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THE GREY MATTER

VOLUME 25

QUARTERLY NEWSLETTER FOR MEDICAL STUDENTS



CODE SILVER

THE GOLDEN HOUR



Every second counts.

In a healthcare landscape defined by immediacy and high stakes, emergency medicine stands at the intersection of preparation and unpredictability—where outcomes can change within seconds, and quiet resilience is paramount for functioning under sustained pressure. Beneath the urgency lies a deeper narrative: one of endurance and an unwavering commitment to protecting life.
Beyond rapid intervention, emergency medicine explores judgment under constraint, compassion amid chaos, and the ability to continue when limits are repeatedly tested. The emergency department reveals medicine at its most intense—and most human.

With its twenty-fifth edition, *The Grey Matter* marks a significant milestone by turning its focus to emergency medicine. Through reflections on twenty-five breakthroughs in modern care, voices from the frontline, and insights from our founders, this edition explores what it means to practice medicine where every moment carries consequence. As we reflect on our journey, we are reminded of the dedication and diligence that quietly shape every decision in the pursuit of saving lives.

- Shreya Iyer, Editor-in-Chief

Happy reading!



CONTENTS

IN THIS ISSUE:

	PAGE NUMBERS
• VITAL 25	1
• FINAL 25	2
• THE ONES WHO BUILT IT	3
• PIGMENT	6
• SCIENCE IN MOTION	7
• DIALOGUE	10
• CODE 25	14
• SHUTTERBUG	16
• BREACH	17
• THE 25TH HOUR	20
• FROM THE DESK OF THE EXECUTIVE DIRECTORS	21
• FROM THE PRINCIPAL'S DESK	23

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VITAL 25

-Parth Rege, III/I M.B.B.S., M.I.M.E.R. Medical College, Pune

Shock is a term known to everyone, yet many remain unaware of the profound physiological response it triggers. Shock is the failure of the body's circulatory system to deliver oxygen-rich blood to the tissues and organs, resulting in cell damage. Beneath this simple word lies a cascade of physiological events: from the adrenaline-driven first 25 seconds to the compensatory adjustments over the next 25 minutes, and the systemic collapse that emerges within 25 hours. Vital 25 offers a sneak peek into these various time frames to understand what truly unfolds inside the body during hypovolaemic shock.

The onset of shock is abrupt. In the first 25 seconds – a period I like to call the "**Phase of Sympathetic Storm**" –the body mounts an instantaneous response. High-pressure baroreceptors present in the carotid sinus and aortic arch, normally stretched by pulsatile arterial pressure, experience reduced stretch due to the falling blood pressure. This decreases afferent signalling to the nucleus tractus solitarius, removing inhibitory control over sympathetic centres. The result is a surge in sympathetic outflow and withdrawal of vagal tone.

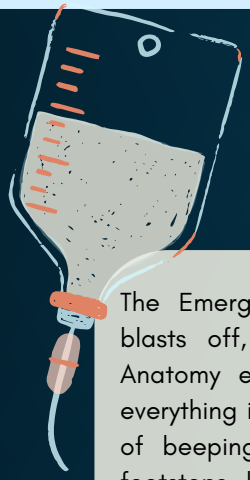
Within 5-10 seconds, β1-mediated tachycardia and increased contractility attempt to preserve cardiac output, while α1-mediated vasoconstriction raises systemic vascular resistance (SVR), producing cool, clammy skin and narrowed pulse pressure. Simultaneously, adrenal chromaffin cells release epinephrine and norepinephrine into circulation within 2-5 seconds, peaking by 10-25 seconds and further intensifying cardiovascular stimulation. Early tachypnoea also develops as baroreceptor unloading and reduced perfusion activate brainstem respiratory centres and peripheral chemoreceptors, producing rapid, shallow breathing.

The burst of reflex neural activity reaches its maximum in no time. This marks the transition of the body into a slower hormone-driven "compensatory phase" that unfolds over the next 25 minutes. Reduced renal perfusion and β_1-adrenergic stimulation cause the release of renin, which activates the Renin-Angiotensin-Aldosterone System (RAAS) pathway. Angiotensin II, produced by RAAS, causes sustained peripheral vasoconstriction, which helps maintain arterial pressure as volume loss continues.

Persistent elevation of angiotensin II for 10-20 minutes constricts efferent arterioles to preserve GFR and stimulates aldosterone, thirst, and ADH release, creating a coordinated endocrine response to restore the volume lost. ADH provides vasoconstriction through the V_1 receptors and water retention through V_2 receptors over 5-30 minutes. By 20-25 minutes, the rising lactate, persistent tachycardia, narrow pulse pressure, and mild respiratory alkalosis indicate the upper limit of compensation. This period represents the "Golden Hour", where timely care makes the most difference.

With continued insult, compensatory mechanisms become exhausted. Decompensation and organ threat dominate over the next 25 hours. Untreated hypovolemic shock shows progressive inflammation and hypoperfusion leading to capillary leaks, cytokine storm, and metabolic collapse. Endothelial activation and cytokines (TNF-α, IL-1β, IL-6) disrupt tight junctions, causing third spacing and severe interstitial edema in the lungs, gut, and extremities. DAMP-mediated cytokine surge amplifies vasodilation, vasoplegia, microvascular thrombosis, and mitochondrial dysfunction, which progresses to refractory hypotension and multi-organ injury. Metabolic acidosis worsens due to lactate accumulation, ATP depletion, loss of thermal regulation, and coagulation abnormalities like DIC. There is evident myocardial depression because of reduced contractility, ventricular dilation, and poor catecholamine responsiveness. Acute Kidney Injury (AKI) evolves into Acute Tubular Necrosis (ATN) with oliguria and rising creatinine. Capillary leak and neutrophilic injury produce ARDS with refractory hypoxemia. Together, these changes culminate in Multiple Organ Dysfunction Syndrome (MODS), often irreversible by 24-25 hours.

In summary, shock is a dynamically evolving process where every second counts. By mapping out the various physiological responses, we understand how the body shifts from a compensating state to a collapsing state. Understanding this progression highlights why early recognition and intervention save lives, but delay allows one's physiology itself to become the enemy.



FINAL 25



- Nittya Modi, III/II M.B.B.S., Rural Medical College, Loni

The Emergency Department does not warm up–it blasts off, often without warning. Like a Grey's Anatomy episode, it begins calmly, and suddenly, everything is happening all at once. The routine noise of beeping monitors, rustling papers, and hurried footsteps keeps everyone in a state of constant anticipation. At any moment, the doors will swing open, and the entire room will spring into action for a single patient.

Here is what 25 minutes can look like in the ED:

00:00 minutes: A stretcher suddenly bursts in through the door, "Casualty mein accident ka case aaya hai – jaldi!" A 22-year-old is wheeled in, his face bearing the unmistakable post-trauma look.

01:00 minutes – Triage. The vitals are measured, and the nurse murmurs, "BP bohot low hai," as she attaches the leads. A red wristband is fastened, signifying the degree of urgency and seriousness. The ED in-charge's forehead begins to bead with sweat.

02:00 minutes: The trauma alert echoes overhead. The curtains around the patient close in on him.

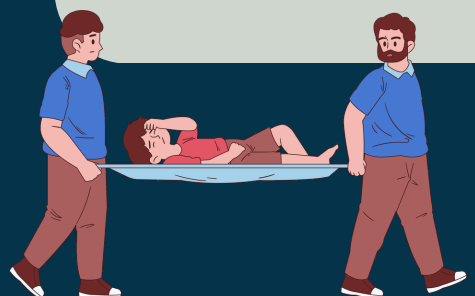
03:00 minutes: A primary survey is taken by the nurse, with little needing to be said. The doctor calls for oxygen and two large-bore cannulas.

05:00 minutes: Oxygen is administered, two 18Gs are inserted, and a blood sample is drawn. The patient is asked for a brief history. He answers in half-sentences – gasps laced with pain. What must he be thinking of right now?

07:00 minutes: As soon as the patient is hooked, the monitor alarms: a racing heart rate, a dropping SpO2. The beeps push everyone to move faster as a sense of urgency fills the room.

09:00 minutes: A quick bedside ultrasound is ordered. Free fluid is found in the Morrison's pouch. How ironic that nothing brings a physician more relief than a positive finding!

11:00 minutes: With a working diagnosis of internal bleeding, more aggressive attempts at stabilization begin. A norepinephrine infusion is prepared.



13:00 minutes: The doors swing open a second time, his time bringing in a crying mother and a father pretending to be calm. At the front desk, they ask a million questions, the answers to which no one has yet. They must be dealt with care, respect, and empathy.

15:00 minutes: Laboratory reports return, showing elevated lactate and low hematocrit levels, confirming that the patient needs to be operated on immediately.

17:00 minutes: The parents listen anxiously as the condition of their son is explained. They sign the consent form with trembling hands. The mother's hands join as if in prayer.

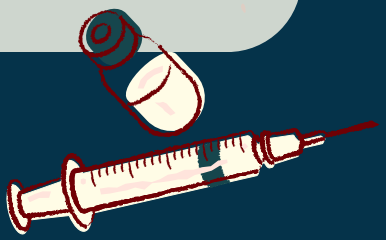
19:00 minutes: A rapid sequence of events unfolds like a well-choreographed dance. The mamas are paged; the OT is alerted. Fluids have been running throughout, and the nurse adjusts them without needing to be asked.

21:00 minutes: The surgeons arrive with a calm urgency – such a rare, but special quality! They perform a quick reassessment and state firmly, "Shift him to the OT immediately."

23:00 minutes: The bed, in all of its glory of attached oxygen, monitors, and IV lines, is rolled out of the casualty. The mother follows closely behind, with trembling hands, pleading to the surgeons and calling out to her son. Can he hear her?

At the 25-minute mark, the OT doors swing open, and the ED hands him over to the surgical team. The first battle ends, while the next one has just begun.

In textbooks, emergencies are read as algorithms. In the casualty, however, they are measured in mere minutes. These minutes test judgment, instinct, and teamwork. Twenty-five minutes in the casualty can feel like a blur, a lifetime, or both at once. These are the minutes that not only influence some digits on the monitor, but also rewrite lives.



THE ONES WHO BUILT IT



Dr. Riya Barar, M.B.B.S., D.G.O., and Dr. Damini Narkhede, M.B.B.S., Resident in the Department of Obstetrics and Gynaecology, co-founders of The Grey Matter.

In conversation with Shreya Iyer, III/II M.B.B.S., M.I.M.E.R. Medical College, Pune.

1. What was the driving force behind launching The Grey Matter?

Riya: Damini and I were neighbours in our first year, with rooms right next to each other in the hostel. We shared a love for books, reading, and discussing topics that weren't really covered in lectures or typical medical college conversations. Coming from different backgrounds across the state, we realized our batchmates had diverse perspectives, which led to really interesting discussions in the hostel. One day, I ran to her room and suggested starting a newsletter—featuring book reviews, interviews with interesting teachers, and ideas beyond clinical studies—to engage medical students on campus.

Damini: Both Riya and I had kind of observed that MIMER, at the time, didn't really have an activity like this, which we would see was very much present in other colleges or other institutes. We thought it could be a really nice initiative for students in my batch. Both of us loved the idea of having a newsletter that would be led by students, be for the students, by the students, and a space where people could put their work out there and be seen outside of their academic achievements. Both of us had thought of this and discussed it with each other, and it just happened that both of us were on the same page.

2. After graduating with your MBBS, what path did your professional journey take, and how did your early editorial experience influence it, if at all?

Riya: I did my internship at Cooper Hospital, following which I joined LTMMC for my residency in Obstetrics and Gynaecology. I am now doing my senior residency at Kurla Baba Hospital. My experience with The Grey Matter, and MIMER in particular, really shaped me. The newsletter allowed me to connect with professors 20-30 years into their respective fields. There were many times when we had to talk to the higher-ups to negotiate when the edition would come out, and how the money would come in for the paper and the website. These are the things that give you a sense of real life—if I want to do something and get it done, how am I going to do it? How is my idea going to play out? The journey of executing the idea was really special for all of us.

Damini: I am currently in my third year of residency in Obstetrics and Gynaecology at MGM Medical College, Kamothe. I don't see the editorial journey as having influenced my career, but I would say the whole idea of writing and noticing things and putting things into perspective is very central to my personal life. I still reflect and write about my experiences in the hospital, although it's not on as large a scale as a newsletter. In my opinion, the *creative keeda* kicks in once in a while. These are things that stay with you long after you have left the place. These experiences shape you in a way and positively influence your perspective.

3. What were some of the key challenges you faced while putting together the initial editions, and how did you navigate them?

Riya: Getting an edition out in time, along with the pressure of studies and other extracurriculars, sometimes made the process feel overwhelming. Initially, it was just Damini and me working on the first newsletter. Slowly, from the second one onwards, we put together a team. We didn't realise this at the time, but the faculty outside is not as approachable in the way they were at MIMER.

Prioritising is the most important thing when it comes to dealing with a lot on your plate. Studies need to be consistent, because if they are not, you're going to have a lot of pressure at the end, which I personally cannot deal with. It helped that the institute was very supportive. Dr. Thind sir, who was my guide and counsellor at the time, helped a lot with the workings of the newsletter.

Damini: Although our difficulties were not major hurdles, one of the most significant issues was that neither of us was tech-savvy or familiar with design. We chose basic software and learned by doing. In the early days, we had just one laptop. After classes, we took turns working—college work first, then the newsletter. Once, we typed an entire issue and accidentally deleted it, so we retyped it overnight. We weren't knowledgeable, but we were determined: if we couldn't work smart, we worked hard. Financing the first issue was difficult, but after it was well-received, professors stepped in to support us, which took a massive burden off our shoulders. Editorial challenges also arose in the form of great submissions that didn't fit the theme and were hard to reject. Criticism existed too, but that is inevitable. Twenty-five editions are proof that we have learned to focus on the work and ignore the noise.

We always had support from everyone around us. Dr. Suchitra Nagare ma'am, Dr. Sushma ma'am, Dr. Sandesh sir, and Dr. Phadke sir—everyone has been pivotal to the success of the newsletter.

4. Is there a particular moment, article, or idea from the early editions that stands out to you?

Riya: I really loved the interview with Dr. Wagh sir, who was the Head of Pharmacology at the time. He was very shy and kept saying, "Me? Why?" which made the experience even more endearing.

Of course, the interview with Dr. Zarir Udwadia was iconic. Doing a tuberculosis edition and getting the opportunity to interview someone with such a wide impact in the field was incredible. The Grey Matter was never meant to be limited to our own college; the idea was always to extend beyond it and understand what was happening outside. The tuberculosis edition, in particular, remains very memorable.

I also loved the Pride edition—it was colourful, vibrant, and truly stood out. Of course, the first edition will always be special. It was small and simple, about eight pages, with the cover featuring a photo of MIMER at sunset, something every student takes photos of when they're in the library.

Damini: Riya and my interview with Dr. Zarir Udwadia stands out to me. I remember how nervous we were when we went to Hinduja Hospital, knowing how busy he was and how valuable his time is. Much senior to us, he had a wider worldview and an incredible depth of knowledge, which was deeply inspiring. We both walked out of that interview feeling motivated. This was before COVID, and I remember him anticipating the impact of such a wave, almost sensing how significant it would be. I clearly recall how Riya and I walked in like little girls, wondering what we could offer someone of his stature. Riya brought a plant, which we gave him. He had thoughtfully taken time out for us, welcoming us into his beautiful office filled with books and posters. He spoke about a weekly journal club with his DNB students on topics beyond respiratory medicine, an idea I found truly phenomenal.

5. Looking at the newsletter today as readers rather than editors, what impresses you most about how it has grown or adapted over time?

Riya: Honestly, I'm happiest about the fact that the newsletter still exists today. It is wonderful to see so many students enthusiastically participating and carrying forward the work of the newsletter.



Damini: I saw that the last edition was about sleep. I am really surprised by how each edition keeps getting more creative. One would think that it would get harder to come up with new ideas, but every edition seems to top the previous one. Even the social media presence of the newsletter has been going strong, which was something we initially struggled with. However, as time went on, younger people took over managing the Instagram page, and it naturally started looking much better than what we could have done back then. We started the newsletter with just the two of us, and then found brilliant and genuinely interested people who were excellent at what they did. That spirit has continued, and it is clear that the current team is doing a fantastic job.

6. What advice would you offer to future editors, contributors, and readers as the newsletter moves beyond its 25th edition?

Riya: I am paraphrasing what we always said: sharing ideas and words is always powerful. Having access to a newsletter and a platform to express one's thoughts is incredibly valuable. To anyone involved in this newsletter in any way—whether as a contributor or part of the team—please know how precious it is and how deeply we love it. I hope people use it to gain exposure, share their perspectives, and reflect on their learnings from life and from others. Sharing these ideas within the medical community is important because we need more of this exchange. We need stronger bonds beyond trauma bonding - connections built through intellectual debates and ideas that go beyond textbooks. I truly believe the newsletter offers this platform, and I hope it continues to do so.

Damini: My advice would be something I have always believed in: medicine is not just about academics. Often, the system makes it seem like it is, and it is easy to get bogged down by that. Academics matter, but medicine is also intuition, curiosity, kindness, persistence, and all the other amazing adjectives you can think of. It is important to find your own space in it rather than trying to mimic someone else.



You can have people you admire, and it is important to let their work fuel your own - but remember, no two paths are ever the same.

For anyone who wants to write for the newsletter, I urge you to try and express yourself, no matter what you think of your own work. Our newsletter shares lived experiences, beliefs and recommendations. These have the power to touch lives and foster a sense of community-something so vital in medical school, which can often feel isolating or stressful. I have always believed in the Margaret Mead quote, which is still up on the newsletter's website: "Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has."

COMIC



-By Khyati Garg, III/II M.B.B.S., M.I.M.E.R. Medical College, Pune.

Pigment



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Mahi Patel, III/II M.B.B.S.
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Nupur Sonawane, III/I M.B.B.S.
M.I.M.E.R. Medical College, Pune.



Nidhi Patil, III/I M.B.B.S.
M.I.M.E.R. Medical College, Pune.

SCIENCE IN MOTION

25 Years of medical breakthroughs, curated by the editorial team.

Over time, science and medicine have advanced at an unprecedented pace, transforming seemingly impossible ideas into life-changing realities. From groundbreaking surgeries and vaccines to gene therapies and artificial intelligence, each era has redefined how we understand, treat, and prevent disease. The following milestones trace this remarkable journey of innovation, decade by decade.

Breakthroughs in the past 25 years

2000-2005:

1) The Human Genome Project (2000)

In June 2000, scientists released the first draft of the human genome, marking a turning point in biology, calling it the Human Genome Project or HGP. For the first time, researchers had a map of nearly all human genes, revealing the blueprint behind inherited diseases, various cancer pathways, and drug responses. This milestone launched modern genomics, accelerated genetic testing, and laid the foundation for personalised medicine. It remains one of the defining achievements of biomedical science.

2) mRNA Vaccine Platform (1999-2001)

Between 1999 and 2001, Karikó and Weissman found a way to modify synthetic mRNA so that the body wouldn't treat it as foreign or react with inflammation. Their discovery showed that cells could be instructed to make a harmless viral protein, triggering immunity without using live viruses. This simple but powerful idea became the foundation of today's fast, adaptable mRNA vaccines, such as the Pfizer COVID-19 vaccine, which we all know of.



3) Blood Stem Cells (2004)

Led by Stuart Orkin, scientists at Boston Children's Hospital identified TAF1 as the first regulatory molecule that halts blood stem cell proliferation while preserving self-renewal, function, and integrity. This discovery clarifies long-term blood production and holds promise for treating blood cancers and disorders by sustaining functional blood cell generation over time.

4) World's first partial face transplant (2005)

In November 2005, Bernard Devauchelle and Jean-Michel Dubernard led the world's first partial face transplant. Since then, over 35 procedures have advanced medical innovation. Although it has raised ethical and clinical challenges, face transplantation represents a significant step forward in restorative medicine and continues to shape future surgical possibilities.

5) Imatinib and the Dawn of Targeted Cancer Therapy (2001)

In 2001, Imatinib proved that cancer could be treated by precisely targeting a specific molecular abnormality—in this case, the BCR-ABL fusion protein driving chronic myeloid leukaemias CML. Its unprecedented response rates transformed CML from a fatal disease into a highly manageable condition. Imatinib validated the entire concept of targeted therapy and opened the era of precision oncology, inspiring dozens of lifesaving molecular drugs.

2006-2010:

1) HPV Vaccine (2006)

The HPV vaccine was the first vaccine designed to prevent cancer rather than treat an infection. By targeting high-risk HPV strains (16 and 18), it drastically reduced cervical cancer rates. It also protects against genital warts and several other HPV-related cancers, transforming preventive oncology worldwide.

2) Deep Brain Stimulation Expansion (2007-2010)

DBS uses implanted electrodes to modulate specific brain circuits. Its expansion from 2007 brought effective treatment for Parkinson's, essential tremor, dystonia, severe OCD, and resistant depression. Adjustable and reversible, it revolutionized neuromodulation therapies and paved the way for advanced brain-pacemaker technologies.

3) National TB-HIV Collaborative Framework (2007)

The RNTCP and NACP jointly drafted the National TB-HIV framework in November 2007, with revisions in 2008 and 2009. It aimed to improve the coordinated screening and treatment of TB and HIV, and strengthen multisectoral capacity towards eliminating TB in India by 2025.

4) HIV 'Berlin Patient' Cure (2008)

Timothy Ray Brown became the first person cured of HIV after a bone marrow transplant from a donor with the CCR5-Δ32 mutation. The virus became undetectable without medication. This case proved HIV is curable and inspired gene-editing approaches aimed at replicating this mutation for broader therapy.

5) First Synthetic Cell (2010)

Scientists at the Craig Venter Institute created the first cell controlled entirely by a synthetic genome. They built a bacterial genome chemically and transplanted it into another cell, which then replicated normally. This landmark achievement launched synthetic biology, enabling engineered organisms for medicine, energy, and biotechnology.



2011-2015:

1) New targeted therapies for melanoma (BRAF inhibitors) (2011)

Melanomas arise from melanin-producing pigment cells of the skin. BRAF inhibitors are newer drugs that specifically block mutated BRAF proteins driving melanoma growth. They selectively target cancer cells while sparing normal cells, making treatment more effective and less toxic than traditional chemotherapy, leading to fewer side effects.

2) First successful bionic eye clinical trials (2013)

Bionic vision uses electronic implants to bypass damaged retinal cells and directly stimulate the visual pathway to restore vision. Trials showed that implanted retinal prostheses could restore partial vision in people with severe retinal degeneration, enabling light perception and basic shape recognition. This milestone continues to inspire brain-machine interface research for vision restoration.

3) India eradicates Polio (2014)

India was officially declared polio-free by the World Health Organization on March 27, 2014. This marked a major success for India's vaccination programs like Pulse Polio and the Universal Immunization Program. Today, poliovirus is endemic only in Afghanistan and Pakistan.

4) Successful hand and upper-limb transplants (2015)

Hand and upper-limb transplants showed that complex limb transplantation is feasible, restoring both functional movement and sensation. These surgeries improved the quality of life for the amputees as they were able to perform their daily tasks. In addition, these transplants boost psychological well-being and social confidence, helping recipients regain independence and a sense of normalcy.

5) Creation of 3D-printed bones, tissues, and organs

3D Bioprinting prints biomedical structures using viable cells, biological molecules, and biomaterials. It enables precise replication of structures specific to a patient's anatomy, improving overall surgical planning. It also addresses the global organ shortage by providing an alternative to (limited) donor organs with long waitlists, reducing donor dependence and immune rejection risk.

2016-2020:

1) Molecular mechanisms of the circadian rhythm (2017)

Hall, Rosbash, and Young were awarded the Nobel Prize for discovering the molecular mechanisms governing circadian rhythms. They identified the PER protein, which accumulates in cells during the day, while TIM proteins reduce PER levels at night, forming a negative feedback loop. This forms the basis of the continuously oscillating nature of a biological clock.

2) First CARs to cross the finish line (2017)

In 2017, the FDA approved CD19-directed CAR-T cells for the treatment of relapsed and refractory acute lymphoblastic leukemia in children and young adults, making it the world's first approved gene therapy. Concurrently, it also approved tocilizumab, an anti-IL-6 receptor, to manage cytokine release syndrome, a potentially life-threatening side effect of CAR-T therapy.

3) Using aspirin in MDR-TB (2019)

Tuberculosis causes thrombocytosis and harmful platelet activation during granuloma formation. Research found that blocking platelet activation lowers bacterial load, identifying infection-induced platelet activation as a host-directed therapy target in tuberculosis. It was demonstrated that aspirin, through its antiplatelet action, may provide a new, safe, and inexpensive way to help patients.

4) Dual action of Romosozumab (2019)

It is a monoclonal antibody targeting sclerostin. It boosts osteoblast activity and also reduces bone resorption, thus having a dual action. It is indicated in postmenopausal women at very high risk of fracture, not at high cardiovascular risk. It was approved by the FDA in 2019 and introduced in Indian markets in 2024.

5) First Medication for Transthyretin Amyloid Cardiomyopathy (2019)

Historically, ATTR-CM management was only symptomatic. Tafamidis is the first medication approved for the treatment of ATTR-CM and the only medication that showed a reduction in all-cause mortality and cardiovascular-related hospitalizations in patients with amyloidosis. It significantly reduced mortality, lowered cardiovascular-related hospitalizations, and improved transthyretin stabilization with few adverse effects.

2021-2025:

1) AI-Driven Prediction of Treatment Response (2020-2021)

AI is transforming psychiatry by predicting which mental-health treatments will work best for individuals. By analyzing brain scans, genetics, and clinical data, AI reduces trial-and-error prescribing, speeds up recovery, and enables more personalized, effective, and hopeful mental-health care.

2) AlphaFold2: Cracking the Protein Code (2021):

Released in 2021, AlphaFold2 is an AI system that predicts protein structures with near-experimental accuracy. By solving complex biological problems in minutes, it is accelerating drug discovery, disease research, and biotechnology, marking a breakthrough in modern biology.

3) Multi-Cancer Early Detection (MCED) (2021):

Introduced in 2021, multi-cancer early detection tests use a single blood sample to identify dozens of cancers, often before symptoms appear. Early detection improves treatment success and survival, offering a promising future for cancer prevention and early intervention.

4) Brain-Computer Interfaces (2024)

Brain-computer interfaces allow users to communicate using only their thoughts. Since 2020, implants have enabled paralyzed patients to move robotic arms, send text, and produce speech. With Neuralink's first human implant in 2024, BCIs are rapidly advancing toward restoring movement and communication.

5) Successful treatment of Huntington's disease (2025)

In September 2025, a group of UK researchers reported a breakthrough gene therapy, AMT-130, that slowed Huntington's disease progression by up to 75% in early-stage clinical trials. Delivered via brain injection, the therapy is expected to be costly, but it offers new hope for families affected by the devastating disease.



DIALOGUE

This interview series features conversations between members of the editorial team and 25 doctors, offering insights from across the medical profession.

Q1: What is one core principle you think every medical student should carry throughout their career, regardless of specialty?

1) Dr. Swati Belsare
Professor, Department of Anatomy,
M.I.M.E.R. Medical College, Pune.

Communication, a fundamental skill to be nurtured, is essential for every clinician. A patient may not always be in agony, but is invariably worried about his or her ailment. Similarly, relatives are anxious for their loved ones. Listening attentively to the patient, explaining their condition, and clearly outlining the line of treatment are vital. Careful listening and keen observation greatly aid diagnosis. Verbal communication depends on the right words and tone, while non-verbal communication relies on body language and eye contact. A clinician must be an excellent communicator; half the battle is won with good communication, as caring for a patient extends beyond prescribing drugs or performing surgery.

2) Dr Ankur Ahuja
Professor, Department of Pathology and Haematopathology,
Armed Forces Medical College, Pune.

One core principle every medical student should carry throughout their career is an unwavering commitment to patient-centered care, placing the health, dignity, and unique needs of each patient above all else. Patient-centered care means seeing each patient as a whole person, practicing empathy, active listening, cultural sensitivity, and shared decision making. This approach builds trust and improves outcomes. It also supports lifelong learning as patients' needs evolve. Practically, it involves listening fully to concerns, respecting autonomy, and reflecting on personal biases while updating practice with patient-relevant evidence. This principle consistently shapes ethical, thoughtful, and effective medical practice.

3) Dr. Janice Jaison
Professor, Department of Pathology,
M.I.M.E.R. Medical College, Pune.

Every medical student, regardless of the specialty they pursue, should carry a lifelong commitment to ethical, patient-centred care.

Ethics in medicine means consistently acting with honesty, integrity, and accountability while respecting patient autonomy, dignity, and confidentiality. It requires placing the patients' well-being above personal convenience, bias, or external pressures. As medical knowledge evolves, upholding ethical values ensures that decisions remain compassionate, evidence-based, and just. This principle forms the foundation of trustworthy medical practice and guides clinicians to serve humanity with professionalism and empathy throughout their careers.

4) Dr. Madhu Bansode
Professor and Head, Department of Medicine,
M.I.M.E.R. Medical College, Pune.

Throughout their medical career, a student must include a deep passion for learning and a strong curiosity to understand the "how" and "why" behind every scientific fact and remedy. Equally important is maintaining strict discipline in daily routines, study habits, and overall lifestyle. Above all, a student must nurture genuine empathy for others, especially for patients who are ill or in need. These qualities guide and strengthen a student throughout their journey.

5) Dr. Gauri Yadav
Assistant Professor, Department of Microbiology,
M.I.M.E.R. Medical College, Pune.

Integrity and empathy have profound importance in our profession. Integrity means acting honestly, ethically, and according to moral principles when providing healthcare. It forms the foundation of patient trust and supports collaboration that leads to quality care. It also requires the courage to question and reflect on what is truly best for the patient. Empathy—the ability to understand a patient's experience without over-identifying with them—is an essential communication skill. It helps patients feel safe and express their concerns freely. When we pause, reflect, and act in the best interests of those we serve, we strengthen our core values.

Q2: Among all professions, what, according to you, makes medicine uniquely special?

1) Col. Vikas Ambiya
Vitreoretinal surgeon and Professor, Department of Ophthalmology,
Armed Forces Medical College, Pune.
I chose the medical profession because I wanted a career that would continuously challenge me and allow me to make a significant difference. Vitreoretinal surgery, with its precision and high stakes, fuels my drive to excel. Restoring vision is one of the most powerful outcomes in medicine, and striving to achieve that for my patients keeps me ambitious and focused. This field demands my best, and that is exactly what inspires me.

2) Dr. Biswajit Das
Chief Medical Officer, Non-Functional Selection Grade (NFSG)
Health & Family Welfare Department, Delhi Govt.
The medical profession is most unique, because in no other profession can you touch the lives of people the way a doctor does. Irrespective of the level of medical qualification, if you can heal just one person, reduce the pain of one sufferer, or bring a smile to the face of just one child, the satisfaction it gives you is worth much more than what you get from materialistic accomplishments. Doctors are profoundly selfless individuals who would stand firmly by a patient's side even as an earthquake shakes the OT, while others think only of fleeing—and would even donate their own blood if the situation demanded it.

3) Dr. Vaishali Dhat
Professor and Head, Department of Biochemistry,
M.I.M.E.R. Medical College, Pune.
Medicine stands apart from all other professions because it touches the very essence of human life. It combines rigorous scientific understanding with empathy, allowing practitioners to not only diagnose and treat illness but also guide and support people during their most vulnerable moments. The field also demands continuous learning, evolving with discoveries and technologies, ensuring that every day brings fresh challenges and opportunities to grow. Above all, medicine offers the chance to make a real difference by easing suffering, promoting health, and improving the quality of life for individuals and communities.

4) Dr. Smita Bhide
Professor and Head, Department of Pathology,
M.I.M.E.R. Medical College, Pune.
Medicine is a profession where knowledge alone is not enough. Empathy, trust, and ethical responsibility are equally essential. The dual role of scientist and healer, and the privilege of offering both treatment and hope to the patients, is a great source of inspiration for me. For me, medicine represents the highest form of responsibility and the deepest expression of care. Medicine is the only profession where science, ethics, and compassion must coexist seamlessly.
As Hippocrates once said, "Wherever the art of medicine is loved, there is also a love of humanity."

5) Dr. Ojus Wadhwa
Assistant Professor, Department of Surgery
M.I.M.E.R. Medical College, Pune.
Medicine is special because it stands at the intersection of human empathy and advancing technology. A doctor must deeply connect with patients while continuously updating their medical knowledge and skills. It is a profession that cannot rely on past learning alone. Empathy is central, more important than intelligence, because healing requires understanding, feeling, and human connection, alongside technical and scientific competence.

Q3: What is one lesson you learned through practicing medicine that could not be taught in textbooks?

1) Dr. Prashant Nigwekar
Professor, Department of Paediatrics,
RMC, Loni.
Textbooks don't really prepare you for the chaos you will witness in practice. In the hospital, you have to handle multiple patients along with their anxious relatives, while running on a tight schedule. Learning to think clearly and make decisions in all that noise and confusion is something you only pick up on the job and over time. I am still learning myself!

2) Dr. Urmilla Murtadak
Paediatrician and Neonatologist,
Associate Professor, Department of Paediatrics, RMC, Loni.
I would like all amateur doctors to know that documentation and communication are equally critical as the treatment. Early in my career, I admitted a hypertensive patient overnight. Perhaps his comorbidity wasn't clearly highlighted during the handover. By morning, it was overlooked, and care was delayed. Textbooks focus on diagnosis and management, but in practice, clear notes, proper handovers, and explaining plans to the nursing staff and relatives can prevent more problems than a single drug. When you are in a busy hospital setup, small communication gaps can lead to big errors. Learn to communicate in a timely and clear manner.

3) Dr. Sankalp Kurundwade
Senior Resident, Department of Surgery, RMC Loni.
Practice has taught me that patients rarely ever follow textbook words and timelines. Diseases are unpredictable. Looking for textbook words in your patients' history will only cause you confusion and even inaccuracies. Furthermore, complications do not announce their arrival. You must learn to reassess constantly and to stay alert even when things seem stable. Textbooks will teach you patterns, but practice will teach you vigilance and flexibility in your thoughts, and also give you the confidence and expertise to be accurate in your cases.

4) Dr. Roshni
Senior resident, Department of Obstetrics and Gynaecology, RMC Loni.
Practicing at a busy hospital such as ours has taught me that decision-making matters more than perfect technique. Textbooks will give you the ideal steps in the proper sequence, but in real-time surgical practice, one often has limited time and resources, and not the most ideal conditions. Knowing when to modify a treatment plan, when not to operate, or when to call for help is something you learn only in the OT. Experience teaches judgment, whereas textbooks only provide helpful guides.

5) Dr. Shivam Shet
Senior Resident, Department of Surgery, RMC Loni.
Textbooks give you time to think; exams give you time to think. The hospital often does not. All emergencies are situations where decisions are to be made in seconds, not after reading guidelines and referring to your algorithms and flow charts. There is no pause button when a patient is crashing, and everyone is looking at you. You have to learn to assess quickly and act decisively. That ability to think fast and stay practical comes only from real clinical experience.

Q4: What is an aspect of working as a doctor, which you wish was discussed more?

1) Dr. (Col) Bidhan Roy
Professor and Senior advisor
Armed Forces Medical Services.
It is difficult to decide one aspect, but I believe putting efforts towards skill and innovation during our journey of medicine is important. Need-based mentoring is essential. Practical application in disaster management, including humanitarian assistance and disaster relief (HADR) and combat medicine can be a force multiplier during crisis management. Establishing more scientific clubs that conduct research with honest data from our hospitals would strengthen medical services. Understanding systems like hospital administration is necessary to improve quality of services. Finally, effective leadership and communication skills boost clarity and enable better care, while engagement in social work broadens our vision.

2) Dr. Vishal Kini, DNB Medicine, FCPS (Med).
People do not realize how much of a doctor's job involves providing emotional support. Sometimes healing involves simply listening. You grieve the patients you lose, worry about the ones you send home, and still have to gather the strength to be fully present for the next person who needs you.

3) Dr. Vishnu Mantri
Former Associate Professor, Department of Medicine, Index Medical College, Indore.
Doctors need to learn in depth about the legal aspects and the professional liabilities of being a medical practitioner. Examples include the PCPNDT Act, Consumer Protection Act, Environment Act, etc. In today's environment, it is a challenge for practicing doctors to deal with the legal formalities. Understanding human nature and maintaining strong interpersonal relationships are crucial components of skillful patient care.

4) Dr. Hemlata Mantri
Former Assistant Professor, Department of Ophthalmology
Index Medical College, Indore.
The medical profession values practical skill over theoretical knowledge. The current trend among students is to focus on theory; however, it is crucial that we do not forget the importance of developing clinical skills, which not only form the basis of our practice but also help us understand the subject and realize our interests regarding specialization earlier.

5. Dr. Prateek Mittal, MD, Radiology

After MBBS, most doctors tend to view patients only from the perspective of their field of specialization. While a detailed view is important, it is also essential that doctors keep in mind the holistic approach of medical treatment. Symptoms often occur due to an underlying condition, which might not be the area of one's specialization. However, during the process of deriving history and examination, we must make sure to consider the patient as a whole, and not have a bias towards a specific topic or diagnosis.

Q5: What barrier in the healthcare system do you think most limits quality care today, and what changes could address it?

1) Dr. Vaishali Korde
Professor and Head, Department of Obstetrics and Gynaecology, M.I.M.E.R. Medical College, Pune.

The healthcare system of India is still patient-centric, but it is going into the hands of corporates and investors, where it is viewed as a business model, and profit has become the ultimate goal. From smaller individual nursing homes, we have drifted to large, state-of-the-art hospital premises, and though facilities have improved, the human touch is getting lost. The trust, which was once a concrete faith in the treating physician, is missing. A balance between patient satisfaction and professional satisfaction of doctors is essential, along with standardised protocols and changes for more uniform, accessible care.

2) Dr. Santhosh Kumar Rajmani
Professor, Department of Otorhinolaryngology, M.I.M.E.R. Medical College, Pune.

I believe that the lack of timely, relevant, accurate, and complete health-care information is the most hidden barrier limiting quality care in India. The absence of robust statistics weakens planning, resource allocation, and outcome monitoring across a vast geography and a highly diverse population. Strengthening national health information systems, enforcing mandatory disease reporting, using artificial intelligence (AI), integrating digital health records, expanding real-time surveillance platforms, and improving data governance can remedy this gap. Investing in AI-based analytic capacity and transparent public information systems will further enable evidence-driven policy and pave the way for equitable healthcare delivery.

3) Dr. Anandita Gupta
Associate Professor, Department of Otorhinolaryngology, Armed Forces Medical College, Pune.

Delivery of quality healthcare is limited by the non-availability of doctors at the peripheral grassroots level, a lack of paramedical staff, and inadequate infrastructure. Many MBBS graduates are unwilling to serve in remote areas. Mandatory one to two years of rural or field service after internship should be ensured with strict monitoring and accountability. In the armed forces, doctors provide care even in the most remote areas through a well-monitored system of evacuation and enroute care. So, unless we can deliver basic health care to our rural population, we can never achieve "Health for all." An Indian Medical Graduate remains an important pillar in achieving this goal.

4) Dr. Shahaji Gaikwad
Professor and Head, Department of Paediatrics, M.I.M.E.R. Medical College, Pune.

Every patient should be attended to with good communication, counselling, and careful listening to their complaints, as this leads to patient satisfaction. Patients should be informed about the pros and cons and consequences of the disease. Although most patients visit the private sector, the government sector carries a major responsibility in providing care and must be strengthened to improve healthcare delivery. Medical education under CBME has become more exam-oriented with reduced time for teaching and dissection, affecting the quality of training. Strengthening government healthcare and improving curriculum quality are essential for better patient care.

5) Dr. Sanjeev Chincholikar
Professor and Head, Department of Community Medicine, M.I.M.E.R. Medical College, Pune.

An effective and impactful healthcare system can lead India to greater heights, but several barriers limit its effectiveness, including less commitment among the new generation of doctors, confusion in NMC guidelines, inadequate infrastructure and supervision, corruption, long rural distances, lack of transport, and the high cost of private health services. Solutions include discipline and strict time schedules for health professionals, frequent supervision of medical colleges and hospitals, heavy punishment for corruption, increased use of telecommunication in rural areas, wider insurance coverage, prompt ambulance use, and effective strengthening of primary health care and community medicine initiatives.



CODE 25

-By Khyati Garg, III/II M.B.B.S., M.I.M.E.R. Medical College, Pune.

The emergency department is like a warzone, with organised chaos and a sense of urgency. Here is a comprehensive list of 25 things everyone should keep in mind while dealing with common medical emergencies.

1. Re-learn the alphabet: ABCDE
A- Airway
B- Breathing
C- Circulation
D- Disability (CNS evaluation)
E- Exposure

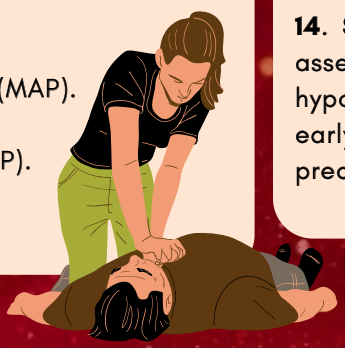
2. How to identify a patient with a life-threatening condition?
a. A chief complaint and focused history
b. A complete and accurate set of vital signs
c. A rapid, focused physical examination

3. Police the Cardiac arrest:
Remember the AHA recommended the basic life-support sequence for all adult patients experiencing cardiac arrest - CAB: Compression, Airway, Breathing.

4. An airway problem kills faster than anything else: Assess rapidly, and approach every airway with a clear plan in place for initial intervention as well as a complete set of back-up plans should your initial attempt be unsuccessful.

5. What a Shock: Characterized by widespread inadequate oxygenation and supply of nutrients to tissues, resulting in dysfunction, the primary resuscitation goals are to optimize oxygenation and ventilation, improve hemodynamic support, and treat the underlying cause.

6. Key points of management of intracranial haemorrhage:
i. Reverse any anticoagulants.
ii. Administer antiepileptic drugs.
iii. Control mean arterial pressure (MAP).
iv. Position the head of the bed.
v. Control intracranial pressure (ICP).



7. Thromboembolism: Use a clinical decision rule (e.g., Wells criteria) to help stratify a patient's pre-testprobability of disease when interpreting diagnostic test results as evaluation for VTE in the ED.

8. Most predictive features of cardiac ischaemia are: pain radiating to the arm, pain associated with vomiting and diaphoresis, and pain worsening with exertion. Note that chest pain is not universal, patient may have dyspnoea.

9. In patients with severe sepsis, initiate early fluid resuscitation and antibiotic or other therapy. Consider norepinephrine as the first-line vasopressor for treatment of sepsis
with hypotension refractory to the initial fluid bolus.

10. Lightning: Secure the scene; rescuers should not become victims. Traditional triage rules do not apply to lightning victims; remember to reverse triage and concentrate on victims who appear to be in cardiopulmonary arrest.

11. Drowning: Prehospital treatment is critical and directed at correcting underlying hypoxia. A normal chest radiograph does not rule out pulmonary injury.

12. Frostbite: Rapid, complete thawing by immersion in circulating water at 40°C–41°C is ideal. Reestablishment of perfusion is intensely painful, and parenteral narcotics are needed in severe cases. Premature termination of thawing increases tissue loss.

13. A woman does not have to be pregnant to have preeclampsia or eclampsia. Some cases occur in the postpartum period, the most common presenting symptoms include headache, shortness of breath, blurry vision, nausea or vomiting, oedema, or epigastric pain.

14. Serum lactate is commonly used as a marker to assess the extent of systemic hypoperfusion and tissue hypoxia. An elevated serum lactate concentration is an early marker of systemic hypoperfusion and often precedes overt changes in a patient's vital signs.

15. Delaying administration of antibiotics until the lumbar puncture (LP) is done in meningitis can be fatal. If there is a clinical suspicion of bacterial meningitis, antibiotics should be administered promptly.

16. Cricothyrotomy: The cricothyroid membrane is too small for an open cricothyrotomy in children under 10 years old; needle cricothyrotomy is recommended for infants and children after failed endotracheal intubation, failed supraglottic airway placement, and ineffective bag-valve mask ventilation.

17. Cardiovascular collapse may occur during intubation in patients who are elderly, hypotensive, or haemorrhaging. Consider lower dose induction agents, ketamine instead of opioids or etomidate, blood before intubation (when safe), and push-dose peri-intubation pressors.

18. Burns: Alkali burns are more dangerous than acid burns, quickly penetrating ocular tissues through liquefactive necrosis.

19. It is difficult to predict which burn patients will develop laryngeal oedema and airway obstruction. Concerning history includes an enclosed space burn.

20. To transport amputated body parts:
- Remove gross contamination with saline irrigation.
- Wrap the part in a saline-moistened sterile gauze.
- Place the wrapped part into a sealed plastic bag or container and into an ice water bath.
- Never put the amputated part directly onto ice or immerse it in disinfection solution.

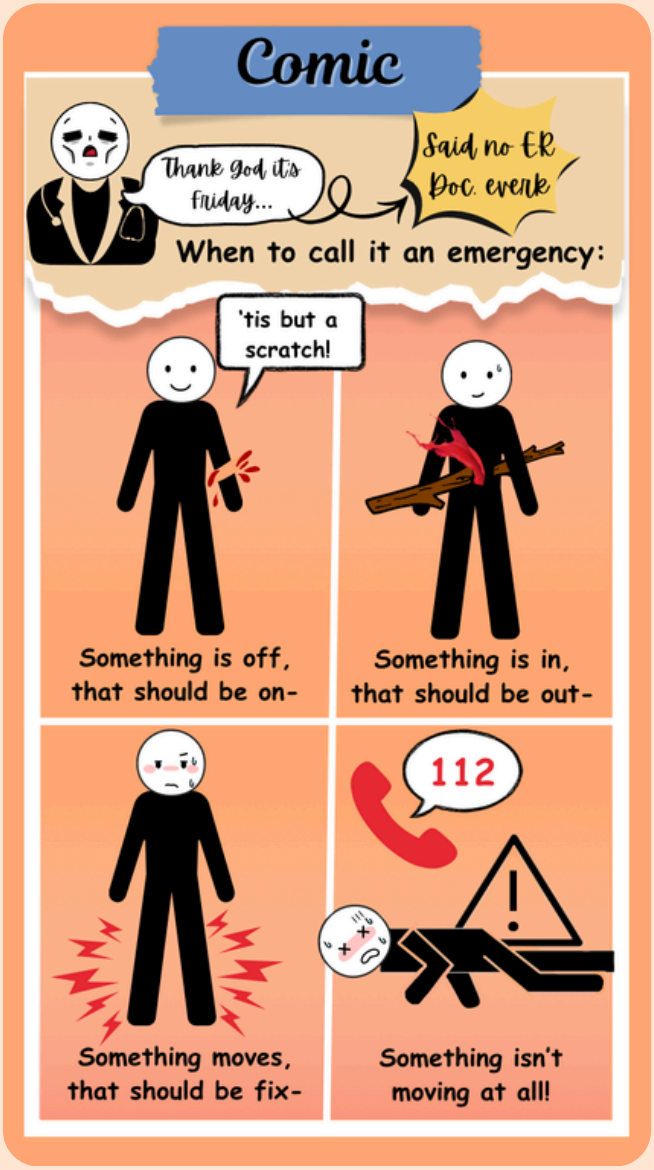
21. When a patient has both a radiation exposure and associated major trauma or medical issues, care for life-threatening trauma or medical problems first.

22. Drug therapy for **acute pulmonary oedema** is aimed at decreasing preload. Nitrates are first-line drugs and are useful as sublingual or an IV NTG drip.

23. Platelet transfusion should be delayed in thrombocytopenic purpura (ITP and TTP) to avoid disease-specific complications and alloimmunization. It is more commonly indicated for primary bone marrow problems.

24. In pregnant patients with abdominal trauma, any viable foetus requires continuous electronic foetal monitoring (EFM), even for patients without external evidence of trauma, because these patients are at risk of placental abruption.

25. Neurogenic shock occurs after cervical or high thoracic injuries cause impairment of sympathetic stimulation to the heart and peripheral vasculature. Signs include flushing, warm extremities, hypotension, and bradycardia. Treat with volume resuscitation and peripheral vasoconstrictors, such as dopamine or norepinephrine.



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BREACH

25 Moments of ethical dilemmas in the medical field, compiled by the editorial team.

Medicine is often portrayed as a steady march toward progress, yet its history is marked by moments where ambition and ideology eclipsed ethics. These cases - ranging from blatant human rights violations to systemic failures - reveal how easily harm can be justified in the name of advancement. An unethical practice of science leads to horrors beyond our comprehension. Exploring these grey areas in medicine is not about condemnation alone, but about reinforcing the ethical foundations necessary for medical experiments to better safeguard humanity moving forward.

1) Unit 731, Japan:
History witnessed war turn medicine evil when Japanese doctors conducted inhumane experiments in wartime China. With the primary objective of creating biological weapons, they conducted "experiments", including intentionally infecting individuals, vivisections, testing of bombs on humans, exposing humans to extreme temperatures and pressure, and much worse. Sheldon Harris, author of Factories of Death, stated, "They just killed people with no inherent purpose other than to see how they reacted to being killed."

2) Nazi Medical Atrocities:
During World War II, Nazi doctors conducted brutal medical experiments on prisoners in concentration camps without any consent. Victims were exposed to freezing temperatures, infections, toxic substances, and surgical procedures without anaesthesia. These atrocities led to immense human suffering and death, but also directly influenced the creation of the Nuremberg Code, which established voluntary informed consent and ethical limits as the foundation of modern human experimentation.

3) Tuskegee Syphilis Study:
The Tuskegee Study (1932-1972) was an unethical experiment in which African American men with syphilis were purposefully left untreated to observe the natural progression of the disease, despite penicillin being the standard cure. Researchers deliberately withheld treatment. Participants were misled and denied informed consent, leading to unnecessary suffering, deaths, and transmission to family members, permanently damaging trust in medical research.

4) J. Marion Sims:
Well known for developing the Sims speculum and the treatment of vesicovaginal fistula, Dr. Sims gained success by performing surgeries on black slaves, presumably without consent. He denied them anaesthesia, despite its prevalence in the medical field at the time, based on the racist belief that black women don't experience pain. The women were stripped naked and placed in a vulnerable position for hours. He focused only on his research, showing no concern for their well-being.

5) Holmesburg prison experiments by Dr. Kligman:
Dr. Kligman was a renowned dermatologist for his work on tretinoin as a treatment for acne. However, his success was built on the backs of the inmates of Holmesburg prison, Philadelphia. The participants were used for testing chemicals that were applied or fed to them, without informing them of their ill effects. Products like talc and perfume were tested, in addition to experimental vaccines for Herpes and Candida, and also dioxin, a component of Agent Orange.

6) The Fernald School Study:
Between 1946 and 1953, Quaker Oats supported research at the Fernald School, feeding oatmeal containing radioactive tracers to institutionalized children with disabilities to study nutrient metabolism. Consent forms omitted key risks, and participants experienced deception and exploitation. Although long-term physical harm appears limited, the study violated fundamental ethical principles, strengthening the need for proper review boards. In 1997, former participants settled lawsuits against Quaker Oats and MIT for approximately $1.85 million.

7) Stanford prison experiment:
Led by Philip Zimbardo, the Stanford Prison Experiment (1971) examined how perceived power affects behaviour. 24 male students were randomly assigned as "guards" or "prisoners" in a simulated prison. Guards became abusive, and prisoners showed severe stress, forcing the study to end after just six days instead of the planned fourteen. While it highlighted the influence of social roles and situations, it was highly criticized and faced ethical issues and possible experimental manipulation.

8) Project MKUltra:
A U.S. CIA research program, Project MKUltra (1953-1973), examined behaviour modification and interrogation methods, including nonconsensual drug administration (notably LSD), hypnosis, sensory deprivation, isolation, and electroshock. Human subjects included prisoners and patients, many suffering lasting psychological harm and at least one confirmed death. The program highlighted severe violations of consent, patient welfare, and research oversight.

9) The Cutter Incident:
In 1955, hope turned to horror during the Cutter Incident. As parents lined up to protect their children from polio, a manufacturing failure left vaccines containing live viruses. Thousands were infected, some paralyzed, and lives were lost. This tragedy shattered blind faith in medical progress but forged a lasting legacy—strict vaccine oversight, rigorous quality control, and safer immunization practices worldwide.

10) The Thalidomide tragedy:
The thalidomide tragedy of the late 1950s and early 1960s stands as a dark chapter in medical history. Marketed as a safe drug for morning sickness, thalidomide caused severe birth defects in thousands of babies worldwide. The disaster exposed flaws in drug testing and regulation, ultimately leading to stricter safety trials, pharmacovigilance systems, and ethical standards in modern medicine.

11) Diethylstilbesterol (DES) prescription tragedy:
Prescribed with confidence, DES (diethylstilbesterol) was once hailed as a miracle drug to protect pregnancies. Instead, it became a silent time bomb. Decades later, daughters exposed to DES in the womb developed rare cancers, infertility, and reproductive defects, while sons faced hidden health risks. This delayed tragedy revealed how unseen drug effects can echo across generations, permanently changing how medicines are tested and prescribed during pregnancy.

12) Creutzfeldt-Jakob disease from contaminated growth hormone:
In France, around the 1980s, children treated with human growth hormone extracted from deceased donors developed Creutzfeldt-Jakob disease due to contaminated pituitary glands. The treatments were life-improving, but donors were not screened for prion disease, and recipients were not fully informed of the risk. This case highlights the ethical tension between therapeutic benefit and potential harm, and the need for informed consent and biologics oversight.

13) The Jesse Gelsinger gene therapy case:
In 1999, Jesse Gelsinger, an 18-year-old with a mild metabolic disorder, volunteered for an experimental gene therapy trial designed for patient benefit. Tragically, the therapy triggered a massive immune reaction, leading to his death within days. Investigations revealed inadequate risk disclosure and conflicts of interest. Jesse's death became a wake-up call, reshaping clinical trial ethics, emphasizing patient safety, informed consent, and the careful balance between medical innovation and human lives.

14) Wakefield MMR Fraud:
A research article with false medical information is detrimental to healthcare worldwide. An example is Dr. Wakefield, who, with 12 colleagues, published a case series suggesting that the MMR vaccine caused autism in children. It was later discovered that they committed fraud for monetary gain. They were found guilty of ethical violations and scientific misrepresentation, and their article was withdrawn. Their paper reduced the prevalence of vaccination and caused measles outbreaks in the UK and USA.

15) Vioxx Withdrawal:
Vioxx, a popular pain-relief drug, was widely prescribed before long-term studies revealed an increased risk of cardiovascular events. The delay in recognising and disclosing these risks raised concerns about transparency, post-marketing surveillance, and the influence of drug companies. It remains a major example of how incomplete safety data can lead to widespread harm.

16) Heparin Contamination Incident:
In 2008, a batch of heparin, a commonly used anticoagulant, was contaminated during overseas manufacturing. Hundreds of patients developed severe reactions. The event exposed weaknesses in global supply chains, quality control, and regulation of imported medical ingredients, highlighting a grey moment where globalization outpaced safety checks.

17) Hormone Replacement Therapy (HRT) controversy:
In the early 2000s, HRT was widely prescribed to post-menopausal women, promoted as a near-routine treatment for symptoms and even as protection against heart disease. This was until the 2002 Women's Health Initiative revealed increased risks of breast cancer, stroke, and cardiovascular disease. The findings abruptly reversed clinical practice, questioned pharmaceutical influence, and reinforced the importance of long-term evidence in preventive medicine.

18) X-ray Overuse Era:
In the early 20th century, during the rise of radiology, X-rays were heavily overused without understanding radiation risks. The overuse became so rampant that devices were even marketed for shoe-fitting and cosmetic purposes. Patients and healthcare workers developed burns, cancers, and blood disorders due to repeated exposure. This period highlighted how technological enthusiasm without safety knowledge can lead to widespread, unintended medical harm.

19) Overuse of Antibiotics and the Rise of Superbugs:
Antibiotics were once seen as wonder drugs, but are still overprescribed to date. This uncontrolled use has accelerated the evolution of antibiotic-resistant bacteria, creating "superbugs" that are now extremely difficult to treat. What began as a medical triumph turned into one of the greatest modern public health threats, showing how success without restraint can backfire over time.

20) Opioid Overprescription Crisis:
In the late 1990s-early 2000s, prescription opioids were promoted as safe and non-addictive, leading to widespread overprescription. Many patients became dependent, contributing to a global crisis. This grey moment exposed flaws in pain-management culture, pharmaceutical influence, and the urgent need for cautious, evidence-based prescribing.

21) The Dengvaxia Vaccine Controversy:
In 2017, Dengvaxia, a dengue vaccine, was introduced in certain countries before it was known that it could increase the risk of severe dengue in those not previously infected. Though developed with good intent, gaps in data interpretation and communication led to loss of public trust and ethical debates about vaccine rollout and informed consent.

22) Unauthorized Human Gene-Editing controversy:
In 2019, Chinese scientist He Jiankui was sentenced to three years in prison and fined for illegally using CRISPR-Cas9 to edit human embryos that resulted in live births, claiming to make the children HIV-resistant. The court found he forged ethical-review documents, violated medical and research regulations, and crossed fundamental ethical lines by performing unregulated germline genome editing on human subjects.

23) E-cigarettes marketed as "safer alternatives":
E-cigarettes were initially promoted as harmless smoking alternatives, even used as tools for smoking cessation. Later evidence linked them to lung injury and nicotine addiction, especially in our generation. The episode showed how incomplete evidence and aggressive marketing can create public-health risks before science catches up.

24) India's Cough Syrup Safety Crisis:
Recently this year, multiple child deaths in Madhya Pradesh and Rajasthan were linked to contaminated cough syrups, including Coldrif. Tests detected toxic diethylene glycol (DEG), which prompted bans and withdrawals. The incident exposed serious gaps in drug manufacturing quality and regulatory control, and post-marketing surveillance; this evoked a nationwide response.

25) The mislabelling of ORS:
After years of misleading high-sugar drinks marketed as "ORS," despite not meeting WHO standards, the Food Safety and Standards Authority of India (FSSAI) stepped in to restrict the label. The change followed sustained advocacy by Hyderabad paediatrician Dr. Sivaranjani Santosh, whose clear, widely shared public education reframed the issue from marketing ambiguity to patient safety—helping convert clinical concern into meaningful national regulatory reform.

The 25th Hour

By Nupur Sonawane and Arya Thakur, III/I M.B.B.S., M.I.M.E.R. Medical College, Pune

Every profession works within the 24 hours of a day—except medicine.
Doctors live in the 25th hour, the invisible hour carved out of exhaustion, borrowed from sleep, taken from their own bodies. It is the hour when the shift should have ended but doesn't; the hour that exists because a patient needs them to keep going. The world never sees this 25th hour, but it is where much of medicine truly happens.

The world sees doctors as calm, strong, and steady—but beneath the white coat lies a human being with an extraordinary capacity for both physical and emotional endurance.

Imagine standing for 10 hours straight in scrubs—tired, sweating, hungry—yet still anchored by the adrenaline of responsibility. Not because you are fearless, but because the person on the table depends entirely on your hands. In those moments, you become the thin, fragile bridge between life and death. Surgeons live this reality for decades, their bodies quietly absorbing the cost.

A recent study suggests that at least 15% of surgeons develop varicose veins from years of long, motionless standing. Orthopedic surgeons manipulate heavy instruments for hours; their backs and necks strained into awkward angles. Emergency physicians sprint through trauma bays, finishing shifts bruised, dehydrated, and emotionally wrung out. Radiologists stand before machines that emit ionizing radiation—tiny exposures that accumulate over years, increasing the risk of thyroid cancer, cataracts, and skin damage.

Doctors are exposed to new microorganisms every single day—tuberculosis, HIV, and multidrug-resistant bacteria. Their work takes them repeatedly into places most people instinctively avoid, and yet they step closer when someone needs them. But the physical strain is only one half of the burden.

There is a belief that doctors must remain detached—objective, analytical, unmoved. But how does one detach from the very thing that makes them human? How do you not feel anything when you witness a patient take their final breath? How do you not absorb the sound of a family breaking apart in the hallway? How do you remain untouched by incurable diseases, irreversible decline, or moments when medicine meets its limits?

These moments accumulate in a doctor's memory—the child they couldn't save, the patient whose hand they held at the end, the family whose world collapsed in seconds. They carry these stories quietly, stitched into the fabric of their everyday lives:
In the conversations that linger after the shift,
In the guilt of cases replayed in the mind,
In the emotional aftermath, no clock ever accounts for.

To survive, doctors learn the fragile balance between empathy and detachment. Walking that tightrope—caring deeply without collapsing—is one of the most demanding and invisible skills of the profession. In a world that expects resilience, many physicians accept these burdens silently, considering them "part of the job." They rarely ask for recognition. But they deserve to be seen—not only as healers, but as human beings who give their time, their sleep, and their hearts every single day in the service of others.

FROM THE DESK OF THE EXECUTIVE DIRECTOR



It is indeed a proud and delightful moment to witness "The Grey Matter" - the quarterly newsletter for medical students, reaching the milestone of its 25th issue. Conceived as the brainchild of Dr. Damini Narkhede and Dr. Riya Barar, the newsletter has steadily grown over the years, with successive batches of students enthusiastically carrying forward the vision and spirit with which it was initiated. The batch "Insurgents" played a significant role in encouraging and supporting this platform—created by the students, for the students—to express their creativity and share their journeys. The Grey Matter has evolved into a vibrant platform that reflects the creativity, curiosity, and diverse perspectives of our students. With engaging theme-based issues, insightful interviews with experts in their respective fields, features on non-teaching staff, contributions from students within and outside the institute, thepopular segments like Shutterbug (Photography) and Pigment (Artistic Talent), the newsletter continues to enrich the academic and cultural life of the campus.The eagerness with which students look forward to each issue speaks volumes about its relevance and impact. Onthe occasion of the 25th issue, I extend my heartiest congratulations to the entire Grey Matter team—past and present—for their dedication and enthusiasm in sustaining this wonderful initiative. I wish the newsletter continued success in inspiring creativity, dialogue, and expression among students in the years to come.

Dr. Suchitra Nagare, Executive Director
& Joint Managing Trustee, MAEER'S MIT
Group of Institution, Pune, India.

FROM THE DESK OF THE EXECUTIVE DIRECTOR



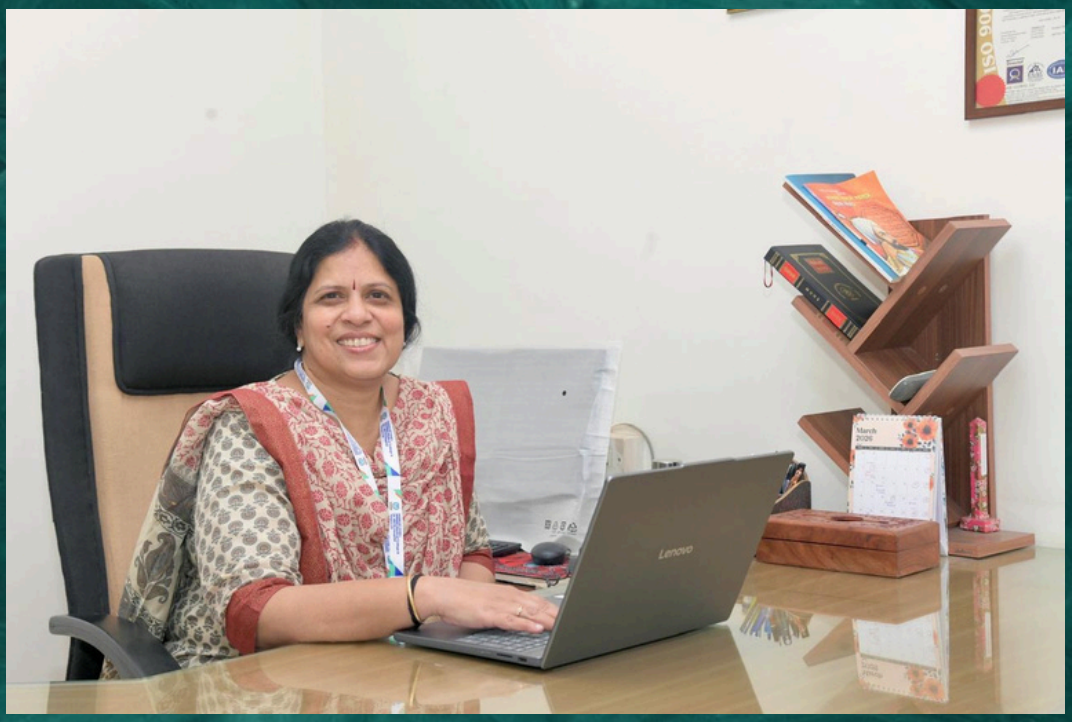
The publication of the 25th issue of The Grey Matter, the quarterly newsletter for medical students, is a noteworthy achievement that reflects consistency, creativity, and the collective efforts of successive batches of students.

Over time, the newsletter has established itself as an engaging medium for sharing ideas, perspectives, and experiences. It brings together a range of thoughtful content, including thematic explorations, meaningful conversations with professionals, and contributions that highlight the many facets of campus life. In doing so, it continues to foster a culture of expression and intellectual curiosity among students.

The strength of The Grey Matter lies in its continuity—each batch contributing with enthusiasm and carrying forward a legacy of initiative and teamwork. It serves not only as a record of student voices but also as a platform that encourages reflection, dialogue, and creativity. I extend my sincere congratulations to all members of The Grey Matter team—past and present for their dedication in sustaining this initiative. I wish the publication continued success in inspiring students and enriching the academic environment in the years to come.

Dr. Virendra Ghaisas, Executive Director & Trustee, MAEER'S MIT Group of Institution, Pune, India.

FROM THE PRINCIPAL'S DESK



Heartiest Congratulations on achieving the significant milestone of publishing the 25th issue of "The Grey Matter"- Quarterly Newsletter for medical students across India! It is truly a proud moment for all of us at MIMER. "The Grey Matter" was conceptualised by Ms. Riya Barar and Ms. Damini Narkhede, our MBBS students from 2016 admission batch and was first published in the year 2017. The successive batch of MBBS students took inspiration from Riya & Damini and carried forward their effort and added more creativity and innovation to it. And with enthusiasm and initiative from them, and consequently the next batches, "The Grey matter" has evolved into a popular Quarterly Newsletter for medical students across India over the past 8 years. Behind this newsletter, there is a dedicated and hardworking group of students working in various capacities as editorial team, creative team and public relations team. The life of a medical student is among one of the most demanding educational paths with many challenges, including but not limited to the vast curriculum. This makes it all the more important to find time for extracurricular activities to aid the all-round development of students. Your passion and commitment inspire your juniors, just like Riya and Damini inspired theirs and so on, and I hope they will publish many more issues and take our quarterly newsletter to the next level. I extend my best wishes and wholehearted support for the continued success and a wider readership for "The Grey Matter."

Dr. Deepa Nair, Principal, MAEER MIT PUNE's MIMER Medical College & Dr. BSTR Hospital, Talegaon (D), Pune.

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NEWSLETTER BASED IN M.I.M.E.R. MEDICAL COLLEGE

OVER THE YEARS





