800 days throughout their lifetime.

But the question arises are they really safe?

This article will explore the safety of sanitary pads and consider alternatives that promote environmentally-friendly menstruation. While pads are commonly used, they have several limitations. Research has revealed that many pads contain chemicals such as Di-n-butyl phthalate, Di-2-Ethylhexyl phthalate, and VOCs like Xylene and Methylene chloride. These chemicals can impact the function of reproductive, endocrine, and cardiovascular systems. Additionally, the plastic components of pads can lead to fungal and bacterial infections that result in vaginitis. Moreover, plastics have harmful effects on the environment as they are non-biodegradable and release chemicals such as dioxins and furans when burned.

For the search for better alternative, following questions arises.

- What are the basis of selection for sanitary products?
- What should people generally keep in mind while purchasing an alternative?

The use of sanitary protection products is primarily influenced by personal preference, social factors, financial situation, and convenience in residential regions. Cloth pads are the most frequently used materials in rural areas, whereas disposable sanitary pads are favoured in cities. The challenge offered by the 3As - Awareness, Accessibility, and Affordability, is largely to blame for this.

Some alternatives so far came across our learning are :-

1. TAMPONS

Tampons are cylindrical inserts made of cotton, rayon, or a blend of both materials that are placed inside the vagina. They come in two types: disposable and reusable.

PROS:

- Comfort:** Tampons are generally more comfortable for most women to wear compared to sanitary pads.
- Improved personal hygiene:** Tampon use tends to make women feel cleaner. Pads can be messy, and if worn for too long, can produce an unpleasant odor.
- Allows for physical activity:** Tampons enable women to go swimming during their period, and they are more comfortable than pads, allowing for a broader range of physical activity.

CONS:

- Higher risk of toxic shock syndrome (TSS):** Tampon use can increase the risk of toxic shock syndrome (TSS), a condition that results when strep bacteria grow in the vagina and enter the bloodstream.
- Not eco-friendly:** The overwrap of tampons, made of non-biodegradable polypropylene, is not environmentally friendly

2. COTTON REUSABLE PADS

Reusable cotton pads are designed to function similarly to disposable pads, with layers of cotton enclosed in a waterproof fabric that can be washed and reused. They offer several benefits:

PROS:

- Environmentally friendly:** Cotton reusable pads are an environmentally-friendly alternative to disposable pads that generate a lot of waste.
- Reusable:** These pads can be washed and reused, making them more cost-effective than disposable pads.
- Healthy:** Using reusable cotton pads eliminates the risk of Toxic Shock Syndrome (TSS), which is associated with tampon use.

CONS:

- Requires washing:** Since cotton reusable pads are washable, they require regular washing after use, which can be time-consuming and require additional resources like water and detergent.
- Less convenient:** Reusable cotton pads may be less convenient to use than disposable pads since they need to be washed and dried before re-use.
- Bulkier than disposable pads:** Reusable pads may be bulkier than disposable pads, which could make them uncomfortable or noticeable under tight clothing.
- May not absorb as much:** Compared to disposable pads, reusable cotton pads may not absorb as much liquid, and therefore need to be changed more frequently.
- May stain:** Reusable cotton pads may stain over time, which could be unsightly and difficult to remove.

3. BAMBOO PADS

The absorbent material used in menstrual pads is bamboo fiber, which is fully biodegradable and environmentally friendly. A study comparing bamboo, cotton, and blended textiles for cloth diapers found that pure bamboo had the strongest antibacterial activity, while a bamboo cotton blend had higher absorption capacity than pure cotton.

Bamboo is considered a water penetration fabric, with a moderate spreading area due to its excellent moisture management capabilities. Recent research has shown that bamboo fiber, with its numerous micro-holes and micro-gaps, can absorb and wick water 3-4 times better than cotton. This makes bamboo a great choice for menstrual pads, as it can help reduce odors and provide superior absorbency compared to traditional cotton pads.

PROS:

- Bamboo fabric is known for its antibacterial properties,** which can help to reduce the growth of bacteria and unpleasant odors.
- Bamboo fibers are highly absorbent,** making them an effective material for menstrual pads.

CONS:

- **Bamboo pads are more expensive than traditional cotton pads.**
- **It may require an initial investment as you would need to purchase a pack of reusable pads.**
- **It may not be as easily accessible as non-biodegradable pads in some areas.**

4. BANANA PADS

Clean pads made from banana tree fibre are currently being sold in India under the brand name "Saathi." They are environmentally friendly and break down within a year of use. A natural absorbent is banana fibre. The texture of the banana is quite pleasant and likely to cause allergies. More importantly, banana fibre's absorbent core is quite effective in containing menstrual fluid and is biodegradable.

PROS:

- **Environmentally friendly:** Cotton reusable pads are an environmentally-friendly alternative to disposable pads that generate a lot of waste.
- **Reusable:** These pads can be washed and reused, making them more cost-effective than disposable pads.
- **Healthy:** Using reusable cotton pads eliminates the risk of Toxic Shock Syndrome (TSS), which is associated with tampon use.

CONS:

- **Requires washing:** Since cotton reusable pads are washable, they require regular washing after use, which can be time-consuming and require additional resources like water and detergent.
- **Less convenient:** Reusable cotton pads may be less convenient to use than disposable pads since they need to be washed and dried before re-use.
- **Bulkier than disposable pads:** Reusable pads may be bulkier than disposable pads, which could make them uncomfortable or noticeable under tight clothing.
- **May not absorb as much:** Compared to disposable pads, reusable cotton pads may not absorb as much liquid, and therefore need to be changed more frequently.
- **May stain:** Reusable cotton pads may stain over time, which could be unsightly and difficult to remove.

5. MENSTRUAL CUPS

Menstrual cups are becoming an increasingly popular alternative to traditional sanitary products like tampons and pads. They are small, reusable silicone or rubber cups that are inserted into the vagina to collect menstrual blood. The cups can be worn for up to 12 hours before being emptied, rinsed, and reinserted. Menstrual cups are eco-friendly, cost-effective, and can reduce the amount of waste generated by disposable pads and tampons. However, like any menstrual product, they have their pros and cons.

PROS:

- **Reusable and eco-friendly**
- **Can be worn for up to 12 hours**
- **Can reduce menstrual cramps and dryness**
- **Can save money in the long run**
- **No risk of toxic shock syndrome**

CONS:

- **Initial cost can be higher than disposable pads or tampons**
- **Learning curve for insertion and removal**
- **Requires access to clean water for cleaning**
- **Not as widely available in stores compared to traditional menstrual products.**

CONCLUSION

As per our understanding, menstrual cups seem one of the most sustainable option for menstrual hygiene as they eliminate the harmful disposal of toxic gases and chemicals into the environment, and also significantly reduces chances of leakage during heavy flow. Made of 100% medical grade silicone, menstrual cups are not only eco-friendly, but they are also free from toxins. The cups are reusable and can last for up to 10 years, which makes them a cost-effective option. Consider, this calculation:

For a woman, bleeding once every month,
1 month 8 pads Rs.70
12 months 100 approximately Rs.800

Total time till menopause : 40 years cost of pads full life Rs. 32000

If a menstrual cup is used,
Cost per piece = 400 Rs
1 Piece will work for = 5 years
Total cup needed in lifetime = 8
Total cost Rs. 3200

This is 10 times less than the money spent on sanitary napkins and can result in significant savings over time. While some women may be hesitant to try something slightly invasive for their menstrual hygiene, they are advised to consider other sustainable green alternatives that are comfortable to wear, easier to use, and having a lower risk of toxic shock syndrome.

REFERENCES:-

- 1. <https://timesofindia.indiatimes.com/readersblog/unity-health-care/bad-health-effects-of-sanitary-napkin-on-women-36196/>**
- 2. <https://www.indiatimes.com/health/healthyliving/pros-and-cons-of-using-tampons-242655.html>**
- 3. <https://www.saraldesigns.in/uncategorized/sanitary-napkins-and-its-environmental-impact-part-1>**
- 4. <https://blog.sparkle.life/breaking-the-dilemma-of-sanitary-pads-disposal/>**
- 5. <https://www.healthshots.com/intimate-health/menstruation/these-reusable-sanitary-pads-made-of-banana-fibre-are-helping-women-have-an-eco-friendly-period/>**
- 6. <https://www.indiatimes.com/health/healthyliving/pros-and-cons-of-using-tampons-2>**
- 7. Sanitary Waste Disposer**
- 8. Sharika, C; Chithra Chandran Adumbil; Joy, Daina; Paul, Elizabeth Jose; Thomas, Ashly.**

- 9.<https://m.timesofindia.com/city/nagpur/sanitary-pads-contain-chemicals-leading-to-cancer-cardio-problems-report/articleshow/95946878.cms#:~:text=Surprisingly%2C%20the%20Phthalate%20levels%20were,some%20cancers%20and%20congenital%20disabilities>
- 10.<https://always-africa.com/en-za/tips-and-advice-for-women/intimate-hygiene/how-to-use-a-tampon-step-by-step-guide>

Unanswered

AASTHA (1 YEAR)

All the people who visit the temple, are they really clean?

Uncaught criminals and killers worship there, who've never been seen,

Why then I, who bleeds for a cause considered impure and denied,

While they visit freely and I still yearn for an answer to find.

Why should a woman's being ever be considered a shame?

But still, society did not leave her from this unnecessary game,

From being made to sleep on the floor to being denied entry in the kitchen,

All the dignity goes plummeting with the untouchable treatment given.

Now, these questions are put in front for everyone to decide,

Can a woman be treated fairly? Now you may change side,

I wish people could be a little empathetic and kind,

So at least women can live with no shame in their mind.



Sharna

Reproductive health (Pregnancy)-related rights and laws for women in India

UJJWAL KUMAR (1 YEAR)

An unborn fetus, alas debatably, is not an entity with human rights. The pregnancy takes place within the body of a woman and has profound effects on her health, mental well-being, and life. Thus, how she wants to deal with this pregnancy must be a decision she and she alone can make. The right to control their own body and fertility and motherhood choices should be left to the women alone. Let us not lose sight of the basic right of women: the right to autonomy and to decide whether to get pregnant or not.

It is very important to know about the laws and rights when we are talking about any particular topic in a particular nation or state here we will discuss the rights and the laws related to reproductive health in the Indian constitution.

In the Indian constitution, numerous reproductive health rights are given under the right to life and the right to be free from torture for women. Most of the reproductive health laws are made to maintain all involved parties, emotional, psychological, and social morality. The reproductive rights of a person fall under both the right to health as well as the right to personal liberty under Article 21.

According to the Right to Health, every woman has the right to access and receive a minimum standard of treatment and care in the public health centre, and providing these facilities is the duty of the state government.

“The inability of women to survive pregnancy and childbirth violates her fundamental right to life as guaranteed under Article 21 of the Constitution of India” and it is the primary duty of the government to ensure that every woman survives pregnancy and childbirth at its best possible level.”

The aforesaid lines were given by the Delhi high court in judgement of maternal deaths.

Article 21 also says,

"It is a personal right of a woman to give birth to a child and nobody can interfere in the personal decision of the wife to carry on or abort her pregnancy."

An unwanted pregnancy or abortion can affect the mental health of the pregnant woman and her unborn child's health.

Laws in place for abortion and pregnancy:

In Indian history, up until 1960 according to IPC section 312, termination was illegal except if the termination has been done to save the women's life. Medical Termination of Pregnancy (MTP) Act 1971, however, was introduced by the Indian government in 1971 to reduce the chances of reproductive health damage.

According to MTP Act 1971, certain pregnancies can be terminated by the registered medical practitioner and gynecologist under defined conditions, albeit it is approved by one or a panel of doctors. For instance, abortion of up to 12 weeks of pregnancy needs one doctor's approval, up to 20 weeks of pregnancy need two doctor's approval and in the condition of rape, for abortion after 20 or 24 weeks, court permission must be sought.



One must remember that laws alone can't always ensure reproductive health and its involved sectors better. As long as we all became aware and fully understand our responsibility towards such sensitive topics, we must keep on striving to strengthen such laws and promote the individuals' self and social safety.

REFERENCES:-

1. [https://www.aiims.edu/aiims/events/Gynaewebite/ec_site/report/1_5_5.htm#:~:text=34%20of%201971\)%20was%20promulgated,t he%20use%20of%20Emergency%20Contraceptive.](https://www.aiims.edu/aiims/events/Gynaewebite/ec_site/report/1_5_5.htm#:~:text=34%20of%201971)%20was%20promulgated,t he%20use%20of%20Emergency%20Contraceptive.)
2. <https://www.drishtiias.com/hindi/daily-updates/daily-news-analysis/abortion-law-in-india>
3. https://timesofindia-indiatimes.com.cdn.ampproject.org/v/s/timesofindia.indiatimes.com/blogs/nonpartisan-perspectives/sexual-and-reproductive-health-rights-srhr-in-india-part-1/?amp_gsa=1&_js_v=a9&usqp=mq331AQIUAKwASCAAgM%3D#amp_tf=From%20%251%24s&aoh=16804556611211&referrer=https%3A%2F%2Fwww.google.com&share=https%3A%2F%2Ftimesofindia.indiatimes.com%2Fblogs%2Fnonpartisan-perspectives%2Fsexual-and-reproductive-health-rights-srhr-in-india-part-1%2F
4. <https://reproductiverights.org/sites/default/files/documents/Reproductive-Rights-In-Indian-Courts.pdf>
5. <https://nickledanddimed.com/2021/11/19/gender-and-law-reproductive-rights-in-indian-jurisdiction/>

Reproductive changes postpartum: How to help a mother cope?

KUMAR TARUN SINGH (1 YEAR)

While having a baby is a great experience, it comes with many complications, some of which can be life-threatening. The postpartum period accounts for not only physical changes but also emotional and behavioural changes. In this article, we discuss some of the difficulties faced by mothers during the period post-parturition, and subsequently the measures needed to be taken by respective caregivers.

Once the baby is born, the uterus undergoes a sudden drastic change in its size, as it shrinks to its initial proportions before pregnancy. This process is called involution and can lead to abdominal pain or cramps after childbirth. These afterpains occur because of oxytocin-controlled uterine contractions which may last for 2-3 days. Breastfeeding has been known to intensify this pain as oxytocin also gets released by the posterior pituitary in response to nipple stimulation.

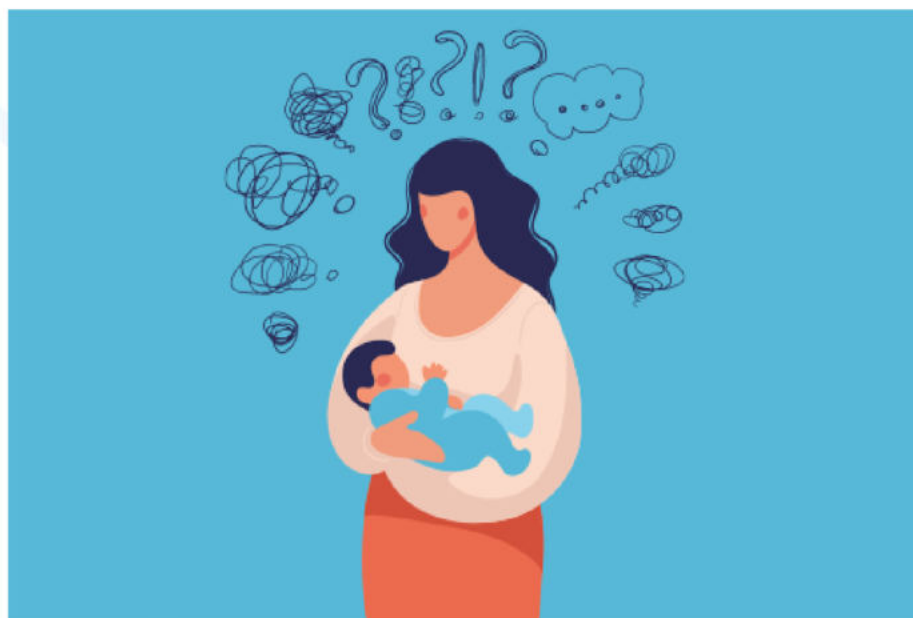
There are several ways through which these pains can be alleviated. Some of which is by ensuring that the mother lies in a prone position while hot water compresses are kept on her lower abdomen. They should frequently urinate to keep the bladder empty and drink hot water to ease the pain. Analgesics can also be used but should be administered as per the physician's order.

Another issue that is faced is lochia. Lochia flow is the vaginal discharge originating from the uterus cervix and vagina. It contains a mixture of uterine tissue, blood, and mucus. These discharges are heavy at first but gradually decrease and stop by 6 weeks post-delivery. The colour of this discharge is red up to 4 days after delivery which signifies the presence of endometrial tissues. The lochia then changes its colour to yellow or pale brown for 5-9 days and comprises mainly blood, mucus, and leucocytes. Finally, the colour of lochia changes to white and contains only mucus that lasts up to 10-14 days.

Prolonged lochial discharge is indicative of sub-involution i.e., the delayed return of the uterus to its standard size postpartum. The absence of lochia on the other hand, or clots including foul odour may, however, allude towards the presence of an infection.

Because of the changes taking place, in addition to dealing with the baby, the period after childbirth can be stressful for the mother. The new challenges that arise during this time can also make the mother feel mentally depressed. During this time, the mother will need social support and an experienced caregiver who can talk to her about her challenges and how she can deal with them. Talking to a licensed therapist may also work wonders in achieving the same.

The skin between the vagina and rectum, known as the perineum, often becomes swollen and tears during childbirth. This causes pain and discomfort for a couple of weeks. To treat this, the area should be kept clean. Sprays or painkillers can be used if prescribed by a doctor or nurse. Some mothers are also diagnosed with postnatal thyroiditis, which is an inflammation of the thyroid glands. The condition occurs in 2 phases, of which the thyrotoxic phase includes symptoms such as anxiety, insomnia, fatigue, weight loss and irritability. The other is the hypothyroid phase, which is characterized by fatigue, weight gain, constipation, dry skin, and depression. Visit the doctor to reduce the symptoms. With proper diet and treatment, many women have been able to recover and regain normal thyroid function.



Apart from this, nutrition is also required for lactating mothers since lactation requires 700kcal of energy to secrete 500-800ml of milk per day.

Gestation and childbirth take enough of a toll on a mother's body, but the work doesn't end there. She and her family need the support and care you can provide, even being considerate of them and their needs is sometimes enough as an outsider. There is no shame in being or helping a mother cope with her changing body. It is imperative that we as a society recognize that a new mother must be given proper healthcare, nutrition and support during and after her pregnancy term, so that she is able to recover and regain her health, prior to her pregnancy.

REFERENCES:-

- 1. <https://www.ncbi.nlm.nih.gov/books/NBK555904/>**
- 2. https://brooksidepress.org/ob_newborn_care_2/?page_id=287**
- 3. <https://www.dignityhealth.org/articles/7-common-postpartum-conditions-new-mothers-should-know-about>**
- 4. <https://www.buzzrx.com/blog/is-postpartum-anxiety-medication-right-for-you>**



Comprehensive Sex Education - An Approach to a Better, Healthier Future

VAAMSI JAJORIA & HIYASMITA SARMA (1 YEAR)

Did you know that only 34% of young people worldwide have accurate understanding of HIV prevention and transmission? Additionally, in certain countries, two out of three young women are unaware of the changes that occur during menstruation. This highlights the urgent need for a high-quality comprehensive sex education (CSE) program to be incorporated into the education system. The goal of such a program is to empower children and young people by equipping them with knowledge, skills, attitudes, and values that can help them achieve optimal health, well-being, and dignity. This program also emphasizes cultivating respectful sexual and social relationships, making informed choices that impact their own and others' well-being, and understanding and protecting their rights throughout their lives.

Due to the prevalence of teenage pregnancy and its known adverse effects, such as eclampsia, puerperal endometritis, and systemic infections in adolescent mothers compared to those aged 20-24, and the higher risks faced by babies of adolescent mothers of low birth weight, preterm birth, and severe neonatal conditions, it is imperative to educate young people on this subject. Pregnant adolescents are also at a higher risk of developing mental health problems, such as depression, intense stress, and pressure to become parents, while facing a lack of support from family and the community, leading to depression, poor decision-making, and drug abuse. Additionally, due to the strong stigma associated with teenage pregnancies, pregnant teens may experience feelings of guilt, anger, denial, embarrassment, and low self-esteem, leading to their reluctance to seek help from anyone, including friends, family, or society, resulting in further isolation. This highlights the urgent need for sex education in today's world.

In our country, people, particularly the youth, often receive inaccurate and misguided information regarding reproductive health and healthy sexual practices. This leads to conflicting attitudes towards a natural aspect of life, reproduction. However, modernization has created a demand for reliable information from young people, which enables them to lead safe, productive, and fulfilling lives. Comprehensive sex education (CSE) effectively meets this need by enabling young people to navigate a world where gender-based violence, gender inequality, early and unintended pregnancy, HIV, and other STIs pose significant risks to their health and well-being. It helps them understand the consequences of their actions, contributing to better reproductive and mental health.

Despite evidence that comprehensive sex education does not increase sexual activity, sexually transmitted diseases or sexual risk-taking behaviour among students, opposition to mandatory sex education in schools still exists. This rejection often stems from a broader opposition to the realization of human rights for certain groups, including women, LGBTI+ individuals, and, to some extent, children, citing threats to traditional and religious values. Although providing this essential information during a student's school or college years can have the greatest impact on their minds, discussing sexual and reproductive health remains taboo in our society. Eliminating stigma around this "forbidden knowledge" is necessary for society to develop a healthier approach to sex and reproductive health and lead us to a livelier future.

Healthy sexuality is characterized by the ability to express one's sexuality in ways that improve one's life, without compulsion, prejudice, or violence. It involves having a positive and respectful attitude towards sexuality and romantic relationships, as well as the ability to enjoy and control sexual and reproductive behaviour without guilt, fear, or shame. In addition, practicing health-promoting behaviors such as regular checkups and STD testing, and showing respect for diversity are also essential for maintaining sexual health and well-being.

Sex education plays a crucial role in promoting sexual well-being by helping young people understand how to protect themselves from risks such as sexually transmitted infections, exploitation, abuse, and other forms of sexual violence. It has a significant impact on one's

social, mental, and physical well-being, and can prevent dire consequences that may arise from lack of knowledge or misinformation.

The reality is that sexual relations are a natural part of life, and it is better to be prepared and informed to prevent any negative consequences. Sex education is an essential aspect of navigating life, and it is crucial to acknowledge its significance in ensuring a smoother, more contented life.

REFERENCES:-

1. <https://www.ohsu.edu/womens-health/benefits-healthy-sex-life#:~:text=Better%20heart%20health%2C%20possibly%20including,Increased%20libido>
2. <https://www.unesco.org/en/articles/why-comprehensive-sexuality-education-important#:~:text=Sexuality%20education%20has%20positive%20effects,or%20STI%2FHIV%20infection%20rates.>
3. <https://www.health.state.mn.us/people/sexualhealth/characteristics.html>
4. https://www.nsvrc.org/sites/default/files/saam_2015_what-is-healthy-sexuality-and-consent.pdf

Understanding Status Quo of Reproductive Health of Sex Workers in India

LAZI PARWEEN (1 YEAR)

Prostitution can be defined as the exchange of sex for money or other goods or services. It involves individuals selling sex in a promiscuous and emotionally indifferent manner, often for commercial reasons rather than their own desire. It is worth noting that prostitution is neither explicitly legalized nor regulated in India, although associated activities are deemed illegal under The Immoral Traffic (Prevention) Act, 1956. However, on May 19, 2017, the Supreme Court of India ruled that sex workers, like any other professionals, are entitled to dignity and constitutional rights. This decision marked a significant step forward in recognizing the rights and health care of sex workers in India.

In India, female sex workers are at a high risk of contracting sexually transmitted infections (STI's), including HIV/AIDS. According to UNAIDS, 2.4 million people are affected by HIV/AIDS in India, and in 2019, the Joint United Nations Programme on HIV/AIDS estimated a mean HIV prevalence of 36% among sex workers. Additionally, the average reported prevalence of active syphilis among sex workers is 10.8%. While less is known about the prevalence or incidence of other STI's and viral hepatitis infections among sex workers, increased rates have been documented in different contexts around the globe.

The risk of contracting an STI can have serious consequence on an individual's health, including infertility, cervical cancer (which is the 7th most common cancer worldwide), and infections such as herpes, syphilis, gonorrhea, and Chlamydia. Young sex workers may be at an even higher risk, as their genitals are not fully developed.

Sex workers also face stigma, discrimination, and legal barriers, which can make it difficult for them to access healthcare and receive the support they need. For example, a study conducted in India found that more than 90% of pregnant sex workers continued to engage in sex work during their pregnancy, which can lead to maternal mortality. Many sex workers also report having had unprotected intercourse in the past, which increases their risk of contracting HIV/AIDS.

The women involved in prostitution often suffer from various other health conditions, such as dental problems, lip burns from hot crack pipes, facial rashes and sores, herpes, frostbite, swollen legs, bleeding ulcers, abscesses on their legs, and cellulitis or osteomyelitis. Gynecologists warn that sexually active women have a higher risk of breast cancer, and research has shown that risky sexual practices, such as unprotected sex and sex with multiple partners, can increase the risk of cervical cancer as well.

In conclusion, prostitution can have severe negative impact on the physical and mental health of individuals involved. The lack of access to medical facilities, combined with risky sexual practices and drug use, can lead to various reproductive health concerns such as sexually transmitted infections, breast cancer, cervical cancer, etc. Sex workers therefore require more medical attention than the general population, but their lack of awareness or access to medical facilities often exacerbates their suffering. In some cases, the severity of their illnesses can lead to death. It is crucial to address their health and safety concerns and provide appropriate medical care and resources to ensure the well-being of those involved.

REFERENCES:-

1. <https://m.timesofindia.com/topic/underage-prostitute>
2. <https://nashikcorporation.in/discussion/girls-marriage-age-in-india>
3. <https://mediaindia.eu/tag/sexual-health-in-sex-workers/>

Clearing the Air: Debunking Common Misconceptions About Sex!

MANAS SINGHAL (III YEAR)

Exploring the complex world of sex can lead to both delightful and challenging experiences, as it can stir up a range of emotions such as pleasure, fear, shame, and trauma. Our upbringing, experiences, and moral beliefs often heavily influence our personal feelings about sex, making it a taboo subject for many. Additionally, there are numerous misconceptions and myths surrounding sex that often contribute to the discomfort and confusion around the topic. To set the record straight, it's time to dispel some of these common misunderstandings and educate ourselves about the facts. It was way overdue anyway! Let's set the record straight.

Myth #1: "You can't get pregnant the first time you have sex."

Debunk: This is a false assumption. Unprotected sex, even the first time, can result in pregnancy. It's important to use contraception to prevent unintended pregnancy.

Myth #2: "The bigger, the better."

Debunk: Penis size does not determine sexual satisfaction. Both men and women can enjoy sex regardless of penis size.

Myth #3: "Women don't enjoy or need sex as much as men."

Debunk: Women can experience the same level of pleasure and desire as men. The idea that women are less sexual than men is a harmful and false stereotype.

Myth #4: "Masturbation is sinful."

Debunk: This one is a real joke. Masturbation is like a daily vitamin for your sexual health. It's not only normal and healthy, but it's also fun! So, go ahead and indulge in some self-love; your body will thank you.

Myth #5: "You can't get an STI from oral sex."

Debunk: STIs can be transmitted through oral sex, just like through any other form of sexual contact. Using protection and getting tested regularly can reduce the risk of infection.

Myth #6: "You can't get pregnant during your period."

Debunk: While pregnancy is less likely during menstruation, it's still possible. Sperm can survive in the body for up to five days, so if you have a short menstrual cycle, ovulation can occur shortly after your period ends. Using contraception is essential if you're not trying to conceive.

Myth #7: "Pulling out is an effective form of birth control."

Debunk: Withdrawal (pulling out) is not a reliable form of contraception. Pre-ejaculate fluid can contain sperm and lead to pregnancy. It also offers no protection against STIs.

Myth #8: "You can't get pregnant if you have sex in a certain position."

Debunk: Pregnancy can occur regardless of sexual position. Using contraception is crucial to prevent unintended pregnancy.

Myth #9: "The more sex you have, the looser your vagina gets."

Debunk: This myth is not true. The vagina is a muscle that can stretch and contract, but it doesn't become permanently "looser" with time.

Myth #10: "Gay sex is more dangerous and leads to higher rates of STIs."

Debunk: Sexual behaviour, not sexual orientation, determines STI risk. Safe sex practices and regular testing can help reduce STI transmission, regardless of sexual orientation.

Myth #11: "Vaginal Smell Indicates a Problem."

Debunk: Vaginal odour is normal and can vary throughout the menstrual cycle. However, if it comes with itching or unusual discharge, it's best to consult a healthcare provider.

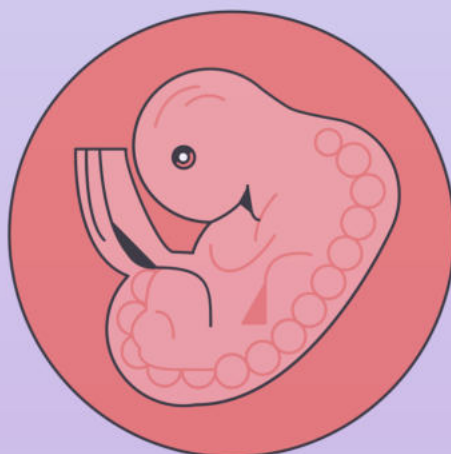
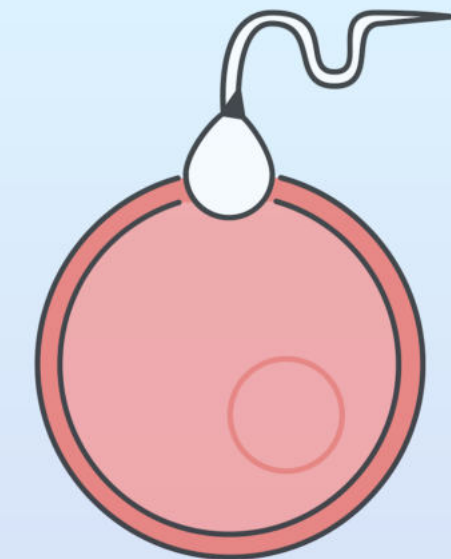
Myth #12: “An Intact Hymen Means a Woman is a Virgin.”

Debunk: Hymens can break for various reasons, so they are not a reliable indicator of virginity. Virginity is a social and cultural construct, and there's no one way to define it.

Let's wrap up this myth-busting extravaganza with a dash of humour, shall we? It's essential to remember that misinformation about sex is abundant and can be downright hilarious. Whether it's the notion that men need to last longer in bed (sorry fellas, but it's quality over quantity, right?), or that having sex during your period will somehow bring about the apocalypse (it won't, I promise), these myths are more amusing than anything else. So, let's take a moment to relish in the ridiculousness of it all, share a hearty laugh, and then refocus on enjoying our bodies and our sexuality in whatever way suits us. Life is too short to stress over whether you're doing it "right." Let's embrace our quirks, revel in our differences, and continue to dismantle these myths, one chuckle at a time!

REFERENCES:-

1. <https://timesofindia.indiatimes.com/readersblog/dr-nikita-nagar/debunking-five-common-myths-about-gynecology-51282/>
2. <https://www.healthline.com/health/healthy-sex/virginity-myth>
3. <https://www.bedsider.org/features/310-5-myths-about-pulling-out-busted>
4. "The Truth About 7 Masturbation Myths" by Healthline
5. <https://www.psychologytoday.com/us/blog/fulfillment-any-age/201207/6-myths-about-female-sexuality-and-why-theyre-wrong>
6. <https://www.womenshealthmag.com/relationships/a19900249/sex-myths/>
7. "The Top 10 Myths About Sex" by Medical News Today link



Various Types of Disorders Related to Reproductive Health

KONGKANA SAIKIA & SUKANYA BORDOLOI (II YEAR)

1. PCOS (Polycystic Ovary Syndrome): PCOS is a condition in which the ovaries produce an abnormal amount of androgens. These are male sex hormones that are usually present in women only in small amounts.

CAUSES

- The exact cause of PCOS is not known yet.
- It can be genetic in some cases. Women with PCOS often have high insulin levels.

SYMPTOMS

- Irregular menstrual cycle, ovaries containing cysts, excess body hair (hirsutism), obesity
- Infertility (Severe Cases)
- Skin tags (Small pieces of excess skin), dark leathery skin on soft areas

DIAGNOSIS

- Physical exam such as a pelvic exam,
- Ultrasound, to observe cysts and the endometrial lining
- Blood test to check hormone level of androgen

TREATMENT

- Medication to cause ovulation
- Changes in diet and lifestyle

2. Dysmenorrhea: Dysmenorrhea is the occurrence of severe and frequent cramps and pain during the period. It may be either primary or secondary (caused by other physical issues)

CAUSES

- Chemical imbalance in body
- Endometriosis
- Pelvic Inflammatory Disease
- Abnormal pregnancy
- Infection, tumor or polyps in the pelvis

SYMPTOMS

- Cramps and pain in the lower abdomen
- Low back pain
- Pain radiating down legs
- Nausea, vomiting, diarrhoea
- Fatigue and weakness
- Headaches

DIAGNOSIS

- Ultrasound
- MRI
- Laparoscopy
- Hysteroscopy

TREATMENT

- Prostaglandin inhibitors
- Oral contraceptives
- Proper diet and exercise
- Heating pad or hot bath
- Hysterectomy

3. Erectile Dysfunction (ED): Erectile dysfunction (ED) is the inability to get or keep an erection firm enough to have sexual intercourse. Occasional ED is quite common. Frequent ED, however, can be a sign of health problems that need treatment.

CAUSES

- Cardiovascular disease
- Diabetes
- Hypertension
- Obesity
- Low testosterone level
- Stress and anxiety, Sleep disorders

SYMPTOMS

- Trouble getting an erection
- Premature ejaculation
- Delayed ejaculation
- Anorgasmia, the inability to achieve orgasm

DIAGNOSIS

- Physical exam
- Examination of psychosocial history
- Ultrasound
- Blood test
- Nocturnal penile tumescence test

TREATMENT

- Medications
- Therapy
- Vacuum pumps to stimulate erection

4. AIDS: Acquired Immuno Deficiency Syndrome is a disease caused by the HIV virus that damages the immune system of the body. It is a sexually transmitted disease.

TRANSMISSION

- Through body fluids
- Vaginal or anal sex
- Contaminated needles
- From pregnant mother to child
- Through breastfeeding

SYMPTOMS

- Chronic fever and fatigue
- Swollen lymph nodes
- Sores and lesions in mouth and genital regions
- Dark splotches and skin rashes
- Diarrhoea and weight loss

DIAGNOSIS

- Antigen antibody test
- Antibody test
- Nucleic acid test

TREATMENT

- Antiretroviral therapy
- Stops the virus from reproducing and makes it undetectable.
- Continuous for the whole lifetime

5. Other STDs: Sexually transmitted diseases (STDs), or sexually transmitted infections (STIs), are infections that are passed from one person to another through sexual contact. They are highly contagious and may even be life-threatening in some cases. These include gonorrhoea, chlamydiosis, syphilis, trichomoniasis, Genital herpes, etc.

CAUSES

- Bacteria, for e.g. chlamydia
- Virus for e.g. Human Papilloma Virus
- Parasite, for e.g. trichomoniasis

SYMPTOMS

- Bumps or sores in the genital area
- Swelling and severe itching
- Discharge, sometimes with bad odour
- Vaginal bleeding
- Painful urination
- painful sex

DIAGNOSIS

- Urine test
- Cheek swab
- Blood test
- Fluid sample from skin sores
- Discharge or cell sample of the body

TREATMENT

- Antimicrobial medication
- Antiviral medication
- HPV vaccine in case of Human Papillomavirus

REFERENCES:-

- 1. <https://www.healthline.com/health/sexually-transmitted-diseases>**
- 2. <https://www.hopkinsmedicine.org/health/conditions-and-diseases/erectile-dysfunction>**
- 3. <https://www.acog.org/womens-health/faqs/dysmenorrhea-painful-periods>**
- 4. <https://my.clevelandclinic.org/health/diseases/8316-polycystic-ovary-syndrome-pcos>**

Breast Cancer Biomarkers

ANUSHKA, RIYA RAJPUT & PREKSHA KUSHWAHA (II YEAR)

Breast cancer is a disease caused by the abnormal growth and replication of cells in the breast. These cells form a multicellular mass or tumour that can be benign or malignant. Breast cancer has five stages: stage 0 (also known as ductal carcinoma in situ or DCIS), and stages I through IV for invasive breast cancer. In India, breast cancer is the most common cancer among females, with an age-adjusted rate of 25.8 per 100,000 women and a mortality rate of 12.7 per 100,000 women. The cancer can originate from different parts of the breast, including lobules, ducts, and connective tissues, but most cases are found to originate in the ducts or lobules of one or both breasts.

The signs and symptoms of breast cancer are as follows: -

- A lump or mass in the breast or underarm area.
- Skin irritation, dimpling, or redness on the breast.
- Pain or tenderness in the breast.
- A change in the texture of the breast skin, such as puckering or thickening.
- A lump or thickening in or near the breast or underarm area.
- Changes in the appearance of the nipple or breast, such as itching, scaling, or a rash.



It is important to note that not all of these symptoms indicate breast cancer, and some women with breast cancer may not experience any symptoms at all. Regular breast self-exams, clinical breast exams, and mammograms are crucial for early detection and treatment.

CANCER MARKERS AND BREAST CANCER MARKERS

Cancer biomarkers, such as antigens or proteins, are produced by both cancerous and normal cells in response to cancer and can be found in urine, tissues, and blood. Elevated levels of these markers can indicate the presence or absence of cancer, as they are produced in larger amounts if cancer is present. Biomarkers are also used to assess the effectiveness of treatment and detect the presence of metastasis or recurrence. In the case of breast cancer, commonly used biomarkers include CA 27-29, CA 15-3, carcinoembryonic antigen, tissue polypeptide specific antigen, estrogen receptor (ER), human epidermal growth factor receptor 2 (HER-2), urokinase plasminogen activator (uPA), plasminogen activator inhibitor 1 (PAI-1), and progesterone receptors (PR).

- Cancer Antigen 15-3 (CA 15-3) is a glycoprotein with a high molecular weight (300-450kDa) that is synthesized by the apical surface of epithelial cells and acini breast cells before being released into the bloodstream. It is expressed in both benign and malignant breast ductal epithelium and its levels in the blood are measured. An elevated level of CA 15-3 indicates metastatic breast cancer. The normal range of this antigen is 0-30U/ml.
- Cancer Antigen 27-29 (CA 27-29) is an epitope found on the core of the MUC-1 protein which is largely released by breast cancer cells in the bloodstream, making it a marker for breast cancer. Elevated levels of CA 27-29 are associated with metastatic breast cancer but may also be elevated in primary breast and non-breast malignancies. The reference range for serum CA 27-29 is 0-38 U/mL. It is used to predict early recurrence of the disease in women with treated carcinoma of the breast.
- Human Epidermal Growth Factor-2 (HER-2) is a gene that makes a protein present on the surface of all breast cells responsible for their normal growth. However, in breast cancer, the HER-2 gene mutates and makes extra copies of the gene, leading to overexpression of the HER-2 protein, which causes cells to divide and grow too fast. HER-2-positive cancers are characterized by high levels of the HER-2 protein and tend to grow and spread faster than other types of breast cancer.

Nearly 20 percent of breast cancers are HER-2 positive. Targeted treatments for HER2-positive breast cancer can be very effective.

- **Urokinase Plasminogen Activator (uPA)** is a serine protease involved in cancer invasion and metastasis. uPA antigen is elevated in breast cancer tissue, which correlates with poor prognosis in breast cancer patients. uPA can be used as a diagnostic biomarker in breast cancer. uPA is prognostic in nodes-negative patients. Mesupron (Upamostat), a small molecule serine protease inhibitor, appears to be safe when combined with Capecitabine, an anti-cancer drug, for progression-free survival in human breast cancer.
- **Estrogen and Progesterone Receptors (ER/PR)** are hormone receptors found on the surface of breast cancer cells. Their presence indicates that the cancer is hormone receptor-positive and can be treated with hormone therapy. Hormone therapy can be very effective in treating ER/PR-positive breast cancer.

Table 1. List of Some Important Breast Cancer Biomarkers

Name	How it analyzed?	Uses
BRAC1 and BRAC2 gene mutations	Blood samples and /or tumor cells are analyzed.	To determine treatment.
CA15-3/CA27.29	Blood samples are taken and measure the level of these markers.	To assess treatment or recurrence.
Carcinoembryonic antigen (CEA)	Blood samples	To track treatment and recurrence.
Estrogen receptor (ER)/ Progesterone receptor(PR)	Tumor cells	To determine treatment.
Urokinase Plasminogen Activator	Tumor cells	Prognostic in nodes-negative patients
HER-2/neu gene amplification	Tumor cells	To determine treatment.

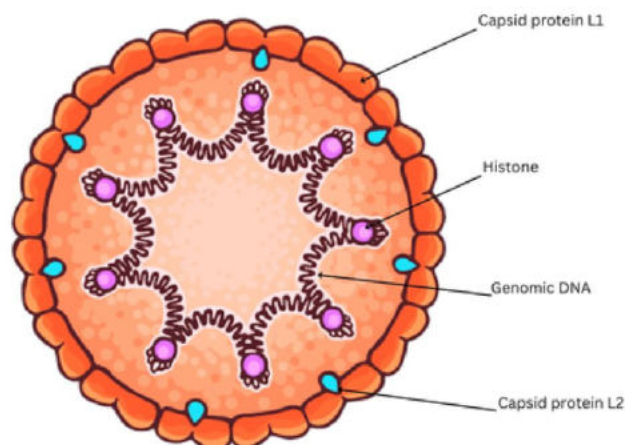
REFERENCES:-

1. <https://www.ncbi.nlm.nih.gov/books/NBK482286/>
2. <https://www.sciencedirect.com/science/article/pii/S2452336416300395>
3. <https://images.app.goo.gl/XeK85vfCThkjcMuX7>
4. <https://www.sciencedirect.com/topics/pharmacology-toxicology-andpharmaceutical-science/ca-15-3-antigen>
5. <https://pubmed.ncbi.nlm.nih.gov/11239757/>
6. <https://pubmed.ncbi.nlm.nih.gov/28181405/#:~:text=Abstract,compared%20for%20incidence%2C%20mortality%20rates>
7. <https://medlineplus.gov/lab-tests/her2-breast-cancer-testing/#:~:text=If%20HER2%20protein%20levels%20are,probably%20have%20HER2%2Dnegative%20cancer>
8. <https://www.cancer.org/cancer/breast-cancer/if-you-have-breast-cancer.html#:~:text=It%20can%20start%20in%20one,body%20and%20grow%20there%2C%20too.>
9. Image design by Maya Chastain-
<https://www.healthline.com/health/breast-cancer/warning->

Cervical Cancer And Vaccination

SUKANYA BORDOLOI, KONGKANA SAIKIA, SONAM SONI & ANSHITA DEO (II YEAR)

Cervical cancer is a malignant tumour of the cervix, which is the lower part of the uterus that opens into the vagina. It is the fifth most common type of cancer among humans worldwide and the second most common in the case of women. Long-lasting infection with certain types of human papillomavirus (HPV) creates great risk for developing cervical cancer, followed by smoking. Other risk factors include a weak immune system, birth control pills, multiple sexual partners and genetics. There are more than 40 HPV types that can infect the genital areas of both men and women, including the skin of penis, vulva (area outside the vagina), anus, and the inner linings of the vagina, cervix, and rectum. HPV can also infect the oropharyngeal region in humans. On the basis of pathogenicity and enhancing cancer risk, Human Papilloma Virus(diagram below) is classified under two major categories:



A. Low-risk group: This type of HPV generally causes skin warts on hands, feet, genital area and anus. It may also cause respiratory papillomatosis, which is a type of respiratory disorder. It does not cause cancer and in most cases, goes away on its own even if left untreated. It includes HPV types 6, 11, 43, 44, etc

B. High-risk groups: This is the type of HPV that causes cancer. It includes HPV types 16, 18, 31, 33, 35, 39, 45, etc. HPV 16 and 18 are responsible for at least 50% of high-risk cases.

Most people who become infected with HPV do not realise and begin treatment for a very long time. As per statistical estimation, by the age of 50, at least 4 out of every 5 women is expected to be infected with HPV at one point in their lives. HPV is also very common in men, but often has no symptoms.

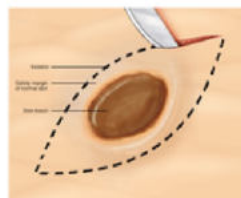
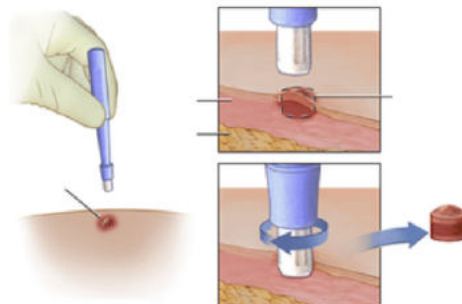
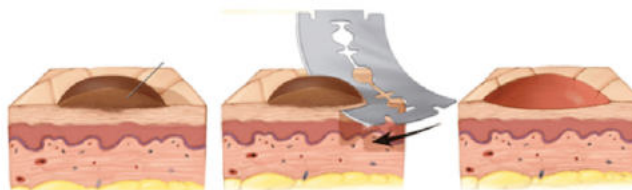
CLINICAL FEATURES:

Early stages of cervical cancer generally don't produce any symptoms. Signs and symptoms of more advanced cervical cancer cases, however, include:

- Watery and bloody vaginal discharge which may also have a foul odour.**
- Lower abdominal pain or pelvic pain.**
- Vaginal bleeding or contact bleeding during intercourse (between periods or after menopause).**
- Bleeding after douching or a vaginal exam is also a common sign.**
- Loss of appetite, weight loss, fatigue, leg pain, swollen legs, bone fractures, and leakage of urine or faeces from the vagina are also common symptoms of advanced cases.**

DIAGNOSIS:

- The Papanicolaou test or Pap smear test**
- Punch biopsy (diagram below)**
- A Cervical biopsy (most commonly used for confirmatory diagnosis)**
- Other investigations used are USG, CT, MRI, FDG-PET and PET-CT.**



PREVENTION:

•**Screening:** Screening investigations such as Pap test and cervical cytology has greatly reduced the fatality rate and incidence in cervical cancer patients. Such screenings are recommended to begin at age 21 and may be continued upto 65 years of age, after which it can be discontinued if no abnormal results are observed for the previous 10 years and no other history of STDs exists. For instance, Pap test screening should be done every three to five years with appropriate follow-up. This test should be continued even if the person has taken the HPV vaccine.

•**Vaccination:** Currently, abstinence and lifetime mutual monogamy are the only full proof protective measures against all genital HPV infections. Barrier methods of contraception, like condoms, confer protection against HPV infection but do not fully eliminate it. Moreover, the infection is asymptomatic other than the presence of genital warts in the early stages, making the prevention much more difficult. HPV vaccine is one of the most recommended interventions for cervical cancer control in most countries of the world. The Cervical cancer vaccine was developed based on DNA recombination technologies and is used to express the L1 major capsid protein of HPV in yeasts (*Saccharomyces cerevisiae*), which self-assemble to form empty shells resembling a virus, called virus-like particles (VLPs). The Two vaccines licensed globally are available in India; a quadrivalent vaccine (Gardasil™) and a bivalent vaccine (Cervarix™).



- o **Gardasil™**: There are two types of Gardasil available in the market- Gardasil 4, which is a quadrivalent vaccine (protects against 4 types of HPV- 16,18,6,11) and Gardasil 9, which is a nonavalent vaccine (protects against 9 types of HPV- 16,18,6,11,31,33,45,52,58). This vaccine protects against both cervical cancer and genital warts.
- o **Cervarix™**: This vaccine confers protection only against cervical cancer. It is a bivalent vaccine that protects against HPV types 16 and 18.

Vaccine type	Cost (in INR)	Efficacy
Gardasil	2800	98%
Cervarix	3299	90.4%

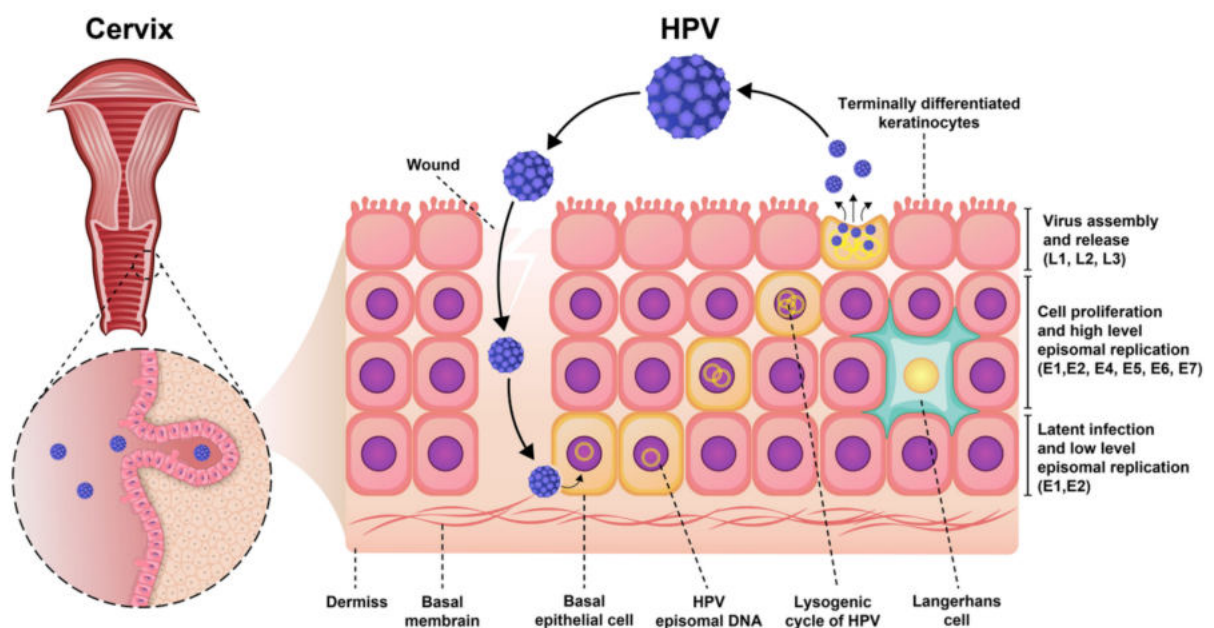
Table 1. Cost and efficacy of cervical cancer vaccines

These vaccines may prevent **70% of cervical cancer, 80% of anal cancer, 60% of vaginal cancer, 40% of vulvar cancer, and have shown more than 90% efficacy in preventing HPV- positive oropharyngeal cancer.** The vaccines offer protection for 5 to 10 years, once administered.

Age (in years)	Doses
9-14	2 doses in the interval of 6 months
15-26	3 doses in the interval of- <ul style="list-style-type: none"> • 0, 2 and 6 months in case of Gardasil • 0, 1 and 6 months in case of Cervarix
27-45	Not recommended, but can be taken after discussion with the clinician.

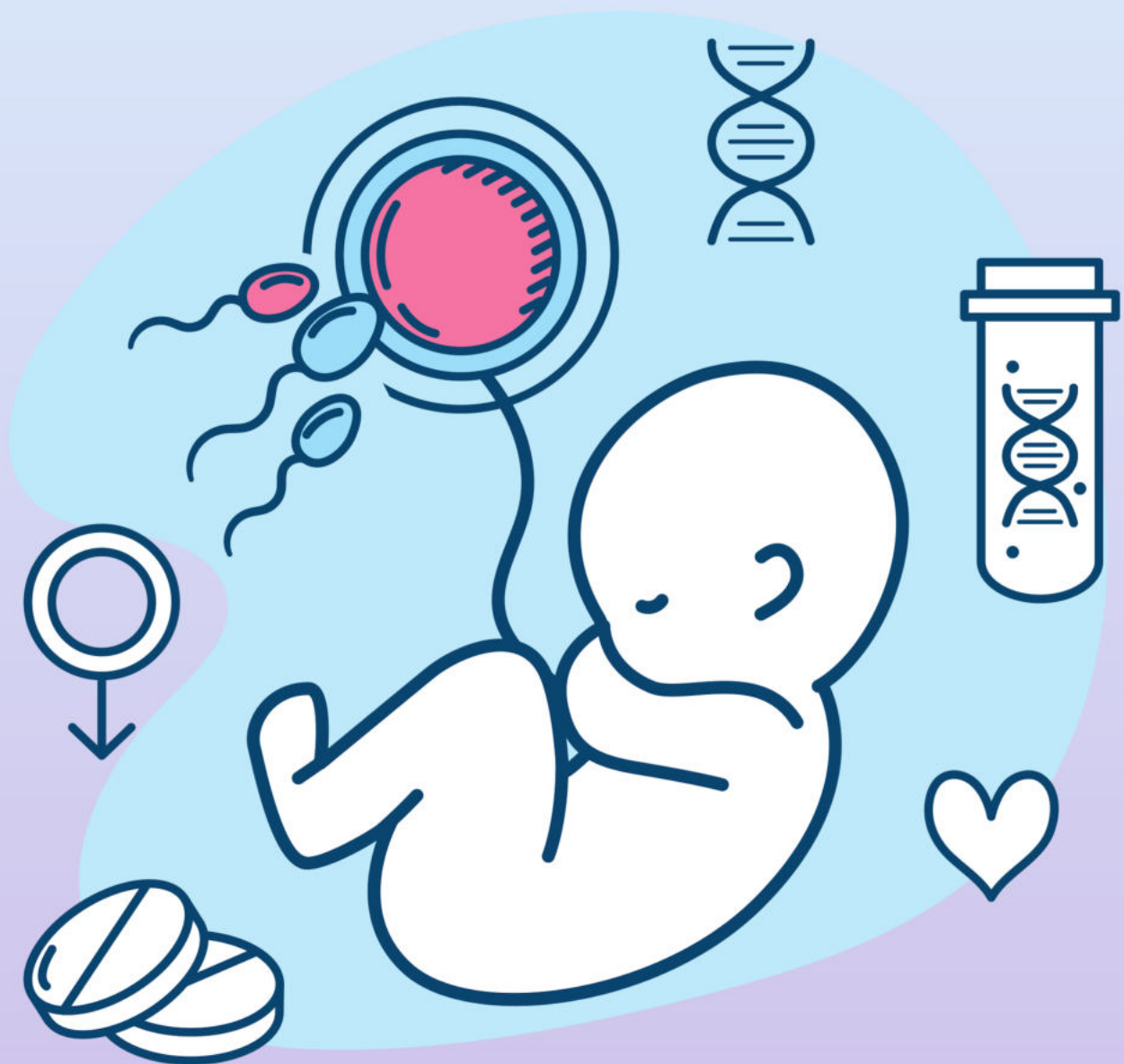
Table 2. Doses schedule of HPV vaccine for different age groups

HPV vaccines can be given simultaneously with other vaccines such as Hepatitis B and Tdap and it can also be taken by immunocompromised people in a 3 dose schedule of 0, 2 and 6 months. But the vaccine should not be taken if the person is pregnant, has any moderate to severe illness, allergic to latex or yeast or previous doses of the HPV vaccine. At present, there is no data to support the use of boosters. As for the case of vaccines for men who are at a risk of cervical cancer, the HPV vaccine is not licensed for use. Efficacy studies among males are underway. Australia is the first country to approve the quadrivalent HPV vaccine for males between 9 and 15 years old and the vaccine was approved for usage in case of males between the ages of 9 and 26 years in other developed nations. (schematic diagram below)



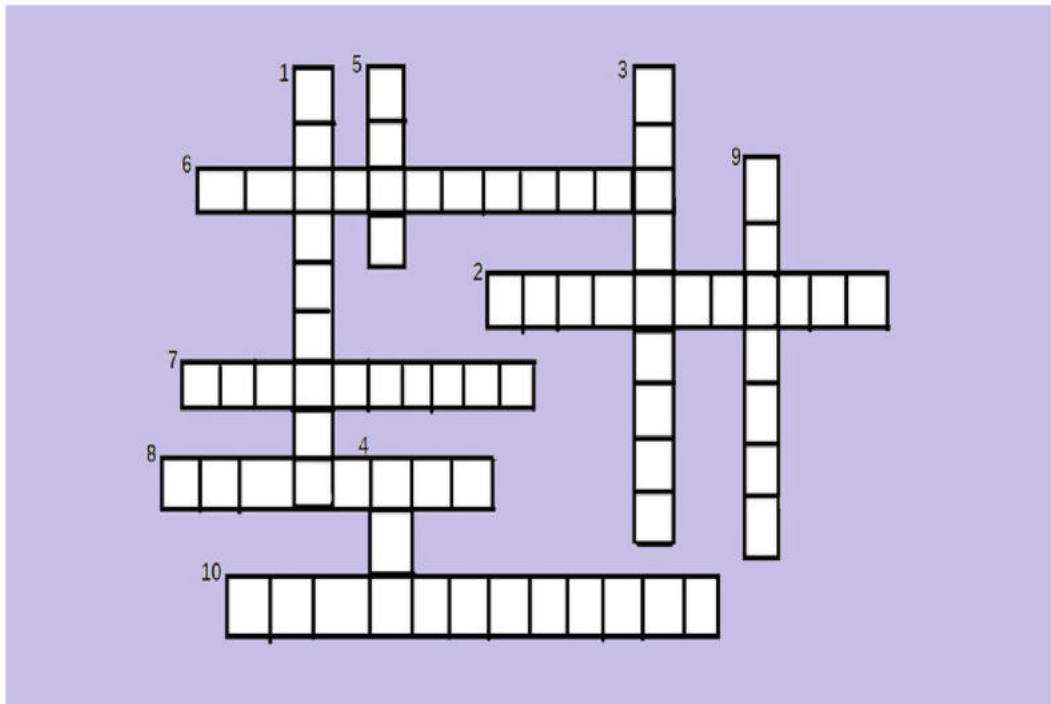
REFERENCES:-

1. https://en.wikipedia.org/wiki/Cervical_cancer
2. <https://www.cancer.gov>
3. <https://www.cdc.gov>
4. <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>
5. <https://www.sciencedirect.com>
6. <https://www.ncbi.nlm.nih.gov>
7. Robbins and Cotran Pathologic Basis of Disease by Vinay Kumar, Abul Abbas and Jon Aster
8. <https://screening.iarc.fr/atlasHPVdetail.php?Index=018>
9. https://www.researchgate.net/figure/Skin-biopsy-is-the-current-standard-for-skin-conditions-diagnosis-The-three-main-types_fig2_335191357
10. <https://www.medanta.org/patient-education-blog/hpv-vaccines-can-prevent-cervical-cancer-pending/>
11. <https://www.frontiersin.org/articles/10.3389/fimmu.2021.805695/full>



CROSSWORD PUZZLE ON REPRODUCTIVE HEALTH

ANAMIKA BINU (III YEAR)



DOWN

1. The choice to refrain from sexual activity
2. Loss of pregnancy before 20th week
3. Surgical birth
4. A widely accepted method of contraception in India
5. A hormonal disorder causing enlarged ovaries with small cysts

ACROSS

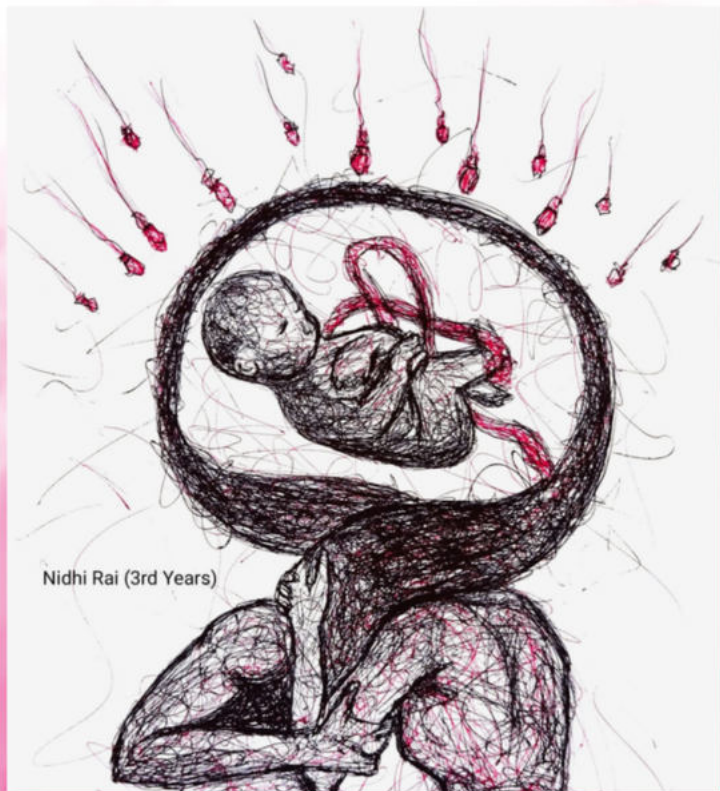
6. Primary male sex hormone
7. Absence of monthly menstrual periods
8. LH and FSH is secreted by this part of pituitary
9. Part of female reproductive system that remains blocked after tubectomy
10. Inflammation of the tube at the back of the testicles in males

ANSWERS

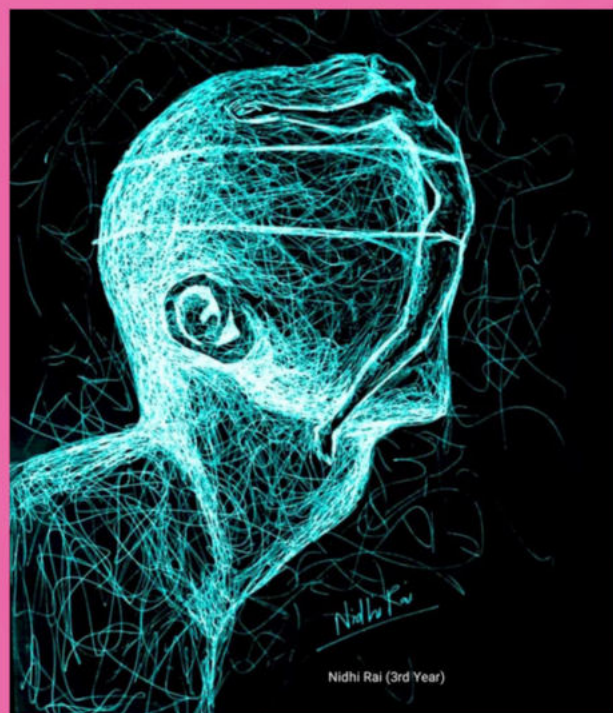
1. Abstinence 2. Miscarriage 3. Caesarean 4. IUD 5. PCOD 6. Testosterone 7. Amenorrhea 8. Anterior
9. Oviduct 10. Epididymitis



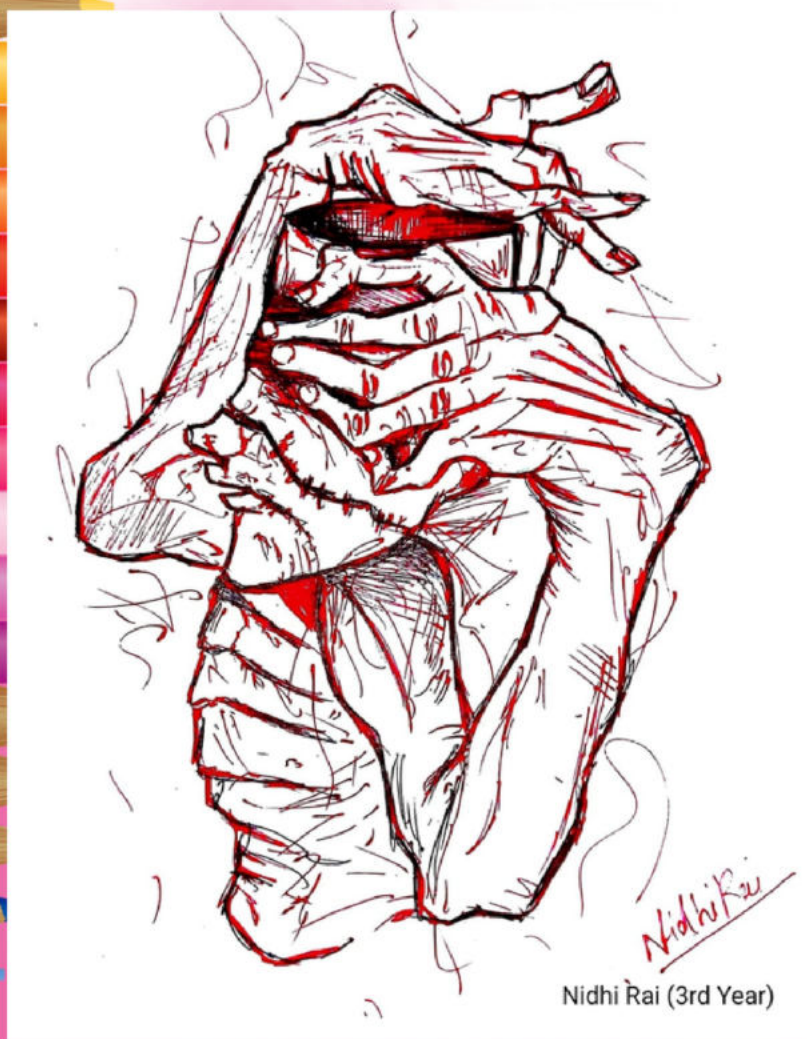
CREATIVE CORNER



P E N S K E T C H E S



by
Nidhi rai





Sharma



shame



yg_photography._





YG PHOTOGRAPHY



She was drowning in the darkness looking for help, will she be able to find her way?

The path seemed to be adventurous but will she be willing to take that.

She found light but still trying to find her way, she seems to be lost but i know she's a warrior she will at last find her way out of the darkness.

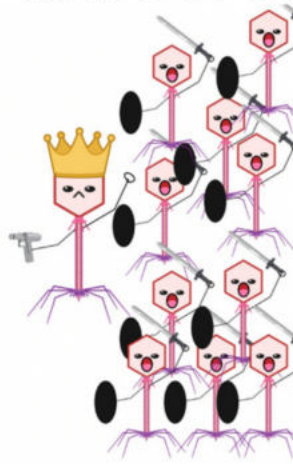
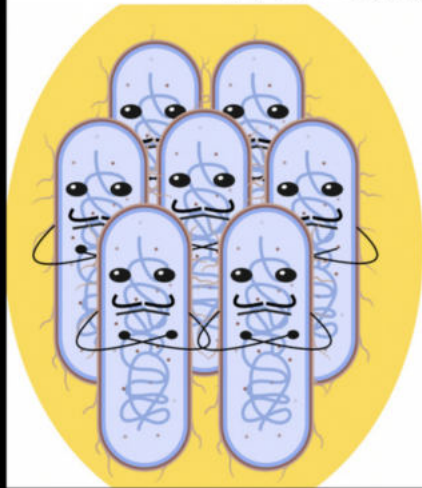
yg_photography._



Madhurja Saha

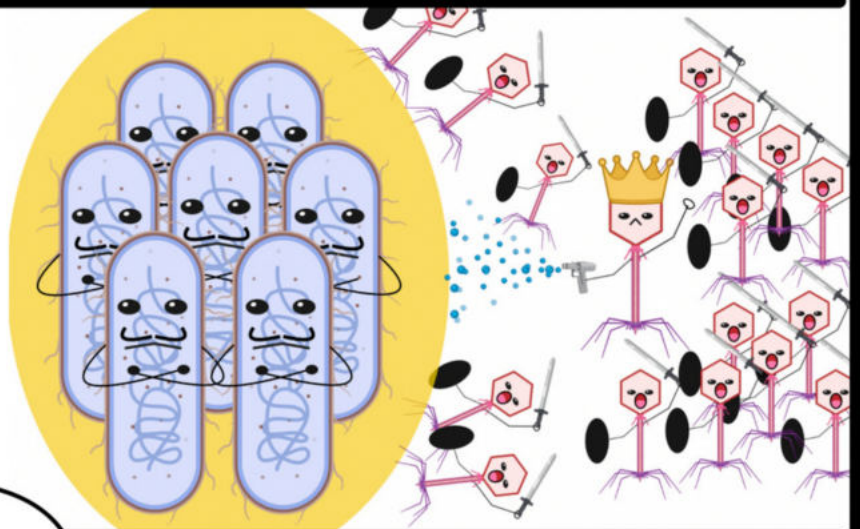


THE GREAT BATTLE OF BACTERVILLA

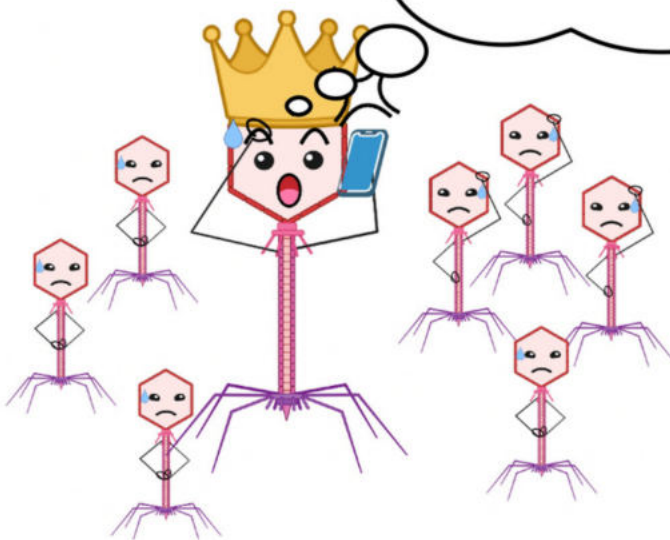


Infection is never an option unless it is a matter of survival and so it was for phages. It was inevitable and so was co evolution. Phages were cunning and well armed with lysins...

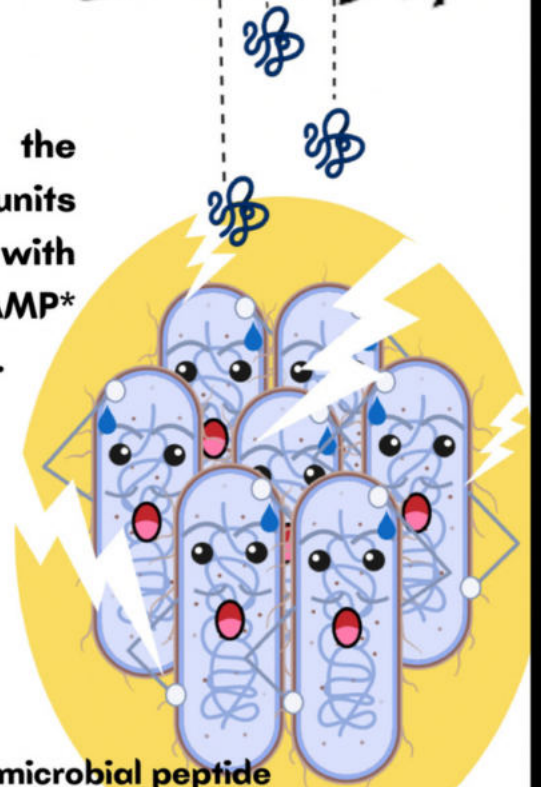
... but neither their clever brains nor advanced arsenals proved to be that efficient. Bacteria were protected by something supernatural. It was something in their environment (nutrient rich) which made them strong enough to withstand the phage army.



Alpha to Delta, Alpha to Delta come in! The ammunitions aren't working as expected. Our situation is not looking good. Send backup units ASAP.



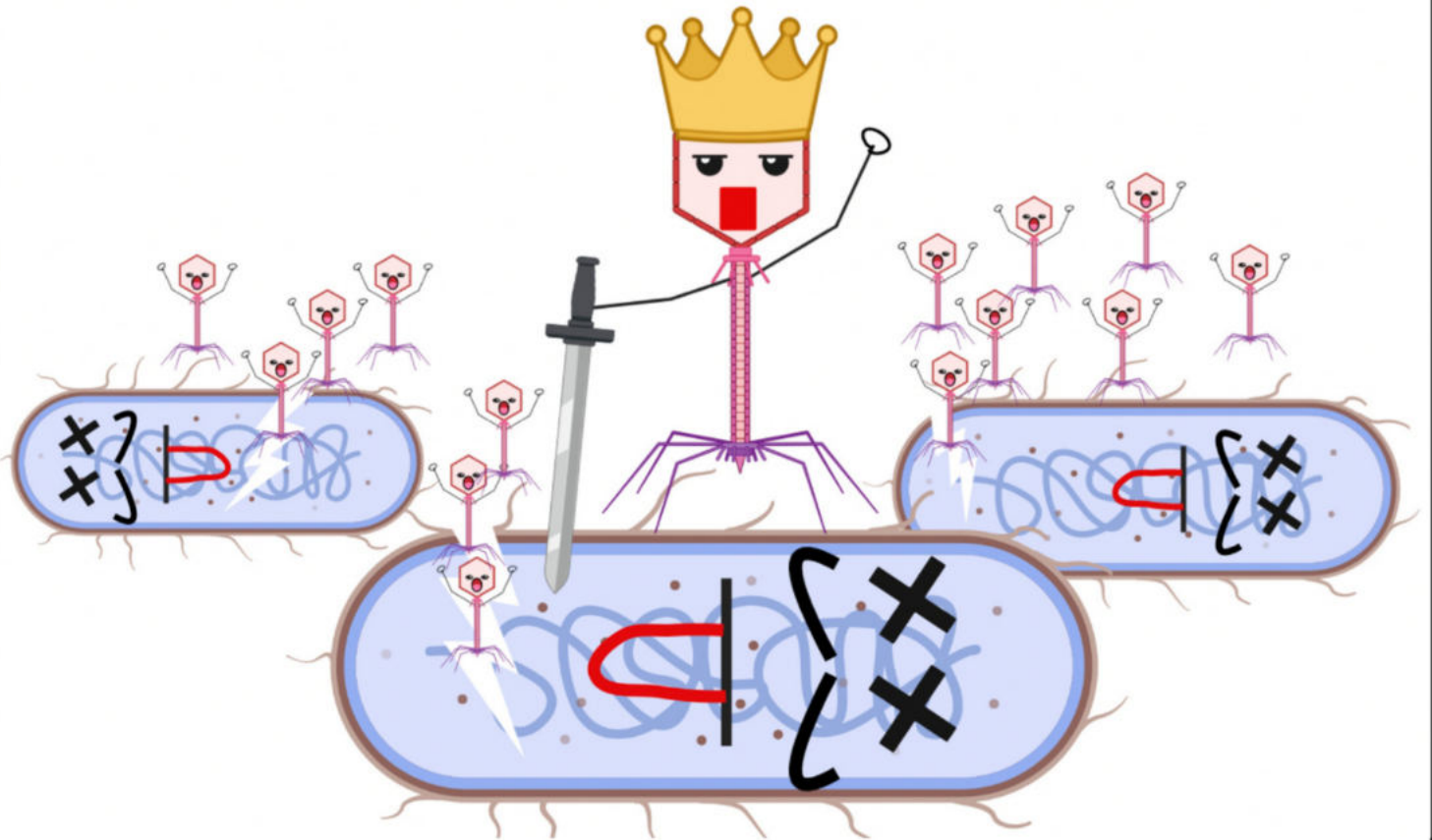
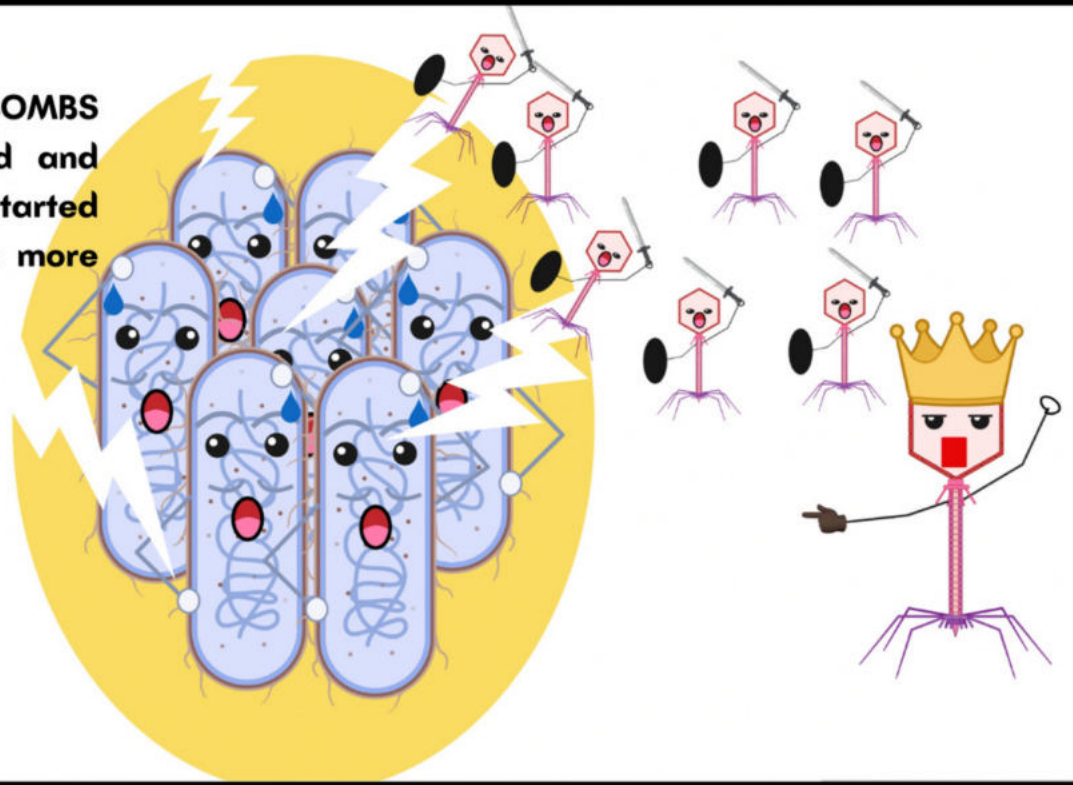
And so the backup units arrived with lethal AMP* BOMBS...



To increase the effectiveness of their lysin weaponry, they asked higher authorities for some additional support

*AMP- antimicrobial peptide

Backup units' AMP BOMBS worked as expected and phage army started attacking with even more aggression.



And finally Phages stood victorious in the Great Battle of Bactervilla, in the battle of life, battle of survival, battle of evolutionary supremacy...


By Anirudh, Mehak, Shrishti



Cathexis'22

Theme: "Kitchen is your health tool"


The Department of Biomedical Science, Acharya Narendra Dev College under the aegis of DBT and IQAC organized its annual festival, Cathexis'22, on April 22, 2022 in the seminar hall of the college. Ms. Anuja Aggarwal, Senior Dietitian, AIIMS delivered a talk on the topic "Kitchen is your health tool". During the event, the editorial Society of the department also released its annual magazine, Biomer'22 'Kitchen is our health tool'. The organizing team consisted of the convenors - Dr. Sunita Jetly and organizing committee - Dr. Satendra Singh, Dr. Rimpay Kaur Chowhan and Dr. Ritu Khosla; and the student coordinators, Nikita Gupta, Sakshi Sharma and Manas Singhal. The undergraduate students from the department enthusiastically participated in various activities held viz. Heads up, Murder Mystery, Quiz-O-Mania and Whisper challenge.



DEPT. OF BIOMEDICAL SCIENCE
ACHARYA NARENDRA DEV COLLEGE
ACCREDITED 'A' GRADE BY NAAC (SCORE 3.31)
UNDER THE AEGIS OF DBT AND IQAC

INVITES YOU FOR
"CATHEXIS-2022"
ANNUAL SOCIETY FUNCTION

Speaker Ms Anuja Agarwala



Senior Dietitian-AIIMS
Topic-Kitchen -Your health Tool
Date -18th April
Time -11am
Venue- Seminar Room , ANDC

Dr Ravi Toteja Principal
Dr Sunita Jetly Teacher-in-Charge
Ms Sakshi Rawat President -BMS



DEPT BIOMEDICAL SCIENCE
CATHEXIS - BMS SOCIETY
PRESENTS ITS ANNUAL FUNCTION

Talk CATHEXIS'22

Kitchen -Your health Tool;
Speaker Ms Anuja Aggarwal
11:00 am Seminar Hall
12:30 pm: Unveil the Biomer'22

Events and Student Coordinators

Heads up
*Yash and Sharika
Murder Mystery;
*Mehak and Shrishti
Quiz-O-Mania
*Deeparati and Harinandna
Whisper Challenge
*Hiya and Himanshi

Organizing Team
Dr Satendra Singh
Dr Ritu Khosla
Dr Rimpay Kaur

Office Bearers
Nikita Gupta
Sakshi Sharma



Career Counselling Series

Studying in Europe - Interaction with Seniors

Department of Biomedical Science, Botany and Zoology of Acharya Narendra Dev College (ANDC), University of Delhi under the patronage of Prof. Ravi Toteja (Officiating Principal, ANDC) organized the first session of ANDC career counselling series 2022 titled “Studying in Europe - Interaction with Seniors” under the aegis of DBT-STAR College Scheme and IQAC. The session was held on 29th August 2022 at 3:00 pm in the Seminar room. For this session, Alumni from ANDC’s Department of Biomedical Sciences, Dr. Varshini Padmanabhan and Dr. Rohit Gokhale were invited to provide insight into their careers as graduate students at two of the Europe's leading universities. The organizing team consisted of the convenors - Dr. Archana Pandey (Department of Biomedical Science), Dr. Rashmi Sharma (Department of Botany) and Dr. Seema Makhija (Department of Zoology); organizing committee - Dr. Satendra Singh, Dr. Rimpay Kaur Chowhan, Dr. Ritu Khosla, Dr. Deepshikha, Dr. Manoj Kumar Singh, Dr. Sumit Sahni, Dr. Vineet Kumar Singh, Dr. Neelgagan Singh, Dr. Rahul Dev and Dr. Vineet Girdharwal; and the student coordinators, Mehak Sharma and Saarthak Kumar.

The session opened with an engaging talk of Ms. Varshini Padmanabhan, who did PG Diploma in Biochemical and Molecular Technology from Sri Venkateswara College, University of Delhi and then moved on to pursue Masters in Biomedical science with a Major in Neuroscience at University of Antwerp, Belgium. After her, Mr. Rohit Gokhale shared his experience of pursuing a Masters in Molecular Mechanisms of Disease Radboud University, Netherlands. They both shared their journey from the time of their under-graduation from ANDC to their present times and discussed the plethora of options available for the students to apply for. They guided the students about available scholarships and pre-requisites of applying to Masters programme at various universities in Belgium, Germany and Netherlands. The session concluded with an informal Q&A discussion among students and speakers. It indeed was an inspiring session reflecting the fact that through the experience and guidance of the seniors, building student’s best career is very much possible.



ACHARYA NARENDRA DEV COLLEGE

University of Delhi
(All India NIRF 2022 Ranking-18, NAAC Grade 'A' with Score-3.31)

Under the aegis of IQAC and DBT-STAR College Scheme



Presents

ANDC Career Counselling Series

"Studying in Europe - Interaction with Seniors"



VARSHINI PADMANABHAN

Masters in Biomedical Science; Major-Neuroscience (2022),
University of Antwerp, Belgium
B.Sc. (H) Biomedical Science (2019),
ANDC, University of Delhi



ROHIT R GOKHALE

Masters in Molecular Mechanisms of Disease (2023),
Radboud University, Netherlands
B.Sc. (H) Biomedical Science (2021),
ANDC, University of Delhi



AUGUST 29, 2022

TIME: 3:00 PM

VENUE: SEMINAR ROOM



<p>Patron</p> <p>Prof. Ravi Toteja Officiating Principal</p>	<p>Convenors</p> <p>Dr. Archana Pandey Department of Biomedical Science</p> <p>Dr. Rashmi Sharma Department of Botany</p>	<p>Prof. Seema Makhija Department of Zoology</p>
--	--	---

<p>Organizing Committee</p> <p>Dr. Satendra Singh, Dr. Rimpay K Chowhan, Dr. Ritu Khosla, Dr. Deepshikha (Department of Biomedical Science) Dr. Manoj Kumar Singh, Dr. Sumit Sahni, Dr. Vineet Kumar Singh (Department of Botany) Dr. Neelgagan Singh, Dr. Rahul Dev, Dr. Vineet Girdharwal (Department of Zoology)</p>	<p>Student Coordinators</p> <p>Mehak Sharma (III year) Saarthak Kumar (II year) (Department of Biomedical Science)</p>
--	---





Bacteriophage Workshop

Report

Hands-on Training Workshop on Phage Biology- Discovery and Analysis and Webinars on Bacteriophage Therapy, held on 20-25 January, 2023. Acharya Narendra Dev College (ANDC), under the DBT STAR scheme and IQAC, in collaboration with Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET), and Institute of Eminence-Delhi School of Skill Enhancement and Entrepreneurship Development (IOE-DSEED), and intellectual partner- Society for Bacteriophage Research and Therapy organised "Hands-on Training Workshop on Phage Biology-Discovery and Analysis and Webinars on Bacteriophage Therapy" from January 20-25, 2023. In all, 20 participants including undergraduate and postgraduate and PhD students registered and attended the workshop. The workshop was designed to impart an understanding of the role of bacteriophages as therapeutics and biocontrol agents and to impart hands-on training in microbiological techniques required for isolation, propagation and characterisation of phage and in silico tools used in the analysis of phage genomes.

included online The inaugural session was held at Acharya Narendra Dev College on 20th January, which also talks by Bacteriophage experts from Industry and academia. The organising committee for the inaugural session consisted of Prof. Urmi Bajpai, Dr Satendra Singh and Dr Rimpay Kaur Chowhan, Faculty, Department of Biomedical Science, ANDC; Ms. Ritu and Ms. Kanika, Research Scholars, Department of Biomedical Science and Mr Mitesh Dagar were the resource persons; Ms Swati Maurya, Ms Jyoti Dagar and Mr Sandip Antil, Research Scholars, Department of Zoology, ANDC participated as volunteers. The welcome note was given by Prof. Ravi Toteja, Principal, ANDC. The invited guests present on the day were Prof. Rup Lal, INSA Senior scientist ANDC; Prof. Vijay Kumar Chaudhary, NASI-Senior Scientist and Director Delhi School of Skill Enhancement and Entrepreneurship Development; Prof. Amita Gupta, Professor at the Department of Biochemistry and Director CIIDRET; Prof. Pawan Sharma, Sr. Res. Scientist & Principal Investigator at ICGEB; ANDC faculty members, registered participants and online attendees (about 50).

A short introduction to CIIDRET and IoE-DSSEED's initiative of "100 DAYS TRAINING & SKILL ENHANCEMENT FESTIVAL" by Prof. Amita Gupta and Prof. Vijay Chaudhary and Prof Urmi Bajpai apprised the participants on the workshop schedule and moderated the online talks. The inaugural talk on "Phage-encoded lysins as therapeutics" was given by Prof. T.S. Bal Ganesh, President, Gangagen Biotechnologies Pvt. Ltd., India, followed by a talk by Dr Sabrina Green, Research Associate, KU, Leuven University, Belgium on "Finding phages for phage therapy". The inaugural session ended with refreshments and the workshop resumed the next day with a hands-on training at CIIDRET from January 21-22, 2023 and at ANDC from January 23-25, 2023 at ANDC. The participants learned Basic Microbiology Techniques, Media Preparation, Phage titration methods-concept of CFU & PFU, Isolation of bacteriophage from the environment, Plaque Assay & Spot Titer, Methods to enumerate phages, Phage DNA Isolation using PCI Method and Phage genome analysis using Bioinformatics. The workshop was successfully completed and the participants gave a highly positive response and requested for similar such workshops in the future.



Farewell of batch 2019-22

A farewell is a tender-hearted moment for the seniors who are saying good bye to the institute and are set to begin and achieve new heights in life. The sweet and sour memories are left behind to face the upcoming challenges and achieve their dreams. For the graduating batch of biomedical science department the junior batches, assembled for a memorable and indelible treat on 22nd April, 2022.

The zestful event started in the morning among the dynamic and vibrant juniors and seniors who arrived in the venue in a well dressed manner according to the theme of 'Bollywood' . The enthusiasm of students was the portent for the wonderful event. The remarkably eloquent anchors and hosts were there for the entire event .The joyful juniors took the lead and organized several cultural events ranging from delightful songs to magnificent dance performances, followed by several fun games. The teachers also arrived in the event to shower their blessings and share the bittersweet memories of the college leaving batch. Their presence during the event made it more exuberant.

The best wishes were conveyed by juniors with a unique catchphrase for each and every senior for their future endeavors . The talent hunt round was also organized which definitely left a emotional memory in everyone's mind. The selected seniors were bestowed with Mr. and Miss farewell titles as a small token of love and respect.

With lots of fun the day came to an end but it left a emotional and touching memory in the each and every one's minds.



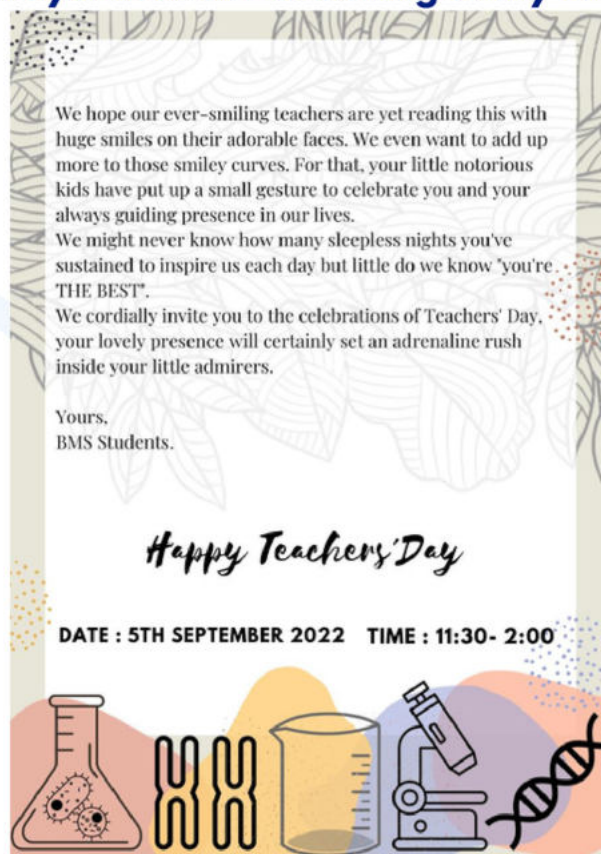


Teacher's Day - 2022

Teachers are truly bestowed with the gift of influencing lives both inside and outside of their classroom. They are the stupendous stars of Education. A single day is not enough to make them feel extra special but the teacher's day of 2022 was a tiny effort by biomedical science students to do something dedicated to our hardworking and devoted teachers.

It was organised in a magnificent manner on 5th September during first half of the day in our department labs. The students were high spirited along with our teachers. The ceremony began with cutting of the special teacher's day cake, beautiful planters with a sweet, funny personalized catchphrase on the plant pot were presented to the teachers. An awe-inspiring presentation was made by the students including pre-recorded clips, animations and creations which was a mark of respect for our passionate teachers. The programme was followed by special words of blessings by teachers, fun activities and games. Both, students and teachers participated actively and collectively it turned out to be a splendid event.

Though, the Event ended but the wise words of our teachers will always remain in every student mind. They definitely left a significant impact on our lives and will always motivate us during every step of our life.





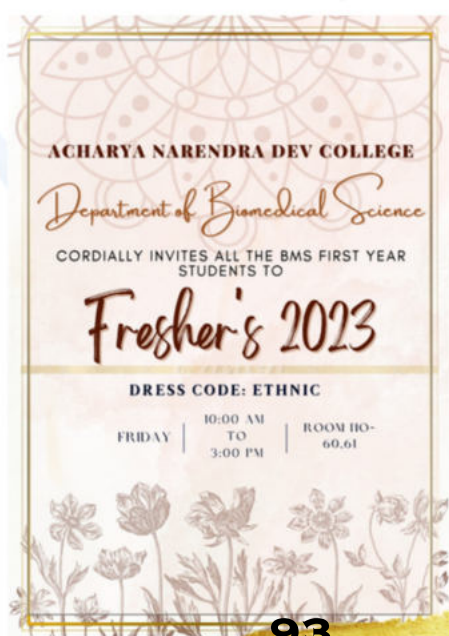
Freshers - 2023

After a two-year hiatus caused by the Covid crisis, the Department of Biomedical Sciences at Acharya Narendra Dev College hosted an offline fresher's party on January 21, 2023, to welcome the new batch of 2022-26. The event provided an opportunity for the juniors to meet their seniors and become a part of the department's close-knit community.

The day was filled with excitement and fun activities, giving the new batch a chance to display their skills and interact with their seniors. The event kicked off with an introduction by the teacher-in-charge, Dr. Archana Pandey, followed by the fresher's batch introducing themselves.

Seniors organized fun games that everyone participated in enthusiastically, creating a lively atmosphere. The highlight of the day was a mouth-watering lunch, followed by a captivating dance and music performance by the seniors. The fresher's then took the stage for a ramp walk.

At the end of the talent competition, awards were given to the most outstanding participants. Aman was crowned Mr. Fresher, Tanisha as Miss Fresher, Madhur as Mr. Talented, Vinita as Miss Talented, Ritik as Mr. Dashing and Zaiba as Miss Dashing. The program concluded on a sweet note, with lots of photos and high hopes for a bright future ahead.





NII visit of students from ANDC, DU for National Science Day-2023

Since 1987, our nation has celebrated National Science Day on February 28 in honor of Sir CV Raman, a renowned Indian physicist who made the "Raman Effect" discovery. On 28 February 2023, students from Acharya Narendra Dev College, University of Delhi attended National Science Day in National Institute of Immunology (NII) on the theme of "Global Science for Global Wellbeing" accompanied with Dr. Archana Pandey, Associate Professor, Biomedical Science.

More than 15 Colleges were invited to NII on this occasion to attend this event which began with the registration session for the event followed by the lightning talks of 5 minutes by a member of each laboratory to show up the kind of work going on in their respective laboratory and to promote research enthusiasm among science undergraduates. The talks were so curiosity provoking and provided students with the perspective on the underlying mechanism of various immune and infectious disorders to promote analytical thinking in the students to come up with a potential cure for these in the future. After the lightning talk session, the Poster Presentation event was there, where the researchers from different backgrounds presented and explained their research work. Watching passionate researchers explain their research and people conveying scientific aptitude was a delight to watch for any science scholar.

After the poster presentation session, NII organized an interactive Quiz for the UG students of all the invited colleges. The team from Acharya Narendra Dev College won 3rd prize there. The quiz and poster presentation results were revealed at the day's end. All of the prizewinners were awarded and congratulated by the higher authorities. Dr. S. Gopalan Sampathkumar, a senior scientist from the National Institute of Immunology, gave the final vote of thanks and interacted with undergraduate students to encourage research among them.



TEAM ANDC (left to right: Anshika Sharma, Muskan, Shivam, Vridhi Singh, Saarthak, Mohd. Afham)

LIST OF DEPARTMENTAL ACTIVITIES

S.N O	Name of Workshop/Conference/Seminar/Talk	Date From -To
1.	One-Day workshop on "Tools in Modern Biology" for the non-teaching staff.	April 21, 2022
2.	National Workshop on Skill Enhancement of Non-teaching Staff	July 13-20, 2022
3.	National Workshop on "Career and Skill Enhancement of Non-teaching Staff".	September 17, 2022
4.	Outreach Workshop on "Cell and Molecular Biology Techniques" for students of GD Goenka Public School.	October 12-13, 2022
5.	3rd International Symposium on Ciliate Biology (ISCB-2022) organized by Acharya Narendra Dev College and Maitreyi College, University of Delhi	November 8, 2022
6.	Hands on training workshop on Phage Biology -Discovery and Analysis and webinars on bacteriophage therapy	January 20-25, 2023
7.	One day workshop on Quantitative Microbial Ecology: Opportunities and way-ahead	February 4, 2023

In Commemoration of Centenary Celebrations of University of Delhi

ACHARYA NARENDRA DEV COLLEGE
NAAC Accredited Grade 'B' | NIRF Ranking 2021-20 | DBT STAR Status College

organizes

National Workshop on Skill Enhancement of Non-teaching Staff (NWSENS-2022)
under the aegis of DBT STAR College Scheme and IQAC
July 13-20, 2022

WORKSHOP MANUAL

Patron: Prof. Ravi Toteja Program Convenors: Prof. Seema Mahija Dr Archana Pandey

Sponsors: CILIKA, mercon, INDIAN SCIENTIFIC

One day Workshop on **Quantitative Microbial Ecology:**
Opportunities and Way-ahead
February 4, 2023
organized by

ACHARYA NARENDRA DEV COLLEGE
University of Delhi
Under the aegis of DBT STAR College Scheme & IQAC

In association with

Gargi College University of Delhi IMILI-SAC PhixGen Pvt. Ltd.

sponsored by **ISME**
Institute of Science and Management Education
SCAN TO REGISTER

ACHARYA NARENDRA DEV COLLEGE
UNIVERSITY OF DELHI
ACCREDITED 'B' GRADE BY NAAC
NIRF 2021 RANKING -38
Under the aegis of DBT STAR Scheme and IQAC

Department of Biomedical Science
organizes a
Hands-on Training for Support Staff on
Tools in Modern Biology

Date: April 21, 2022 Time: 11:00am-3:00pm

pH meter **PATRON**
Prof. Ravi Toteja

PCR **CONVENORS**
Dr Archana Pandey

Electrophoresis unit **COORDINATORS**
Dr Satendra
Dr Ritu Khosla
Dr Rimpri Kaur

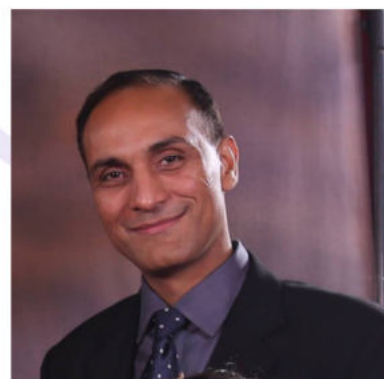
FACULTY



Dr. Archna Pandey (TIC)



Prof. Urmi Bajpai



Prof. Gagan Dhawan (On leave)



Dr. Sunita Jetly



Dr. Rajesh Chaudhary



Dr. Satendra Singh



Dr. Rimpay Kaur Chowhan



Dr. Ritu Khosla



Dr. Deepshikha

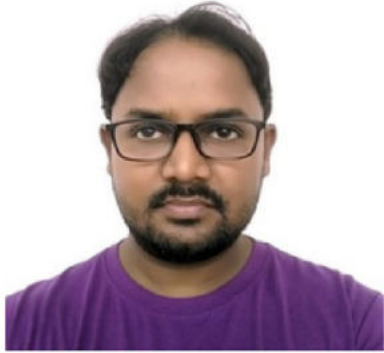


Dr. Vandana



Dr. Rajeev

NON-TEACHING STAFF



Vinesh Kumar



Nitesh Kumar



Ajay Kumar Gupta



Surendra Sharma



Ashutosh



Dharmendra Kumar



Jaynta Sarswat

BIOMER TEAM

Chief Editor



Deeparati

Chief Designers



Nidhi Rai



Yash Goel

BIOMER

Editorial Team

- **DR. RIMPY KAUR CHOWHAN (FACULTY)**
- **HIRTIK SINGH**
- **ARPITA SINGH**
- **ANKITA MALAKAR**
- **HIYASMITA SARMAH**
- **HARINANDANA B**
- **AAKANKSHA RATHEE**
- **MANAS SINGHAL**
- **SONAM**
- **ANAMIKA BINU**
- **PRAGATI DEEP**
- **JASMAN**
- **SHARIKA**
- **TARUN**
- **MADHURJA SAHA**
- **ARYAMAN MAJUMDER**
- **RIYA XAVIER**

Designing Team

- **KONGKANA**
- **HIYASMITA**
- **ARPITA SINGH**

Cover Page Credits

- **YASH**
- **MEHAK**

CATHEXIS TEAM



Anirudh Kumar
President



Saarthak Kumar
Vice President



Mehak Sharma
Treasurer



Nidhi Rai
Designing Head



Yash Goel
Technical Head



Niharika Sharma
Secretary

SPONSORS



AARNA BIOMEDICAL PRODUCTS
(Dr. PAWAN MEHROTRA)



TechMedBuddy

TECHMEDBUDDY
(Mr. ALOK ANAND)



UNINXT STUDY OVERSEAS



SA GROUP

