



VELAMMAL MEDICAL COLLEGE HOSPITAL AND RESEARCH INSTITUTE

Department of Community Medicine

Student-centric learning methods

As per the recommendations of the Medical Council of India, the institute promote and implement the instructional methods that are learner centred, invoking the critical thinking, self-directed learning to motivate them to become lifelong learners. Much focus is given in creating a supporting and collaborative learning environment for students. Our department has successfully incorporated student-centric learning strategies like problem-based learning (PBL), team-based learning (TBL), flipped classroom and e-learning to facilitate higher learning skills among MBBS students.

1. Experiential learning

The students are engaged in the experiential learning through various teaching learning strategies like practical/demonstration, clinical posting, periodical field visits and community survey, student seminar, simulation, role play and involving students in various hospital and community-based research.



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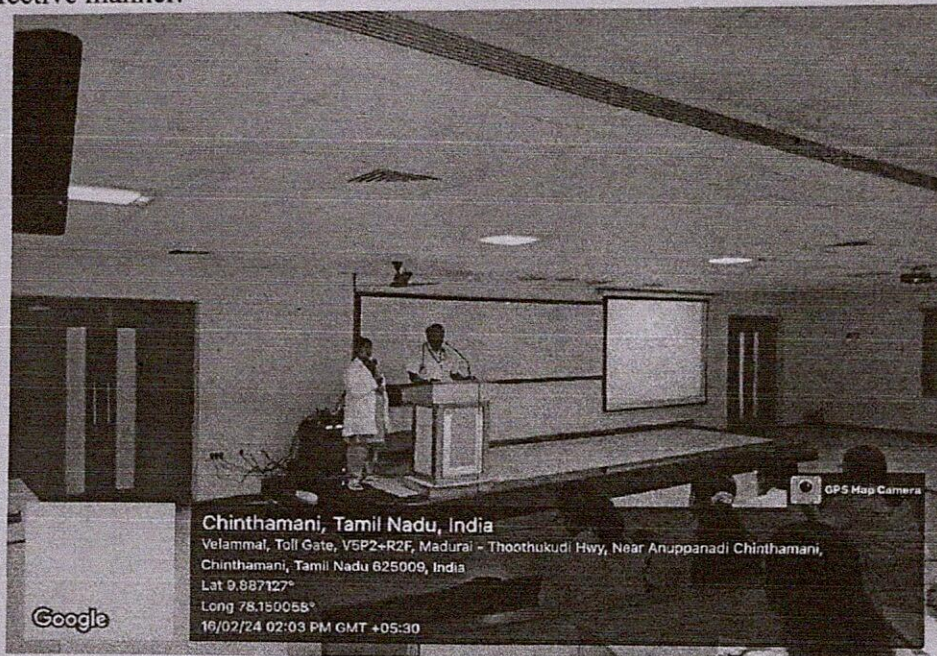
Prof. T. THIRUNAVUKKARASU, M.D., F.A.C.P.
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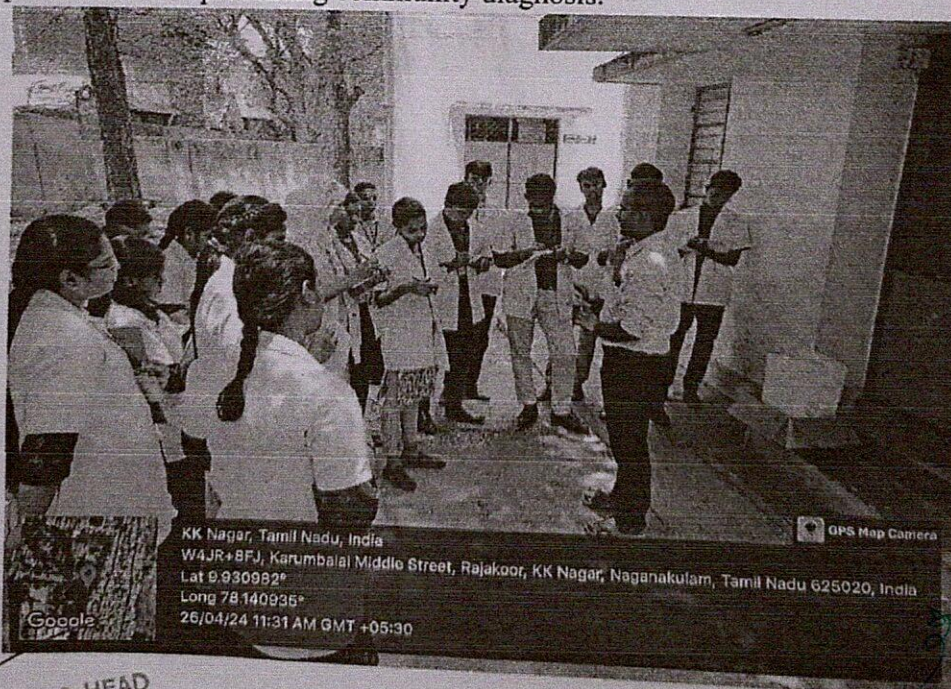
2. Integrated/interdisciplinary learning

Our department has implemented horizontal, vertical, as well as transdisciplinary integration by involving various pre & para clinical and clinical departments to teach a pertinent topic in more effective manner.



3. Participatory learning

The department of community medicine involves students regularly in village health survey and family health survey where students are actively involved in interaction with the community and teachers motivates them to reflect upon their own experience and skills in solving problems while presenting community diagnosis.



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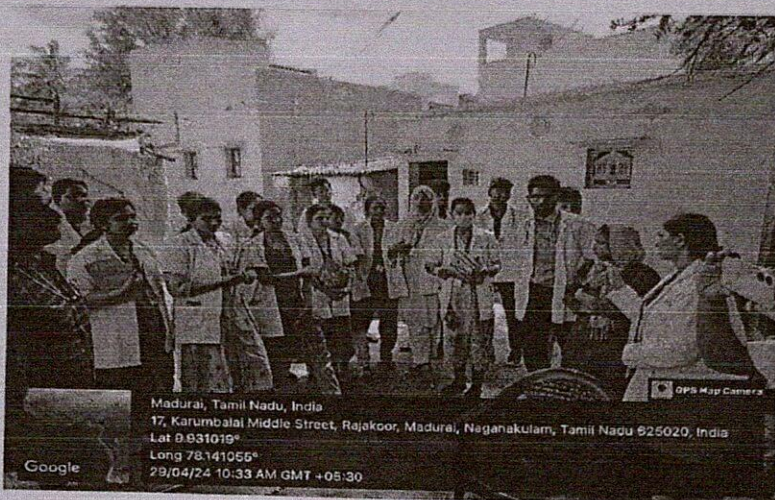
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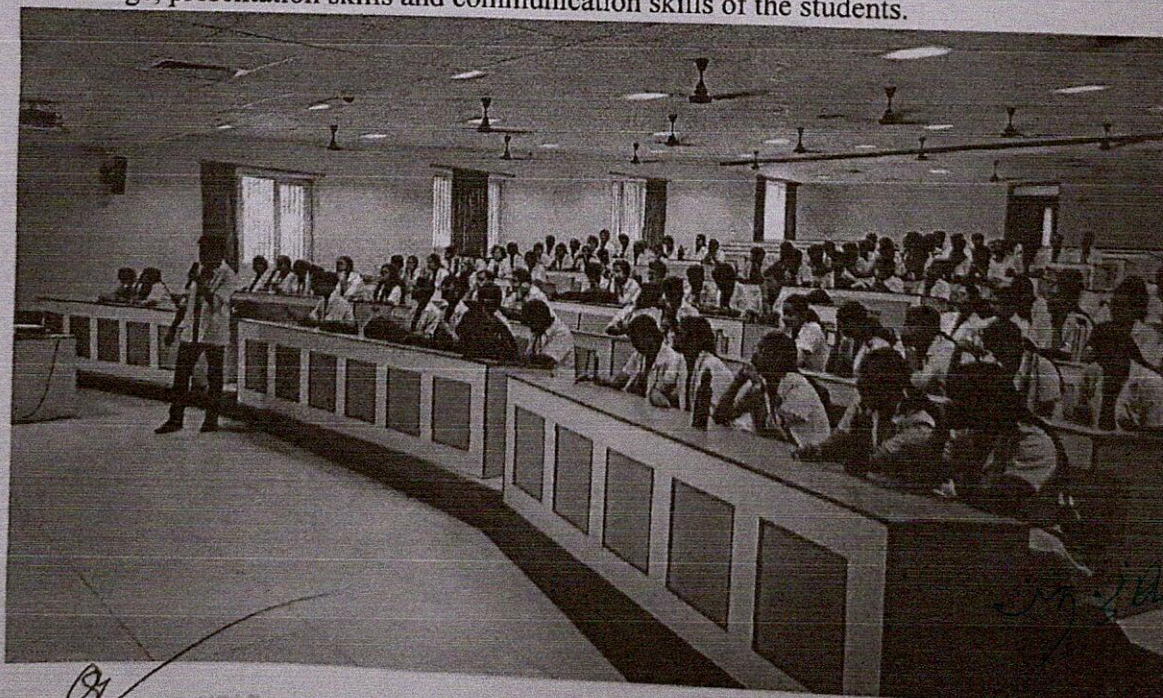
4. Problem solving methodologies

The group of students are given a case scenario and are advised to identify the problem and to list out the necessary steps to diagnose and manage the case. The students are encouraged to think out of box and give their approach to different case scenarios. Finally, the students are encouraged to present the analysis of the problem, synthesize and test information.



5. Self-directed learning

Along the entire span of the academic calendar, self-directed learnable topics are identified and given to students at intervals as per the university guidelines especially focusing on recent advances in the subject. The reference material including books, articles and websites, is communicated in advance to the students. The doubts of the students are clarified. In addition to these students are encouraged to undertake research projects. Student Seminars are organised regularly by assigning a topic to group of students which improves the knowledge, presentation skills and communication skills of the students.



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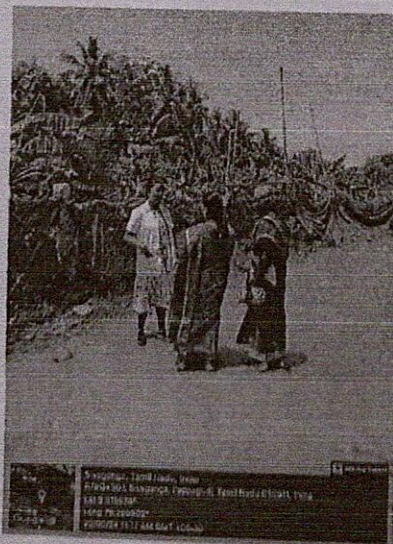
6. Patient-centric and Evidence-Based Learning


The students are provided with the case studies and the faculty encourages them to further identify and review Evidence Based Medicine strategies and resources to diagnosis and manage the condition. The communication skills are taught during the lectures as well as during practical, clinical rotation regularly. Patient-centric approach and communications skills are evaluation through OSPE.



7. Learning in the Humanities

The faculties of are more focused toward teaching medical students the issues beyond clinical illness, especially bio-psychosocial aspects, communication, epidemiology, the natural history of diseases, health systems and the role of support mechanism, the knowledge of which is crucial in providing comprehensive care to the patient. Department of Community Medicine is primarily involved in of imparting community-based education. Students are actively engaged in survey, camps and awareness programmes.




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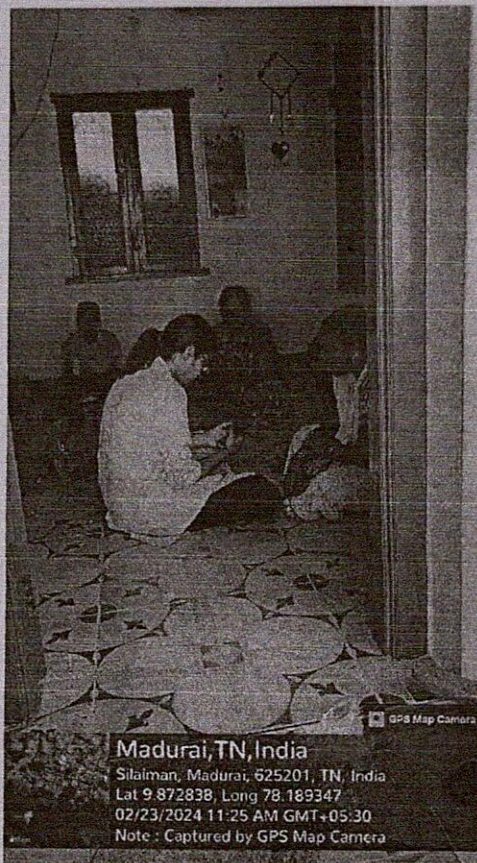
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8. Role play

Role-play is used as a teaching methodology. Faculties help the student to organise role play on the topic like communication skills, deaddiction etc.



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VELAMMAL MEDICAL COLLEGE HOSPITAL AND RESEARCH INSTITUTE MADURAI - 625 009

THEORY CLASS SCHEDULE, JUNE 2024

BATCH-2021-22

3rd year MBBS

(8 - 9 am)

| SN | Date | Topic | Faculty |
|----|-----------|---|------------|
| 1 | 4.6.2024 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Trachoma, Tetanus & Yaws | Dr. Santha |
| 2 | 11.6.2024 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Hospital Acquired Infections | Dr. Samir |
| 3 | 18.6.2024 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Brucellosis & Salmonellosis - Flipped Classroom | Dr. Sudhir |

Practical class schedule - IT/SGD/SDL

(2 - 4 pm)

| SN | Date | TOPIC | Faculty |
|----|---|--|--|
| 1. | 3.06.24(A) 4.06.24(B) 5.06.24(C) | <u>SGD</u> : CM 12.1, 12.2 & 12.3 Define and describe the concept of Geriatric Services, health problems of aged population, prevention of health problems of aged population & National program for elderly | Dr. Munish Dr. Alamelu Dr. Asifa Dr. Pavithra |
| 2. | 10.06.24(A) 11.06.24(B) 12.06.24(C) | <u>SGD</u> : CM 6.1 & 6.2 Formulate a research question for a study, Describe and discuss the principles and demonstrate the methods of collection, classification, analysis, interpretation and presentation of statistical data. | Dr. Ramji Dr. Santha Dr. Asifa Dr. Pavithra |
| 3 | 17.06.24(A) 18.06.24(B) 19.06.24(C) | <u>SDL</u> : CM 15.1, 15.2 & 15.3 Define and describe the concept of Mental Health, warning signals of mental health disorder & National Mental Health program. | Dr. Sriandaal Dr. Sudhir Dr. Gavin Dr. Thendral |

❖ Dear faculties kindly adhere to teaching schedule, exchange of classes require prior permission

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MADURAI - 625009

BATCH-2022-23

2nd year MBBS

Theory Schedule

(9 - 10 am)

| SN | Date | Topic | Faculty |
|----|---------|--|---------------|
| 1. | 3.6.24 | CM 7.2 & 8.1: Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Poliomyelitis - Problem Based Learning | Dr. Praveena |
| 2. | 10.6.24 | CM 7.2 & 8.1: Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Viral Hepatitis | Dr. Alamelu |
| 3. | 17.6.24 | CM 7.2 & 8.1: Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Acute Diarrhoeal Diseases - Integrated Teaching | Dr. Sudhir |
| 4. | 24.6.24 | CM 7.2 & 8.1: Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Cholera & Typhoid Fever - Student Seminar | Dr. Sriandaal |

CLINICAL POSTING SCHEDULE, JUNE 2024

Batch: 2022-23 - II Year MBBS

| Roll No: 57-76 | | 13.5.2024 – 16.6.2024 | | Time:10 am – 1 pm | |
|----------------|----------|---|--|-------------------|--|
| SNo. | Date | Topic | Faculty | | |
| 1 | 3.06.24 | Orientation to Family Health Survey, Village Health Survey, Diet Survey | Dr.Samir,Dr.Sudhir, Dr.Praveena,Dr. Munish | | |
| 2 | 4.06.24 | RHTC, Village Health Survey | Dr. Sriandaal | | |
| 3 | 5.06.24 | UHTC, Family Health Survey & Diet Survey I | Dr. Alamelu | | |
| 4 | 6.06.24 | World Environment Day Awareness Activity, Family Health Survey & Diet Survey II | Dr. Sriandaal | | |
| 5 | 7.06.24 | Community Diagnosis – Data Interpretation | Dr Ramji, Dr. Munish | | |
| 6 | 10.06.24 | Visit to Solid waste Management | Dr. Santha | | |
| 7 | 11.06.24 | Visit to Sewage Treatment Plant | Dr. Alamelu | | |
| 8 | 12.06.24 | Visit to Anganwadi | Dr. Santha | | |
| 9 | 13.06.24 | Visit to Water Treatment Plant | Dr.Sudhir | | |
| 10 | 14.06.24 | End posting examination | All faculties & PGs | | |

❖ Dear Faculties, adhere to teaching schedule, exchange of classes requires prior permission

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DEPARTMENT OF COMMUNITY MEDICINE
THEORY CLASS SCHEDULE, MAY 2024

| BATCH-2021-22 | | 3 rd year MBBS | (8 - 9 am) |
|---------------|-----------|---|------------|
| SN | Date | Topic | Faculty |
| 1 | 07.5.2024 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Dengue - Lecture | Dr. Samir |
| 2 | 28.5.2024 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of (Zika virus, Yellow Fever, Nipha virus) diseases- Flipped Classroom | Dr. Sudhir |

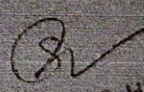
Practical class schedule - IT/SGD/SDL


| SN | Date | TOPIC | Faculty |
|----|---|---|--|
| 1 | 6.05.24(A) 7.05.24(B) 8.05.24(C) | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Leprosy- Small Group Discussion | Dr Alamelu Dr Asifa Dr Pavithra |
| 2 | 27.05.24(A) 28.05.24(B) 29.05.24(C) | CM 7.2 & 8.2 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Non Communicable Diseases (Obesity, Diabetes, Oral Disease, RTA)-Self Directed Learning | Dr. Sriandaal Dr Asifa Dr Pavithra |

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Department of Community Medicine
THEORY CLASSES SCHEDULE, APRIL 2024

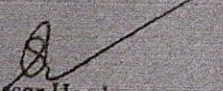
BATCH-2021-22

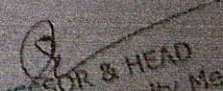
3rd year MBBS

(8 - 9 am)

| S.N | Date | Topic | Faculty |
|-----|----------|--|--------------|
| 1. | 02.04.24 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Sexually Transmitted Diseases – Student Seminar | Dr. Praveena |
| 2. | 9.04.24 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Plague & Leptospirosis- Flipped Classroom | Dr. Sudhir |
| 3. | 16.04.24 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of Lymphatic Filariasis- Student Seminar | Dr. Munish |
| 4. | 30.04.24 | CM 7.2 & 8.1 : Enumerate, describe and discuss the modes of transmission and measures for prevention and control of - Malaria Chikungunya - JAPANESE ENCEPHALITIS EKYANUR FOREST DISEASE, CHIKUNGUNYA - INTERACTIVE LECTURE | Dr. SANTHA |

Exchange of classes require prior permission


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Department of Community Medicine
THEORY CLASSES SCHEDULE, FEBRUARY 2024

BATCH - 2022-23

| S.N | Date | 2 nd year MBBS Topic | (9 - 10 am) Faculty |
|-----|----------|--|------------------------|
| 1 | 05.02.24 | CM 1.4 Describe the concept of solid waste, human excreta disposal - Flipped classroom | Dr. Praveena |
| 2 | 12.02.24 | CM 1.4 Describe the concept of sewage and its disposal - Students seminar | Dr. Sudhar |
| 3 | 19.02.24 | CM 3.7 Identify and describe the identifying features and life cycles of mosquito, its Public Health importance and their control measures - Lecture | Dr. Munish |
| 4 | 26.02.24 | CM 3.5 Describe the standards of housing and the effect of housing on health - Interactive Lecture | Dr. Samir |

2nd year MBBS (2022-23 BATCH)

Practical class schedule - IT/SGD/SDL

(2 - 4 pm)

| S.N | Date | Topic | Faculty |
|-----|----------|--|--|
| 1. | 16.02.24 | Integrated Teaching CM8.1 Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases - Tuberculosis | Dr. Sriandaal Dr. Asifa Dr. Pavithra |
| 2. | 22.02.24 | Small Group Discussion CM 3.7 Identify and describe the identifying features and life cycles of vectors its Public Health importance and their control measures CM 3.8 Describe the mode of action, application cycle of commonly used insecticides and rodenticides | Dr. Alamelu Dr. Bharath Dr. Shalini |

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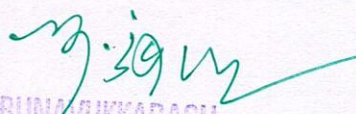
Department of Physiology

Student Centric Methods

Student-centric methods in medical education focus on engaging students actively and tailoring learning experiences to their needs and preferences. Self-directed learning (SDL) empowers students to take ownership of their education, fostering critical thinking and lifelong learning skills. The flipped classroom model enhances understanding by allowing students to review lecture materials at their own pace and use classroom time for interactive, hands-on activities. Seminars promote in-depth discussion and exploration of topics, while quizzes provide immediate feedback and reinforce knowledge. Roleplay offers immersive experiences that develop communication and clinical skills in a realistic context. Experiential learning, particularly through gamified methods, makes learning dynamic and enjoyable, increasing student motivation and retention. Case-based learning helps students apply theoretical knowledge to real-world scenarios, enhancing problem-solving abilities. Blended learning combines traditional face-to-face instruction with online resources, providing a flexible and comprehensive educational approach. These diverse, student-centric methods collectively create a robust, engaging, and effective learning environment in medical education.

| S.no | Student Centric method | Competition type | Date |
|------|-------------------------|------------------|------------|
| 1 | Blood Quiz | Intracollege | 6.11.2023 |
| 2 | General Physiology Quiz | Intracollege | 31.05.2024 |

| S.no | Student Centric method | Topic | Date |
|------|--|--------|------------|
| 1 | Experimental learning - Gamified Learning | AETCOM | 19.01.2024 |


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| S.no | Student Centric method | Modules |
|------|------------------------|---------|
| 1 | SDL | 10 |

| S.no | Student Centric method | Modules |
|------|----------------------------------|---------|
| 1 | Early Clinical Exposure (ECE) | 9 |

| S.no | Student Centric method | Number |
|------|------------------------|--------|
| 1 | Seminar | 8 |

| S.no | Student Centric method | Modules | Sessions |
|------|------------------------|----------------|----------|
| 1 | Case Based Learning | Theory classes | 5 |
| | | Assignments | |

| S.no | Student Centric method | Topics |
|------|------------------------|-------------------|
| 1 | Flipped Classroom | Taste pathway |
| | | Olfactory pathway |


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**Velammal Medical College and Hospital,
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Department of Physiology

Early Clinical Exposure Topics for 2023-2024 Batch

Early Clinical Exposure involves assessment of student level of learning through assessment of the synopsis and reflection. Department of Physiology had conducted about 9 Early Clinical Exposure topics for the First year MBBS students for the 2023-24 Batch. This unique learning methodology was employed so as to augment the clinical concepts in a non-conventional way to didactic lectures. Pre and Post Test was conducted.

| Sl No | Date | Topic | Faculty |
|-------|------------|------------------------|-----------|
| 1 | 13.10.2023 | Anemia | All staff |
| 2 | 10.11.2023 | Myasthenia Gravis | All staff |
| 3 | 22.11.2023 | Electromyography (EMG) | All staff |
| 4 | 23.11.2023 | Dumping Syndrome | All staff |
| 5 | 01.12.2023 | Cholera | All staff |
| 6 | 19.02.2024 | Cystic Fibrosis | All staff |
| 7 | 18.03.2024 | Liddle's Syndrome | All staff |
| 8 | 04.04.2024 | Hemiplegia | All staff |
| 9 | 02.05.2024 | Thalamic Syndrome | All staff |


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7. Formative Assessment of Early Clinical Exposure

Note:

- Formative Assessment of ECE sessions involves assessment of student level of learning through assessment of the synopsis and reflection
- The student shall submit the same at the end of the session. This can be both in the offline and online modes.

| No | Topic | MARKS (out of 10 marks) | Initial of Facilitator |
|----|------------------------|-------------------------|------------------------|
| 1 | ANAEMIA | 10 | JS |
| 2 | MYASTHENIA GRAVIS | 10 | JS |
| 3 | ELECTROMYOGRAPHY (EMG) | 6 | JS |
| 4 | DUMPING SYNDROME | 8 | JS |
| 5 | CHOLERA | 8 | SV |
| 6 | CYSTIC FIBROSIS | ab | JS |
| 7 | LITTLE'S SYNDROME | 10 | JS |
| 8 | HEMIRECTIA | 10 | JS |
| 9 | THALAMIC SYNDROME | 10 | JS |

23

ECE Session 4: DUMPING SYNDROME

Date

23.11.2023

Initial of Facilitator

JS

Objective of ECE Session

To learn about Dumping Syndrome
- post surgical occurrence
- clinical features.

Synopsis of Learning ⇒ also called rapid gastric emptying // Dumping syndrome is a gastrointestinal disorder characterized by rapid and uncontrolled emptying of stomach contents into small intestine.

Clinical Features:

- o Early dumping
 - rapid entry of undigested food into SI
 - nausea → diarrhea / shocky after eating
 - abdominal cramps
 - bloating
- o Late dumping
 - reactive hypoglycemia due to exaggerated release of insulin
 - weakness / 1-3 hours after a meal
 - sweating
 - palpitations

⊛ Dumping syndrome most commonly happens as a complication of surgery on stomach such as gastric bypass surgery.

Treatment

- o Dietary modifications - Small, frequent meals / avoiding simple sugars
- o Medications - Octreotide / Incretin hypoglycemia / acarbose to regulate gastric emptying.

Reflections

This ECE session briefly outlines the gastrointestinal disorders marked by rapid stomach emptying, emphasizing its post-surgical occurrence & treatment/management thru dietary modifications & medication.

⊛ An estimate 20% to 50% of people who had stomach surgery develop some symptoms of dumping syndrome //

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Pre and Post Test :

13/10/23

Early clinical Exposure - 1

Pre Post - Test

1) Write the normal RBC count range in adult male?

4.5 - 5 million cells/mm³ ✓

2) Which of the following is sign of Anemia?

Cyanosis ✗

3) Anemia can be checked in which of the following locations?

3/5
Mucous Conjunctiva ✓

4) Which of the following is not a sign of anemia?

Vomiting ✓

5) Absence of palmar crease is sign of severe anemia?

False ✗

Post - test

1) 5 - 6 million cells/mm³ ✓

2) Pallor ✓

3) Conjunctiva ✓

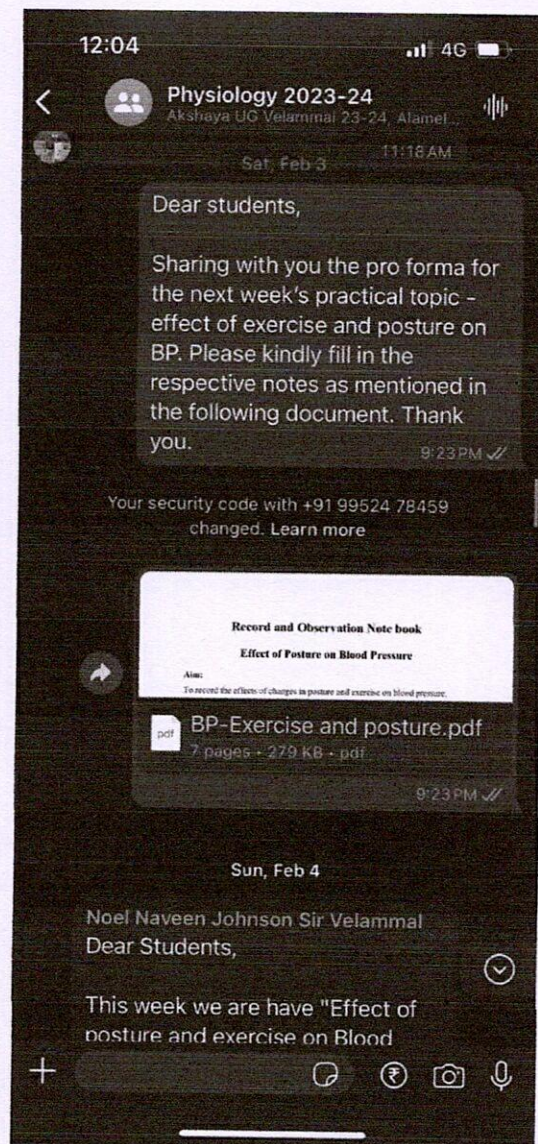
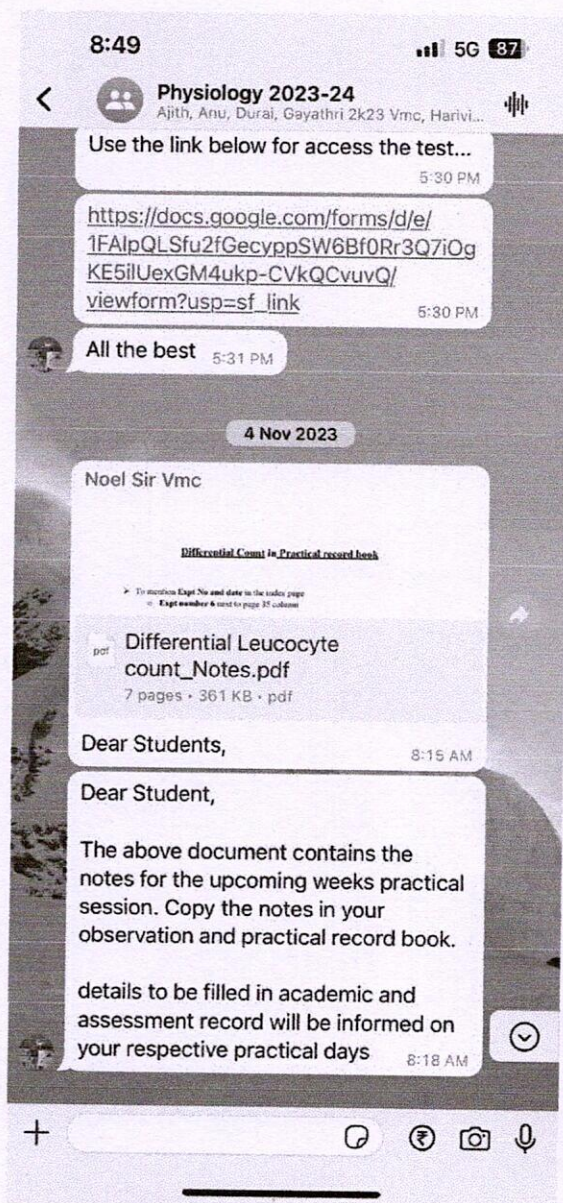
4) Vomiting ✓

5) True ✓

5/5 Done

BLENDED LEARNING

We, the department of physiology are following the blended learning for the first year MBBS students. We regularly post the reading materials including study topic, specific learning objectives, course outline and the detailed content via the online platform like WhatsApp group. We instruct the students to go through the reading materials before they come for the class. During their practical classes, we explain the concepts pertaining to the particular experiment and demonstrate it to the students. As they are already primed about the topic and the contents, they tend to be more interactive and learn the experiment in a better way. The students are assessed based on the NMC competencies.



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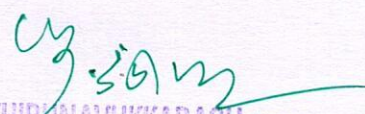
| Date | Day & Time | Class topic | Batch | Faculty | Date | Day & Time | Class topic | Batch | Faculty | M.O. |
|------------|--------------------|------------------------------------|------------------|---|------------|----------------------|---|------------------|---|------|
| 30.01.2024 | Tuesday (11am-1pm) | ECG workshop (theory) | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | 15.02.2024 | Tuesday (11-1pm) | CNS Examination | A-batch (C1-50) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | |
| 31.01.2024 | Wednesday | ECG workshop (practical) | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | 20.02.2024 | Tuesday (11am-1pm) | Spirometer & Metronome Engiography workshop | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | |
| 01.02.2024 | Thursday | ECG workshop (practical) | A-batch (C1-50) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | 21.02.2024 | Wednesday (11am-1pm) | Spirometer & Metronome Engiography workshop | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | |
| 05.02.2024 | Tuesday | Effect of posture & exercise on BP | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | 28.02.2024 | Thursday (8am-10am) | B - Central Practical Exam | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | |
| 07.02.2024 | Wednesday | Effect of posture & exercise on BP | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | 29.02.2024 | Friday (8am-10am) | S - Central Practical Exam | A-batch (C1-50) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | |
| 08.02.2024 | Thursday | Effect of posture & exercise on BP | A-batch (C1-50) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | 29.02.2024 | Saturday (8am-10am) | S - Central Practical Exam | A-batch (C1-50) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | |
| 13.02.2024 | Tuesday | CNS Examination | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | 05.03.2024 | Wednesday (11am-1pm) | Re Examination | B-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | |
| 14.02.2024 | Wednesday | CNS Examination | C-batch (C1-100) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | 06.03.2024 | Thursday (11am-1pm) | Re Examination | A-batch (C1-50) | Dr. S. Anu, Dr. John, Dr. Raju, Dr. Dinesh, Dr. Harsh | |

4. Haematology Lab Record

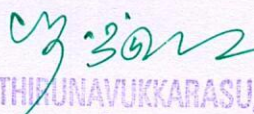
Note:

1. This section captures the attainment of the various competency mile-stones attained through haematology lab work.
2. The learner shall make observation in the lab and makes entries as mandated in the concerned record book.
3. The record books shall be verified by the faculty facilitator periodically / at the end of each session or module and the completion of each such activity shall be recorded in this section by the learner and signed by the facilitator.
4. The end of each session shall be appended by an end of training formative assessment in the topic / session / module. eg: OSPE. Such sessional outcomes and feed for such outcomes may be suitably entered in the concerned documents.

| No | Test / Procedure / Experiment | Date of Completion | Initials of Facilitator |
|----|---|--------------------|-------------------------|
| 1 | Microscope. | 28.09.2023. | Dr. S. Anu |
| 2 | Hemoglobinometer. | 05.10.2023. | Dr. S. Anu |
| 3 | RBC count. | 12.10.2023. | Dr. S. Anu |
| 4 | Estimation of WBC count. | 19.10.2023. | Dr. S. Anu |
| 5 | Hemoglobin estimation. | 02.11.2023. | Dr. S. Anu |
| 6 | Differential Leucocyte count Identification of WBC. | 07.12.2023. | Dr. S. Anu |
| 7 | Determination of Blood group. | 14.12.2023. | Dr. S. Anu |
| 8 | Determination of bleeding & clotting time. | 14.12.2023. | Dr. S. Anu |
| 9 | RBC indices | 07.01.2024. | Dr. S. Anu |
| 10 | absolute Eosinophil count. | 04.01.24. | Dr. S. Anu |


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| No | Test / Procedure / Experiment | Date of Completion | Initials of Facilitator |
|----|---------------------------------|--------------------|-------------------------|
| 11 | Erythrocyte sedimentation Rate. | 04.04.24 | lg |
| 12 | Packed cell volume. | 04.04.24 | u |
| 13 | Osmotic fragility. | 04.04.24 | u |
| 14 | Specific gravity. | 04.04.24. | te |
| 15 | Platelet count | 13.06.24 | lg |
| 16 | Reticulocyte count | 13.06.24 | lg |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |

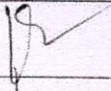













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5. Clinical Physiology Lab Record

Note

1. This section includes academic mile stones attained through Clinical Physiology lab work.
2. The learner shall make observation entries as mandated in the record book
3. The record note books shall be verified by the faculty facilitator at the end of each session or module.
4. The completion of each such activity shall be recorded in this section by the learner and signed by the facilitator
5. The end of each session shall be appended by an end of training formative assessment in the topic / session / module. eg: OSPE, DOPS etc. Such sessional outcomes and feed for such outcomes may be suitably entered in the concerned documents.

| No | Test / Procedure / Experiment | Date of Completion | Initials of Facilitator |
|----|---|--------------------|-------------------------|
| 1 | General Examination | 04.01.2024. | U |
| 2 | Examination of pulse | 11.01.2024 | U |
| 3 | Examination of blood pressure. | 25.01.2024. | U |
| 4 | Examination of ECG | 01.02.2024. | U |
| 5 | Examination of effect of posture + exercise on BP | 08.02.2024. | U |
| 6 | Examination of CVS. | 15.02.2024. | U |
| 7 | spirometry. | 29.02.2024 | U |
| 8 | Morison's hydrography. | 29.02.2024 | U |
| 9 | Examination of RS | 07.03.2024 | U |
| 10 | Pethography | 14.03.2024 | U |
| 11 | Examination of sensory system. | 15.04.2024. | U |

| No | Test / Procedure / Experiment | Date of Completion | Initials of Facilitator |
|----|--|--------------------|---|
| 12 | Examination of knee jerk reflex. | 18.04.2024. |  |
| 13 | Examination of motor system. | 09.05.2024 |  |
| 14 | Examination of cranial nerves (1-6) | 09.05.2024 |  |
| 15 | Examination of cranial nerves (7-12). | 09.05.2024. |  |
| 16 | Cerebellar functions. | 09.05.2024 |  |
| 17 | Harvard step test | 09.05.24. |  |
| 18 | Recording of aortic pulse. | 13.06.24 |  |
| 19 | Observation of Cardio-vascular + Autonomic | 13.06.24 |  |
| 20 | EEG interpretation. | 13.06.24 |  |
| 21 | Respiratory efficiency test | 20.6.24 |  |
| 22 | Examination of abdomen. | 20.6.24 |  |
| 23 | Observation in Abdomen nerveless exp. | 20.6.24 |  |
| 24 | Basic life support. | 20.6.24. |  |
| 25 | | | |
| 26 | | | |
| 27 | | | |

Differential Count in Practical record book

- To mention **Expt No and date** in the index page
 - **Expt number 6** next to page 35 column
- To write **Expt number and date** in page number 35
- To write the following in page number 39

Aim:


To determine the differential count of white blood cells

Apparatus Required:

Grease free and dry glass slides, Leishman's Stain, Distilled water, Lancet, Spirit, and Cotton.

Leishman's Stain - Composition and function:

1. Methylene Blue (Basic component) – Stains acidic granules in cytoplasm especially granules of basophils and nuclei of leucocytes
2. Eosin (Acidic component) – Stains cytoplasm, basic granules in cytoplasm and hemoglobin of RBCs.
3. Acetone free methyl alcohol – Fixes the cells (Acetone free methyl alcohol is used as acetone is a lipid solvent that lyses cell membrane).


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Basic Life Support (BLS)

Basic life support generally refers to the type of care that first responders, healthcare providers and public safety professionals provide to anyone who is experiencing cardiac arrest, respiratory distress or an airway obstruction.

Chain of survival:

- Recognition of cardiac arrest and activation of emergency response system.
- Early CPR with an emphasis on chest compressions.
- Rapid defibrillations.
- Basic and advanced emergency medical service.

Before performing CPR:

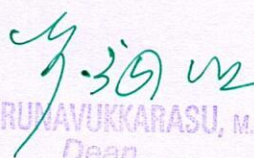
- Scene safety – ensure the safety of the collapsed person.
- Check for responsiveness and assess for breathing.
- Shift patient to safety and call emergency services.
- Perform CPR rescue breaths if needed.

In 2010, American Heart Association (AHA) guidelines for CPR rearranged the order of performing CPR. Currently AHA teaches the rescuers to practice C – A – B (Chest compressions, airway and breathing).

If a medical professional is a rescuer, then he should check the carotid pulse after victim before starting compressions. Pulse should be checked for a minimum of 5 seconds and not more than 10 seconds. In case pulse is present but there is no breathing, maintain patient's airway and begin rescue breathing. Administer one breath every 5 to 6 seconds not exceeding 10 to 12 breaths per minute check for change in carotid pulse every 2 minutes.

Chest compressions:

- Place the heel of the interlocked hands on point of intersection of intermammary line and angle of sternum with wrist, elbow and shoulder in a straight line.
- Compressions should be initiated within 10 seconds of recognition of cardiac arrest.
- Push hard and fast at a rate of 100 to 120 compressions per minute and to a depth of at least 2 inches for an average adult while avoiding excessive chest compressions.
- Avoid complete chest recompression after compression to ensure adequate ventricular filling.
- Minimum interruptions during compressions (< 10 seconds).


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PULSE & JVP in Practical Record Book

- To mention Expt No and date in the index page
 - Expt number 2 next to page number 155 column and the date on which you will be doing the experiment
 - Write the Expt number and date on page number 155
 - Write the following (starting from the free space in the lower half of page number 161
-

Aim:

To examine the arterial and venous pulse of the given subject

Name:

Age:

Gender:

Occupation:

Observations:

Radial Pulse Examination:

| | Features of Pulse | Right side | Left side |
|---|------------------------------|------------|-----------|
| 1 | Rate | | |
| 2 | Rhythm | | |
| 3 | Volume | | |
| 4 | Character | | |
| 5 | Condition of the vessel wall | | |
| 6 | Radio-femoral delay | | |
| 7 | Pulse deficit | | |


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Velammal Medical College Hospital and Research Institute

Department of Physiology

Case based Learning

Case based learning helps the students to communicate with the peer people and understand the clinical case in an easier way. It also promotes team work and critical thinking among students to arrive at the diagnosis. Department of physiology regularly conducts case-based learning activities for first year MBBS students and the relevant materials are posted in the student WhatsApp group prior for them to access and orient themselves. Then the cases are discussed in the class. Few more case scenario samples are given as assignments and the answers are graded. The outcome of this case-based learning is analyzed during Theory and Practical Internal Assessment.

| S.no | Topics | Date |
|-------------|--------------------|-------------|
| 1 | General Physiology | 28/09/2023 |
| 2 | CVS | 20/02/2024 |
| 3 | RS | 21/02/2024 |
| 4 | Endocrine | 20/04/2024 |
| 5 | Reproduction | 20/04/2024 |

Case discussion during classes:

1. A 35-year-old man and his wife present to the clinic seeking assistance with conception. They have been actively trying to conceive for the past 18 months without success. The wife has regular menstrual cycles, and her recent gynecological examination was unremarkable. The man has no significant past medical history and is not taking any medications. He denies any history of sexually transmitted infections, genitourinary surgery, or exposure to gonadotoxic agents. His physical examination is normal.
2. A 14-year-old girl presents to the clinic with concerns about her menstrual cycle. She experienced menarche at the age of 12 and her menstrual cycles have been irregular

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since then. Over the past year, she has experienced unpredictable menstrual cycles, with intervals varying from 20 to 50 days. She reports heavy menstrual flow, lasting 7-9 days, and significant menstrual pain, interfering with her school attendance and daily activities.

3. A 29-year-old woman presents to the clinic with a complaint of amenorrhea. She reports having regular menstrual cycles since menarche at the age of 12, with a cycle length of 28-30 days. However, she has not had a menstrual period for the past 3 months. The patient denies any recent weight changes, excessive physical activity, or significant stress.
4. A 38 year old female presents to her primary care physician with complaints of weight gain, particularly in her abdomen and face, despite no change in diet or exercise routine. She also reports feeling fatigued, weak, and experiencing easy bruising, along with irregular menstrual periods. She mentions noticing stretch marks on her abdomen and thighs.

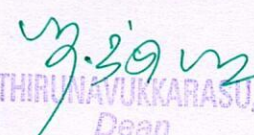
Blood pressure: 160/90 mmHg;

Heart rate: 90 bpm

Visual examination reveals central obesity with a buffalo hump (fat accumulation between the shoulders), moon facies (rounding and redness of the face), and prominent purple striae on her abdomen and thighs.

Skin examination shows thinning and easy bruising.

Proximal muscle weakness is noted, particularly in the upper extremities.


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Assignments :

29/10/2024

4) When Charles returned to his apartment at 5 pm in the evening, he turned on his old kerosene-fueled space heater, as his apartment was chilly he did not open the windows after spending an hour fixing dinner and another half hour eating it while watching TV, he noticed that his vision became progressively blurred. When he got up to go to the kitchen he felt light headed and unsteady, he became very disoriented and fainted out. The next thing he remembers was waking up in the intensive care unit of the hospital. He was visited by his wife who had come home sometime later. An arterial blood sample drawn when he first arrived at the hospital shows the following values:-

$\text{N}_2: 573 \text{ mmHg}$, $\text{O}_2: 95 \text{ mmHg}$,
 $\text{CO}_2: 40 \text{ mmHg}$ & $\text{CO}: 0.4 \text{ mmHg}$.

a) what was the reason for his syncope attack:-

Charles likely experienced a syncope (fainting) attack due to CO poisoning. His use of a kerosene fueled space heater without proper ventilation lead to the production of CO, which binds to Hb, reducing O_2 carrying capacity and causing hypoxia.

b) what is the treatment for his condition:-

Treatment for CO poisoning:-

The primary treatment for CO poisoning involves removing the individual from the source of exposure and administering high flow oxygen. This helps eliminate CO from the body and restores O_2 levels. In severe cases hyperbaric O_2 therapy may be considered to accelerate CO elimination.

Signs and symptoms like those experienced by Mr. Charles. Understanding the O_2 dissociation curve and its influencing factors helps explain how shifts in this curve can affect O_2 delivery to tissues.

IA Theory Assessment:

Velammal Medical College Hospital and Research Institute Madurai -09
Physiology Internal Assessment Test IX - CNS

Answer all Questions

- Time : 3 hours
- Marks : 100
- Date : 08.05.24 & 09.05.24

Section I - Essay

2 X 15 = 30

1. A 31-year-old male came to OPD with history of difficulty in walking and difficulty in speech. Tremors were observed when he attempted any voluntary activity but ceased during rest. Muscle tone was reduced. History of head injury in an RTA 3 months before.

- a. Identify the part of the brain that is affected in the above disorder. (1)
- b. Draw and name the functional divisions of the affected part. (2)
- c. Describe in detail the connections and functions of this part. (7+3)
- d. Mention 4 other signs of this lesion. (2)

2. In the clinical physiology laboratory of a medical college, a student observed exaggerated knee jerk while tapping the patellar tendon.

- a. Name one clinical condition where deep reflexes are exaggerated. (1)
- b. Draw the structure of muscle spindle and explain. (6)
- c. Discuss with a flow chart the reflex pathway of knee jerk. (4)
- d. What is the significance of α - γ coordination? (2)

e. How is Jendrassik's maneuver done for i) Upper limbs ii) Lower limbs (2)

Section II - Short answers

10 X 5 = 50

1. A 50 year old man was brought to the hospital with complaints of hemi anaesthesia and sharp, burning, electric shock like pain. In spite of the presence of his limb, he gropes for it in the air. He had a history of stroke 6 months before. MRI findings confirmed thalamic syndrome.

- a. Lesion of which blood vessel results in this condition? (1)
- b. What is the reason behind hemianesthesia in this condition? (1)
- c. What are the functions of thalamus? (3)

2. A 70 year old female came to the hospital with complaints of resting tremor. Physical examination revealed cog wheel rigidity and bradykinesia.

- a. What is the probable diagnosis? (0.5) Name 2 other features of this disease. (0.5)
- b. How do you treat this condition? (1)
- c. Draw the direct and indirect pathways of basal ganglia. (3)
- d. Reasons for chorea and athetosis. (1)

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Practical Assessment:

Station 1

1. A 65-year-old male came with complaints of weakness in the limbs for the past few weeks. Examine the Motor system of the given subject.
2. A 50-year-old male patient has come for routine examination. Perform General examination. Examine the arterial pulse of the given subject.

Station 2

1. A 60-year-old male with diabetes for 10 years has come for routine examination. Examine the Sensory system in the given subject.
2. Record the Normal Stethogram of the given subject and demonstrate the Effect of Deglutition, Voluntary breath holding, Hyperventilation & Exercise on respiration.


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Velammal Medical College Hospital & Research Institute

Department of Physiology

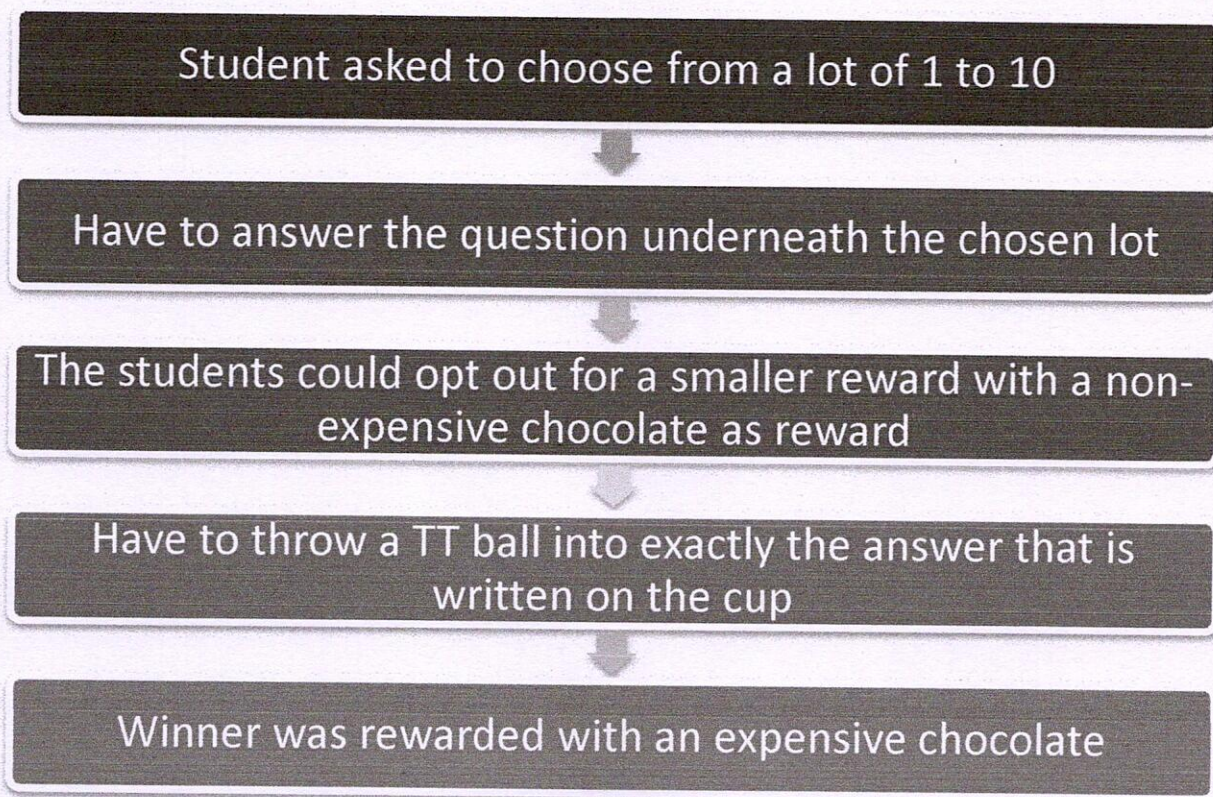
Departmental Activity Report

“Gamefied Learning - AETCOM”

For 2023 – 2024 batch

A Experimental learning was conducted on the topic “AETCOM” for the first year MBBS students of **2023 - 2024 batch** on **19th January 2024** (Friday, 10am to 1pm) in the Department of Physiology, Velammal Medical College building.

The interested students can opt in for the game and it tested their cognitive and motor skill prowess intoto. The game workflow was as below :



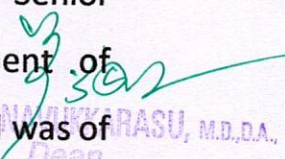
The students thoroughly enjoyed the session as it was a new format of learning and few were able to receive the top reward while others settled for reward of the first part of the game. Students were encouraged by this new initiative and were wanting for more of such ideas in the future.

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VELAMMAL MEDICAL COLLEGE AND RESEARCH INSTITUTE
DEPARTMENT OF PHYSIOLOGY
DEPARTMENTAL ACTIVITY REPORT- ROLEPLAY – 2022 -2023 BATCH
BASED ON AETCOM MODULE

11.12.2023

A Roleplay – based on the AETCOM module was organized for the first year MBBS students of batch 2023-2024 on 11.12.2023 from 11 am to 1 pm in the lecture hall 1 of Velammal medical college. Four teams were participated in this roleplay program. Each team consisted of 10 - 12 participants. The topics for the roleplay program was Depression (Communication), Infertility(Miscommunication), Cancer (Breaking the bad news) and Myocardial Infarction (2ND Opinion). The teams were selected based on lot system and topics were allotted to them randomly. The program started with the welcome address by **Dr.Ajit Kumar**, Assistant Professor , Department of physiology. All the 3 teams enacted their topics based on the AETCOM module- Doctor patient relationship, second opinion, how to communicate to the patient and their attenders, physician's role and responsibilities to the society and community etc., All these AETCOM components were highlighted along with case scenarios. The event was judged by **Dr.Rabindranath**, Professor and HOD of Psychiatry department. At the end of each team's performance, Dr.Rabindranath sir shared his thoughts about the enactment. Vote of thanks was delivered by **Dr.S.Anu**, Prof and HOD of department of Physiology. The program ended with announcing the results and Certificate of merit were awarded to the winners **Dr. Durai Arasan**, Assistant Professor and **Dr. Noel Naveen Johnson**, Senior Resident and **Dr.M.A. Hariviknesh**, Postgraduate from department of Physiology were fully involved in getting this program over the mark and was of


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immense help throughout. Department attender **Mr. Kumaresan** and **Mr. Vinith** from Audio visuals department were of great help as well in attending to the sos technical complaints arising here and there during the program and sorting them out.

Best Male Performer – Monish, Guhan, Nishanth

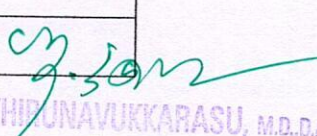
Best Female Performer – Madhunisha

Best Team Performance – Team Myocardial Infarction (AETCOM
Module- Second Opinion)

Role play team list

Team A – Depression

| S.no | Name |
|------|------------|
| 1 | Monish |
| 2 | Keerthana |
| 3 | Dinesh |
| 4 | Nethra |
| 5 | Janani |
| 6 | Kovarthini |
| 7 | Vidula |
| 8 | Kavya |
| 9 | Niranjana |
| 10 | Sushmitha |
| 11 | Amitha |

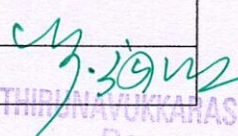

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Team B – Cancer (Breaking the bad news)

| S.no | Name |
|------|------------------|
| 1 | Revanth G |
| 2 | Abhilash A |
| 3 | Haldane Mannie A |
| 4 | Akshaya M |
| 5 | Aishwarya T |
| 6 | Atsay V |
| 7 | Kavya S |
| 8 | Devamithra R S |
| 9 | Jhananitha |
| 10 | Krudharrshna K.P |

Team C – Infertility (Miscommunication)

| S.no | Name |
|------|------------------|
| 1 | Madhunisha |
| 2 | Shivapriya B |
| 3 | Aashiq Ahmed J.M |
| 4 | Johan Divyaraj |
| 5 | Riyas Ahmed A |
| 6 | Guhan K |
| 7 | Shrenik |
| 8 | Sri Rasha |


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| | |
|----|--------------|
| 9 | Allen Nobel |
| 10 | Dayanidhi |
| 11 | Mahilan |
| 12 | Eben Desikan |

Team D – Myocardial Infarction (2ND Opinion)


| S.no | Name |
|------|-----------------|
| 1 | Nishanth |
| 2 | Irfan Mohammad |
| 3 | Mohamad Ashique |
| 4 | Vignesh |
| 5 | Nikilan |
| 6 | Vishwa |
| 7 | Krithin Vijay |
| 8 | Mohanambal |
| 9 | Sakthi |
| 10 | Vyashnavi |
| 11 | Pooja Sree |
| 12 | Pandikaneswari |

AETCOM – ROLEPLAY MARK SHEET

| Team | Topic | Acting (10) | Relevance to topic (10) | Coordination (10) | Powerpoint presentation (10) | Timing (10) | Total (50) | Standing |
|-----------|------------|----------------|-------------------------------|----------------------|------------------------------------|----------------|---------------|-----------------|
| Team A | Depression | 8 | 8 | 6 | 5 | 9 | 36 | 4 th |

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| | | | | | | | | |
|---------------|--------------------|-----------|----------|----------|----------|----------|-----------|-----------------------|
| Team B | Cancer | 9 | 8 | 6 | 7 | 9 | 39 | 2nd |
| Team C | Infertility | 9 | 8 | 5 | 7 | 9 | 38 | 3rd |
| Team D | MI | 10 | 8 | 6 | 8 | 9 | 41 | 1st |


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Velammal Medical College and Hospital, Madurai
Department of Physiology

Self Directed Learning Topics for 2023-2024 Batch

Department of Physiology had conducted about 10 Self Directed Learning topics for the First year MBBS students for the 2023-24 Batch. Self directed learning was employed so as to augment the concepts in a non-conventional way to didactic lectures.

| Sl No | Date and Day | Day & Time | Topic | Faculty |
|-------|------------------------|----------------|---------------------------------|-----------|
| 1 | 29.09.2023 Friday | 12 PM to 1 PM | Tissues | Dr.S.Anu |
| 2 | 27.10.2023 Friday | 9 AM to 10 AM | Lymph | All staff |
| 3 | 08.12.2023 Friday | 12 PM to 1 PM | ECHO | All staff |
| 4 | 05.01.2024 Friday | 9 AM to 10 AM | HIS bundle electrocardiogram | All staff |
| 5 | 15.02.2024 Thursday | 10 AM to 11 AM | Goldblatt Hypertension | All staff |
| 6 | 30.05.2024 Thursday | 9 AM to 10 AM | Visual Evoked Potential | All staff |
| 7 | 14.06.2024 Friday | 10 AM to 11 AM | Radioimmunoassay | All staff |
| 8 | 17.06.2024 Monday | 11 AM to 12 PM | Circumventricular Organ | All staff |
| 9 | 18.06.2024 Tuesday | 10 AM to 11 AM | Bronchial Asthma | All staff |
| 10 | 21.06.2024 Friday | 9 AM to 10 AM | Audiometry | All staff |


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8. Formative Assessment of Self-Directed Learning

Note:

1. Formative Assessment of SDL sessions involves assessment of student level of learning through assessment of the synopsis and bibliography
2. The student shall submit the same at the end of the session. This can be both in the offline and online modes.

| No | Topic | MARKS (out of 10 marks) | Initial of Facilitator |
|----------------|----------------------------------|-------------------------------|---------------------------|
| 1 | | | |
| 29/09/23 2 | TISSUES | 10 | JS |
| 27/10/23 3 | LYMPH | 10 | JS |
| 08/12/23 4 | ELECTROCARDIOGRAM | 10 | JS |
| 05/02/24 5 | HIS BUNDLE ELECTRO CARDIOGRAM | 10 | JS |
| 15/02/24 6 | GOLDBLATT HYPERTENSION | 10 | JS |
| 19/06/24 7 | BRONCHIAL ASTHMA | 10 | JS |
| 19/06/24 8 | RADIOIMMUNOASSAY | 10 | JS |
| 17/06/24 9 | CIRCUMVENTRICULAR ORGAN | 10 | JS |
| 24/06/24 10 | VISUAL EVOKED PHYSIOLOGY | 10 | JS |
| 21/06/24 11 | AUDIOMETRY | 10 | JS |
| 12 | | | |

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SDL Session 05:

Date 15/02/2024

Initial of Facilitator

Time:

Topic of SDL

GOLDBLATT HYPERTENSION

Synopsis of the Study

Goldblatt Hypertension also known as Goldblatt Kidney
(or) Goldblatt Wiggers phenomenon / Renovascular Hypertension

It is a type of secondary hypertension caused by
renal artery stenosis.

CAUSE:- Narrowing / Blockage of renal aa. that supply
the kidney leading to renal artery stenosis due
to atherosclerosis (or) Fibromuscular dysplasia.

PATHOPHYSIOLOGY:- narrowing of renal aa. reduces blood
flow to kidney, thus J₁ cells release
Renin which activates RAAS [Renin Angiotensin
Aldosterone System]

DIAGNOSTICS:- Doppler's Ultra sound, Magnetic Resonance Angiography

TREATMENT:- Treatment of Goldblatt hypertension aims to
improve blood flow to the kidney by ACE inhibitors,
angiotensin II receptor blockers (or) diuretics
and artery stenosis surgery.

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Textbook of Physiology [Vol I] = 10th ed - A.K. Jain

Comprehensive Textbook of Physiology [Vol - II] = 3rd ed - G.K. Pal

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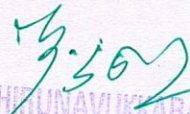
Student seminar – General Physiology 29.09.2023

The Department of Physiology, Velammal medical college organized a student seminar on the topic 'General Physiology on 29.07.2023.

| Topic | Students' names |
|---------------------------------------|------------------------|
| Apoptosis | Meghana Gayathri |
| Edema | Aashik Madhesh |
| Na ⁺ K ⁺ ATPase | Sanjay Adarsh |
| i.v. fluids | Keerthana Niranjana |
| ORS | Varjitha Alamelu |

Student seminar was conducted on 29.07.2023 from 11.00 am to 12.00 pm. Dr.M.Sangeetha, Professor, Department of General medicine judged the event. Students presented their topics in simple and elegant way. At the end of each presentation the judge asked questions regarding their presentations. Their marks were given based on their subject content, delivery, ppt presentation, time management and answering the questions from the judge.

1. Frist place – Edema
2. Second place – NA⁺ K⁺ ATPase
3. Third place – ORS, Apoptosis
4. Best male presenter – Madhesh
5. Best female presenter – Varjitha


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DEPARTMENT OF BIOCHEMISTRY

Simulation based learning

The Department of Biochemistry use innovative methods for enhanced learning. Using the online platform Foldit, students engage in simulation-based learning to grasp complex protein structures. Foldit merges scientific research with interactive participation, offering a revolutionary way to comprehend protein folding. Additionally, the department teaches first-year MBBS students about Polymerase Chain Reaction (PCR) through an online tutorial. Accessed via ["https://www.whfreeman.com/BrainHoney/Resource/6716/SitebuilderUploads/Hillis2e/Student%20Resources/Animated%20Tutorials/pol2e_at_0905_polymerase_chain_reaction_simulation/pol2e_at_0905_polymerase_chain_reaction_simulation.html#"](https://www.whfreeman.com/BrainHoney/Resource/6716/SitebuilderUploads/Hillis2e/Student%20Resources/Animated%20Tutorials/pol2e_at_0905_polymerase_chain_reaction_simulation/pol2e_at_0905_polymerase_chain_reaction_simulation.html#), this tutorial visually explains PCR's significance in molecular biology. By combining simulation-based protein learning and interactive PCR education, the Department of Biochemistry provides comprehensive, hands-on instruction that bridges theoretical knowledge with practical application.

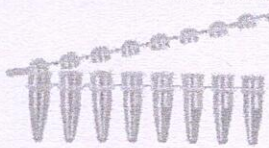
Online simulation-based learning – PCR

Polymerase Chain Reaction Simulation

STEP 1 Test sample with PCR


Your samples are loaded into the eight strip microtubes below with a positive and negative control.

1. Click on the boxes (below) to select the primers you wish to test on your patient samples (up to three).
2. Drag the tubes to the thermocycler.
3. Click the red button on the thermocycler to run your PCR and amplify the DNA.

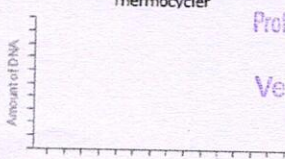


Patient sample: 1 2 3 4 5 6 + -
(Roll over the microtube labels for descriptions.)

| PRIMER LIBRARY | Amplicon size (bp) |
|---|--------------------|
| Viruses | |
| <input type="checkbox"/> Influenza A | 620 |
| <input type="checkbox"/> Influenza B | 700 |
| <input type="checkbox"/> Respiratory syncytial virus (RSV) | 460 |
| <input type="checkbox"/> Human parainfluenza virus 3 (HPIV-3) | 650 |
| <input type="checkbox"/> Adenovirus | 500 |
| <input type="checkbox"/> Rhinovirus | 480 |
| Bacteria | |
| <input type="checkbox"/> Haemophilus influenza (H flu) | 730 |
| <input type="checkbox"/> Streptococcus pneumoniae | 720 |
| <input type="checkbox"/> Acute sinusitis | 450 |



Thermocycler



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Introduction > Test Samples > Develop and Analyze

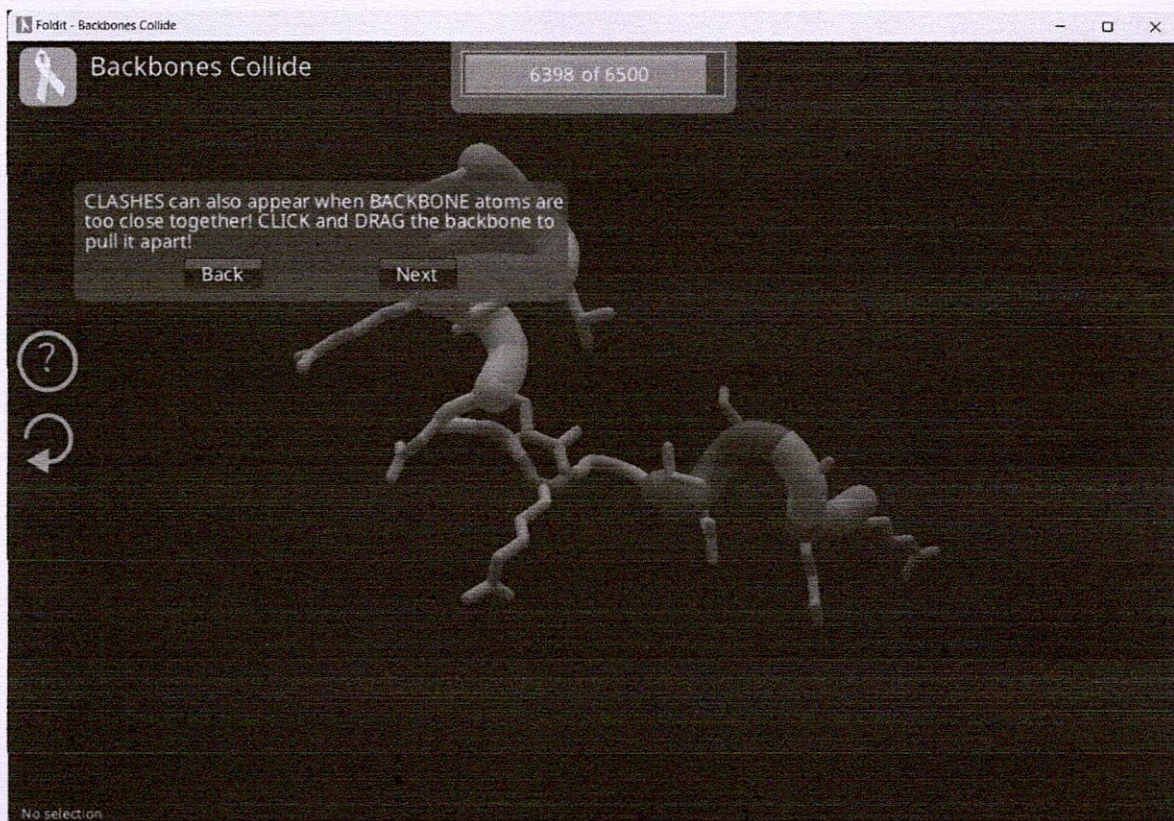
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DEPARTMENT OF BIOCHEMISTRY

Simulation based learning

Online simulation-based learning – Fold it for structure of protein



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