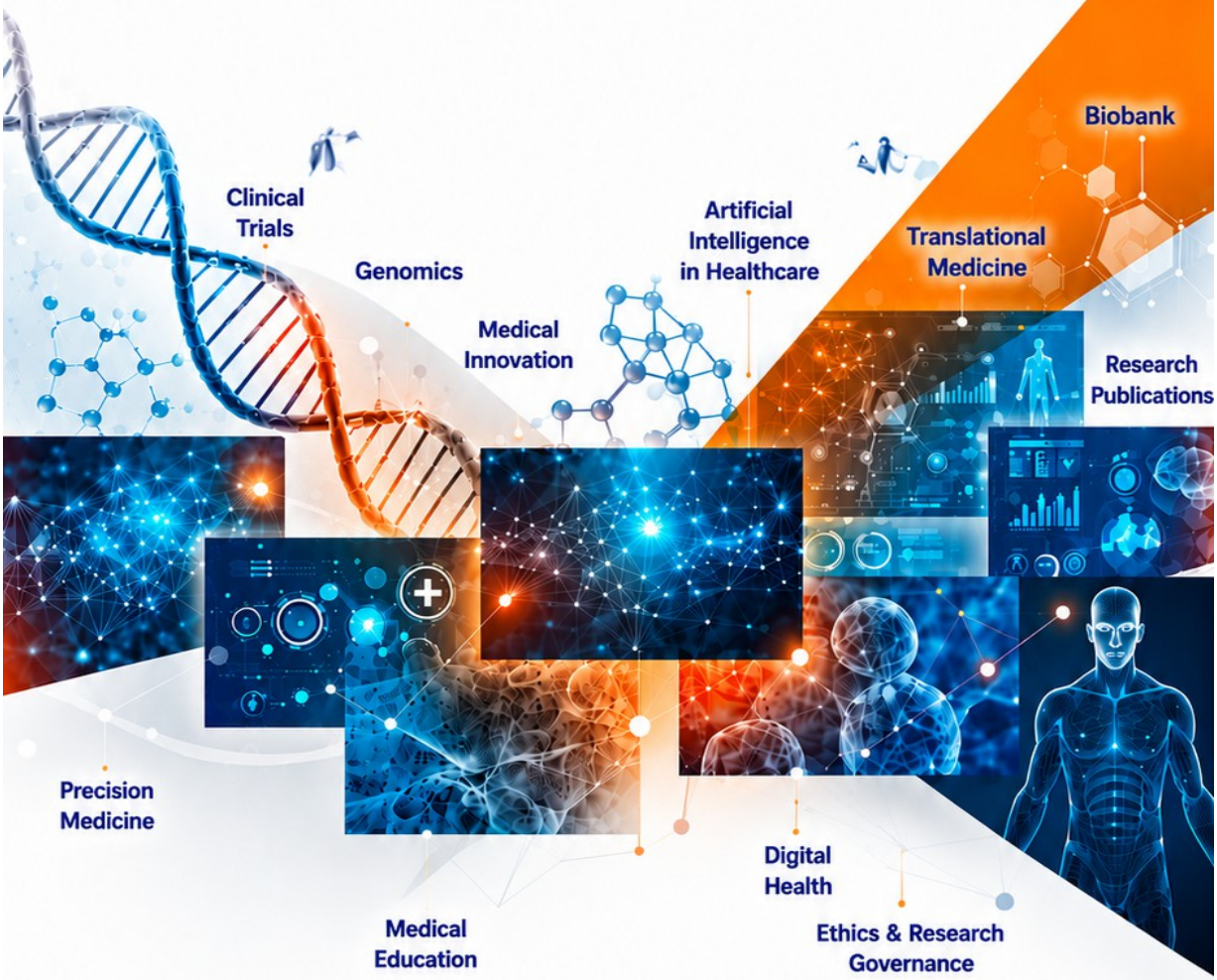
# Annual Reports

# 2023 -2026

# ANNUAL REPORT
# 2025–2026




## YAMER

YASHODA ACADEMY OF MEDICAL EDUCATION AND RESEARCH

HYDERABAD

*Annual Research Report, 2025-2026*

**Research achievements and structured study summaries**

**Yashoda Academy of Medical Education and Research (YAMER)**
Not-for-profit registered society

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**Message from the President, YAMER**



It gives me immense pleasure to present the **YAMER Annual Research Report 2025–2026**, reflecting the growing culture of scientific enquiry, collaboration and evidence-based healthcare across Yashoda Hospitals.

This year's portfolio of 27 medical and health-research publications includes eight flagship studies, eight priority studies and eleven valuable departmental and specialty contributions. Together, they address important challenges in genomics, neurology, cardiology, nephrology, pulmonology, gastroenterology, critical care, artificial intelligence, public health and other clinical disciplines.

The breadth and quality of this work demonstrate the commitment of our clinicians and researchers to generating evidence that improves diagnosis, treatment, patient safety and health-system performance. I congratulate all investigators, collaborators, research staff and participating institutions whose dedication made these achievements possible.

YAMER will continue to encourage ethical, relevant and high-quality research that contributes meaningfully to patient care and the advancement of medical science.

**Dr Gorukanti Surender Rao**
**President, YAMER**

**Message from the Vice President**



It gives me great pleasure to present the **YAMER Annual Research Report 2025–2026**, which reflects the continued growth of multidisciplinary and clinically relevant research across Yashoda Hospitals.

YAMER has consistently encouraged clinicians and researchers to transform questions arising from patient care into meaningful scientific enquiry. The research presented in this report spans diverse medical specialties and demonstrates our growing emphasis on **patient-centred, collaborative and evidence-generating research**.

Our endeavour is to further strengthen research infrastructure, promote investigator-initiated studies, expand collaborations and encourage young clinicians to actively participate in research and innovation.

I congratulate all investigators, research teams and collaborators for their contributions and look forward to YAMER continuing its journey towards **scientific excellence and research that improves patient care and benefits society**.

**Dr Gorukanti Ravinder Rao**
**Vice President**
**Yashoda Academy of Medical Education and Research (YAMER)**

**Message from the General Secretary, YAMER**



The **Annual Research Report 2025–2026** records an important year in YAMER's continuing development as a platform for multidisciplinary medical research, academic collaboration and institutional capacity building.

The studies presented in this report range from large national and international collaborations to randomised trials, multicentre cohorts, diagnostic studies, evidence syntheses, artificial-intelligence applications and focused departmental research. Their value lies not only in publication, but also in their potential to strengthen clinical protocols, screening pathways, quality systems and future research programmes.

YAMER remains committed to ensuring that research is conducted with scientific rigour, ethical responsibility, financial transparency and appropriate institutional oversight. We will continue to facilitate collaboration among clinicians, scientists, statisticians, research coordinators and external partners, while strengthening documentation, monitoring and research-quality systems.

I extend my sincere appreciation to every investigator and supporting team for contributing to this productive and diverse research portfolio.

**Dr Lingaiah Amidyala**
**General Secretary, YAMER**

**VISION:** To lead transformative medical and health research through scientific excellence, innovation, collaboration, and ethical leadership, creating lasting improvements in healthcare and society.

**MISSION:** To promote, facilitate, and strengthen high-quality medical and health research by fostering scientific excellence, ethical research practices, interdisciplinary collaboration, innovation, and capacity building. YAMER is committed to supporting the complete research ecosystem-from concept to translation-through robust governance, advanced infrastructure, education, partnerships, and community engagement, thereby generating evidence that improves clinical practice, healthcare delivery, and population health.

**Overall Research Highlights:** The 2025–2026 Research portfolio demonstrates four particularly strong themes: large-scale collaborative evidence generation, clinically relevant innovation, translation of research into practical diagnostic or treatment pathways, and research addressing Indian health-system priorities. The portfolio includes randomised trials, prospective and retrospective cohorts, multicentre studies, genomic research, evidence synthesis, AI validation, post-marketing surveillance and quality-improvement research.

**Area-wise Research Highlights:**

| Research Area | Major Research Highlights |
|---|---|
| 1. Neurology, Neurogenetics Movement Disorders & Stroke | • In a multinational study of 609 patients across 25 countries, gene-specific movement phenotypes and treatment-response patterns were studies that strengthened precision management of rare neurogenetic disorders in epilepsy.<br>• Integrated MRI and genomic testing in deficient myelination-achieved a 92% family-level molecular diagnostic yield; 14 disorders were identified and nine disease-causing variants were previously unreported.<br>• A rigorous phase 2 randomised trial in 513- Parkinson's patients showed that vodobatinib did not slow disease progression-an important negative result.<br>• Project PAIR-PSP established a national cohort of 1,035 patients with progressive supranuclear palsy, creating a platform for future natural-history and genetic studies.<br>• The GRASSROOT trial prospectively evaluated a lower-cost thrombectomy device for large-vessel-occlusion stroke in India. Demonstrated the potential for value-based indigenous/affordable technologies to expand access to mechanical thrombectomy in resource-constrained settings. |
| 2. Respiratory Medicine & Artificial | • A major multicentre study of 4,782 adults from 16 Indian sites established blood-eosinophil distributions in asthma, COPD and healthy individuals and supported the applicability of |

| Research Area | Major Research Highlights |
|---|---|
| Intelligence in pulmonology | internationally recommended eosinophil thresholds in Indian patients.<br>• The prospective CREATE study evaluated an AI-defined lung-nodule malignancy score in 712 participants. the study demonstrated the potential for AI-assisted chest radiography to triage incidental pulmonary nodules, particularly where CT capacity is constrained. |
| 3. Gastroenterology & Hepatology | • Faecal calprotectin differentiated ulcerative colitis from IBS, with approximately 93.3% sensitivity and specificity at the study threshold, supporting non-invasive triage and potentially reducing unnecessary endoscopy.<br>• A large multicentre post-marketing study of 431 patients from 46 centres supported topical nifedipine–lidocaine as an effective, well-tolerated conservative treatment for acute and chronic anal fissure.<br>• Multicentre research in patients with IBD receiving biologics/small-molecule therapies identified important gaps in latent-TB screening: only 59% underwent standard baseline screening and only 27.2% underwent annual screening beyond one year. Active TB developed in 4.49%, and most active cases had initially screened negative, demonstrating the need for continued surveillance in high-transmission settings. |
| 4. Nephrology, Renal Pathology & Transplantation | • Examination of tumour nephrectomy specimens found clinically relevant non-neoplastic renal disease in 29.7%, including diabetic nephropathy in 20.8%, supporting routine assessment of uninvolved renal parenchyma and targeted postoperative renal follow-up.<br>• Work on transplant glomerulitis emphasised that glomerulitis should not automatically be equated with antibody-mediated rejection and highlighted T-cell-mediated and other antibody-independent mechanisms.<br>• A major regional severe-AKI cohort included 2,315 critically ill patients across 24 hospitals; in-hospital mortality was 47%, and survivors remained at substantial risk of death, new CKD and CKD progression over two years. |
| 5. Oncology & Precision Biomarkers | Serial circulating tumour DNA (ctDNA) was investigated as an early marker of FOLFOX chemoresistance in colorectal cancer. Among 96 patients, 35.4% were chemoresistant; higher baseline ctDNA and persistent TP53 mutations were associated with resistance. A >20% fall in ctDNA by cycle 3 predicted treatment |

| Research Area | Major Research Highlights |
|---|---|
| | response, with AUC 0.84, supporting further development of minimally invasive treatment monitoring. |
| 6.Orthopaedics & Regenerative Medicine | A multicentre, double-blind, placebo-controlled phase 3 trial evaluated pooled allogeneic mesenchymal stromal cells in 146 patients with knee osteoarthritis over 24 months. Treatment produced significant improvement in WOMAC outcomes and evidence of cartilage preservation on MRI and biomarkers. The study provides promising evidence for a potential disease-modifying regenerative approach to osteoarthritis. |
| 7. Endocrinology, Diabetes & Metabolic Health | • Research on frozen shoulder in type 2 diabetes translated available evidence and expert input into a simple six-question screening tool for early case-finding in diabetes clinics; prospective validation is required.<br>• Among adult craniopharyngioma survivors, MASLD was present in approximately two-thirds, while central adiposity was common despite apparently normal BMI. The findings demonstrate the importance of assessing body composition, insulin resistance, liver health and pituitary function rather than relying on BMI alone. |
| 8.Maternal Health & Antimicrobial Resistance | Among 300 symptomatic pregnant women, urine cultures were positive in 38%; *E. coli* accounted for 52.6% of isolates. Multidrug resistance was present in 47.3%, while nitrofurantoin and fosfomycin retained useful activity. Supporting culture-guided treatment. |
| 9. Emergency Medicine, Quality & Patient Safety | The Health-QUEST programme adapted high-reliability practices from ISRO to emergency healthcare. Ten hospitals contributed data from 10,332 emergency visits. Real-time digital measurement and workflow redesign improved several time-based indicators, including triage, pain assessment, investigation review and disposition. Provides a potentially scalable Indian model for measurement-driven emergency-department care |
| 10. Public Health & Tuberculosis | A community-based study of 385 newly diagnosed pulmonary-TB patients found treatment non-adherence in 19.48%. Modifiable determinants included medication side effects, inadequate knowledge, smoking and socioeconomic factors. Findings support patient-centred counselling, adverse-effect management, social support and risk-based follow-up to improve treatment completion and limit transmission and resistance. |

**Flagship studies**

1. The PAIR-PSP Study is a major pan-India collaborative research initiative that mapped 1,035 Progressive Supranuclear Palsy (PSP) patients across 18 movement disorder centers, forming one of the largest systematically profiled national cohorts for this rare atypical parkinsonism brain disorder)
2. Epilepsy–dyskinesia syndromes: a 609-patient, 25-country study in Brain that links genotype, movement phenotype and treatment response and provides a foundation for precision management.
3. Mesenchymal stromal cells for knee osteoarthritis: a multicentre, double-blind, placebo-controlled phase 3 trial with 24-month clinical, MRI and biomarker outcomes.
4. GRASSROOT thrombectomy trial: prospective evaluation of a lower-cost stent retriever in an Indian low- and middle-income-country setting, with high reperfusion and clinically relevant access implications.
5. Blood eosinophils in asthma and COPD: 4,782 participants across 16 Indian sites, providing locally relevant evidence that international treatment thresholds are broadly applicable.
6. Evaluation of c-Abl inhibitor -Vodobatinib in early Parkinson's disease: a rigorous 513-participant phase 2 randomised trial. Its negative result is important because it prevents continued investment in an ineffective disease-modifying strategy.
7. Health-QUEST emergency-care programme: 10 hospitals and 10,332 visits, showing that ISRO-derived reliability practices and real-time digital measurement can improve emergency-department processes.
8. CREATE AI lung-nodule study: a prospective multicountry study of 712 participants demonstrating promising chest-X-ray triage performance, with high negative predictive value.
9. Severe AKI outcomes: 2,315 patients from 24 hospitals in India and Southeast Asia, documenting very high mortality and persistent two-year kidney risk and supporting structured follow-up after AKI.

**High-priority studies**

10. Deficient myelination: a 92% family-level molecular diagnostic yield, showing the value of integrating MRI phenotyping with singleton exome sequencing in resource-constrained settings.
11. Short DAPT after PCI: South Asian real-world evidence in high-bleeding-risk patients.
12. ctDNA and colorectal-cancer chemoresistance: a promising serial biomarker strategy useful for routine clinical adoption after external validation.
13. EBUS biopsy network meta-analysis: a rigorous synthesis of 15 prospective studies identifying EBUS-TBNA plus cryobiopsy as the highest-yield strategy when larger histological samples are required.
14. MASLD in craniopharyngioma survivors: clinically important because conventional BMI missed substantial central adiposity and liver risk in a rare endocrine population.
15. Cricoid versus paratracheal pressure: a randomised within-patient cross-over study providing direct evidence for a common airway-protection decision.

16. Latent-TB screening in IBD: multicentre evidence of major screening gaps and active TB despite negative baseline testing in a high-burden country.

**Other studies**

17. Spectrum of Medical Renal Pathological Findings in Tumor Nephrectomy Specimens: A Multicenter Study from India

18. Acute Pancreatitis beyond Gallstones and Alcohol

19. Transplant Glomerulitis: Paying Due Deference to T-cell Mediated Rejection and Antibody Independent Mechanisms

20. Impact of early initiation of PCSK9 monoclonal antibodies after acute coronary syndrome

21. Optimizing Post-operative Pain Management in Knee Arthroscopy: A Double-Blinded Randomized Controlled Trial of Regional Anesthesia with and without Local Infiltration

22. The Association Between Type 2 Diabetes Mellitus and Frozen Shoulder: Expert Insights on Developing a Screening Tool

23. Factors Influencing Non-adherence to Treatment Among New Patients With Tuberculosis in the Field Practice Area of a Tertiary Care Hospital in Hyderabad: A Cross-Sectional Study

24. Comparative Study of Fecal Calprotectin Levels in Ulcerative Colitis versus Irritable Bowel Syndrome

25. Antibiotic Resistance Patterns in Uropathogens Isolated from Pregnant Women: A Tertiary Hospital Study

26. Effectiveness and Safety of Lidocaine–Nifedipine Combination in Patients With Acute and Chronic Anal Fissure: A Retrospective, Multi-centric, Post-marketing Surveillance Study

## 1. Progressive Supranuclear Palsy in India: Insights from a Large Multicenter Clinical Cohort (Project PAIR-PSP)

**Objectives:** To characterise demographic, clinical, phenotypic and treatment-response patterns in a large, geographically diverse Indian cohort with progressive supranuclear palsy.

**Background:** Most large PSP cohorts come from Europe and North America. India's population size, ancestry diversity and heterogeneous clinical settings offer an important opportunity to broaden understanding of this rare tauopathy.

**Methodology:** Patients meeting Movement Disorder Society PSP criteria were prospectively recruited from specialist movement-disorder centres across India between 2021 and 2025. Standardised demographic and clinical data were collected and PSP phenotypes, disability milestones and symptomatic treatment responses were compared. The multicentre cohort used Movement Disorder Society diagnostic criteria and prospectively recruited patients from specialist centres across all major Indian regions. A common case-report form captured age at onset, sex, disease duration, presenting features, ocular-motor abnormalities, falls, cognitive and behavioural symptoms, speech and swallowing problems and motor disability. Patients were assigned to recognised PSP phenotypes, and clinically important milestones were compared across phenotypes to examine differences in progression.

**Results:** The cohort included 1,035 patients from all major Indian regions. PSP-Richardson syndrome was most frequent (41%), followed by PSP-parkinsonism (18%) and PSP-corticobasal syndrome (11%), with several rarer phenotypes represented. Falls occurred earliest in PSP-progressive gait freezing and PSP-speech/language phenotypes, while disability progressed more slowly in PSP-parkinsonism. Only 21% of levodopa-treated patients reported more than 25% subjective benefit; amantadine provided improvement in a subset. The 1,035-patient cohort had a median age of 65 years and represented southern, northern, western and eastern India. Richardson syndrome accounted for 41%, but the study also documented a broad range of parkinsonian, corticobasal, gait-freezing, frontal, ocular-motor, speech-language and cerebellar phenotypes. Time to falls and other disability milestones differed across subtypes: gait-freezing and speech-language presentations developed falls early, while PSP-parkinsonism progressed more slowly. The work establishes a large clinically characterised Indian **platform for future genetic and longitudinal research**.

**Conclusion:** The cohort demonstrates a high frequency of non-Richardson phenotypes, aggressive progression in selected subtypes, relatively better survival in PSP-parkinsonism and limited pharmacological benefit. Longitudinal and genetic follow-up is required.

**Key achievement:** Established the largest systematically profiled Indian PSP cohort and a national platform for future natural-history and genetics research.

**Highlights:** 1,035 participants provide unprecedented Indian representation in PSP research.

## 2. Molecular and clinical spectrum of epilepsy-dyskinesia syndromes: a cross-sectional study of 609 patients (25 country study)

**Objectives:** To define the molecular and clinical landscape of childhood-onset epilepsy-dyskinesia syndromes, including movement phenotypes, seizures, development, motor disability, **genotype–phenotype relationships** and treatment responses.

**Background:** A systematic multinational data linking genes, pathways, clinical trajectories and treatment effects have been limited in epilepsy-dyskinesia syndromes.

**Methodology:** A multicentre cross-sectional study included 609 patients with childhood-onset movement disorders and pathogenic variants in 105 predefined genes. More than 30 centres in 25 countries contributed standardised clinical data. Functional gene clustering integrated protein–protein interaction and biological data, while one-versus-remainder analyses assessed clinical and treatment-response enrichment. Participating paediatric neurologists and movement-disorder specialists abstracted anonymised data from medical records using a study-specific standardised survey. Eligibility required childhood-onset movement disorder and a confirmed pathogenic variant in one of 105 genes selected through expert consensus. Data covered movement phenomenology, epilepsy, age at symptom onset, development, mobility, disability, comorbidities and treatment response. Protein-protein interaction and functional data were integrated through unsupervised clustering to identify biologically related gene groups. One-versus-remainder enrichment analyses were then used to detect gene-specific and pathway-specific clinical and medication-response patterns.

**Results:** Variants were identified in 74 genes; 12 genes accounted for about two-thirds of cases, with MECP2, ATP1A3 and GNAO1 most frequent. Twelve functional gene clusters were defined. Dystonia (34.2%), stereotypies (24.6%) and ataxia (16.2%) were the most common predominant movement disorders, and mixed phenotypes were frequent. Epilepsy was diagnosed in 66.8%. Developmental and motor outcomes varied markedly by gene. Pathogenic variants were found in 74 genes, and the concentration of two-thirds of cases in 12 genes provided enough observations for comparative analyses. Movement disorders were documented in almost all patients, often as mixed combinations rather than isolated syndromes. Dystonia, stereotypies and ataxia were most frequent, while epilepsy was formally diagnosed in only 66.8%, showing that movement symptoms may dominate some conditions labelled as epilepsy-dyskinesia syndromes. Development, walking and disability varied markedly by genotype.

**Conclusion:** Epilepsy-dyskinesia syndromes show distinct gene- and pathway-specific clinical and therapeutic patterns. Early movement-disorder recognition and genetically informed treatment are essential.

**Key achievement:** Created a comprehensive multinational framework for precision phenotyping, and future interventional trials in rare neurogenetic disease.

**Highlights**

- 609 patients from more than 30 centres and 25 countries were analysed.
- The study links molecular pathways with clinically actionable movement-disorder and medication-response signatures.

### 3. Two-Year Efficacy and Safety Outcomes of Using Allogeneic, Pooled Mesenchymal Stromal Cells for Osteoarthritis of the Knee in a Double-Blind Randomised Placebo-Controlled Phase 3 Study

**Objectives:** To determine whether intra-articular allogeneic pooled bone-marrow-derived mesenchymal stromal cells are safe and can improve symptoms and slow structural progression in grade 2 or 3 knee osteoarthritis.

**Background:** Current osteoarthritis treatments largely relieve symptoms without reliably modifying cartilage degeneration. Mesenchymal stromal cells may provide anti-inflammatory and cartilage-protective effects.

**Methodology:** This was a phase 3, randomised, double-blind, multicentre, placebo-controlled trial in patients with radiographic grade 2 or 3 knee osteoarthritis. The trial was prospectively registered in CTRI. One hundred and forty-six patients were randomised 1:1. Seventy-three received a single intra-articular dose of 25 million cultured, pooled, allogeneic bone-marrow-derived mesenchymal stromal cells and 73 received placebo; both groups subsequently received 20 mg hyaluronic acid.
Participants were assessed at one week and at 1, 3, 6, 12, 18 and 24 months. The principal clinical endpoint was the WOMAC composite score, with pain, stiffness and physical-function subscores and visual analogue pain scores as additional outcomes. MRI T2 mapping and cartilage-volume measurements assessed cartilage quality and structure. Urinary C-terminal cross-linked telopeptide of type II collagen was used as a cartilage-degradation biomarker. Adverse events and progression to total knee replacement were recorded under blinded follow-up.

**Results:** At 24 months, 58 participants in the cell arm and 60 in the placebo arm completed follow-up. WOMAC composite and all WOMAC sub scores improved significantly more with mesenchymal stromal cells than with placebo ($P<0.0001$). MRI T2 mapping showed preservation of cartilage quality in the medial femorotibial compartment in the cell arm, while the placebo arm showed progressive worsening ($P<0.0001$). Cartilage volume in the treatment arm increased by approximately 34.07 $mm^3$ at 12 months and 49.81 $mm^3$ at 24 months. Urinary type-II-collagen degradation marker levels decreased in the cell group at days 90 and 730 but increased in the placebo group ($P<0.0001$), providing biochemical support for a chondroprotective effect. Five adverse events considered possibly treatment-related were local administration-site effects. By 24 months, total knee replacement had been performed in four placebo recipients and one cell-treated participant. The combined **clinical, MRI and biomarker findings** support sustained symptom modification with evidence of structural protection.

**Conclusion:** Allogeneic pooled mesenchymal stromal cells were reported to be safe and effective for grade 2 and 3 knee osteoarthritis over two years, with symptomatic improvement and evidence of cartilage protection**.**

**Key Achievements**: Demonstrated two-year clinical benefit in a phase 3 double-blind trial using a single injection of pooled allogeneic mesenchymal stromal cells. Combined patient-reported outcomes, quantitative MRI and a cartilage-degradation biomarker to support a potential disease-modifying effect.

**4. Mechanical Thrombectomy for Acute Ischaemic Stroke in a Low- and Middle-Income Country: Primary Outcomes from the GRASSROOT Trial:**

**Objectives:** To assess the safety and efficacy of the lower-cost Supernova stent retriever for large-vessel-occlusion acute ischaemic stroke in an Indian multicentre setting.

**Brief Background:** Mechanical thrombectomy is standard care for eligible large-vessel occlusion, but device cost and infrastructure constraints severely limit access in many low- and middle-income countries.

**Methodology:** GRASSROOT was a prospective, single-arm, multicentre Indian trial evaluating the Supernova stent retriever, a value-based device intended to improve access to mechanical thrombectomy in low- and middle-income countries. Thirty-two consecutive eligible patients had acute ischaemic stroke caused by internal carotid terminus, M1 or M2 middle cerebral artery, or basilar artery occlusion and presented within 24 hours of symptom onset. Thrombectomy was performed with the Supernova retriever. The primary efficacy endpoint was successful reperfusion, defined as modified Thrombolysis in Cerebral Infarction grade ≥2b. Primary safety endpoints were symptomatic intracranial haemorrhage within 24 hours and all-cause mortality at 90 days. Number of device passes, first-pass reperfusion, requirement for rescue therapy, device complications, National Institutes of Health Stroke Scale change and 90-day modified Rankin Scale were recorded. Functional independence was defined as an mRS score of 0-2.

**Results:** Participants had a mean age of 58 years, 31% were women, median baseline NIHSS was 14 and median ASPECTS was 8, representing a moderately severe large-vessel-occlusion stroke cohort. Successful reperfusion was achieved in 30 of 32 patients (93.8%) after one to three passes, with a median of one pass. First-pass recanalisation occurred in 22 patients (68.8%), and successfully treated patients did not require adjunctive rescue therapy. Symptomatic intracranial haemorrhage occurred in 3.1% and 90-day mortality was 9.4%. Sixteen patients (50%) achieved functional independence at 90 days. Median NIHSS improved from 14 at baseline to 7 at discharge and 4 at 90 days. No device-related complication or deficiency was reported. These early results support both the clinical performance and the access rationale of a lower-cost thrombectomy platform.

**Conclusion**

The Supernova stent retriever demonstrated strong early safety and efficacy in the Indian trial. A high first-pass reperfusion rate combined with value-based pricing could improve thrombectomy access in lower-resource settings.

**Key Achievements:** Achieved high reperfusion and first-pass success with low symptomatic haemorrhage and no reported device deficiency.

**Highlights:** 93.8% successful reperfusion, 68.8% first-pass recanalisation.

50% functional independence and 9.4% mortality at 90 days.

**5. Blood Eosinophil Counts in Healthy Volunteers and in Patients with Asthma and COPD in India: A Multicentre Cross-Sectional study:**

**Objectives**

To characterise blood eosinophil-count distributions in Indian adults with asthma, COPD and no respiratory disease and determine whether international biomarker thresholds are applicable in India.

**Brief Background:** Blood eosinophils guide corticosteroid treatment and prognosis in obstructive airway disease, but reference data have largely come from high-income countries. Geographic, parasitic, smoking and demographic differences raised uncertainty regarding applicability in India.

**Methodology:** This multicentre cross-sectional study recruited adults from 16 secondary-care clinics across urban and rural India. The study included clinically stable outpatients with physician-diagnosed asthma or COPD and healthy volunteers without chronic lung disease. Potential non-respiratory causes of eosinophilia, recent systemic corticosteroid use, major comorbidity and significant anaemia were excluded. All participants completed standard clinical questionnaires and underwent venepuncture for a full blood count. Demographics were recorded. Asthma and COPD participants underwent pre- and post-bronchodilator spirometry. Blood eosinophil counts were log-transformed and summarised as geometric means with CI. Distributions were compared between healthy volunteers, asthma and COPD, and explored in relation to sex, age, smoking, atopy, inhaled corticosteroid use and lung-function categories. And the data were compared with international data.

**Results:** 1,332 with asthma, 1,001 with COPD and 2,449 healthy volunteers. Overall, 55.7% were men, and most participants with obstructive lung disease were never-smokers or former smokers according to the relevant clinical group. Geometric mean eosinophil count was 173.9 cells/µL in asthma and 198.4 cells/µL in COPD, both higher than 144.7 cells/µL in healthy volunteers. The geometric mean for the complete study population was 162.7 cells/µL. Participants with atopy had higher counts than those without atopy (approximately 213 versus 158 cells/µL). Patients prescribed inhaled corticosteroids also had higher counts than those not prescribed them, probably reflecting treatment selection for more eosinophilic disease rather than a drug effect. The overall Indian distributions were similar to contemporary European datasets, challenging the assumption that background parasitic exposure produces substantially different population thresholds. Approximately one in five obstructive-lung-disease patients had counts above 300 cells/µL, a clinically important treatment and exacerbation-risk threshold.

**Conclusion:** Internationally recommended blood-eosinophil thresholds are broadly applicable to Indian patients with asthma and COPD and can be used to guide evidence-based treatment.

**Key Achievements:** Generated the largest contemporary multicentre comparison of eosinophil distributions among healthy Indian adults and patients with asthma or COPD. Supported the applicability of internationally recommended eosinophil thresholds to Indian obstructive-airway-disease management.

**Highlights:** 4,782 adults recruited at 16 sites. Indian distributions aligned closely with European reference data.

**6. Evaluation of c-Abl inhibitor vodobatinib in subjects with early Parkinson's disease: a phase 2, randomized, double-blind, placebo-controlled study**

**Objectives:** To determine whether vodobatinib, a brain-penetrant c-Abl inhibitor, could slow clinical progression in recently diagnosed Parkinson's disease.

**Background:** Preclinical studies suggested that c-Abl inhibition could reduce alpha-synuclein aggregation, protect dopaminergic neurons and improve motor function. These findings provided a rationale for evaluating vodobatinib as a potential disease-modifying therapy.

**Methodology:** The PROSEEK phase 2 trial randomised 513 participants with early Parkinson's disease and confirmatory DaT-SPECT imaging to vodobatinib 384 mg, vodobatinib 192 mg or placebo. The double-blind primary phase lasted 40 weeks, followed by an optional 36-week extension. The primary outcome was change in MDS-UPDRS Part III motor score; safety, withdrawal and biomarker outcomes were also assessed. Eligible participants had recently diagnosed Parkinson's disease, abnormal DaT-SPECT findings and no symptomatic treatment other than a stable monoamine oxidase-B inhibitor. Randomisation allocated participants to two oral vodobatinib doses or matching placebo under double blinding. Motor function was evaluated using the MDS-UPDRS Part III at baseline and during the 40-week core phase; participants could then enter a 36-week extension. Analyses also included treatment exposure, discontinuation, adverse events and serum neurofilament light chain as a marker of neuroaxonal injury. Dose-response patterns were examined to determine whether biological target engagement translated into slower clinical progression.

**Results:** The study recorded a high, dose-related rate of early withdrawal. Motor-score comparisons favoured placebo rather than either vodobatinib dose. Serum neurofilament light chain increased significantly in both active-treatment groups, providing additional evidence against neuroprotective efficacy. Neither vodobatinib dose slowed deterioration on the primary motor endpoint. Among participants completing the assessment, numerical comparisons favored placebo, and no consistent benefit emerged during the extension. Discontinuation occurred early and more frequently at the higher dose, reducing exposure and demonstrating a dose-related tolerability problem. Serum neurofilament light chain rose significantly in both active-treatment groups rather than showing the reduction expected from neuroprotection. Together, **the clinical**, retention and **biomarker findings** provided convergent evidence that the tested regimen was ineffective for disease modification in early Parkinson's disease.

**Conclusion:** Vodobatinib did not demonstrate clinical or biomarker evidence of disease modification in early Parkinson's disease, and tolerability limited continued treatment.

**Key achievement:** Delivered a large, rigorous negative phase 2 trial that prevents further reliance on an ineffective therapeutic strategy and informs future c-Abl-targeted drug development.

**Highlights:** 513 participants were enrolled in a multicentre placebo-controlled trial.

The findings underscore the importance of biomarker-supported go/no-go decisions in neurodegenerative drug development.

**7. Using space technology approach to improve quality in emergency departments in India: a quality improvement program:**

**Objectives:** To assess emergency-department performance using Health-QUEST indicators, evaluate adoption of ISRO-derived quality practices and determine their effect on time-based key performance indicators.

**Background:** Emergency departments are complex, time-critical environments in which process errors and delays can affect safety. Health-QUEST adapted quality, reliability and safety practices used by the ISRO for healthcare delivery.

**Methodology:** A multicentre pre-post quality-improvement design was used, with each hospital serving as its own control. Baseline performance was measured, teams were trained in Health-QUEST recommendations and indicators were reassessed after implementation. Real-time timestamps were captured through REDCap by scanning patient wristbands. Ten hospitals contributed complete pre- and post-intervention data for 10,332 emergency visits. Seventeen hospitals were initially invited, 14 completed pilot training and 10 supplied complete paired data. Seven time-based indicators were measured: door-to-triage, door-to-doctor, door-to-needle, door-to-pain assessment, door-to-investigation ordering, investigation-order-to-first-review and door-to-discharge or disposition. Wristband scanning through the REDCap mobile application generated real-time timestamps and reduced dependence on retrospective chart abstraction. Pre-intervention data from 5,296 visits were compared with post-intervention data from 5,036 visits within each hospital.

**Results:** Participating hospitals generally achieved rapid triage, and the intervention produced significant improvement in several measures, including triage time, time to pain assessment, time from investigation ordering to first review and discharge/disposition time. All participating departments maintained a median triage time below five minutes, and nine of ten had a baseline median disposition time of about two hours. After training and workflow redesign, statistically significant reductions were observed in several patient-flow intervals, particularly triage, pain assessment, review of ordered investigations and discharge or disposition. Improvement was not uniform for every indicator or every hospital, illustrating that local processes and baseline performance influenced the effect. Nonetheless, the programme demonstrated that a structured, measurement-driven safety model from a high-reliability sector could be adapted to diverse Indian emergency departments and monitored through low-cost digital timestamps.

**Conclusion:** The Health-QUEST programme was feasible and effective in improving multiple time-based emergency-care indicators across diverse Indian hospitals.

**Key achievement:** Demonstrated successful transfer of high-reliability practices from India's space programme to frontline emergency healthcare.

**Highlights:** Used real-time digital data capture across a multicentre hospital network.

- Provides a scalable Indian model for systematic emergency-department quality improvement.

## 8. Evaluation of an Artificial Intelligence Defined Lung Nodule Malignancy Score in Incidental Pulmonary Nodules: The CREATE Study

**Objectives:** To evaluate the ability of the artificial-intelligence-based qXR lung nodule malignancy score to classify incidental pulmonary nodules on chest radiographs as high or low risk.

**Background:** Lung cancer survival depends strongly on stage at diagnosis, but access to low-dose CT screening is limited in many settings. AI applied to widely available chest radiographs may help prioritise patients with incidental nodules for further evaluation.

**Methodology:** CREATE was a prospective observational study involving 712 adults aged 35 years or older with chest-radiograph nodules measuring 8–30 mm. Nodules were flagged by an FDA-cleared qXR detection algorithm and confirmed by radiologists. qXR malignancy risk was compared with radiologist assessment on low-dose CT, Lung-RADS categories and the Mayo Clinic model. Prespecified success thresholds were 20% positive predictive value and 70% negative predictive value. Participants were enrolled between April 2023 and December 2024 and were classified as high risk (498) or low risk (214) according to clinical criteria. After qXR identified a possible nodule on chest radiography, radiologists confirmed eligibility and low-dose CT was used for further risk assessment. The AI-generated lung nodule malignancy score was evaluated against radiologist judgement and against binarised Lung-RADS and Mayo Clinic risk categories. Positive and negative predictive values with 95% confidence intervals were calculated using the Wilson method.

**Results:** Against radiologist assessment on low-dose CT, qXR-LNMS achieved a positive predictive value of 54.2% and a negative predictive value of 93.5%, exceeding the prespecified thresholds. Agreement with the Mayo Clinic model was observed in 70.6% of participants, and performance was consistent across key clinical and demographic subgroups. The AI score comfortably exceeded both prespecified performance benchmarks. Its high negative predictive value indicates particular usefulness for identifying nodules unlikely to be malignant and potentially prioritising limited CT and specialist capacity. Positive predictive value was also substantially above the 20% success threshold, although it does not replace definitive CT-based or pathological evaluation. Agreement with the Mayo model was moderate rather than complete, suggesting that the AI score contributes information that is not identical to traditional clinical prediction. Similar point estimates across age, sex and risk subgroups were reassuring.

**Conclusion:** The AI score showed potential to distinguish benign from malignant incidental pulmonary nodules on chest radiographs and may support lung-cancer detection in resource-limited settings.

**Key achievement:** Provided prospective multicentre evidence that an AI-derived chest-X-ray risk score can serve as an effective triage tool for incidental pulmonary nodules.

**Highlights:** High negative predictive value may help reduce unnecessary escalation.

The approach uses existing radiography infrastructure and is relevant to settings with limited CT capacity.

## 9. Epidemiology and long-term outcomes of critically ill patients with severe AKI in India and Southeast Asia

### Objectives

- To quantify major adverse kidney events (MAKE) during the two years after severe acute kidney injury (AKI).
- To describe mortality, new chronic kidney disease (CKD), CKD progression and long-term dialysis after stage 3 AKI.
- To identify patient and illness characteristics independently associated with poor long-term outcomes.

**Background:** Severe AKI is common in critically ill patients and carries high mortality. Survivors remain at risk of dialysis dependence, CKD, CKD progression and death. This multicentre study assessed two-year kidney and survival outcomes after stage 3 AKI in India and Southeast Asia.

**Methodology:** This multicentre cohort study used the InSEA-RRT registry, which enrolled critically ill patients with KDIGO stage 3 AKI from 24 hospitals between April 2019 and December 2023. The primary outcome was two-year major adverse kidney events (MAKE), including persistent kidney dysfunction, long-term dialysis and death. Multivariable models identified predictors of adverse outcomes.

**Results:** A total of 2,315 patients were enrolled. In-hospital mortality was 47% (1,033 patients)**.** Among survivors, the two-year MAKE incidence was 46.6 per 100 person-years (95% CI 42.7–50.6), with mortality reported in **32%** during follow-up. New CKD occurred at 58.6 per 100 person-years (95% CI 51.0–67.0), while CKD progression among patients with pre-existing CKD was 35.4 per 100 person-years (95% CI 26.0–47.0). Independent predictors of two-year MAKE included older age, male sex, pre-existing CKD, malignancy, cardiac-associated AKI and failure to recover kidney function.

**Conclusion:** Stage 3 AKI was associated with high in-hospital mortality and substantial long-term risks of death and CKD. Survivors, particularly those with incomplete kidney recovery or pre-existing CKD, require structured long-term follow-up.

### Highlights of the results:

- 2,315 patients with stage 3 AKI were enrolled across 24 hospitals
- In-hospital mortality was 47% (1,033 patients).
- Two-year MAKE incidence was 46.6 per 100 person-years.
- New CKD and CKD progression remained frequent after survival of the acute episode. Non-recovery of kidney function was an independent warning sign for adverse long-term outcomes.

## 10. Neuroimaging to Genotype: Delineating the Spectrum of Disorders with Deficient Myelination in the Indian Population

**Objectives:** To define the clinical, neuroimaging and genetic spectrum of disorders associated with deficient central nervous system myelination in Indian patients and to assess the diagnostic value of targeted and broad genomic testing.

**Brief Background:** Permanent hypomyelination and delayed myelination are rare genetic disorders with overlapping clinical and MRI features. Molecular diagnosis is important but may be limited by access to family-based genomic testing.

**Methodology:** This clinicogenomic study included 25 affected individuals from 24 unrelated Indian families. Clinical features, family history and brain MRI findings were reviewed to define myelination patterns. Targeted genetic testing was used when a specific disorder was suspected; unresolved cases underwent mainly exome sequencing with copy-number analysis when needed. Variants were assessed for pathogenicity, inheritance and phenotype correlation. The study also evaluated the diagnostic value of singleton exome sequencing combined with detailed phenotyping in resource-limited settings.

**Results:** A molecular diagnosis was achieved in 22 of 24 families (92%). Targeted testing diagnosed 4/9 families, while broader genomic testing diagnosed 18/23. Fourteen monogenic disorders and 20 pathogenic variants were identified, including 9 novel variants. Singleton exome sequencing, combined with detailed clinical and MRI phenotyping, diagnosed 14/17 families, supporting its value where trio sequencing is unavailable. The findings also showed that deficient myelination can result from diverse genetic disorders.

**Conclusion:** Integration of characteristic neuroimaging patterns with genomic testing provides a high diagnostic yield in patients with deficient myelination. Singleton exome sequencing is particularly valuable where trio testing is not readily available.

**Key Achievements:** Achieved a 92% family-level molecular diagnostic yield through integration of neuroimaging and genomic testing. Expanded the Indian and global variant spectrum by documenting nine novel disease-causing variants and demonstrated a practical singleton-exome pathway for resource-limited settings.

**Highlights**

- 25 affected individuals from 24 unrelated families.
- 14 monogenic disorders and 20 pathogenic/likely pathogenic variants.
- Singleton exome sequencing was diagnostic in 14 of 17 families.

**11. Short Dual Antiplatelet Therapy after PCI with Resolute Onyx Drug-Eluting Stents in High-Bleeding-Risk Patients: One-Year Outcomes from a South Asian Cohort**

**Objectives:** To evaluate the one-year safety and effectiveness of three months of dual antiplatelet therapy followed by ticagrelor monotherapy in high-bleeding-risk patients receiving Resolute Onyx zotarolimus-eluting stents.

**Brief Background:** Patients at high bleeding risk are common in practice but underrepresented. New-generation drug-eluting stents may allow shorter dual antiplatelet therapy, but evidence from South Asian populations is limited.

**Methodology:** This retrospective single-centre study included 150 high-bleeding-risk patients undergoing PCI with Resolute Onyx stents. Patients received 3 months of aspirin plus ticagrelor, followed by 9 months of ticagrelor alone. Follow-up at 3 and 12 months assessed cardiac death, myocardial infarction, stent thrombosis, revascularisation, stroke and bleeding events. Multivariable analysis evaluated predictors of adverse outcomes.

**Results:** Mean age was 75.5 years, 42.3% were women, 33.5% had diabetes, 46.4% had previous revascularisation and 58.3% presented with acute coronary syndrome. Calcification was present in 60.8% of lesions and 88.2% were ACC/AHA B2 or C lesions. Patients met a mean of 1.9 high-bleeding-risk criteria, and 54.6% met at least two. Despite this risk profile, the primary composite endpoint occurred in 5.7%: cardiac death in 2.3% and myocardial infarction in 3.4%. Definite or probable stent thrombosis occurred in 0.3%, target-lesion failure in 3.0%, clinically driven revascularisation in 1.7% and stroke in 0.6%. BARC 1-3 bleeding occurred in 2.1%, and there were no BARC 3-5 major bleeding events. The observed safety-efficacy balance supports further prospective evaluation of early aspirin withdrawal in South Asian high-bleeding-risk populations.

**Conclusion:**

In carefully selected high-bleeding-risk patients, a three-month dual-antiplatelet strategy followed by ticagrelor monotherapy was associated with low ischaemic-event rates and no major bleeding at one year. Larger prospective studies are required.

**Key Achievements:** Provided locally relevant one-year evidence on a short-DAPT strategy in an elderly South Asian cohort with complex coronary lesions. Demonstrated low observed stent-related and bleeding-event rates after transition to ticagrelor monotherapy.

**Highlights**

- 150 high-bleeding-risk PCI patients.
- Primary cardiac death/MI endpoint: 5.7%.
- No BARC 3-5 major bleeding recorded.

## 12. Evaluation of Circulating Tumor DNA as a Biomarker for Chemoresistance in Colorectal Cancer

**Objectives:** To determine whether baseline and early changes in circulating tumour DNA and selected mutations can predict resistance to first-line FOLFOX chemotherapy in colorectal cancer.

**Brief Background:** Chemoresistance is a major barrier in colorectal cancer. Circulating tumour DNA offers a minimally invasive way to measure tumour burden and track molecular changes during therapy.

**Methodology:** This prospective observational study enrolled 96 patients with stage II-IV colorectal adenocarcinoma starting first-line FOLFOX chemotherapy. Plasma was collected before treatment and after cycles three and six. Circulating tumour DNA (ctDNA) concentration was measured at each time point, allowing both baseline tumour-burden assessment and evaluation of early molecular response. From the plasma samples cancer-related gene changes- ctDNA was analysed for KRAS, NRAS and TP53 mutations. Tumour response was independently assessed by imaging according to RECIST version 1.1, and patients were classified as responders or chemoresistant. Differences in ctDNA and mutation frequency were examined using analysis of variance and chi-square testing. Logistic regression evaluated predictors of treatment response, and receiver-operating-characteristic analysis assessed the discriminative value of early ctDNA reduction.

**Results:** Thirty-four of 96 patients (35.4%) were classified as chemoresistant. The mean age was 60.3 years and 58.3% were men. Baseline ctDNA was significantly higher in resistant patients than in responders: 38.7 ± 10.5 ng/mL versus 25.4 ± 9.3 ng/mL ($P<0.001$), suggesting that a greater circulating molecular tumour burden was associated with treatment failure. TP53 mutations were present in 58.8% of resistant patients compared with 27.9% of responders ($P=0.004$). Persistent mutation detection during treatment further supported ongoing resistant disease. A decline in ctDNA of more than 20% by cycle three was associated with treatment response (OR 4.12, 95% CI 1.76-9.67; $P=0.001$). The area under the ROC curve was 0.84, indicating good early discrimination of chemoresistance.

### Conclusion

High baseline circulating tumour DNA and persistent TP53 mutations were associated with chemoresistance, while an early decline in circulating tumour DNA predicted response.

**Key Achievements:** Demonstrated that serial ctDNA can provide an early molecular signal of FOLFOX response before completion of treatment. Linked elevated baseline ctDNA and TP53 mutation persistence with chemoresistance, supporting more individualised monitoring

### Highlights

- 96 patients with stage II-IV colorectal cancer. 35.4% demonstrated chemoresistance.
- Cycle-three ctDNA reduction predicted response with AUC 0.84.

## 13. Endobronchial ultrasound-guided mediastinal biopsies for the diagnosis of mediastinal diseases: A network meta-analysis

**Objectives:** To compare the diagnostic efficacy and safety of endobronchial ultrasound (EBUS)-guided mediastinal biopsy strategies and identify the most effective approach for mediastinal diseases.

**Background:** EBUS-guided transbronchial needle aspiration (EBUS-TBNA) is the established first-line technique for mediastinal sampling, but its small cytological specimens may be inadequate for lymphoma, uncommon tumours and benign diseases. Forceps biopsy and cryobiopsy can provide larger histological specimens, but their relative performance had not been clearly ranked.

**Methodology:** A network meta-analysis searched multiple databases up to 21 February 2025. Fifteen prospective studies involving 1,316 participants were included. Five strategies were compared: EBUS-TBNA, forceps biopsy, cryobiopsy, EBUS-TBNA plus forceps biopsy, and EBUS-TBNA plus cryobiopsy. Single-arm, pairwise and network meta-analytical methods were used to assess efficacy and safety. The review focused on prospective studies of patients undergoing EBUS-guided sampling for mediastinal lesions. Diagnostic efficacy was examined both for individual techniques and for combined sampling strategies, while safety was assessed from reported procedure-related adverse events. Direct comparisons were incorporated into pairwise analyses and then integrated through a network model so that techniques not compared within the same trial could also be ranked. Effect estimates were expressed as odds ratios with uncertainty intervals, and comparative ranking was used to identify the strategy most likely to provide the best diagnostic outcome.

**Results:** Combining EBUS-TBNA with either forceps biopsy or cryobiopsy improved diagnostic performance. EBUS-TBNA plus cryobiopsy ranked best and was significantly more effective than EBUS-TBNA alone, forceps biopsy alone, cryobiopsy alone and EBUS-TBNA plus forceps biopsy. All EBUS-based approaches showed favourable and broadly comparable safety profiles. The network estimates quantified the advantage of the leading strategy: EBUS-TBNA plus cryobiopsy outperformed EBUS-TBNA alone, forceps biopsy alone, cryobiopsy alone and EBUS-TBNA plus forceps biopsy. Concomitant needle aspiration enhanced both forceps and cryobiopsy, supporting complementary cytological and histological sampling. Importantly, the higher diagnostic yield was not accompanied by a clear safety penalty, as complication profiles were favourable across the included EBUS-based methods.

**Conclusion:** EBUS-TBNA remains the diagnostic cornerstone for mediastinal lesions, while the addition of cryobiopsy offers the highest diagnostic yield when larger histological samples are required.

**Key achievement:** The study identified EBUS-TBNA plus cryobiopsy as the most effective option.

**Highlights:** 15 prospective studies and 1,316 participants were synthesised.
Combined needle aspiration and cryobiopsy may be particularly valuable for non-lung-cancer mediastinal disease.

## 14. Prevalence of Metabolic Dysfunction-Associated Steatotic Liver Disease in Craniopharyngioma Patients Using Non-Invasive Investigations

**Objectives:** To estimate the prevalence of MASLD among adult craniopharyngioma survivors and identify associated metabolic and endocrine factors using non-invasive assessment.

**Background:** Craniopharyngioma survivors commonly develop hypothalamic obesity, pituitary hormone deficiencies and metabolic syndrome. These abnormalities may predispose to MASLD even when body mass index is not elevated, but Indian data are limited.

**Methodology:** A cross-sectional observational study evaluated 48 adult craniopharyngioma survivors at a tertiary centre. Assessment included anthropometry, waist–hip ratio, DXA body-fat measurement, liver ultrasonography, FibroScan provided controlled attenuation and liver-stiffness measurements, while FIB-4 was used as an additional non-invasive fibrosis index. Metabolic testing included glucose control, fasting lipids and HOMA-IR, and pituitary evaluation assessed growth hormone and other deficiencies common after craniopharyngioma treatment. Associations between MASLD and anthropometric, metabolic and hormonal factors were examined.

**Results:** MASLD was identified in 62.5% by ultrasonography and 66.7% by controlled attenuation parameter. Central adiposity was frequent despite mean BMI below 25 kg/m² in most participants: 72.9% had an elevated waist–hip ratio and 62.5% had body fat of at least 30%. MASLD was associated with insulin resistance, higher HbA1c, hypertriglyceridaemia, low HDL, growth-hormone deficiency and low IGF-1. Advanced fibrosis was detected in 6.3%. The two non-invasive steatosis methods produced closely similar prevalence estimates, strengthening confidence that MASLD was common in this endocrine population. Many survivors had normal or near-normal BMI while showing central fat accumulation and high total body-fat percentage. Insulin resistance, dysglycaemia, high triglycerides, low HDL, growth-hormone deficiency and lower IGF-1 were significantly linked to MASLD. FibroScan identified advanced fibrosis in 6.3%, demonstrating that the problem was not limited to simple steatosis. The results support routine hepatic and metabolic surveillance based on body composition and endocrine status rather than BMI alone.

**Conclusion:** MASLD and visceral adiposity are highly prevalent in adult craniopharyngioma survivors. Surveillance should extend beyond BMI and include metabolic, hepatic and endocrine evaluation.

**Key achievement:** Identified a substantial hidden burden of MASLD in a rare endocrine population and demonstrated the value of non-invasive multimodal screening.

**Highlights:** Central adiposity was common despite apparently normal BMI. The findings support optimisation of pituitary replacement and long-term liver-risk monitoring.

## 15. Cricoid versus paratracheal pressure as airway protective manoeuvres for oesophageal occlusion: A prospective randomised cross-over study

**Objectives:** To compare cricoid pressure and paratracheal pressure for oesophageal occlusion and glottic visualisation during rapid-sequence induction.

**Background:** Cricoid pressure is traditionally used to reduce pulmonary aspiration risk, but its effectiveness and impact on laryngoscopy remain debated. Paratracheal pressure has been proposed as an alternative.

**Methodology:** A prospective randomised cross-over study included 134 ASA I–II adult surgical patients. In a blinded three-anaesthesiologist protocol, video laryngoscopy and nasogastric-tube insertion were performed without pressure and with cricoid or paratracheal pressure in random sequence. Failure to advance the tube at least 15 cm indicated oesophageal occlusion. Percentage of Glottic Opening scores were recorded. Each patient served as his or her own control in the cross-over sequence. Following induction of anaesthesia, the laryngoscopist first attempted passage of a 16-Fr nasogastric tube without external pressure and then repeated the attempt under cricoid and paratracheal pressure in random order. One anaesthesiologist performed video laryngoscopy and tube insertion, a second applied the allocated manoeuvre and a third recorded outcomes, preserving procedural blinding. Oesophageal occlusion was defined pragmatically as inability to advance the tube 15 cm or more. Glottic view was quantified with the Percentage of Glottic Opening score before tracheal intubation and routine anaesthesia.

**Results:** Cricoid pressure achieved oesophageal occlusion in 95.52% compared with 81.34% for paratracheal pressure ($P<0.001$). Median POGO score was also higher with cricoid pressure (90 versus 70; $P<0.001$), indicating better glottic visualisation. Cricoid pressure prevented advancement of the nasogastric tube in 128 of 134 patients, compared with 109 of 134 under paratracheal pressure. The absolute difference of more than 14 percentage points was statistically significant. Cricoid pressure also produced a superior laryngoscopic view: median POGO was 90 versus 70, with non-overlapping confidence intervals. Thus, in this controlled setting, cricoid pressure performed better on both the protective and airway-visualisation outcomes. Paratracheal pressure still occluded the oesophagus in more than four-fifths of participants, supporting its role as an alternative when cricoid pressure is difficult, contraindicated or poorly applied.

**Conclusion:** Cricoid pressure was more effective for oesophageal occlusion and produced better laryngeal views. Paratracheal pressure remains a reasonable alternative when cricoid pressure cannot be used.

**Key achievement:** Generated direct within-patient comparative evidence for two commonly discussed aspiration-prevention manoeuvres.

**Highlights**

- Randomised cross-over design reduced between-patient variability.
- Supports cricoid pressure as the preferred technique while defining an evidence-based alternative.

### 16. Latent tuberculosis screening for inflammatory bowel disease in a tuberculosis-endemic region remains porous and suboptimal: A multicentre study

**Objectives:** To evaluate latent-TB screening practices and determine the incidence of active tuberculosis among patients with inflammatory bowel disease receiving biologics or small-molecule inhibitors.

**Background:** Advanced therapies for inflammatory bowel disease can increase the risk of tuberculosis reactivation. Screening before treatment is essential in India, but compliance, annual reassessment and real-world effectiveness remain uncertain.

**Methodology:** This retrospective multicentre cohort included 378 patients who initiated infliximab, adalimumab, vedolizumab or tofacitinib between 2018 and 2022. The study assessed use of tuberculin skin testing, interferon-gamma release assay, chest radiography and CT at baseline and annually, and recorded latent and active tuberculosis. The study reviewed records from multiple Indian centres and included adults with IBD starting anti-TNF therapy, vedolizumab or tofacitinib. Baseline screening was evaluated according to whether patients underwent tuberculin skin testing, interferon-gamma release assay and chest imaging; a more diligent strategy used multiple complementary tests. For patients receiving advanced therapy beyond one year, annual repeat screening was also assessed. The analysis recorded the type of IBD, therapy exposure, latent-TB diagnosis and prophylaxis, subsequent active TB and potential predictors. Particular attention was paid to active TB occurring despite a negative baseline screen.

**Results:** Standard baseline screening was performed in 59% and a more diligent strategy in 33%. TST and IGRA were completed in 69.0% and 78.8%, while annual screening occurred in only 27.2% of patients treated for more than one year. Latent TB was detected in 10.72%. Active TB developed in 4.49%, mostly among anti-TNF users; 70.6% of those developing active TB had a negative initial latent-TB screen. Among 378 patients, 41.8% had ulcerative colitis and 57.1% Crohn's disease; more than four-fifths received an anti-TNF agent. Only 59% underwent standard baseline screening and 33% received the more comprehensive strategy. Although IGRA and chest imaging were used more often than TST, annual reassessment was performed in only 27.2% of patients treated beyond a year. Latent TB was identified in 10.72%, yet active TB developed in 4.49%, predominantly during anti-TNF therapy. Twelve of the 17 active cases had initially screened negative, showing that a single baseline test cannot fully protect patients in a high-transmission setting.

**Conclusion:** Latent-TB screening before and during advanced IBD therapy remains inadequate in a high-burden setting. A negative baseline test does not eliminate subsequent risk.

**Key achievement:** Provided multicentre evidence exposing critical gaps in TB prevention for immunosuppressed IBD patients in India.

**Highlights**

- Supports standardised multimodal baseline screening and periodic reassessment.
- Shows the need for continued clinical vigilance even after a negative initial screen.

## 17. Spectrum of Medical Renal Pathological Findings in Tumor Nephrectomy Specimens: A Multicenter Study from India

**Objectives:** To characterise non-neoplastic renal pathology in tumour nephrectomy specimens and correlate these changes with clinical findings and postoperative kidney function.

**Brief Background:** Pathology reporting of nephrectomy specimens often focuses on the tumour, although disease in the remaining renal parenchyma may influence the risk of chronic kidney disease after surgery.

**Methodology:** This multicentre retrospective pathology study reviewed 168 radical or partial nephrectomy specimens removed for renal tumours. In addition to evaluating the neoplasm, pathologists systematically assessed the uninvolved renal parenchyma for glomerular, tubulointerstitial and vascular abnormalities. Features of diabetic nephropathy, nephrosclerosis and other medical renal disease were recorded. Histopathological findings were linked with available clinical information, including diabetes, hypertension and renal function. Serum creatinine was documented before surgery and at three and six months after nephrectomy. The prevalence and spectrum of non-neoplastic pathology were described, and postoperative creatinine change was compared according to the presence and type of medical renal disease.

**Results:** Clinically relevant non-neoplastic renal pathology was found in 29.7% of nephrectomy specimens, showing that nearly one-third of patients had disease in the remaining kidney tissue that could influence long-term renal outcome. Diabetic nephropathy was the most frequent diagnosis and was present in 20.8% of all cases. Of the diabetic-nephropathy specimens, 77.1% showed early diffuse mesangial sclerosis rather than advanced nodular disease, meaning that much of the pathology might have been clinically silent. Patients with diabetic nephropathy experienced a significant increase in serum creatinine from the preoperative measurement to six months after surgery ($P=0.009$). The reduction in nephron mass after nephrectomy therefore unmasked or accelerated renal functional decline in a susceptible subgroup. Other glomerular, tubulointerstitial and vascular lesions contributed to the spectrum. The study supports routine description of uninvolved parenchyma and targeted nephrology follow-up, metabolic control and blood-pressure management after surgery.

**Conclusion:** Systematic examination of non-neoplastic parenchyma can identify patients at risk of progressive kidney disease and enable earlier preventive and therapeutic intervention.

**Key Achievements:** Established the clinical value of examining non-neoplastic parenchyma in tumour nephrectomy specimens. Linked histologically early diabetic nephropathy with measurable postoperative deterioration in renal function.

**Highlights:** 168 multicentre nephrectomy specimens. Non-neoplastic pathology in 29.7%. Diabetic nephropathy in 20.8%; creatinine rise significant at six months.

**18. Acute Pancreatitis beyond Gallstones and Alcohol:**

**Objectives:** To identify the frequency and clinical profile of non-alcoholic and non-biliary causes of acute pancreatitis and examine disease severity and outcomes.

**Background:** Alcohol and gallstone disease account for most acute pancreatitis, but less common causes such as hypertriglyceridaemia, drugs, infections, hyperparathyroidism and post-ERCP pancreatitis require specific investigation and management.

**Methodology:** A prospective observational study included 150 adults with acute pancreatitis at Yashoda Hospitals, Secunderabad, from June 2021 to May 2022. Chronic pancreatitis was excluded. Etiology was assessed using clinical history, laboratory tests and appropriate imaging/endoscopy. Patients were classified by cause, including idiopathic pancreatitis, and evaluated for presentation, severity, complications, organ failure, hospital course and mortality.

**Results:** Alcohol was the leading cause (36%), followed by biliary disease (30%) and idiopathic pancreatitis (14%). Non-alcoholic/non-biliary causes included drug-induced pancreatitis (5.33%), hypertriglyceridaemia (4.67%), infection (3%), post-ERCP pancreatitis (2%) and hyperparathyroidism (2%). Abdominal pain was the predominant presentation, while organ failure and mortality were low among the non-alcoholic/non-biliary cases. The cohort was predominantly male and abdominal pain was reported in almost all patients. The etiological distribution showed that uncommon and secondary causes collectively formed a clinically important group rather than isolated exceptions. Drug-induced, metabolic, infectious, endocrine and procedure-related pancreatitis together accounted for a meaningful proportion of admissions. In the non-alcoholic and non-biliary subgroup, severe organ dysfunction and death were uncommon, but identifying the cause remained important because several conditions required targeted treatment, withdrawal of an offending medicine or prevention of recurrence.

**Conclusion:** A meaningful proportion of acute pancreatitis arises from causes other than alcohol and gallstones. Early etiological evaluation is necessary to institute specific treatment and minimise hospital stay.

**Key achievement:** Demonstrated the clinical importance of systematically investigating uncommon and potentially treatable causes of acute pancreatitis in a tertiary hospital setting.

**Highlights**

- One-third of cases were attributable to causes other than alcohol or biliary disease.
- The findings support routine assessment of triglycerides, calcium/PTH, medication exposure, infection and procedure-related causes.

## 19. Transplant Glomerulitis: Paying Due Deference to T-cell Mediated Rejection and Antibody Independent Mechanisms

**Objectives:** To critically interpret transplant glomerulitis and emphasise that it should not automatically be equated with antibody-mediated rejection.

**Background:** Transplant glomerulitis is commonly viewed as a hallmark of antibody-mediated rejection. However, similar histological lesions can occur through T-cell-mediated, immune-complex, thrombotic, infectious and other antibody-independent mechanisms.

**Methodology:** This commentary appraised a large transplant-biopsy study comparing biopsies with and without glomerulitis and normal donor-specific-antibody-negative tissue. It assessed Banff definitions, C4d staining, molecular findings, alternative causes of glomerulitis and the implications of diagnosing antibody-mediated rejection and starting targeted therapy.

**Results:** The analysis highlighted a broad differential diagnosis for glomerulitis and the potential initiating or perpetuating role of T cells. Reliance on a single marker could lead to inappropriate classification and therapy. The appraisal showed that glomerulitis is a pattern of microvascular injury rather than a disease-specific diagnosis. T cells may initiate or sustain endothelial injury even when donor-specific antibodies are absent, and immune-complex disease, thrombotic injury and infection may produce similar morphology. we noted limitations in the specificity and reproducibility of glomerular or arterial C4d staining and considered peritubular-capillary C4d more firmly linked to antibody-mediated injury. The central clinical message was that a morphology-first label without serological and molecular correlation can lead to overdiagnosis of antibody-mediated rejection and potentially unnecessary, toxic and costly therapy.

**Conclusion:** Although transplant glomerulitis frequently accompanies antibody-mediated rejection, diagnosis and treatment should incorporate the full histological, serological, molecular and clinical context, including possible T-cell-mediated injury.

**Key achievement:** Refined the clinical interpretation of transplant glomerulitis and cautioned against unnecessary antibody-directed treatment based on morphology or C4d staining alone.

**Highlights**

- Promotes a broader differential diagnosis rather than a one-lesion–one-disease approach.
- Supports integrated pathology and clinical decision-making in renal transplantation.

## 20. Impact of early initiation of PCSK9 monoclonal antibodies after acute coronary syndrome

**Objectives:** To review the rationale, evidence, safety and practical relevance of initiating PCSK9 inhibitors early during hospitalisation for acute coronary syndrome.

**Background:** Patients remain at very high risk of recurrent cardiovascular events immediately after acute coronary syndrome. High-intensity statins are essential, but many patients do not achieve recommended LDL-cholesterol targets rapidly enough, leaving substantial residual risk.

**Methodology:** The review synthesised evidence from major clinical trials, coronary imaging studies, meta-analyses and contemporary lipid-management recommendations, including EVOPACS, EVACS, PACMAN-AMI and HUYGENS. Evidence relevant to the very-early post-ACS period was also reviewed, when recurrent-event risk is highest. Trial evidence on in-hospital PCSK9 inhibitor administration was considered alongside intravascular ultrasound and optical coherence tomography studies of plaque composition. The review compared the speed and magnitude of LDL-C reduction, achievement of guideline targets, plaque regression and stabilisation, early cardiovascular outcomes and treatment safety. It also discussed practical integration with high-intensity statins and ezetimibe, barriers to initiation before discharge and the relevance of the evidence to Indian patients who frequently present at younger ages and with high residual risk.

**Results:** Early in-hospital PCSK9 inhibitor use produced rapid and intensive LDL-cholesterol reduction, with more than 90% of patients in key trials reaching LDL-C targets of 1.4 mmol/L or lower by discharge. Imaging studies showed plaque regression, increased fibrous-cap thickness and reduction of lipid-rich necrotic core. Meta-analyses indicated reductions in major cardiovascular events and ACS-related hospitalisation over 6–18 months, with an acceptable safety profile. Across the early-initiation trials, LDL-C fell within days rather than months, and more than 90% of treated patients achieved levels at or below 1.4 mmol/L by discharge or early follow-up. Imaging trials extended the finding beyond laboratory control: intensive PCSK9 inhibition was associated with regression of atheroma volume, thickening of the protective fibrous cap and reduction in lipid-rich necrotic material. Pooled evidence suggested fewer major adverse cardiovascular events and ACS-related admissions over approximately 6-18 months, without a major increase in treatment-limiting adverse effects. The review therefore supports discharge pathways that secure very-low LDL-C before follow-up losses occur.

**Conclusion:** Early addition of a PCSK9 inhibitor can close the post-ACS lipid-treatment gap and strengthen secondary prevention in selected very-high-risk patients.

**Key achievement:** Translated trial and imaging evidence into a clinically relevant strategy for rapid lipid control after acute coronary syndrome, including its application in India.

**Highlights:** Supports treatment intensification before discharge rather than delayed outpatient escalation. Links biochemical LDL-C reduction with plaque stabilisation and improved cardiovascular outcomes.

## 21. Optimizing Post-operative Pain Management in Knee Arthroscopy: A Double-Blinded Randomized Controlled Trial of Regional Anesthesia with and without Local Infiltration

**Objectives:** To assess whether intraoperative local infiltration of ropivacaine and clonidine at the hamstring donor site and within the knee joint improves immediate postoperative analgesia after arthroscopic surgery.

**Background:** Although knee arthroscopy is minimally invasive, postoperative pain can delay mobilisation, rehabilitation and functional recovery. Local infiltration may enhance the analgesia achieved with spinal anaesthesia.

**Methodology:** A prospective, double-blind randomised controlled trial enrolled 60 patients undergoing arthroscopic surgery for internal derangement of the knee at Yashoda Hospital, Secunderabad. Thirty patients received spinal anaesthesia plus infiltration with 0.2% ropivacaine and clonidine, while 30 received spinal anaesthesia alone. The intervention group received local infiltration at both the hamstring donor site and within the joint using 25 mL of 0.2% ropivacaine with clonidine in addition to spinal anaesthesia. Baseline characteristics, including age, sex and mechanism of injury, were compared to confirm group comparability. Immediate postoperative pain was recorded on the visual analogue scale.

**Results:** The groups were comparable at baseline. Mean immediate postoperative VAS pain was markedly lower with local infiltration than with spinal anaesthesia alone (0.53 versus 4.67; $P<0.001$). Approximately 76.7% of patients receiving infiltration reported no immediate postoperative pain. The two randomised groups were similar in age, sex and injury mechanism, reducing the likelihood that baseline differences explained the outcome. Immediate pain scores were nearly nine times lower in the infiltration group, with a mean VAS of 0.53 compared with 4.67 in controls. Twenty-three of the 30 patients receiving infiltration reported no pain in the immediate postoperative period. The magnitude and consistency of the difference support the clinical relevance of treating both the intra-articular source of pain and the hamstring-harvest site, with the practical potential to facilitate earlier mobilisation and participation in physiotherapy.

**Conclusion:** Ropivacaine–clonidine infiltration at the donor site and intra-articularly provides substantially better immediate pain relief and can facilitate earlier mobilisation after knee arthroscopy.

**Key achievement:** Established a simple perioperative analgesic intervention that produced a large and clinically meaningful reduction in immediate postoperative pain.

**Highlights:** Randomised and double-blinded design strengthened the evidence.
The technique may support enhanced recovery and early rehabilitation pathways.

## 22. The Association Between Type 2 Diabetes Mellitus and Frozen Shoulder: Expert Insights on Developing a Screening Tool

**Objectives:** To review the relationship between type 2 diabetes and frozen shoulder and develop a concise patient-administered screening questionnaire for routine diabetes care.

**Background:** Frozen shoulder is more frequent, severe and prolonged in people with diabetes. Pain and restricted shoulder movement impair daily activities and may interfere with glucose monitoring, medication use and other self-care tasks. Existing assessment tools are often lengthy and clinician dependent.

**Methodology:** PubMed, Scopus and Google Scholar were searched for English-language adult human studies published from January 1900 to January 2025. Evidence on epidemiology, mechanisms, clinical assessment and patient-reported measures was synthesised. Experts qualitatively reviewed proposed questions for relevance, clarity and ease of use; no formal Delphi process was undertaken. The literature search covered epidemiology, diabetes-related mechanisms, clinical manifestations, functional impairment and available shoulder questionnaires. Candidate questions were derived from commonly reported symptoms and activities limited by adhesive capsulitis, including pain, overhead movement, reaching behind the back, dressing and sleep disturbance. The proposed tool was intentionally designed as a rapid screen rather than a diagnostic instrument; patients who screen positive would still require physical examination and, where indicated, imaging or specialist assessment.

**Results:** The review linked frozen shoulder in diabetes to chronic inflammation, collagen accumulation, advanced glycation and capsular fibrosis. A six-question screening tool was proposed covering shoulder pain, movement limitation and sleep disturbance. The tool is brief, patient administered and intended to identify patients requiring clinical evaluation. The review showed that diabetes is associated not only with a higher occurrence of frozen shoulder but also with more severe pain, prolonged stiffness and poorer treatment response. Hyperglycaemia, advanced glycation, chronic low-grade inflammation and excess collagen deposition were identified as plausible pathways leading to capsular thickening and fibrosis. Existing shoulder instruments were considered too lengthy or clinician-dependent for routine diabetes visits. The proposed six-item questionnaire therefore focuses on easily recognised symptoms and functional limitations. It offers a practical case-finding approach.

**Conclusion:** Early recognition and treatment of frozen shoulder may improve mobility, diabetes self-care and quality of life. The proposed screening questionnaire is promising but requires validation in real-world practice.

**Key achievement:** Converted evidence and expert input into a practical six-item screening instrument suitable for routine diabetes clinics.

**Highlights**

- Bridges endocrinology and musculoskeletal care.
- Focuses on early case-finding rather than waiting for advanced functional limitation.

## 23. Factors Influencing Non-adherence to Treatment Among New Patients With Tuberculosis in the Field Practice Area of a Tertiary Care Hospital in Hyderabad: A Cross-Sectional Study:

**Objectives:** To estimate non-adherence to anti-tuberculosis treatment among newly diagnosed pulmonary TB patients and determine the factors associated with non-adherence.

**Background:** Tuberculosis is curable, but missed or interrupted treatment contributes to treatment failure, transmission, relapse and drug resistance. Adherence is influenced by patient, social, disease, medicine and health-system factors.

**Methodology:** A community-based cross-sectional study was conducted in Hyderabad field-practice areas from October 2020 to March 2021. A simple random sample of 385 newly diagnosed pulmonary TB patients registered under DOTS was interviewed using a pretested semi-structured questionnaire covering sociodemographic, clinical and treatment-related factors. All newly diagnosed pulmonary tuberculosis patients registered under the DOTS programme during the study period formed the sampling frame, from which 385 participants were selected by simple random sampling. Trained interviewers used a predesigned and pretested semi-structured questionnaire. It captured demographic and socioeconomic characteristics, disease and treatment details, medicine-related adverse effects, access to services, stigma, smoking and patient knowledge about treatment completion. Adherence status was determined from the treatment history and programme records.

**Results:** Non-adherence was observed in 19.48% of participants. Significant associations were found with socioeconomic status, education, marital status, medication side effects, awareness of the need to complete treatment and smoking. The mean participant age was 43 years and nearly four-fifths were men. Approximately one in five patients was non-adherent, a level sufficient to threaten individual cure and promote ongoing transmission and drug resistance. Non-adherence clustered with lower socioeconomic position, limited education, marital circumstances, smoking, medication adverse effects and inadequate understanding of the need to complete the full course. These findings show that adherence is not determined by a single patient behaviour; it reflects interacting social, informational and treatment burdens. The results support counselling, adverse-effect management, family and social support and more responsive programme follow-up rather than punitive approaches.

**Conclusion:** Improving adherence requires a patient-centred strategy combining education, counselling, management of adverse effects, social support and more responsive healthcare delivery.

**Key achievement:** Quantified local treatment non-adherence and identified modifiable determinants that can guide targeted TB-programme interventions.

**Highlights:** Nearly one in five newly treated patients was non-adherent.

The findings support risk-based counselling and intensified follow-up for socially and clinically vulnerable patients.

## 24. Comparative Study of Fecal Calprotectin Levels in Ulcerative Colitis versus Irritable Bowel Syndrome:

**Objectives:** To evaluate the ability of faecal calprotectin to distinguish ulcerative colitis from irritable bowel syndrome in patients with overlapping gastrointestinal symptoms.

**Brief Background:** Ulcerative colitis and irritable bowel syndrome may both present with abdominal pain, diarrhoea and urgency, but require very different management. Colonoscopy and biopsy are accurate for ulcerative colitis but invasive, creating a need for practical non-invasive biomarkers.

**Methodology:** This study included 60 adults, equally divided between ulcerative colitis (UC) and irritable bowel syndrome (IBS). UC was confirmed clinically, endoscopically and histologically, while IBS was diagnosed using Rome IV criteria with normal colonoscopy and histology. Faecal calprotectin was measured from fresh stool samples by ELISA, with >50 µg/g considered elevated. Mean levels and positivity rates were compared to assess its ability to distinguish inflammatory from functional bowel disease.

**Results:** Mean faecal calprotectin was approximately 623.5 micrograms per gram in ulcerative colitis and 36.4 micrograms per gram in irritable bowel syndrome, demonstrating a large separation in biomarker distribution. Twenty-eight of 30 patients with ulcerative colitis (93.3%) had a level above 50 micrograms per gram, while only two of 30 patients with irritable bowel syndrome (6.7%) exceeded the threshold. Using the study classification, the 50-microgram threshold corresponded to approximately 93.3% sensitivity and 93.3% specificity. The strong contrast supports the biomarker as a triage test rather than as a replacement for endoscopy where inflammatory disease remains clinically likely. The findings indicate that a low calprotectin value may help avoid unnecessary invasive investigation in appropriately selected patients, while a raised result can prioritise colonoscopy and specialist review.

**Conclusion:** Faecal calprotectin effectively discriminated inflammatory ulcerative colitis from non-inflammatory irritable bowel syndrome and can support non-invasive triage for further endoscopic evaluation.

### Key Achievements

- Demonstrated clear discrimination between confirmed ulcerative colitis and Rome IV-defined irritable bowel syndrome using a non-invasive stool biomarker.
- Generated a simple clinical triage approach that could reduce avoidable endoscopy while accelerating evaluation of inflammatory disease.

### Highlights

- 30 ulcerative colitis and 30 irritable bowel syndrome participants.
- Mean calprotectin 623.5 versus 36.4 micrograms/g.
- 93.3% of ulcerative colitis cases exceeded the diagnostic threshold.

**25. Antibiotic Resistance Patterns in Uropathogens Isolated from Pregnant Women: A Tertiary Hospital Study:**

**Objectives:** To identify uropathogens in symptomatic pregnant women and determine their antimicrobial susceptibility and multidrug-resistance patterns.

**Brief Background:** Urinary tract infection during pregnancy can cause maternal pyelonephritis, preterm labour and adverse neonatal outcomes. Increasing resistance can make empirical treatment ineffective and requires local susceptibility data.

**Methodology:** Three hundered pregnant women attending antenatal services at YHS hospital with symptoms suggestive of urinary tract infection were evaluated. Clean-catch midstream urine was obtained before definitive antimicrobial treatment. Samples were inoculated on cystine-lactose-electrolyte-deficient and MacConkey agar. Significant bacterial growth was identified using standard colony-count and biochemical methods. Confirmed uropathogens underwent Kirby-Bauer disc-diffusion testing in accordance with Clinical and Laboratory Standards Institute procedures (CLSI). Susceptibility to commonly prescribed oral and parenteral agents was recorded. Descriptive statistics were used to report culture positivity, organism distribution, resistance to individual antibiotics and the proportion of isolates meeting multidrug-resistance criteria.

**Results:** Significant bacterial growth was detected in 114 of 300 specimens, giving a culture-positivity rate of 38% among symptomatic pregnant women. Escherichia coli was the predominant organism, accounting for 52.6% of isolates. Klebsiella pneumoniae contributed 21.1%, Enterococcus faecalis 13.2% and Proteus mirabilis 7.9%, with other organisms forming a small minority. Approximately three-quarters of isolates were resistant to ampicillin and co-trimoxazole, indicating poor suitability of these drugs for unselected empirical treatment in the study setting. Most isolates remained susceptible to nitrofurantoin and fosfomycin. Multidrug resistance was identified in 47.3% of isolates and was particularly frequent among E. coli. The results reinforce culture-based treatment in pregnancy and periodic local updating of the antenatal UTI antibiogram.

**Conclusion:** A substantial proportion of UTIs in pregnancy were caused by organisms resistant to commonly used antibiotics. Culture-guided therapy and periodic local surveillance are essential.

**Key Achievements:** Defined the local uropathogen and susceptibility profile in a clinically important antenatal population. Identified nitrofurantoin and fosfomycin as agents retaining useful activity despite a high multidrug-resistance burden.

**Highlights:** Culture positivity: 38%, E. coli accounted for 52.6% of isolates., Multidrug resistance detected in 47.3%.

## 26. Effectiveness and Safety of Lidocaine-Nifedipine Combination in Patients With Acute and Chronic Anal Fissure: A Retrospective, Multi-centric, Post-marketing Surveillance Study

**Objectives:** To evaluate the real-world effectiveness and safety of topical nifedipine 0.3% plus lidocaine 1.5% in acute and chronic anal fissure.

**Background:** Anal fissure causes severe pain and bleeding. Surgery is effective but carries a risk of faecal incontinence, increasing interest in sphincter-relaxing topical therapy.

**Methodology:** A retrospective multicentre post-marketing surveillance study analysed 431 patients from 46 institutions: 290 with acute and 141 with chronic fissure. The cream was applied twice daily. Healing, pain on a five-point visual analogue scale, rectal bleeding and adverse events were assessed through eight weeks. Patient records were drawn from gastroenterology and surgical practices across 46 centres. All patients received topical nifedipine 0.3% plus lidocaine 1.5% twice daily for four weeks and were followed for eight weeks. Acute and chronic fissures were analysed separately as well as together. The primary outcome was clinical healing or resolution at scheduled follow-up visits. Secondary measures included the trajectory of pain on a five-point visual analogue scale, the presence of bleeding per anus and reported adverse events. Repeated assessments allowed to describe the timing of improvement and compare response patterns between acute and chronic disease.

**Results:** Fissure resolution increased significantly by week 8, accompanied by major reductions in pain and bleeding. Overall resolution was comparable in acute and chronic fissures, although acute cases showed greater late improvement in bleeding and pain. All reported adverse events were mild and self-limiting. Healing increased progressively and was highly significant by week eight. Pain scores and rectal bleeding declined in parallel, indicating that the treatment addressed both the fissure and its principal symptoms. Overall healing did not differ significantly between acute and chronic groups, although acute fissures showed greater late reductions in bleeding and pain. Tolerability was favourable: reported adverse effects were mild, self-limited and did not reveal a major safety signal. The large multicentre practice-based sample therefore supports topical nifedipine-lidocaine as a conservative option that may reduce the need for surgery and its associated continence risk.

**Conclusion:** Topical lidocaine–nifedipine was effective and well tolerated for both acute and chronic anal fissure and offers a useful non-surgical treatment option.

**Key achievement:** Generated large, multicentre real-world safety and effectiveness evidence for a conservative therapy that may reduce the need for surgery.

**Highlights**

- Included 431 patients across 46 centres.
- Demonstrated symptom relief, healing and excellent tolerability over eight weeks.

**list of ongoing projects: 2 2**

1. Epidemiology, Disease Patterns and Regional Variations in the Burden of Allergic Bronchopulmonary Aspergillosis in India
2. AI-Enabled Precision Care Platform involving genomics and pharmacokinetics in neurology : A Pilot Study for Clinical Validation
3. Metabolic Dysfunction-Associated Steatotic Liver Disease and Diabetic Nephropathy: A Case-Control Study with Assessment of Insulin Resistance
4. Association between Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) and Coronary Artery Disease: A Case-Control Study with Assessment of Insulin Resistance
5. Prospective Observational Study of Artificial Intelligence Enabled Digital Auscultation to Track Early Wheeze Burden, Treatment Response, and Clinical Outcomes in Hospitalized Patients with Acute Wheezing Illnesses
6. Clinical Impact of Low Viscosity Soluble Fiber Supplementation in Intensive Care Unit Patients: A Multicenter Randomized Double Arm Open Label Prospective Study
7. Machine Learning Model versus Early Warning Score for Predicting Unplanned Intensive Care Unit Readmission: A Prospective Cohort Study
8. Serial Venous Excess Ultrasound Assessment for Prediction of Acute Kidney Injury in Cardiac Intensive Care Unit Patients: A Prospective Observational Study
9. Validation of a New Autism Screening Questionnaire with Potential Digitalization Application: A Comparison with Modified Checklist for Autism in Toddlers
10. Acute Kidney Injury, as measured by Biochemical, Radiological and Clinical Parameters Epidemiology in Intensive Care Unit Patients 2
11. Artificial Intelligence Enhanced Detection of Pulmonary Nodules and Masses on Chest Radiographs for Early Lung Cancer Screening and Diagnosis: A Multicenter Study
12. Digital Longitudinal Monitoring of Patients with Parkinson's Disease Between Subsequent Outpatient Department Visits: A Pilot Feasibility Study
13. A Comparative Trial Evaluating the Need for Soft Tissue Release in CORI Robotic-Assisted Versus Conventional Total Knee Arthroplasty
14. Prognostic Value of Six-Hour Delta Shock Index versus Lactate Clearance for Predicting Intensive Care Unit Mortality in Septic Shock: A Prospective Observational Study in a Fifty-Bedded Tertiary Care Intensive Care Unit
15. Assessment of Navigational Concordance Between Two Virtual Bronchoscopic Navigation Platforms and Bronchial Branch Tracing for Sampling Peripheral Pulmonary Lesions
16. Determining the Optimal Number of Samples in Endobronchial Ultrasound Guided Mediastinal Lymph Node Cryobiopsy: A Prospective Comparative Study
17. A Study to Compare the Efficacy and Safety of Dual Agent Pleurodesis (Povidone-Iodine and Talc) Versus Single Agent Pleurodesis (Talc) in Malignant Pleural Effusions
18. Rapid Assessment of Left Ventricular Function in the Emergency Department: Correlation Between Mitral Annular Plane Systolic Excursion and Left Ventricular Ejection Fraction
19. A Randomized Controlled Trial Comparing Endoscopic Ultrasound Guided Coil and Cyanoacrylate Injection Embolization with Coil Alone and Glue Alone for Managing Gastric Varices
20. A Worldwide Global Inception Cohort Study – FENICE II, on Fluid Challenge in ICU
21. A Prospective Study to Evaluate the Clinical Utility of Breath-Sound Recordings Using a Digital Stethoscope in Patients Attending the Pulmonary Department at Yashoda Hospitals
22. Estimation of Hepatic Steatosis and Fibrosis in an Asymptomatic Young Indian Population Using FibroTouch

**List of Published papers: 30**

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**Capacity Building:**
Workshops and Trainings : between 2025 to 2026

| S.No | Event | Event Type | Specialty |
|---|---|---|---|
| 1. | Workshop on ECG | Workshop | Cardiology |
| 2. | BLS & ACLS Provider Course | Training | Emergency Medicine |
| 3. | ICU Essentials for Anaesthesia | Workshop | Anaesthesiology |
| 4. | Cervical Spine Boot Camp | Workshop | Orthopaedics |
| 5. | Rheumatological Emergencies | CME | Rheumatology |
| 6. | Edu Dialysis | Workshop | Nephrology |
| 7. | Blood Gases & Electrolytes | Workshop | Critical Care |
| 8. | Pediatric Life Support for Nurses | Training | Pediatrics |
| 9. | Peripheral Nerve Surgery | Workshop | Neurosurgery |
| 10. | Alloimmunization in Pregnancy | CME | Obstetrics & Gynaecology |
| 11. | Mega CME Kakinada | CME | Multi-specialty |
| 12. | Mechanical Ventilation | Training Program | Critical Care |
| 13. | Positive Parenting | Workshop | Pediatrics |
| 14. | AI in Radiology | Workshop | Radiology |
| 15. | ICOG Fellowship in Endoscopy | Fellowship | Gastroenterology |
| 16. | Pediatric Neurology Program | CME | Pediatric Neurology |
| 17. | Voluntary Blood Donation Drive | Academic Outreach | Transfusion Medicine |
| 18. | Practical Aspects in Dialysis | Workshop | Nephrology |
| 19. | Maternal Emergencies & Neonatal Critical Care | Workshop | Obstetrics & Neonatology |
| 20. | Provider Courses BLS & ACLS | Training | Emergency Medicine |
| 21. | Mastering Endometriosis | Workshop | Obstetrics & Gynaecology |

| | | | |
|---|---|---|---|
| 22. | Benign Gynecology | CME | Obstetrics & Gynaecology |
| 23. | National Ultrasound Life Support | Hands-on Workshop | Emergency Medicine |
| 24. | Pulmo Mentor 2026 | Educational Program | Pulmonology |
| 25. | Pediatric Emergency Medicine | Workshop | Pediatrics |

**Conference:**

| S.No. | Event | Specialty |
|---|---|---|
| 1. | YG CON 2025 | Multi-specialty |
| 2. | THROMBOCON 2025 | Hematology |
| 3. | Paramedic Summit | Emergency Medicine |
| 4. | Regional Pulmo Update | Pulmonology |
| 5. | Neuro Rhythm | Neurology |
| 6. | Deccan Arthroplasty Summit | Orthopaedics |
| 7. | Immuno Nexus | Immunology |
| 8. | Neuro Con | Neurology |
| 9. | IBD Conclave 2.0 | Gastroenterology |
| 10. | Regional Pulmo Update | Pulmonology |
| 11. | Eye Rheum Connect | Rheumatology/Ophthalmology |
| 12. | AI in Healthcare 2.0 | Digital Health |
| 13. | Head & Neck Precision Onco Summit | Oncology |
| 14. | Hematolink 3.0 | Hematology |
| 15. | ENDO Connect | Endocrinology |
| 16. | Excellence in Fetal Medicine | Fetal Medicine |
| 17. | Semicon 2026 | Multi-specialty |
| 18. | Gynae Onco Connect | Gynecologic Oncology |
| 19. | NePCON 2026 | Nephrology |
| 20. | National Autism Stakeholders Summit | Pediatrics/Neurology |
| 21. | Child Neurology Research Conclave | Neurology |
| 22. | TENDOC; Deccan Arthroplasty Summit | Orthopaedics |
| 23. | Fistula Congress 2026 | Proctology/General Surgery |
| 24. | Incycon 2026 | Infectious Diseases |

## Hands on Training Workshops :









## Conferences :





**Strategic Partnership and Collaborations - current**

SHARE
SOCIETY FOR HEALTH ALLIE
RESEARCH AND EDUCATION IND

IIPH
INDIAN INSTITUTE of PUBLIC HEALTH
ESTABLISHED BY PHFI
GANDHINAGAR | HYDERBAD | DELHI
BHUBANESWAR | SHILLONG | BENGALURU



MOU Signing between SHARE India, IIPH-PHFI and Yashoda Hopsitals

**POD Health**

**Income and Expenditure 2025-2026**

## Income:

| Income (in Lakhs) | Grants | Donations | Project(s) related | Foreign Contribution | Testing | Others | Total Income (in Lakhs) |
|---|---|---|---|---|---|---|---|
| For R&D Activities | 0 | 484.70 | 0 | 0 | 0 | 3.56 | **488.26** |
| For Non R&D Activities | 0 | 116.46 | 0 | 0 | 0 | 16.93 | **133.39** |
| Total Income | **0** | **601.16** | **0** | **0** | **0** | **20.49** | **621.65** |

## Expenditure:

| Expenditure (in Lakhs) | Capital Expenditure | Revenue expenditure other than salaries | Salaries | Others | Total Expenditure (in Lakhs) | Percentage |
|---|---|---|---|---|---|---|
| For R&D Activities | 84.17 | 0 | 137.10 | 267.04 | **488.31** | **78.93** |
| For Non R&D Activities | 0 | 0 | 8.12 | 122.16 | **130.28** | **21.07** |
| Total Expenditure | **84.17** | **0** | **145.22** | **389.20** | **618.59** | **100.00%** |

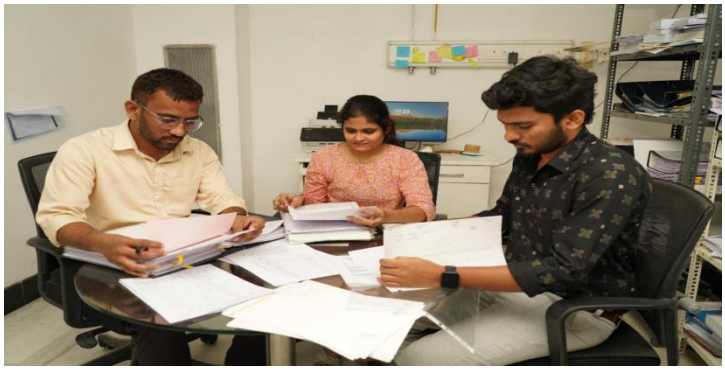
**Infrastructure**
**Research Infrastructure and Core Facilities**

| Total Land & Building Area | Total Land area (in acres) | Total Built up area (in Sq.m) | Total Land & Building area for R&D | Total Land & Building area with Organization |
|---|---|---|---|---|
| 1600 sq.yards | 0.329 | 1337.80 | 2400 sft | 750 Sq. Yards |

| Sl. No | Equipment Type | Name of Particulars |
|---|---|---|
| 1 | HPLC | HemoCue |
| 2 | Gas Chromatography | HemoCue |
| 3 | PCR Machine | Qiagen |
| 4 | Elisa Reader and Washer | Bio-Rad |
| 5 | Flow Cytometry | BD |
| 6 | Immune Analyzer | Abbott |
| 7 | Hematology Analyzer | Stago |
| 8 | Serology Analyzer | Abbott |
| 9 | Blood Gas Analyzer | Radiometer |
| 10 | Ultrasound with Probe | Samsung |
| 11 | -80 Deep freezer | Remi |
| 12 | -20 Deep freezer | Celfrost |
| 13 | 2-8$^{o}$ C Refrigerator | Celfrost |
| 14 | 12-24 Refrigerator | Celfrost |
| 15 | Cold centrifuge | Remi |
| 16 | Incubator | Bio-Technics |
| 17 | Auto Analyzer | Sysmex |
| 18 | Microscope | Motic |
| 19 | Water Bath | Bio-Technics |
| 20 | Shakers, Scales, Balances and Pipettes | Remi, Wensar, Wensar, Thermo |
| 21 | Fundoscopy | Remidio Innovative Solutions |

**Facilities and Research Platforms:** (three photos of labs with people and one photo with system- data analysis)









# FY 2025–2026

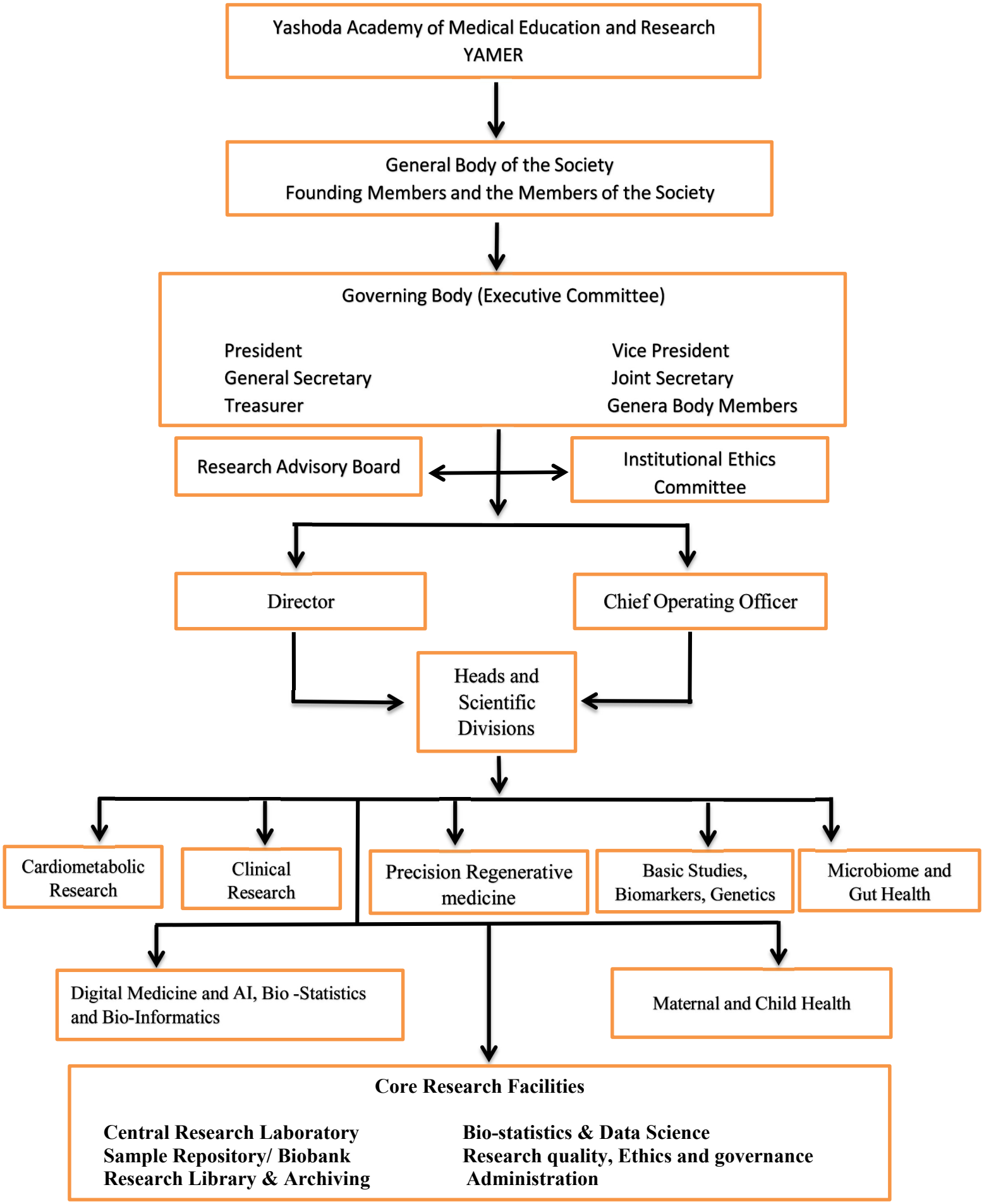
| Scientific Staff | Technical Staff | Administrative Staff |
|---|---|---|
| Dr. R Hemalatha | Metilda Richards | Mr. Madhu Kiran |
| Dr. Vishnu Reddy | Gangadhar | Ms. Jyothi |
| Dr. B.V.C.S. Srinivasa Rao | Manognya | Mr. Jeeven |
| Dr.V Lakshmi | Sabha | |
| Dr. K Sunitha Premalatha | Rahul | |
| Mr. B. Prasad | Chandana | |
| Mr. T. Lakshmaiah Naidu | Deepti | |
| Mr. Madhusudhan A. | Hema | |
| Mr. Avula Venkaiah | Shankar Nayak | |
| Mr. Sidharth Narain | Prashanth | |
| | Sowmya | |
| | Triveni | |
| | Bhavu Singh | |
| | Suresh | |
| | Aishwarya | |
| | Sowmya | |
| | R Akash | |
| | Vadapally Bhavani | |

**General body members**

| S.No | Name | Designation |
|---|---|---|
| 1 | G Surender Rao | President |
| 2 | G Ravender Rao | Vice President |
| 3 | A Lingaiah | General Secretary |
| 4 | B Jagan Mohan | Joint Secretary |
| 5 | G Devender Rao | Treasurer |
| 6 | B Venkat Reddy | Executive Member |
| 7 | P Devender | Executive Member |

**Executive Committee / Governing Body**

| S.No | Name | Designation |
|---|---|---|
| 1. | G Surender Rao | President |
| 2. | G Ravender Rao | Vice President |
| 3. | A Lingaiah | General Secretary |
| 4. | B Jagan Mohan | Joint Secretary |
| 5. | G Devender Rao | Treasurer |
| 6. | B Venkat Reddy | Executive Member |
| 7. | P Devender | Executive Member |


Yashoda Academy of Medical Education and Research
YAMER
General Body of the Society
Founding Members and the Members of the Society
Governing Body (Executive Committee)
President
General Secretary
Treasurer
Vice President
Joint Secretary
Genera Body Members
Research Advisory Board
Institutional Ethics Committee
Director
Chief Operating Officer
Heads and Scientific Divisions
Cardiometabolic Research
Clinical Research
Precision Regenerative medicine
Basic Studies, Biomarkers, Genetics
Microbiome and Gut Health
Digital Medicine and AI, Bio -Statistics and Bio-Informatics
Maternal and Child Health
Core Research Facilities
Central Research Laboratory
Sample Repository/ Biobank
Research Library & Archiving
Bio-statistics & Data Science
Research quality, Ethics and governance
Administration

## Research Advisory Board for year (2026-2029)

| S. No | Name | | Design ation |
|---|---|---|---|
| 1. | Dr. Nirmal Kumar Ganguly (Padmabhushan) | Current position, Former DG - ICMR | Chairperson |
| 2. | Dr. Sesikeran. B | Current position, (Former Director ICMR – NIN) | Co-Chairperson |
| 3. | Dr. Partha Majumder | Distinguished Prof.John C. Martin Center for Liver Res and Innovation | Member |
| 4. | Dr. TS Rao | Current position, (Former Sr. Advisor DBT) | Member |
| 5. | Dr Atul Kotwal | ICMR Chair, (Former Executive Director, NHSRC MoHFW) | |
| 6. | Dr. Nair | Current position, (Former Scientist - G, ICMR – NIN) | Member |
| 7. | Dr. Dinesh | Current position, (Former Scientist - G, ICMR – NIN) | |
| 8. | Dr. T Ramamurthy | (Former Scientist - G, ICMR-NICED) | Member |
| 9. | Dr Rukmini Mridual | Current position | Member |
| 10. | Dr Hemalatha R | Current position, (Former Director, ICMR – NIN) | Member |
| 11 | Prof. Aditya Prasad Dash | Fmr VC, Central univ of TN; Ex-Scientist and Advisor WHO | Member |

**Ethics committee - (CDSCO Registered and DHR Recognized. Refer ann )**

| S. No | Name | Designation | Internal/External Organisation |
|---|---|---|---|
| 1 | Justice L.Narasimha Reddy | Chairman/Legal Expert | |
| 2 | Dr.S.Manimala Rao | Member Secretary | |
| 3 | Dr. B. Sesi Keran | Member | |
| 4 | Dr.D.Govinda Das | Member | |
| 5 | Dr.Meena Hariharan | Member | |
| 6 | Dr.I.Dinakar | Member | |
| 7 | Sri.Borra Satyanarayana Murthy | Member | |
| 8 | Dr.K.Kiran Kumar | Member | |
| 9 | Sri.Thota Devidas | Member | |
| 10 | Sri.Srinivas Kondamalla | Member | |
| 11 | Dr.BVCS.Srinivasarao | Joint Sectetary | |


ANNUAL
REPORT
2024 - 2025
RESEARCH
TRAINING
INNOVATION
EDUCATION
PATIENT CARE
YAMER
YASHODA ACADEMIC OF
MEDICAL EDUCATION AND RESEARCH
Hyderabad

# YAMER

## *Annual Research Report, 2024-2025*

**Research achievements and structured study summaries**

**Yashoda Academy of Medical Education and Research (YAMER)**
Not-for-profit registered society

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**VISION:** To lead transformative medical and health research through scientific excellence, innovation, collaboration, and ethical leadership, creating lasting improvements in healthcare and society.

**MISSION:** To promote, facilitate, and strengthen high-quality medical and health research by fostering scientific excellence, ethical research practices, interdisciplinary collaboration, innovation, and capacity building. YAMER is committed to supporting the complete research ecosystem-from concept to translation-through robust governance, advanced infrastructure, education, partnerships, and community engagement, thereby generating evidence that improves clinical practice, healthcare delivery, and population health.

**Overall Research Highlights:**

YAMER's 2024-2025 research portfolio comprises 24 unique scientific publications spanning maternal and renal health, critical care, antimicrobial resistance, diabetes complications, cardiovascular medicine, neurogenetics, neuromodulation, artificial intelligence, anaesthesia, paediatrics, ophthalmology, surgery and clinical nutrition. The portfolio combines large national and international collaborations with prospective studies, controlled clinical investigations, long-term cohorts, laboratory validation, evidence synthesis and community-based research.

The strongest work is distinguished by methodological rigour, scale, novelty and relevance to Indian clinical practice or public health. Three studies merit flagship status: the pregnancy-associated acute kidney injury meta-analysis covering 424,081 pregnancies, the prospective 19-hospital IMPRES antimicrobial-resistance study, and the 4,290-patient diabetic peripheral-neuropathy study conducted across 543 centres. Priority contributions include functional validation of a novel TOMM7 variant, non-invasive vagus-nerve stimulation for drug-resistant epilepsy, the ANTARTICA coronary-thrombus strategy, long-term cardiomyopathy outcomes, endocrine-hypertension screening, lipid-method validation, rural diabetic-foot prevention, ICU nutritional assessment and a governance-oriented synthesis of AI in cerebrovascular disease.

**Area-wise Research Highlights 2024–2025:**

| Broad Research Area | Major Research Highlights |
|---|---|
| **1. Maternal Health, Nephrology & Critical Care** | • The **IMPRES multicentre study** enrolled **936 patients across 19 Indian hospitals**, documenting a high burden of multidrug-resistant Gram-negative infections, including **47% carbapenem resistance**, with 28-day mortality of **23.5%**. • ICU research also evaluated bedside anthropometric measures such as MUAC and mid-arm muscle circumference for monitoring nutritional and muscle decline in critically ill patients. • A major meta-analysis on **pregnancy-associated acute kidney injury** synthesised 43 studies |

| Broad Research Area | Major Research Highlights |
|---|---|
| | covering **424,081 pregnancies across 15 low- and middle-income countries**, quantifying maternal and fetal risks and highlighting preventable causes such as hypertensive disorders, haemorrhage and sepsis. |
| **2. Diabetes, Endocrinology, Cardiometabolic Health & Clinical Biochemistry** | • A large multicentre study of **4,290 patients from 543 diabetes-care centres** characterised diabetic peripheral neuropathy and strengthened the case for systematic neurological and foot-risk screening. • Community research in rural Andhra Pradesh identified important gaps in HbA1c monitoring, sensory assessment and preventive diabetic-foot care. • Prospective screening in patients with diabetes and resistant hypertension identified a **21% screen-positive rate for primary aldosteronism**, highlighting the importance of detecting secondary causes of hypertension. • Laboratory research involving **1,020 lipid profiles** evaluated agreement between directly measured LDL-C and commonly used calculation equations, supporting locally validated lipid-reporting methods. |
| **3. Cardiovascular Medicine & Risk Stratification** | • The **ANTARTICA study** evaluated a deferred antithrombotic strategy in selected young STEMI patients with non-occlusive thrombus and preserved coronary flow, providing a cost-conscious proof-of-concept approach requiring further prospective confirmation. • A **210-patient dilated cardiomyopathy cohort**, followed for up to 10 years, characterised long-term mortality and potentially modifiable cardiometabolic and thyroid risk factors. • Cardiovascular biomarker research showed that a combined **CRP–troponin I–LDL model** achieved **88% sensitivity and 84% specificity**, supporting multimarker approaches to cardiovascular risk classification. |
| **4. Neurosciences, Neurogenetics & Artificial Intelligence** | • A novel **TOMM7 splice-site variant** was linked to Leigh syndrome, with transcript-level demonstration of abnormal splicing, expanding the recognised phenotype of this rare mitochondrial disorder. • A sham-controlled study of **120 patients with drug-resistant epilepsy** reported promising reductions in seizure frequency and improvements in quality of life with non-invasive vagus nerve stimulation. • A comprehensive review of **122 AI/ML studies** in cerebral small-vessel disease and stroke demonstrated potential for automated diagnosis, imaging quantification and clinical prediction. |

| Broad Research Area | Major Research Highlights |
|---|---|
| **5. Anaesthesia, Perioperative Medicine & Pain Management** | • A sustained programme of comparative regional-anaesthesia research evaluated **supraclavicular brachial plexus, quadratus lumborum, erector spinae, pericapsular nerve group, fascia iliaca, adductor canal and femoral nerve blocks**. • After total knee arthroplasty, adductor canal block prolonged analgesia by about **4.55 hours**, reduced rescue analgesic requirements and improved early mobility compared with femoral nerve block. • Pericapsular nerve group block after hip arthroplasty also provided lower pain scores and longer analgesia than suprainguinal fascia iliaca block. • Additional work compared sedative and adjuvant strategies using dexmedetomidine, dexamethasone, clonidine and propofol. |
| **6. Surgery, Ophthalmology & Paediatric Clinical Research** | • A surgical observational study documented the **varied clinical presentations of Meckel's diverticulum**, reinforcing the importance of diagnostic suspicion in unexplained abdominal presentations. • Neuro-ophthalmology research compared **retinal nerve fibre layer and macular ganglion cell complex thickness** as predictors of visual impairment in papilloedema secondary to idiopathic intracranial hypertension. • Paediatric research characterised **adenovirus-associated diseases** in children attending a tertiary-care setting, helping improve clinical recognition of viral disease and potentially reduce unnecessary antibiotic use. |
| **7. Public Health, Prevention & Community-Based Research** | • Rural diabetes research highlighted gaps in neuropathy screening, glycaemic monitoring and preventive foot care, with implications for **amputation prevention and community-level diabetes services**. • Maternal-kidney research and AMR surveillance addressed major public-health priorities relevant to resource-constrained settings. • Several projects were designed with direct implementation relevance, including screening pathways, laboratory-method validation and practical bedside assessment tools. |
| **8. Precision Medicine, Diagnostics & Research Innovation** | • The portfolio incorporated **exome sequencing, transcript analysis, multimarker cardiovascular risk models, AI-assisted imaging, laboratory-method validation and non-invasive neuromodulation**. • These approaches demonstrate YAMER's movement towards **precision diagnosis, patient stratification and clinically actionable research** rather than descriptive research alone. • The year also showed strong participation in national and |

| Broad Research Area | Major Research Highlights |
|---|---|
| | international collaborations and generation of Indian evidence relevant to local clinical practice. |

### Flagship Projects

**1. Pregnancy-associated acute kidney injury meta-analysis:** the strongest policy-level study, synthesising 43 reports and 424,081 pregnancies from 15 countries and quantifying major maternal and fetal risks.
**2. IMPRES antimicrobial-resistance study:** a prospective national ICU cohort of 936 patients across 19 hospitals, directly informing empirical antibiotic policy, stewardship and infection control.
**3. Multicentre diabetic peripheral-neuropathy study:** the largest clinical dataset in the report, with 4,290 patients from 543 centres and clear implications for early foot screening and amputation prevention.

### Priority Projects

**4. TOMM7-associated Leigh syndrome:** a novel genotype-phenotype report strengthened by transcript-level functional confirmation of aberrant splicing.
**5. Non-invasive vagus-nerve stimulation:** a 120-patient sham-controlled study with promising seizure and quality-of-life findings.
**6. ANTARTICA study:** an innovative, cost-conscious proof-of-concept strategy for selected stable young STEMI patients, requiring prospective randomised confirmation.
**7. Dilated cardiomyopathy cohort:** a 210-patient study with follow-up extending to ten years, defining mortality burden and clinically relevant cardiometabolic and thyroid risk markers.
**8. Primary aldosteronism screening:** a pragmatic prospective study identifying a high screen-positive rate and confirmatory-test attrition as an important implementation gap.
**9. LDL-C formula concordance:** a 1,020-sample laboratory comparison with direct relevance to local lipid reporting and treatment thresholds.
**10. Rural diabetes complication screening:** community evidence of major gaps in HbA1c monitoring, sensory assessment and preventive foot-care practices.
**11. ICU bedside anthropometry:** a practical study supporting repeated low-cost assessment of nutritional and muscle decline in critically ill patients.
**12. AI in cerebral small-vessel disease:** a strategically relevant synthesis emphasising validation, equity, explainability, safety and governance before clinical deployment.

### Other Projects

**13.** Prediction of Cardiovascular Disease Risk Using Biomarkers in Blood

**14.** Clonidine versus Dexmedetomidine as an Adjuvant to Bupivacaine in Ultrasound-Guided Supraclavicular Brachial Plexus Block

**15.** Hyperbaric Levobupivacaine with Nalbuphine versus Hyperbaric Ropivacaine with Nalbuphine for Lower-Limb Orthopaedic Surgery

**16.** Ultrasound-Guided Quadratus Lumborum Block vs Erector Spinae Block after Hip Arthroplasty

**17.** Ultrasound-Guided Pericapsular Nerve Group Block versus Suprainguinal Fascia Iliaca Compartment Block after Total Hip Arthroplasty

**18.** Ultrasound-Guided Adductor Canal Block versus Femoral Nerve Block in Knee Arthroplasty

**19.** Varied Presentations of Meckel's Diverticulum: A Single-Centre Observational Study

**20.** Longitudinal Comparison of RNFL and mGCC Thickness as Predictors of Functional Visual Impairment in Papilledema Secondary to Idiopathic Intracranial Hypertension

**21.** Comparative Study of Dexmedetomidine and Propofol for Sedation in the Intensive Care Unit

**22.** Adenovirus-Associated Diseases among Children in a Tertiary-Care Hospital

**23.** Dexmedetomidine versus Dexamethasone as an Adjuvant to Ropivacaine in Ultrasound-Guided Supraclavicular Brachial Plexus Block

**24.** Dexmedetomidine versus Dexamethasone as an Adjuvant to Ropivacaine in Erector Spinae Plane Block for Lumbar Spine Surgery

## Flagship Projects

### 1. Incidence of Pregnancy-Associated Acute Kidney Injury in Low- and Middle-Income Countries: A Meta-analysis

**Objectives:** To estimate the incidence, major causes and maternal and fetal outcomes of pregnancy-associated acute kidney injury in low- and middle-income countries.

**Brief Background:** Pregnancy-associated acute kidney injury is an important contributor to maternal and fetal morbidity and mortality, with a disproportionate burden in lower-resource countries. Existing evidence is fragmented because diagnostic definitions and reporting methods vary.

**Methodology.** A PROSPERO-registered systematic review and meta-analysis examined pregnancy-associated acute kidney injury (AKI) in low- and middle-income countries. Searches covered major databases from 2013–March 2025. Forty studies using comparable KDIGO criteria were included in pooled analyses. The review assessed AKI incidence, maternal and fetal outcomes, and causes, using random-effects meta-analysis, subgroup analyses, meta-regression, and risk-of-bias assessment to address heterogeneity.

**Results.** Forty-three studies were included in the systematic review and 40 in the quantitative meta-analysis, representing 424,081 pregnancies across 15 low- and middle-income countries.

The pooled incidence was 91 cases per 10,000 pregnancies (95% CI 63-133). The highest regional estimate was in the WHO African Region at 254 cases per 10,000 pregnancies (95% CI 152-421), illustrating marked geographical inequity.

Case fatality among women with pregnancy-associated acute kidney injury was 10.8% (95% CI 7.6-15.3). Neonatal death or stillbirth occurred in 29.8% of affected pregnancies (95% CI 24.2-36.1). Compared with pregnancies without acute kidney injury, the condition was associated with 18.8-fold higher odds of maternal death and 4.6-fold higher odds of an adverse fetal outcome.

Pre-eclampsia and related hypertensive disorders accounted for 44.1% of cases, obstetric haemorrhage for 26.2% and sepsis for 16.5%. These causes are substantially preventable or amenable to earlier recognition, providing a clear programme and policy focus.

**Conclusion:** Pregnancy-associated acute kidney injury is a major preventable maternal-health problem in low- and middle-income countries. Improved antenatal care, early recognition and prevention of pre-eclampsia, haemorrhage and sepsis are priority interventions.

#### Key Achievements

- Produced one of the most comprehensive contemporary estimates of pregnancy-associated acute kidney injury in lower-resource settings.
- Quantified both the clinical burden and preventable aetiological profile, providing evidence for investment in antenatal care, emergency obstetric care and kidney-support services.

#### Highlights

- 424,081 pregnancies from 15 countries.

- Pooled incidence: 91 per 10,000 pregnancies.
- Maternal case fatality 10.8%; neonatal death or stillbirth 29.8%.

## 2. Epidemiology and Clinical Outcome of Common Multidrug-Resistant Gram-Negative Bacterial Infections in a Network of Hospitals in India (IMPRES)

**Objectives:** To describe the clinical profile, resistance patterns and 28-day outcomes of ICU patients infected with Pseudomonas aeruginosa, Escherichia coli, Acinetobacter baumannii or Klebsiella pneumoniae across India.

**Brief Background:** Antimicrobial resistance is increasing rapidly in Indian intensive care units. These four gram-negative organisms account for a substantial proportion of isolates and are frequently resistant to commonly used empirical antibiotics.

**Methodology.** IMPRES was a prospective, multicentre observational study conducted in adult intensive care units at 19 hospitals across India. The protocol was registered with the Clinical Trials Registry-India and implemented after ethics approval and written consent.

Consecutive critically ill patients with clinically significant infection and microbiological confirmation of one of four common gram-negative "PEAK" organisms – Pseudomonas aeruginosa, Escherichia coli, Acinetobacter baumannii or Klebsiella pneumoniae – were enrolled. Patients not treated with curative intent and those participating in another trial were excluded.

A standard electronic case-record form captured demographics, comorbidity, diagnosis, APACHE II severity, infection site, community- versus hospital-acquired infection, risk factors for multidrug resistance, empirical and definitive antimicrobial therapy, susceptibility and resistance mechanisms, organ dysfunction, ventilator days and outcome.

**Results.** Of 1,052 enrolled patients, 936 were included in the final analysis. The study documented a very high resistance burden across commonly used agents: 84% to cephalosporins, 68% to fluoroquinolones, 55% to piperacillin-tazobactam, 47% to carbapenems and 37% to aminoglycosides. Colistin resistance, although less common, was present in 4.2%.

Overall crude 28-day mortality was 23.5%. Mortality was higher when the cultured isolate was resistant to the empirical antibiotic regimen than when it remained susceptible (29.6% versus 21.4%), although this comparison did not reach statistical significance.

Patients with carbapenem-resistant PEAK infection had 32% mortality and those with colistin-resistant infection had 27% mortality. These results indicate that resistance to last-line agents identifies a particularly vulnerable ICU subgroup.

**Conclusion:** Multidrug resistance is highly prevalent in Indian ICUs and is associated with substantial mortality. The findings reinforce the need for local antibiograms, early appropriate therapy and strengthened antimicrobial stewardship.

**Key Achievements:** Created a national multicentre clinical dataset linking gram-negative resistance patterns with 28-day ICU outcomes. Demonstrated the magnitude of resistance to both standard empirical regimens and reserve antibiotics, directly informing stewardship and infection-control priorities.

### Highlights

- 936 analysable ICU patients across 19 hospitals.

- Carbapenem resistance in 47%; colistin resistance in 4.2%.
- Overall 28-day mortality: 23.5%.

### 3. A Real-World Multicenter Cross-Sectional Observational Study to Assess the Clinical Profile of Peripheral Neuropathy in Patients with Diabetes

**Objectives:** To determine the prevalence and characteristics of foot-health problems and identify factors associated with foot deformities among Indian patients with type 2 diabetes and diabetic peripheral neuropathy.

**Brief Background:** Diabetic peripheral neuropathy and structural foot abnormalities increase ulcer and amputation risk. Large, real-world Indian data on symptoms, deformities and associated clinical risk factors have been limited.

**Methodology.** This real-world, retrospective cross-sectional study analysed 4,290 adults with type 2 diabetes and diabetic peripheral neuropathy from 543 primary, secondary and tertiary-care centres across multiple Indian states.

Information was collected during a single clinical visit between October and November 2023. Demographic and anthropometric data, diabetes duration, HbA1c, treatment, smoking, alcohol use and previous COVID-19 were documented.

Neuropathic symptoms including burning, tingling, muscle cramps and loss of sensation, together with dry skin, infection, ingrown toenails and structural foot abnormalities were recorded. Major microvascular and macrovascular comorbidities were also captured.

**Results.** The cohort had a mean age of 51.1 years; 67.7% were men and 32.3% women. The commonest foot-health findings were dry skin (44%), infection (19.7%) and ingrown toenails (16.6%). Burning sensation was reported by 35.4%, muscle cramps by 31.5% and loss of sensation by 26.6%, demonstrating a substantial symptomatic neuropathy burden.

The strongest independent associations with multiple foot complications were nephropathy (OR 3.96), retinopathy (OR 3.85) and coronary artery disease (OR 3.48). Prior COVID-19, smoking, hypertension and dyslipidaemia approximately doubled the odds; alcohol use and higher HbA1c were also significant.

Diabetes duration was not independently associated with the number of foot complications. This finding emphasises that structured foot examination should begin early and should not be deferred merely because diabetes is of shorter duration.

**Conclusion:** Foot-health abnormalities and neuropathic symptoms are common among Indian patients with diabetes. Routine structured foot assessment and early management should be integrated into diabetes care regardless of disease duration.

**Key Achievements**

- Established a large multicentre Indian profile of neuropathic symptoms and foot-health abnormalities in routine diabetes care.
- Identified both high-risk comorbidities and modifiable behaviours that can be incorporated into targeted foot-screening pathways.

**Highlights**

- 4,290 patients from 543 centres.
- Dry skin 44%; foot infection 19.7%.
- Nephropathy and retinopathy were the strongest predictors of multiple foot complications.

## Priority Projects

### 4. Bi-Allelic Splicing Variant, c.153-2A>C in TOMM7 Is Associated with Leigh Syndrome

**Objectives:** To establish the clinical and molecular consequences of a novel homozygous TOMM7 splice-site variant in an infant with Leigh syndrome.

**Brief Background:** TOMM7 regulates assembly and stability of the mitochondrial outer-membrane translocase complex. Previously reported TOMM7 variants were associated with progeroid and developmental phenotypes, while severe neonatal mitochondrial disease was poorly characterised.

**Methodology.** This was a molecularly characterised case report of a four-month-old girl with severe neonatal-onset neurological and metabolic disease. The child underwent detailed clinical assessment for hypotonia, developmental impairment, lactic acidosis and optic atrophy. Biochemical investigations and brain MRI were used to evaluate a suspected mitochondrial encephalopathy and demonstrated a Leigh syndrome pattern. Exome/genomic testing identified a novel homozygous canonical splice-site variant, TOMM7 c.153-2A>C. Parental testing established the expected inheritance and helped assess segregation within the family. RNA was obtained from the parents and converted to complementary DNA. Transcript analysis was performed to determine whether the variant altered normal splicing, thereby providing functional evidence beyond computational prediction.

**Results.** The infant presented with neonatal hypotonia, persistent lactic acidosis, optic atrophy and severe early neurological impairment. Neuroimaging showed symmetrical abnormalities consistent with Leigh disease, supporting a primary mitochondrial disorder. Genetic testing detected the novel biallelic TOMM7 c.153-2A>C splice variant. TOMM7 encodes a component that regulates assembly and stability of the translocase of the outer mitochondrial membrane complex, making loss of function biologically compatible with impaired mitochondrial protein import. Complementary-DNA analysis demonstrated shorter abnormal transcripts resulting from aberrant splicing. This functional evidence confirmed that the canonical splice-site change disrupted normal RNA processing rather than representing an incidental rare variant. The case extended the TOMM7 phenotype from the previously described progeroid, lipodystrophic and developmental presentations to a severe neonatal mitochondrial encephalopathy with a Leigh syndrome pattern.

**Conclusion:** Bi-allelic loss-of-function TOMM7 variants can cause severe, early-onset mitochondrial disease with a Leigh syndrome phenotype.

### Key Achievements

- Established a new genotype-phenotype relationship between biallelic TOMM7 loss of function and Leigh syndrome.
- Used transcript-level functional analysis to confirm the pathogenic mechanism of a novel splice variant.

**Highlights**

- Novel TOMM7 c.153-2A>C variant.
- Aberrant splicing demonstrated on cDNA analysis.
- Broadens TOMM7-associated disease to severe neonatal Leigh syndrome.

### 5. Investigating the Efficacy of Non-Invasive Vagus Nerve Stimulation in Treating Drug-Resistant Epilepsy

**Objectives:** To evaluate whether adjunctive non-invasive vagus nerve stimulation reduces seizure frequency and improves quality of life in patients with drug-resistant epilepsy.

**Brief Background:** Approximately one-third of people with epilepsy remain inadequately controlled despite appropriate antiseizure medicines. Implantable vagus nerve stimulation can be beneficial but requires surgery, creating interest in non-invasive alternatives.

**Methodology.** The study enrolled 120 patients with drug-resistant epilepsy and assigned 60 to active non-invasive cervical vagus nerve stimulation and 60 to a sham-control procedure. Participants continued their established antiseizure medicines during the 12-week intervention. Active stimulation was applied over the cervical vagus nerve for two minutes on each side of the neck, three times daily. The control group received sham stimulation intended to mimic treatment exposure without active neuromodulation. Monthly seizure frequency and Quality of Life in Epilepsy-31 scores were recorded at baseline, six weeks and 12 weeks. Participants were monitored for headache, neck discomfort and other adverse effects. Completion of follow-up was reported for all 120 participants.

**Results.** The active-treatment group began with a mean seizure frequency of 15.8 per month, which declined to 11.2 at six weeks and 8.7 at 12 weeks. This represented a 45% reduction and was statistically significant. The sham group changed from 16.1 seizures per month at baseline to 15.4 at six weeks and 14.8 at 12 weeks, an 8% reduction that was not statistically significant. The separation between groups was evident at six weeks and increased by the end of treatment. Quality-of-life scores in the intervention group improved from 55.4 at baseline to 65.8 at six weeks and 72.0 at 12 weeks, a 30% improvement. Control scores increased only from 54.9 to 57.6, approximately 5%. Mild adverse effects occurred in about 10% of actively treated participants and consisted mainly of headache and transient neck discomfort. No serious treatment-related event was reported. The findings are encouraging but require confirmation in independently monitored and rigorously registered trials.

**Conclusion:** Non-invasive vagus nerve stimulation showed potential as a safe adjunctive treatment for drug-resistant epilepsy, improving both seizure burden and quality of life over 12 weeks.

#### Key Achievements

- Demonstrated clinically meaningful improvement in both seizure burden and patient-reported quality of life with a non-surgical neuromodulation approach.
- Provided preliminary evidence that repeated cervical stimulation can be delivered with mainly minor local adverse effects.

#### Highlights

- 45% reduction in monthly seizure frequency with active treatment.
- 30% improvement in QOLIE-31 score.

- No implanted device or surgical procedure required.

## 6. ANTARTICA Study: Antithrombotic Strategy for the Management of Non-occlusive Thrombus with ST-Segment Elevation Myocardial Infarction in Young Patients

**Objectives:** To evaluate a deferred-intervention antithrombotic strategy using dabigatran and clopidogrel for clinically stable young patients with STEMI, non-occlusive coronary thrombus and preserved TIMI 2/3 flow.

**Brief Background:** Immediate PCI in selected patients with a large thrombus burden may increase distal embolisation and no-reflow. A cost-effective medical strategy that allows thrombus resolution before intervention could reduce procedural risk in carefully selected stable patients.

**Methodology.** The ANTARTICA study was a retrospective proof-of-concept comparison of two management strategies in clinically stable young patients with ST-segment elevation myocardial infarction, substantial but non-occlusive coronary thrombus and preserved TIMI 2 or 3 flow. One hundred and forty-five patients received a deferred-intervention antithrombotic strategy using dabigatran plus clopidogrel. A comparator group of 147 similar patients underwent standard-of-care percutaneous coronary intervention. New York Heart Association functional class and left-ventricular ejection fraction were assessed at presentation and six months. All medically treated patients underwent CT coronary angiography at six months to document persistence or resolution of the thrombus. Clinically important bleeding, recurrent myocardial infarction and cardiac mortality were recorded. Because treatment allocation was retrospective and selected, the analyses were interpreted as hypothesis-generating rather than as proof of equivalence or superiority.

**Results.** CT coronary angiography at six months demonstrated complete thrombus resolution in all patients managed with dabigatran and clopidogrel. This was the study's principal angiographic proof-of-concept finding. Functional improvement was greater in the antithrombotic arm: mean NYHA class improved from 3.53 to 1.07, compared with 3.60 to 1.49 after standard PCI (P=0.013). Mean left-ventricular ejection fraction increased from 45.1% to 49.2% in the medical-treatment group, while the control group changed only from 44.0% to 44.9% (P<0.001 for the comparative improvement). TIMI bleeding and reinfarction were reported to be low, and there was no mortality in either group.

**Conclusion:** The findings provide proof-of-concept that a deferred, combined antithrombotic approach may be feasible in highly selected stable young STEMI patients with non-occlusive thrombus. Prospective controlled validation is required before broader adoption.

### Key Achievements

- Generated proof-of-concept evidence for a deferred antithrombotic strategy in a narrowly defined STEMI subgroup.
- Demonstrated complete imaging-confirmed thrombus resolution with favourable six-month functional and ventricular outcomes in the selected medical arm.

### Highlights

- 145 antithrombotic-strategy patients versus 147 PCI controls.

- Complete thrombus resolution in the medical arm.
- No mortality reported in either group.

## 7. Clinical Profile and Risk Factors of Dilated Cardiomyopathy with 10 Years Follow-Up: A Study from South India

**Objectives:** To describe the clinical profile and cardiovascular risk factors of patients with dilated cardiomyopathy (DCM). To estimate mortality over long-term follow-up and describe the recorded causes of death. To determine which baseline characteristics were independently associated with mortality.

**Background:** Dilated cardiomyopathy is characterised by ventricular dilatation and impaired systolic function and can lead to progressive heart failure, arrhythmia, thromboembolism and sudden death. Prognosis varies widely and depends on age, severity, comorbidity, aetiology and response to treatment. Indian long-term cohorts are relatively uncommon, particularly those examining metabolic and endocrine comorbidities such as diabetes and thyroid dysfunction. This study followed a South Indian hospital cohort for up to ten years to characterise presentation, common risk factors and predictors of mortality.

**Methodology:** A prospective observational study (2012–2022) followed 210 patients with dilated cardiomyopathy (DCM) for 1–10 years. DCM was diagnosed using echocardiographic evidence of LV dilatation and reduced systolic function. Clinical history, examination, laboratory tests, ECG and echocardiography were performed, with NYHA functional classification and assessment of cardiovascular risk factors. Patients were followed every 6–12 months, with survival assessed in person or by telephone. Statistical analysis included chi-square tests, regression analysis for mortality predictors, and Kaplan-Meier survival analysis, with $p < 0.05$ considered significant**.**

**Results:** Over a mean 6.5-year follow-up**,** 68 patients (32.3%) died, with most deaths reportedly due to sudden cardiac death. Mortality was associated with older age, hypertension, diabetes, alcohol use, thyroid dysfunction and advanced NYHA class. In adjusted analysis, age ≥65 years, hypertension, diabetes, alcohol consumption and thyroid dysfunction remained significant predictors of mortality. Smoking and dyslipidaemia were not significant, while CKD could not be reliably assessed in the adjusted model. Overall, the study identified older age and cardiometabolic, alcohol-related and thyroid disorders as important mortality risk factors, but findings were limited by single-centre recruitment, loss to follow-up and limited characterization of DCM aetiology.

**Conclusion:** Over a mean follow-up of 6.5 years, approximately one-third of the DCM cohort died, most recorded deaths being sudden cardiac deaths. Older age, hypertension, diabetes, alcohol consumption and thyroid dysfunction independently marked higher mortality risk.

### Highlights of the results

- Mortality was 32.3% over follow-up extending to ten years.
- Sudden cardiac death accounted for 76.4% of recorded deaths.
- Hypertension (70.4%) and diabetes (61.9%) were highly prevalent.
- Alcohol consumption showed the largest reported adjusted association with mortality.
- Thyroid dysfunction was common and independently associated with death.

### 8. Screening for Primary Aldosteronism in Type 2 Diabetic Patients with Resistant Hypertension: A Prospective Study at a Tertiary Care Hospital in Southern India

**Objectives:** To assess screening positivity and confirmed primary aldosteronism among patients with type 2 diabetes and resistant hypertension using a pragmatic approach without routine withdrawal of antihypertensive medication**.**

**Brief Background:** Primary aldosteronism is a common and treatable cause of endocrine hypertension with major cardiovascular consequences. Screening is often underused because medication modification and confirmatory testing can be difficult in routine practice.

**Methodology.** This prospective tertiary-centre study screened 85 adults with type 2 diabetes and resistant hypertension for primary aldosteronism. Paired plasma aldosterone concentration and direct renin concentration were collected between 8 and 10 am while patients continued their clinically necessary antihypertensive medicines. Measurements were performed by chemiluminescent immunoassay. A screen was positive when aldosterone exceeded 10 ng/dL, direct renin was below 12 microIU/mL and the aldosterone-to-renin ratio exceeded 2.5. Spontaneous hypokalaemia with markedly elevated aldosterone and suppressed renin allowed direct confirmation; other screen-positive participants were offered seated saline-infusion testing. We documented not only biochemical results but also acceptance or refusal of confirmatory testing, thereby assessing practical barriers to completing the diagnostic pathway.

**Results.** Eighteen of 85 patients (21%) met all three biochemical screening criteria. This relatively high screen-positive proportion indicates that primary aldosteronism should be actively considered in diabetes with resistant hypertension. Two of the 18 had baseline hypokalaemia, aldosterone above 20 ng/dL and suppressed renin and were considered confirmed without an additional suppression test. Of the remaining 16 screen-positive participants, 13 declined confirmatory testing. Three underwent seated saline infusion: two failed to suppress aldosterone and were confirmed, while one suppressed appropriately and was excluded. Four patients were therefore confirmed, giving a minimum prevalence of 4.7%. Because most screen-positive patients did not complete confirmation, the true prevalence may have been higher. The attrition highlights the need for simpler confirmatory strategies and pragmatic screening guidance.

**Conclusion:** Primary aldosteronism is clinically relevant in resistant hypertension with diabetes. Pragmatic screening without unsafe medication withdrawal and the development of simpler, validated confirmatory strategies may improve case detection.

**Key Achievements**

- Demonstrated the feasibility of screening without routinely withdrawing antihypertensive medication.
- Quantified the major loss of patients at the confirmatory stage, identifying a modifiable implementation barrier in endocrine-hypertension care.

**Highlights**

- 85 patients with diabetes and resistant hypertension.

- 21% screened positive.
- Minimum confirmed prevalence: 4.7%; 13 positive screens declined confirmation.

## 9. Concordance between LDL Cholesterol Estimated by Various Formulas and Directly Measured LDL Cholesterol

### Objectives

- To compare LDL cholesterol values calculated with six commonly used equations against directly measured LDL-C.
- To quantify agreement, bias and limits of agreement, particularly when triglycerides were <=400 mg/dL.
- To identify formulas that may provide the most reliable estimates in the local clinical population.

**Background:** LDL-C is a central marker for assessing atherosclerotic cardiovascular risk and guiding lipid-lowering treatment. Direct homogeneous assays are available but can be more expensive or less accessible than calculation from total cholesterol, HDL-C and triglycerides. The Friedewald equation remains widely used, although accuracy can decline at higher triglyceride concentrations or low LDL-C. Newer equations, including Sampson and extended Martin/Hopkins, and population-derived alternatives such as Anandaraja and de Cordova, may behave differently across settings. Local validation is therefore important before equations are used interchangeably in clinical decision-making.

**Methodology:** A prospective laboratory comparison was conducted at Yashoda Hospital, Secunderabad, from 1–28 February 2025. It included 1,020 adults aged 18–65 years with complete lipid profiles. Patients with major metabolic, hepatic, renal or pancreatic disorders and those receiving lipid-modifying drugs or steroids were excluded. Direct LDL-C was measured enzymatically and compared with LDL-C estimated using six equations: Friedewald, DeLong, Sampson, Anandaraja, de Cordova and extended Martin/Hopkins. Agreement was assessed using Lin's concordance correlation coefficient, mean differences, limits of agreement and Bland–Altman plots. Statistical significance was set at $p<0.05$.

**Results:** The 1,020 participants included 619 men and 401 women, with a mean age of 40.9±8.0 years. Among equations applied at triglycerides ≤400 mg/dL, DeLong showed the best agreement with direct LDL-C (concordance coefficient 0.962; mean difference −1.6 mg/dL), followed closely by Sampson (0.960; 1.89 mg/dL). Friedewald also showed good concordance (0.949; 3.82 mg/dL), while extended Martin/Hopkins showed lower agreement (0.935) and greater positive bias (9.68 mg/dL). Without triglyceride restriction, de Cordova (0.924) outperformed Anandaraja (0.887). Overall, DeLong and Sampson were the most concordant methods. The findings highlight the importance of local validation of LDL-C equations, particularly because the study population excluded several common clinical conditions and treatments.

**Conclusion:** DeLong and Sampson showed the closest overall agreement with directly measured LDL-C in this cohort. Formula selection should be validated against the local assay and patient population, especially when therapeutic decisions depend on small differences around treatment thresholds.

**Highlights of the results**

- DeLong had the highest concordance coefficient (0.962).
- Sampson was nearly equivalent (0.960) with low mean bias.
- Friedewald retained good overall concordance (0.949).
- Extended Martin/Hopkins showed the largest reported mean positive difference (9.68 mg/dL).
- Anandaraja had the weakest concordance despite a small average bias.

## 10. Screening for Peripheral Neuropathy and Peripheral Vascular Disease in Patients with Type 2 Diabetes Mellitus: A Community-Based Cross-Sectional Study from Rural Andhra Pradesh, India

**Objectives:** To assess neuropathic symptoms, peripheral vascular status and foot-care practices among adults with type 2 diabetes in rural Andhra Pradesh.

**Brief Background:** Rural patients with diabetes often have limited access to complication screening and foot-care education. Peripheral neuropathy and vascular disease may therefore remain undetected until ulceration or infection develops.

**Methodology.** This community-based cross-sectional study was conducted in five villages in rural Andhra Pradesh. Using random sampling, 173 known adults with type 2 diabetes aged 40 years or older were recruited. The study focused on individuals already living in the community rather than patients selected from a specialist diabetic-foot clinic. Structured interviews documented diabetes treatment, comorbidities, recent HbA1c testing and routine foot-care behaviours. Clinical examination assessed symptoms and signs of peripheral neuropathy and recorded peripheral vascular status qualitatively through pedal-pulse screening. The prevalence of neuropathic symptoms, vascular findings, monitoring gaps and preventive behaviours was summarised to identify practical targets for village-level intervention.

**Results.** Loss of hot/cold discrimination was reported by 153 of 173 participants (88.4%), indicating a very high burden of sensory impairment. Seventy-five per cent had at least one additional comorbidity. Although 164 participants (94.8%) were receiving treatment for diabetes, only 29 (16.8%) had undergone an HbA1c test during the preceding year. Treatment coverage therefore did not translate into adequate monitoring of metabolic control. Preventive foot-care practices were extremely limited. Only six participants (3.5%) reported applying moisturiser between the toes, and only three (1.7%) regularly used a mirror to inspect the soles of their feet. People were taking diabetes medication but had little access to complication screening, glycaemic monitoring or structured foot-care education. Community health workers and primary-care teams could address these deficiencies through recurring screening and practical demonstrations.

**Conclusion:** Peripheral complications and poor self-care practices are widespread in rural communities. Community screening, education and linkage to regular metabolic monitoring are urgently needed.

### Key Achievements

- Provided village-level evidence on the disconnect between diabetes treatment and complication prevention.
- Identified simple, measurable behaviours and monitoring gaps that can be targeted through community foot-care programmes.

### Highlights

- 173 participants from five villages.
- 88.4% reported impaired temperature discrimination.

- Only 16.8% had annual HbA1c testing; only 1.7% used a mirror for foot inspection.

## 11. Assessment and Reassessment of Muscle Mass in Critically Ill Patients by Bedside Classic Anthropometrics: Will That Be Enough?

### Objectives

- To determine whether conventional bedside anthropometric measurements can detect nutritional deterioration during ICU stay.
- To compare Nutritional Risk Screening (NRS) and Subjective Global Assessment (SGA) classifications.
- To examine associations between anthropometric status and discharge outcome.

**Background:** Critical illness causes muscle wasting and nutritional decline. Simple bedside measures such as weight, BMI, MUAC, triceps skinfold, MAMC and calf circumference may help monitor these changes.

**Methodology:** This single-centre observational study included 147 adults admitted to the ICU at Yashoda Hospital, Secunderabad, from January–June 2024. Anthropometric measurements and NRS/SGA scores were recorded at ICU admission and discharge. Clinical and nutritional data and outcomes were analysed using SPSS 21, with $p<0.05$ considered significant.

**Results:** Patients received only 56.07% of prescribed energy and 51.3% of protein on average. Weight, MUAC, triceps skinfold, MAMC and calf circumference decreased significantly during ICU stay ($p=0.001$), whereas BMI showed no significant change ($p=0.065$). NRS identified 53.1% as moderately and 8.8% as severely malnourished. Lower anthropometric measurements were associated with adverse outcomes. MAMC ($p=0.002$), calf circumference ($p=0.005$), BMI, MUAC and triceps skinfold differed significantly across outcome groups. Repeated bedside anthropometry, particularly MUAC and muscle-related measures, may therefore provide a practical way to monitor nutritional and functional decline in critically ill patients.

### Conclusion

Simple repeated anthropometric measures detected substantial nutritional and muscle-related decline during ICU stay and were associated with discharge outcome. They are useful bedside tools, and may complement rather than replace structured nutrition assessment and clinical judgement.

### Highlights of the results

- Weight, MUAC, triceps skinfold, MAMC and calf circumference declined significantly.
- NRS classified 61.9% as moderate or severe risk.
- SGA classified 47.6% as moderately or severely malnourished.
- Patients who died had the lowest mean anthropometric values.
- MUAC and MAMC showed strong practical discrimination across outcomes.

## 12. The Role of Artificial Intelligence and Machine Learning in the Assessment, Diagnosis, and Prediction of Cerebral Small Vessel Disease

### Objectives

To synthesise current evidence on the use of artificial intelligence and machine learning for imaging assessment, early detection, risk prediction, clinical decision support and prognosis in cerebral small vessel disease and stroke.

### Brief Background

Cerebral small vessel disease contributes substantially to stroke and vascular cognitive impairment, but conventional interpretation of subtle and heterogeneous imaging markers is time-consuming and variable.

**Methodology.** A narrative review searched PubMed through January 2025 for AI and machine-learning applications in cerebral small vessel disease and stroke. From 390 publications, 122 relevant studies were included after screening, comprising 11 randomised trials, 23 systematic reviews and 9 meta-analyses. The review assessed AI for imaging, lesion detection, outcome prediction, biomarkers, wearables and clinical workflows, while also considering generalisability, bias, interpretability, safety and cost.

**Results.** AI-assisted non-contrast CT interpretation for intracerebral haemorrhage achieved approximately 93% sensitivity and 92% specificity in representative studies. Automated stroke-alert pathways shortened door-to-needle time by about 18-25 minutes and enabled faster notification of specialist teams. Machine-learning models improved automated segmentation and burden measurement of white-matter hyperintensities, reducing inter-rater variability. Classification of enlarged perivascular spaces on MRI reached approximately 94% accuracy in selected datasets. Some models predicted 90-day disability more accurately than clinician assessment (approximately 89% versus 72% in cited evidence), and AI tools showed potential in gait, eye-tracking, retinal-image, EEG, risk-factor and recurrence prediction. However, better workflow did not consistently translate into improved 90-day functional independence. Performance was often weaker in older adults, people with diabetes and populations under-represented in training datasets. The evidence base remained dominated by retrospective or single-centre validation. The review therefore identified external validation, equity, explainability, governance and health-economic evaluation as prerequisites for safe deployment.

**Conclusion:** AI can strengthen diagnosis, risk stratification and workflow efficiency in stroke and cerebral small vessel disease, but safe routine implementation requires external validation, explainability, bias control and clear governance.

### Key Achievements

- Synthesised 122 studies across imaging, prediction, biomarkers and implementation rather than considering individual AI tools in isolation.
- Balanced promising diagnostic performance with an explicit framework for validation, bias control, explainability and clinical governance.

**Highlights**

- 122 studies retained from 390 screened publications.
- ICH detection around 93% sensitivity and 92% specificity.
- Implementation priorities: validation, equity, explainability, safety and cost.

## Other Projects

### 13. Prediction of Cardiovascular Disease Risk Using Biomarkers in Blood

#### Objectives

To evaluate selected inflammatory, cardiac and lipid biomarkers as predictors of cardiovascular disease and to develop a combined biomarker model for risk classification.

#### Brief Background

Clinical risk factors alone may not identify all individuals at high cardiovascular risk. Biomarkers reflecting inflammation, myocardial injury and lipid metabolism may improve early detection and risk stratification.

**Methodology.** The study included 300 adults aged 40–70 years: 150 with confirmed cardiovascular disease and 150 healthy controls. After overnight fasting, blood samples were collected to measure hs-CRP, troponin I, LDL-C, HDL-C and IL-6. Biomarker levels were compared between groups, while ROC curves assessed individual diagnostic performance. Multivariable analysis evaluated whether combining inflammatory, myocardial-injury and lipid biomarkers improved cardiovascular risk classification.

**Results.** All five biomarkers differed significantly between participants with and without cardiovascular disease. The direction of change was biologically consistent: inflammatory and myocardial-injury markers and LDL cholesterol were higher in cardiovascular disease, while HDL cholesterol was lower. C-reactive protein showed the strongest individual discrimination with an area under the ROC curve of 0.89. Troponin I was the next strongest individual predictor with an AUC of 0.85, indicating that both systemic inflammation and subclinical myocardial injury contributed substantial diagnostic information. A combined model incorporating C-reactive protein, troponin I and LDL cholesterol achieved 88% sensitivity and 84% specificity. The combined approach performed better than reliance on a single biomarker and illustrates the potential value of multimarker risk assessment. The results support further prospective validation of an integrated blood-biomarker panel for earlier cardiovascular risk identification.

**Conclusion:** A multimarker approach combining inflammatory, myocardial-injury and lipid markers may support earlier identification and clinical risk stratification of cardiovascular disease.

#### Key Achievements

- Demonstrated that integrating inflammatory, cardiac-injury and lipid biomarkers can improve cardiovascular disease classification.
- Identified C-reactive protein and troponin I as the most informative individual measures in the studied population.

#### Highlights

- 300 participants: 150 cardiovascular disease cases and 150 controls.
- CRP AUC 0.89; troponin I AUC 0.85.

- Combined panel sensitivity 88% and specificity 84%.

## 14. Clonidine versus Dexmedetomidine as an Adjuvant to Bupivacaine in Ultrasound-Guided Supraclavicular Brachial Plexus Block

### Objectives

- To compare clonidine and dexmedetomidine as adjuvants to bupivacaine for supraclavicular brachial plexus block.
- To compare onset and duration of sensory and motor block, duration of analgesia and rescue analgesic requirement.
- To assess haemodynamic stability and adverse effects.

**Background:** Ultrasound-guided supraclavicular block can provide surgical anaesthesia and prolonged postoperative analgesia for forearm procedures while reducing reliance on general anaesthesia and systemic opioids. Alpha-2 adrenergic agonists are used as adjuvants to extend block duration. Clonidine has a long history in regional anaesthesia, whereas dexmedetomidine is more alpha-2 selective and may produce a faster, denser and longer block. Direct comparisons are useful because improved analgesia must be balanced against bradycardia, hypotension and sedation.

**Methodology.** A prospective, double-blind, randomised study included 60 ASA I–II adults undergoing both-bone forearm surgery. Patients received ultrasound-guided supraclavicular brachial plexus block with bupivacaine plus either clonidine (n=30) or dexmedetomidine (n=30). Onset and duration of sensory/motor block, pain scores, rescue analgesia and haemodynamic parameters were assessed.

**Results.** The two randomised groups were comparable in age, sex, weight and height. The mean ages were 39.30 +/- 12.9 years in the clonidine group and 35.27 +/- 9.18 years in the dexmedetomidine group. Each group contained 16 men and 14 women. Dexmedetomidine accelerated the onset of both sensory and motor blockade. Mean sensory onset was 3.63 +/- 0.56 minutes with dexmedetomidine versus 5.37 +/- 0.55 minutes with clonidine, and mean motor onset was 5.23 +/- 0.77 versus 6.43 +/- 0.73 minutes; both differences were reported as $p<0.01$. Time to complete sensory and motor block was also shorter with dexmedetomidine.

The duration outcomes consistently favoured dexmedetomidine. Mean sensory block lasted 520.43 +/- 16.31 minutes compared with 426.60 +/- 17.40 minutes in the clonidine group. Mean motor block lasted 503.37 +/- 16.87 versus 412.00 +/- 17.15 minutes. Time to first rescue analgesia was 702.90 +/- 28.69 minutes with dexmedetomidine and 601.43 +/- 23.50 minutes with clonidine, a difference of approximately 101 minutes. These findings indicate that the benefit was not limited to faster onset; the more important clinical effect was extension of postoperative analgesia.

Serial heart-rate measurements did not differ significantly between groups, and systolic and diastolic blood pressures were generally comparable during intraoperative and postoperative observation. Overall, the study supports dexmedetomidine as the more effective adjuvant for prolonging block and analgesia.

### Conclusion

Dexmedetomidine added to bupivacaine produced faster onset and longer sensory block, motor block and analgesia than clonidine.

**Highlights of the results**

- Sensory onset was approximately 1.7 minutes faster with dexmedetomidine.
- Sensory block was prolonged by about 94 minutes.
- Motor block was prolonged by about 91 minutes.
- First rescue analgesia was delayed by about 101 minutes.
- Serial haemodynamic measurements were broadly comparable.

## 15. Hyperbaric Levobupivacaine with Nalbuphine versus Hyperbaric Ropivacaine with Nalbuphine for Lower-Limb Orthopaedic Surgery

### Objectives

- To compare intrathecal hyperbaric levobupivacaine plus nalbuphine with hyperbaric ropivacaine plus nalbuphine.
- To compare onset and duration of sensory and motor blockade and duration of postoperative analgesia.
- To compare haemodynamic effects and adverse events.

**Background:** Spinal anaesthesia is widely used for lower-limb orthopaedic surgery because it is economical, produces rapid anaesthesia and provides reliable muscle relaxation. Ropivacaine and levobupivacaine were developed as alternatives to racemic bupivacaine, with the aim of retaining regional anaesthetic efficacy while reducing cardiac and central nervous system toxicity. Nalbuphine, an opioid agonist-antagonist, can be used intrathecally as an adjuvant. The clinically relevant question is whether one local anaesthetic combination produces faster onset, longer block and better postoperative analgesia without increasing adverse effects.

**Methodology:** A prospective, randomised, double-blind study included 60 ASA I–II adults undergoing elective lower-limb orthopaedic surgery under spinal anaesthesia. Patients received intrathecal nalbuphine with either levobupivacaine (n=30) or ropivacaine (n=30). Block onset and duration, rescue analgesia, pain scores, haemodynamics and adverse effects were assessed.

**Results:** The groups were similar in age, sex and ASA classification. Mean age was 37.9 +/- 12.6 years in the ropivacaine group and 36.2 +/- 12.8 years in the levobupivacaine group. Fifty of the 60 participants (83.3%) were men, and 53 (88.3%) were ASA I. Levobupivacaine produced faster block onset. Sensory block to T10 began at 2.12 +/- 0.72 minutes in Group LB compared with 2.89 +/- 0.47 minutes in Group R. Motor onset was 2.57 +/- 0.60 versus 3.28 +/- 0.49 minutes. Both comparisons were reported as $p<0.01$. Block duration also favoured levobupivacaine. Mean sensory duration was 412.2 +/- 35.9 minutes versus 346.8 +/- 29.7 minutes, an extension of about 65 minutes. Mean motor duration was 317.4 +/- 48.6 versus 247.2 +/- 26.4 minutes, an extension of about 70 minutes. The time to first rescue analgesia was reported as 458.8 +/- 51.3 minutes with levobupivacaine and 373.4 +/- 27.7 minutes with ropivacaine, extending analgesia by approximately 85 minutes. Visual analogue pain scores were comparable during the first three postoperative hours and were lower thereafter in the levobupivacaine group according to the narrative.

### Conclusion

Intrathecal hyperbaric levobupivacaine with nalbuphine produced a faster and longer spinal block and delayed rescue analgesia compared with hyperbaric ropivacaine with nalbuphine. The observed haemodynamic and adverse-event profiles were similar in the two groups.

### Highlights of the results

- Sensory and motor onset were significantly faster with levobupivacaine.
- Sensory block lasted about 65 minutes longer.

- Motor block lasted about 70 minutes longer.
- First rescue analgesia was delayed by about 85 minutes.
- No hypotension or bradycardia was reported in either group.

## 16. Ultrasound-Guided Quadratus Lumborum Block versus Erector Spinae Block after Hip Arthroplasty

### Objectives

- To compare quadratus lumborum block (QLB) and lumbar erector spinae block (ESB) for analgesia after hip arthroplasty.
- To compare pain scores, duration of analgesia and rescue analgesic requirement.
- To evaluate block performance time, mobility, haemodynamic stability and adverse effects.

**Background:** Hip arthroplasty causes significant postoperative pain, which may delay mobilisation and increase opioid requirements. Quadratus lumborum block (QLB) and lumbar erector spinae block (ESB) are ultrasound-guided fascial-plane techniques used for hip analgesia. This study compared their analgesic efficacy, opioid-sparing effect, mobility, haemodynamic stability, and safety.

**Methodology:** This prospective, double-blind RCT was conducted at Yashoda Hospital, Secunderabad, from November 2023 to November 2024. One hundred ASA I–II adults undergoing hip arthroplasty were randomised equally to QLB or lumbar ESB. Both groups received the same local-anaesthetic solution and volume under ultrasound guidance after spinal anaesthesia. Outcomes included block performance time, postoperative pain scores, duration of analgesia, rescue analgesic requirements, TUG performance, haemodynamic parameters, oxygen saturation, and adverse events. Statistical significance was set at $p<0.05$**.**

**Results.** The groups were demographically comparable. Block performance time was similar between QLB and ESB **(**15.34 vs 14.97 min; p=0.71**).** ESB produced significantly lower pain scores during the first 6 postoperative hours and a longer duration of analgesia **(**14.28 vs 12.54 h; $p<0.01$**).** Rescue analgesic requirements were also lower with ESB, with two rescue doses needed in 22% vs 54% of patients in the ESB and QLB groups, respectively. TUG times were comparable (14.12 vs 15.43 s; p=0.32**),** and haemodynamic and oxygenation parameters remained similar. Bradycardia occurred in two ESB patients, with no major difference in overall adverse events.

Functional mobility was similar. Overall, ESB provided a modestly longer duration of analgesia and lower rescue analgesic use, with the largest pain-score advantage in the first six hours. The absence of a mobility difference suggests that the analgesic improvement did not translate into a detectable TUG advantage within the study's size and measurement schedule.

**Conclusion:** Lumbar ESB provided modestly superior postoperative analgesia and reduced rescue analgesic requirements compared with QLB, without significant differences in block performance time, early mobility, or haemodynamic stability. Its main benefit was evident during the first 6 postoperative hours.

### Highlights of the results

- Block performance time was comparable between techniques.
- ESB lowered pain scores mainly during the first six postoperative hours.

- Analgesia lasted 14.28 hours with ESB versus 12.54 hours with QLB.
- Two rescue doses were required in 22% of ESB versus 54% of QLB patients.
- TUG mobility times did not differ significantly.

## 17. Ultrasound-Guided Pericapsular Nerve Group Block versus Suprainguinal Fascia Iliaca Compartment Block after Total Hip Arthroplasty

### Objectives

- To compare pericapsular nerve group block (PCNG) with suprainguinal fascia iliaca compartment block (SFIC) after total hip arthroplasty.
- To compare sensory and motor block characteristics, pain scores and duration of analgesia.
- To compare haemodynamic variables and adverse events.

**Brief Background:** Pain after total hip arthroplasty can delay mobilisation. The pericapsular nerve group (PENG) block targets articular branches of the anterior hip and may provide effective analgesia with less motor impairment, while the suprainguinal fascia iliaca compartment (SFIC) block provides broader analgesia. This study compared their analgesic efficacy, block characteristics, haemodynamic effects, and safety.

**Methodology:** This prospective randomised controlled study was conducted in the Department of Anaesthesiology at Yashoda Hospital, Secunderabad, from November 2023 to November 2024. One hundred adult ASA I-II patients scheduled for unilateral primary total knee arthroplasty were randomised into two groups of 50. Patients unable to consent, those allergic to local anaesthetic, chronic strong-opioid users, patients with pre-existing neurological deficits or lung disease, active drug or alcohol misuse and those undergoing bilateral arthroplasty were excluded. Participants received pre-anaesthetic assessment, fasting, pantoprazole and alprazolam premedication, intravenous access and standard ECG, pulse oximetry and non-invasive blood-pressure monitoring. Spinal anaesthesia was administered with 0.5% hyperbaric bupivacaine and buprenorphine. Group A received an ultrasound-guided femoral nerve block with 15 mL of 0.2% ropivacaine followed by catheter placement. Group B received an ultrasound-guided adductor canal block with the same bolus and catheter placement. In the post-anaesthesia care unit, both groups received a continuous 0.2% ropivacaine infusion at 8 mL/hour. Quantitative comparisons used unpaired t tests or Mann-Whitney tests as appropriate, and categorical variables were assessed using standard frequency comparisons. SPSS 26 was used and $p<0.05$ was considered statistically significant.

**Results:** The study included 100 patients, with women representing 75% of the cohort. The groups were similar in sex distribution and ASA class, although mean age was higher in the ACB group (60.12 years) than the FNB group (56.85 years), with p=0.01. Sensory onset was numerically faster with FNB (7.77 +/- 1.27 minutes) than ACB (8.51 +/- 1.32 minutes), but the reported p value of 0.19 indicated no significant difference. Motor onset was likewise similar at 10.72 +/- 2.09 versus 11.04 +/- 2.05 minutes (p=0.5).

The duration pattern differed by modality. Sensory block lasted 510.79 +/- 97.60 minutes with FNB and 615.64 +/- 102.85 minutes with ACB; despite the approximately 105-minute numerical difference, with p=0.11. Motor block lasted 579.5 +/- 92.10 minutes with FNB and 565.32 +/- 92.78 minutes with ACB (p=0.25). The principal analgesic endpoint clearly favoured ACB: mean analgesia lasted 15.59 +/- 4.63 hours compared with 11.04 +/- 3.85 hours after FNB ($p<0.01$), an extension of about 4.55 hours. Pain scores were significantly lower in the ACB group at all measured times except 24 hours.

Rescue analgesic use was lower with ACB, with mean dose counts of 0.91 versus 1.53 ($p<0.01$). Early functional mobility also favoured ACB. At 48 hours, mean Timed Up and Go performance was 13.32 seconds after ACB and 16.82 seconds after FNB ($p<0.01$), consistent with the motor-sparing rationale for adductor canal blockade. Systolic and diastolic blood pressure, heart rate and respiratory rate remained comparable during postoperative monitoring. The results therefore show that continuous ACB did not produce a faster block but provided longer analgesia, reduced rescue medication and improved measured mobility.

**Conclusion:** PENG block provided superior postoperative analgesia and a longer analgesic duration than SFIC block, without significant differences in sensory/motor block characteristics or haemodynamic stability.

**Highlights of the results**

- Analgesia lasted 13.23 hours with the pericapsular block versus 10.89 hours with SFIC.
- Pain scores were lower in the pericapsular group at all reported time points.
- Sensory and motor onset differences were not statistically significant.
- Blood-pressure and heart-rate profiles were comparable.
- The drug concentration and age criteria require clarification.

## 18. Ultrasound-Guided Adductor Canal Block versus Femoral Nerve Block after Total Knee Arthroplasty

### Objectives

- To compare continuous adductor canal block (ACB) with femoral nerve block (FNB) after total knee arthroplasty.
- To compare block characteristics, pain scores, duration of analgesia and rescue analgesic use.
- To evaluate early mobility, haemodynamic stability and adverse effects.

### Background

Effective analgesia after total knee arthroplasty is essential for early ambulation and rehabilitation. Femoral nerve block provides reliable pain relief but may weaken the quadriceps and delay mobilisation. Adductor canal block is intended to preserve more motor function while maintaining sensory analgesia. Continuous catheter techniques may extend benefit beyond the initial bolus. This randomised study compared the two approaches using pain, rescue analgesia and a Timed Up and Go measure of mobility.

**Methodology.** This prospective randomised controlled study was conducted in the Department of Anaesthesiology at Yashoda Hospital, Secunderabad, from November 2023 to November 2024. One hundred adult ASA I-II patients scheduled for unilateral primary total knee arthroplasty were randomised into two groups of 50. Patients unable to consent, those allergic to local anaesthetic, chronic strong-opioid users, patients with pre-existing neurological deficits or lung disease, active drug or alcohol misuse and those undergoing bilateral arthroplasty were excluded. Participants received pre-anaesthetic assessment, fasting, pantoprazole and alprazolam premedication, intravenous access and standard ECG, pulse oximetry and non-invasive blood-pressure monitoring. Spinal anaesthesia was administered with 0.5% hyperbaric bupivacaine and buprenorphine. Group A received an ultrasound-guided femoral nerve block with 15 mL of 0.2% ropivacaine followed by catheter placement. Group B received an ultrasound-guided adductor canal block with the same bolus and catheter placement. In the post-anaesthesia care unit, both groups received a continuous 0.2% ropivacaine infusion at 8 mL/hour.

**Results.** The study included 100 patients, with women representing 75% of the cohort. The groups were similar in sex distribution and ASA class, although mean age was higher in the ACB group (60.12 years) than the FNB group (56.85 years), with p=0.01. Sensory onset was numerically faster with FNB (7.77 +/- 1.27 minutes) than ACB (8.51 +/- 1.32 minutes), but the reported p value of 0.19 indicated no significant difference. Motor onset was likewise similar at 10.72 +/- 2.09 versus 11.04 +/- 2.05 minutes (p=0.5).

Rescue analgesic use was lower with ACB, with mean dose counts of 0.91 versus 1.53 ($p<0.01$). Early functional mobility also favoured ACB. At 48 hours, mean Timed Up and Go performance was 13.32 seconds after ACB and 16.82 seconds after FNB ($p<0.01$), consistent with the motor-sparing rationale for adductor canal blockade. Systolic and diastolic blood pressure, heart rate and respiratory rate remained comparable during postoperative monitoring. The results therefore show that continuous ACB did not produce a faster block but provided longer analgesia, reduced

rescue medication and improved measured mobility. The age imbalance could confound functional comparisons, although the older ACB group nevertheless performed better on TUG.

**Conclusion**

Continuous ACB provided longer analgesia, lower rescue analgesic use and better 48-hour mobility than continuous FNB after total knee arthroplasty. Onset and motor-block duration were broadly similar, while haemodynamic stability was maintained in both groups.

**Highlights of the results**

- ACB extended mean analgesia by approximately 4.55 hours.
- Rescue-dose use was lower with ACB (0.91 versus 1.53).
- 48-hour TUG performance was faster with ACB.
- Block onset was not significantly different.
- Haemodynamic and respiratory variables were comparable.

## 19. Varied Presentations of Meckel's Diverticulum: A Single-Centre Observational Study

### Objectives

- To describe the spectrum of clinical presentations of Meckel's diverticulum encountered at one tertiary centre.
- To illustrate the role of imaging, diagnostic laparoscopy and histopathology in difficult or atypical cases.
- To highlight operative management and decision-making for symptomatic and incidentally discovered diverticula.

### Background

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract, but most affected individuals remain asymptomatic. When complications occur, presentation can mimic appendicitis, nonspecific abdominal pain, gastrointestinal bleeding or small-bowel obstruction. Persistent umbilical discharge due to a patent omphalomesenteric duct is uncommon but important in children. Because no single symptom is diagnostic and imaging can be unrevealing, clinicians often need a high index of suspicion and, in selected cases, diagnostic laparoscopy.

**Methodology.** This observational case series was conducted in the Department of Minimally Invasive and Robotic Gastrointestinal and Bariatric Surgery at Yashoda Hospital, Somajiguda, from January 2022 to March 2025. Nine patients with Meckel's diverticulum were included. Cases were eligible when the diverticulum was diagnosed radiologically or intraoperatively and subsequently confirmed histopathologically when resected. The demographic information, presenting symptoms, imaging findings, intraoperative anatomy, surgical management and clinical outcome were extracted. Three patients presented with intestinal obstruction. One patient had chronic right iliac fossa pain after a childhood appendicectomy. One adolescent presented with prolonged melena and anaemia. Three diverticula were encountered during surgery for appendiceal disease, and one child presented with chronic umbilical discharge from a patent omphalomesenteric tract. Contrast-enhanced computed tomography, ultrasound, endoscopy, fistulography and diagnostic laparoscopy were used according to presentation. Operative treatment included laparoscopic diverticulectomy or wedge resection, adhesiolysis, small-bowel resection and anastomosis when gangrene was present, appendicectomy when indicated, and excision of the umbilical sinus tract with umbilical reconstruction. In two incidentally discovered broad-based diverticula, the surgeons documented the finding but did not resect it.

**Results.** The nine cases demonstrated five distinct clinical patterns. Three patients presented with intestinal obstruction. A 10-year-old boy had constipation, abdominal distension and bilious vomiting; laparoscopy showed volvulus caused by a Meckel's diverticulum with gangrenous small bowel, requiring laparoscopic small-bowel resection and anastomosis. A 51-year-old man had an obstruction in which omentum adherent to the diverticulum created a space through which bowel entered and twisted; laparoscopic adhesiolysis and diverticulectomy were performed. A 40-year-old woman had colicky obstruction caused by torsion of a distended diverticulum around its vertical axis and underwent laparoscopic resection. These cases illustrate several mechanical pathways by which the same congenital anomaly can obstruct bowel.

A 54-year-old woman with recurrent right iliac fossa pain despite appendicectomy in childhood had an unremarkable contrast CT. Diagnostic laparoscopy identified an inflamed Meckel's diverticulum, and wedge resection was performed. A 16-year-old boy with six months of melena and anaemia had negative upper endoscopy and colonoscopy; CT identified a diverticulum, which was removed laparoscopically. These two cases show that a normal conventional work-up does not exclude Meckel's pathology when symptoms persist.

Three patients had appendiceal disease with an incidental diverticulum. A 22-year-old man with acute appendicitis had a long, narrow-neck diverticulum that was prophylactically resected at the time of appendicectomy. A 30-year-old man with perforated appendicitis and a 19-year-old woman with an inflamed pelvic appendix each had a short, broad-based diverticulum; these were left in situ and documented. The contrasting management reflects ongoing uncertainty about prophylactic removal and suggests that morphology and operative context influenced decisions. The ninth patient, a seven-year-old child with persistent umbilical discharge, had a fistulogram and CT demonstrating communication with small bowel through a patent omphalomesenteric duct. Laparoscopic diverticulectomy, sinus excision and umbilical refashioning were undertaken. The series supports laparoscopy as both a diagnostic and therapeutic tool, particularly when symptoms are unexplained or imaging is non-diagnostic.

**Conclusion**

Meckel's diverticulum can present as obstruction, bleeding, chronic pain, an incidental operative finding or a persistent umbilical sinus. Persistent diagnostic suspicion and selective use of laparoscopy are important when common investigations do not explain the clinical picture.

**Highlights of the results**

- Intestinal obstruction was the largest symptomatic group (three cases).
- One patient had chronic pain despite an unremarkable CT and prior appendicectomy.
- One adolescent with melena had negative endoscopy before Meckel's diverticulum was identified.
- Incidental diverticula were resected selectively according to morphology and context.
- A patent omphalomesenteric duct explained chronic umbilical discharge in a child.

## 20. Longitudinal Comparison of RNFL and mGCC Thickness as Predictors of Functional Visual Impairment in Papilledema Secondary to Idiopathic Intracranial Hypertension

### Objectives

- To compare retinal nerve fibre layer (RNFL) and macular ganglion cell complex (mGCC) thickness as structural predictors of visual function in papilledema due to idiopathic intracranial hypertension (IIH).
- To assess relationships with best-corrected visual acuity (BCVA), visual field index (VFI) and pattern standard deviation (PSD) over three visits.
- To examine whether predictive performance differs between eyes and over time.

### Background

IIH is characterised by raised intracranial pressure without an identifiable structural cause and commonly produces papilledema, headache and visual symptoms. Monitoring is difficult because optic-disc swelling can initially increase RNFL thickness, while later axonal loss causes thinning. Macular ganglion cell measurements may detect neuronal injury and central visual dysfunction that is not fully captured by peripapillary RNFL. Longitudinal comparison of both structural measures against visual acuity and field outcomes may improve detection of progression and help avoid relying on a single OCT parameter.

**Methodology.** The study was a longitudinal retrospective analysis of patients with IIH and papilledema. Both right and left eyes were assessed at baseline, one month and three months. Structural assessment used Cirrus spectral-domain optical coherence tomography. The protocol included optic-disc cube 200 x 200 acquisition across a 6 x 6 mm area and high-definition five-line raster scanning. Average circumferential RNFL thickness and mGCC thickness were obtained using the device software. Functional outcomes included best-corrected visual acuity and Humphrey 30-2 visual-field indices, specifically VFI and PSD. We modelled each functional outcome separately using RNFL or mGCC thickness as a predictor for each visit and each eye. Linear regression generated regression coefficients and adjusted R-squared values to describe predictive strength. Correlation patterns were also examined.

**Results.** Across three visits, both RNFL and mGCC thickness were associated with functional visual measurements, but their strengths differed by outcome. RNFL showed a moderate-to-strong positive relationship with VFI in both eyes at all visits, indicating that eyes with greater preserved RNFL thickness tended to retain a better overall visual field. At the first visit, RNFL predicted BCVA with adjusted R-squared values of 0.51 in the right eye and 0.31 in the left eye.

mGCC became more informative for central visual function during later visits. It showed stronger relationships with BCVA, particularly at visits two and three, and was comparable with or somewhat better than RNFL for PSD. Both RNFL and mGCC correlated negatively with PSD, as expected: thinning was associated with greater localised field irregularity. There was slightly stronger overall mGCC correlations in later visits, particularly in the left eye, suggesting that mGCC may be more responsive to evolving neuronal loss after acute disc swelling begins to resolve.

Serial plots showed gradual reductions in both structural measures over the three-month period. mGCC thickness declined more sharply than RNFL between visits one and three, especially in the left eye, indicating asymmetrical structural change. At the same time, RNFL remained consistently stronger for predicting VFI, which represents broader visual-field preservation. RNFL may be more useful for global field function, while mGCC may better reflect central acuity and localised functional change during follow-up.

**Conclusion**

RNFL and mGCC provide complementary information in IIH-related papilledema. RNFL was the more consistent predictor of global visual-field index, while mGCC appeared more sensitive to later central visual and localised field changes.

**Highlights of the results**

- RNFL consistently predicted VFI across visits and both eyes.
- mGCC showed stronger associations with BCVA in later visits.
- Both measures declined over three months, with sharper mGCC thinning.
- Left-eye changes appeared more pronounced, suggesting asymmetric progression.
- Using both OCT markers may be preferable to relying on either alone.

## 21. Comparative Study of Dexmedetomidine and Propofol for Sedation in the Intensive Care Unit

### Objectives

- To compare dexmedetomidine and propofol for sedation of mechanically ventilated ICU patients.
- To assess sedation quality using the Ramsay Sedation Score and analgesia using the visual analogue scale.
- To compare heart rate and blood-pressure effects during 24 hours of infusion.

### Background

Mechanically ventilated ICU patients require sedation to reduce anxiety, improve comfort and facilitate ventilator tolerance. Excessive or unstable sedation can prolong recovery, worsen haemodynamics and complicate assessment. Propofol has rapid onset and offset but can lower blood pressure and provides no intrinsic analgesia. Dexmedetomidine provides cooperative sedation and some analgesic effect but can cause bradycardia.

**Methodology.** This prospective, randomised, double-blind comparative study was conducted in the anaesthesia department of MGM Hospital, Warangal, between 2019 and 2021. Sixty ICU patients aged 18-60 years who required immediate sedation to initiate and tolerate mechanical ventilation were allocated by computerised randomisation to two groups of 30. Patients with known or suspected intolerance to either study drug, pregnancy, acute unstable angina or acute myocardial infarction were excluded. Group D received dexmedetomidine as a 1 microgram/kg loading dose over ten minutes followed by 0.2-0.7 micrograms/kg/hour. Group P received propofol as a 0.5-1 mg/kg loading dose followed by 25-75 micrograms/kg/minute. Heart rate and blood pressure were recorded at baseline, after loading and at 30 minutes, 1, 2, 6, 12, 18 and 24 hours. Ramsay Sedation Score and visual analogue pain score were measured at prespecified intervals through 24 hours. Statistical analysis used GraphPad quick-calculation software, analysis of variance for demographic comparisons, paired t tests for within-group changes and independent t tests for between-group comparisons.

**Results.** The groups were demographically comparable. Mean age was 35.5 +/- 14.7 years in the dexmedetomidine group and 40.2 +/- 13.4 years in the propofol group (p=0.329). Mean weights were 66.1 and 68.5 kg, respectively, and 65% of all participants were men. Baseline systolic and diastolic blood pressures did not differ significantly. After infusion, blood pressure decreased in both groups, but the decline was consistently greater with propofol. At 30 minutes, mean systolic pressure was 114.2 mmHg with dexmedetomidine and 104.5 mmHg with propofol; by 24 hours the corresponding values were 111.6 and 100.6 mmHg. Diastolic pressure showed a similar pattern, and between-group p values after sedation were <0.0001.

Sedation scores generally favoured dexmedetomidine at intermediate time points. Mean Ramsay scores were 2.9 versus 1.7 at one hour, 3.0 versus 2.1 at two hours and 3.2 versus 2.5 at six hours, all reported as p<0.0001. Differences were smaller later but remained statistically significant in the displayed table at 12 and 24 hours. Pain scores were significantly lower with dexmedetomidine at 30 minutes (1.71 versus 3.3, p=0.0004), but the groups did not differ

significantly at most subsequent time points. Thus, the evidence for an analgesic advantage was strongest immediately after starting sedation rather than uniformly throughout 24 hours.

Heart rate fell in both groups but more markedly with dexmedetomidine. At 30 minutes, mean heart rate was 67.7 beats/minute with dexmedetomidine versus 81.9 with propofol; at 24 hours, values were 61.2 versus 82.1.

**Conclusion**

Dexmedetomidine achieved higher Ramsay sedation scores and was associated with less blood-pressure reduction than propofol, but produced a larger decrease in heart rate.

**Highlights of the results**

- Dexmedetomidine produced higher Ramsay scores at 1, 2 and 6 hours.
- Propofol was associated with lower systolic and diastolic pressures after infusion.
- Dexmedetomidine produced a larger heart-rate reduction.
- A pain-score advantage was clearest at 30 minutes.

## 22. Adenovirus-Associated Diseases among Children in a Tertiary-Care Hospital

### Objectives

- To describe the age distribution, clinical manifestations and comorbid conditions among children diagnosed with adenovirus infection.
- To document hospital stay, respiratory support and antibiotic use.
- To examine age-related differences in symptoms.

### Background

Human adenovirus can cause respiratory, gastrointestinal, ocular and systemic illness, particularly in young children. The clinical picture often includes persistent high fever and raised inflammatory markers and may be mistaken for bacterial infection, contributing to antibiotic use. Severe disease is more likely in young or immunocompromised patients, although most infections are self-limited. Local hospital data can help clinicians recognise the broader phenotype and use respiratory-panel testing more appropriately.

**Methodology.** This was a prospective, observational, single-centre study conducted in the Department of Paediatrics at Yashoda Hospital, Secunderabad, from July to December 2023. The sample comprised 100 children with laboratory-diagnosed adenovirus infection. Eligible participants were boys or girls aged one month to 15 years whose caregivers agreed to participation. Neonates, children older than 15 years and those whose caregivers declined were excluded. Selected patients underwent clinical assessment, blood testing, C-reactive protein measurement and respiratory-panel testing. We reviewed medical history, physical findings and test results and recorded the spectrum of adenovirus-associated illness, symptoms, comorbid conditions, hospital duration, respiratory support and treatment. Age was categorised as <1 year, 1-5 years, 6-10 years and 11-15 years. Symptoms included fever, cough, coryza, shortness of breath, gastrointestinal symptoms, noisy breathing, sore throat, headache, conjunctivitis and ear pain. Comorbid or associated diagnoses such as gastroenteritis with dehydration, adenoid or tonsillar hypertrophy, sepsis, pansinusitis, sickle-thalassaemia and shock with Down syndrome were tabulated. Statistical analysis used SPSS 26. Continuous variables were summarised as mean +/- standard deviation and compared using unpaired t or Mann-Whitney testing according to distribution. Categorical associations were tested using chi-square or Fisher exact procedures, with $p<0.05$ considered significant.

**Results.** The largest age group was 1-5 years, comprising 51% of the 100 children. Infants aged one month to <1 year accounted for 21%, children aged 6-10 years for 24%, and those aged 11-15 years for 4%. Boys modestly outnumbered girls (55% versus 45%). High-grade persistent fever was universal: all 100 children had fever. Cough occurred in 79%, cold symptoms in 67%, vomiting in 34%, shortness of breath in 18%, loose stools in 13%, abdominal pain and noisy breathing in 12% each, sore throat in 10%, headache in 5%, conjunctivitis in 3% and ear pain in 1%. The clinical spectrum therefore extended well beyond a simple upper respiratory infection.

Age-specific analysis showed that cough and loose stools differed significantly across age groups. Cough was reported in 95.2% of infants, 84.3% of children aged 1-5 years, 50% of those aged 6-10 years and all four older children ($p=0.001$). Loose stools occurred in 28.6% of infants,

5.9% of the 1-5-year group, 8.3% of 6-10-year-olds and 50% of the four adolescents (p=0.007). Abdominal pain also showed an age-associated pattern in the table, occurring mainly among 1-5-year-olds. Small cell counts in the oldest category make those percentages unstable.

Seventy-five children had no recorded comorbidity or associated condition. Among the remaining 25, gastroenteritis with dehydration and adenoid hypertrophy each occurred in five patients, tonsillar hypertrophy and sepsis in four each, pansinusitis in three, and sickle-thalassaemia and shock with Down syndrome in two each. Hospital stay was 1-5 days in 44%, 6-10 days in 44%, 11-15 days in 11% and 16-20 days in one child. Nebulisation was used in 69%. Two children received high-flow nasal cannula, two received oxygen and one received both. Azithromycin was not given to 52%; 48% received it, initiated between admission day and day four. All children were discharged without reported complications. The absence of adverse outcomes is reassuring, but the 48% azithromycin exposure despite confirmed viral infection supports timely testing and antimicrobial stewardship.

**Conclusion**

Hospitalised adenovirus-positive children most often presented with persistent fever, cough and coryza, but gastrointestinal and systemic features were also common. Early virological diagnosis may support appropriate supportive care and reduce unnecessary antibiotic use.

**Highlights of the results**

- Fever occurred in 100% and cough in 79% of cases.
- Children aged 1-5 years formed the largest group (51%).
- One-quarter had a recorded comorbidity or associated diagnosis.
- Nearly half received azithromycin despite confirmed viral infection.
- All 100 children were discharged without reported complications.

## 23. Dexmedetomidine versus Dexamethasone as an Adjuvant to Ropivacaine in Ultrasound-Guided Supraclavicular Brachial Plexus Block

### Objectives

- To compare dexmedetomidine and dexamethasone as adjuvants to 0.75% ropivacaine for supraclavicular block.
- To compare onset and duration of sensory and motor blockade and duration of analgesia.
- To compare sedation, haemodynamic stability and adverse effects.

### Background

Supraclavicular brachial plexus block provides anaesthesia for forearm and hand surgery, and adjuvants are frequently added to prolong analgesia. Dexamethasone has a well-established block-prolonging effect, while dexmedetomidine may provide faster onset, prolonged blockade and sedation through alpha-2 agonism. Comparative evidence is useful because any additional benefit must be weighed against bradycardia or excessive sedation.

**Methodology.** This prospective randomised controlled study was conducted over eight months in the Department of Anaesthesia at Yashoda Hospital, Secunderabad, from 1 December 2020 to 1 August 2021. Sixty patients scheduled for forearm or hand surgery were randomised by computer table into two groups of 30. Eligible patients were 21-65 years old and classified as ASA I, II or III. Exclusions included local-anaesthetic allergy, contraindication to regional anaesthesia, pre-existing neurological deficit, lung disease, renal or liver impairment and inability to consent. After ethics approval and written consent, patients underwent pre-anaesthetic evaluation and fasting. Standard ECG, pulse oximetry and non-invasive blood-pressure monitoring were applied, intravenous access was secured and Ringer lactate was administered. Under ultrasound guidance, the subclavian artery and brachial plexus were identified in the supraclavicular fossa and a 20G, 100-mm short-bevel needle was advanced in plane. Group A received 20 mL of 0.75% ropivacaine with dexmedetomidine 50 micrograms. Group B received 20 mL of 0.75% ropivacaine with dexamethasone 8 mg. We measured onset and duration of sensory and motor block, time to rescue analgesia, sedation score, heart rate, oxygen saturation and systolic and diastolic pressure, and recorded adverse effects. Haemodynamic monitoring was frequent during the first 15 minutes, then continued intraoperatively and postoperatively. SPSS 21 was used. Quantitative data were analysed with t or Mann-Whitney tests and categorical data with chi-square or Fisher exact tests, using $p<0.05$.

**Results.** The groups were comparable in age, sex, weight, ASA class and baseline haemodynamic variables. Mean age across the sample was approximately 33.6 years; 63.3% of participants were men and 36.7% women. Most were ASA I or II. Dexmedetomidine accelerated onset. Mean sensory onset was 10 +/- 2.6 minutes with dexmedetomidine compared with 14 +/- 4.1 minutes with dexamethasone ($p<0.0001$). Mean motor onset was 17.6 +/- 2.58 versus 24 +/- 3.99 minutes ($p<0.01$). Thus, the average onset advantage was four minutes for sensory block and more than six minutes for motor block.

Dexmedetomidine also prolonged block duration. Sensory block lasted 18 +/- 4.1 hours compared with 16 +/- 2.6 hours ($p=0.02$), and motor block lasted 17 +/- 2.8 versus 15 +/- 2.6

hours (p=0.0023). Mean duration of analgesia was 19.6 +/- 2.81 hours with dexmedetomidine and 17 +/- 2.52 hours with dexamethasone (p<0.0001). The difference of approximately 2.6 hours is clinically relevant for postoperative rescue-medication timing.

Sedation was greater with dexmedetomidine. At three hours, the mean sedation score was 2.1 +/- 0.3 versus 1.7 +/- 0.4 (p=0.0003). Heart rate, oxygen saturation and systolic and diastolic pressures were described as comparable overall across measurement times. Two patients in the dexmedetomidine group developed bradycardia. No significant oxygen-desaturation signal was identified.

## Conclusion

Dexmedetomidine produced faster onset and prolonged sensory block, motor block and analgesia compared with dexamethasone. It also increased sedation and was associated with bradycardia in two patients, while overall haemodynamics remained stable.

## Highlights of the results

- Sensory onset was four minutes faster with dexmedetomidine.
- Motor onset was more than six minutes faster.
- Analgesia lasted about 2.6 hours longer.
- Dexmedetomidine produced higher sedation scores.
- Bradycardia occurred in two dexmedetomidine recipients.

## 24. Dexmedetomidine versus Dexamethasone as an Adjuvant to Ropivacaine in Erector Spinae Plane Block for Lumbar Spine Surgery

### Objectives

- To compare dexmedetomidine and dexamethasone as perineural adjuvants to 0.2% ropivacaine in bilateral erector spinae plane block for lumbar spine surgery.
- To compare intraoperative opioid requirement, postoperative pain, rescue analgesia and tramadol consumption.
- To evaluate time to mobilisation and perioperative haemodynamic stability.

### Background

Lumbar spine surgery is often followed by moderate or severe postoperative pain, and opioid-heavy analgesia can delay mobilisation and cause nausea, sedation or respiratory effects. Erector spinae plane block is a relatively simple ultrasound-guided fascial-plane technique that may reduce perioperative opioid need. Dexmedetomidine and dexamethasone are both used to prolong regional analgesia, but they act through different mechanisms. A head-to-head comparison can clarify which adjuvant produces a more durable opioid-sparing effect and faster recovery.

**Methodology.** This prospective, randomised, double-blind controlled study was conducted at Yashoda Hospital, Secunderabad, from December 2020 to August 2021. Sixty adults aged 21-75 years, with ASA physical status I-III and BMI 18-35 kg/m2, scheduled for elective lower lumbar spine surgery were randomised into two groups of 30. Exclusions included inability to consent, relevant drug or local-anaesthetic allergy, peripheral neuropathy, BMI above 35, schizophrenia or bipolar disorder, substance misuse and daily use of specified antidepressants, tramadol or morphine. Group A received bilateral ESP block with 28 mL of 0.2% ropivacaine plus dexmedetomidine 1 microgram/kg diluted to 2 mL, divided as 15 mL per side. Group B received 28 mL of 0.2% ropivacaine plus dexamethasone 8 mg in 2 mL, again divided bilaterally. Patients underwent standard general anaesthesia with glycopyrrolate, ondansetron, fentanyl, propofol and atracurium, endotracheal intubation and mechanical ventilation. After induction in the prone position, a low-frequency ultrasound probe was used to identify paraspinal muscles and the transverse process; the needle was advanced in plane and the study solution deposited. Outcomes included surgical duration, total intraoperative fentanyl, serial postoperative pain scores, time to first rescue analgesia, total postoperative tramadol, additional rescue analgesia within 48 hours, time to mobilisation, pulse, mean arterial pressure, systolic and diastolic pressure and oxygen saturation. Analysis used SPSS 21 with chi-square/Fisher tests and t or Mann-Whitney testing.

**Results.** The mean age of the cohort was 49.68 years, and age, sex, ASA class, weight and surgical duration were comparable between groups. Women constituted 63.3% and men 36.7%. Intraoperative fentanyl requirement was lower with dexmedetomidine. The findings were 116.67 +/- 23.97 micrograms in Group A versus 131.67 +/- 24.51 micrograms in Group B ($p=0.02$).

Postoperative analgesia also favoured dexmedetomidine. Mean time to first rescue analgesia was 8.27 +/- 2.20 hours compared with 6.67 +/- 1.99 hours ($p<0.01$). Total postoperative tramadol consumption was 39.17 +/- 45.61 versus 67.18 +/- 53.08 in the dexamethasone group ($p<0.01$).

Only five participants required additional rescue analgesia within 48 hours - one in the dexmedetomidine group and four in the dexamethasone group - although the small count did not provide a stable independent comparison. Numerical pain scores were significantly lower with dexmedetomidine from two through 48 hours. At two hours, means were 0.93 versus 1.90; at 24 hours, 1.60 versus 2.50; and at 48 hours, 1.03 versus 1.90.

Recovery was faster in Group A. Mean time to mobilisation was 1.80 +/- 0.81 days with dexmedetomidine and 2.94 +/- 0.90 days with dexamethasone ($p<0.01$), a difference of more than one day. Pulse rate, mean arterial pressure, systolic and diastolic pressure and oxygen saturation remained comparable at baseline, intubation, post-block and serial intraoperative time points. No major haemodynamic penalty was identified. The combined reduction in fentanyl, lower pain scores, delayed rescue requirement and earlier mobilisation supports a clinically coherent opioid-sparing effect.

**Conclusion**

Dexmedetomidine as an ESP-block adjuvant reduced perioperative opioid requirements, improved pain scores, delayed rescue analgesia and accelerated mobilisation compared with dexamethasone. Haemodynamic measurements were broadly comparable.

**Highlights of the results**

- Intraoperative fentanyl requirement was lower with dexmedetomidine.
- First rescue analgesia was delayed by about 1.6 hours.
- Postoperative tramadol consumption was substantially lower.
- Mobilisation occurred about 1.1 days earlier.
- Pain scores were lower from 2 to 48 hours.

## Overall Institutional Achievements

- Multidisciplinary breadth: Research engagement across clinical specialties, diagnostic disciplines, public health, data science and translational medicine.
- National and international collaboration: Participated in multicentre Indian studies, global reviews, rare-disease genomic collaborations and prospective interventional trials.
- Indian evidence generation: Several studies address locally important gaps, including ICU antimicrobial resistance, rural diabetic-foot prevention, pregnancy-associated kidney injury, endocrine hypertension, long-term cardiomyopathy risk and cardiovascular treatment in South Asian populations.
- Innovation and precision medicine: Exome sequencing, transcript analysis, AI-assisted assessment, multimarker risk classification, non-invasive neuromodulation, local laboratory-method validation and ultrasound-guided regional anaesthesia.
- Research-to-practice potential: The findings can inform empirical antibiotic policies, maternal-risk reduction, diabetic-foot screening, primary-aldosteronism pathways, lipid-reporting methods, perioperative pain management, ICU nutrition and long-term follow-up.

## Closing Note

Collectively, these projects and publications reflect a broad research ecosystem combining work with high-value national and international collaboration. Continued emphasis on prospective designs, transparent data systems, external validation, long-term follow-up and translation into clinical pathways were encouraging. Ethical, patient-centred and policy-relevant medical research are being taken up prospectively.

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## Capacity Building

**Workshops and Trainings** :

| S.No | Year | Event | Event Type | Specialty |
|---|---|---|---|---|
| 1. | 2024 | Resus Rumble | Workshop | Emergency Medicine |
| 2. | 2024 | Advanced Endoscopy Workshop | Workshop | Gastroenterology |
| 3. | 2024 | ICU Management Program | Workshop | Critical Care |
| 4. | 2024 | Medical Genetics Workshop | Workshop | Genetics |
| 5. | 2024 | Academic Grand Rounds | Academic Session | Multi-specialty |
| 6. | 2024 | Fellowship Academic Program | Academic | Multi-specialty |
| 7. | 2024 | Journal Club | Academic Session | Internal Medicine |

**Conference:**

| S.No. | Year | Event | Event Type | Specialty |
|---|---|---|---|---|
| 1. | 2024 | Neuro Conference | Conference | Neurology |
| 2. | 2024 | Women's Health Conference | Conference | Obstetrics & Gynaecology |
| 3. | 2024 | POEM Procedure & Post-Op Care | Webinar | Gastroenterology |
| 4. | 2024 | Beat the Heat – Expert Insights on Heat Stroke | Webinar | Emergency Medicine |
| 5. | 2024 | Toxidromes OP Poisoning | Webinar | Emergency Medicine |
| 6. | 2024 | Pediatric Respiratory Emergencies | Webinar | Pediatrics |
| 7. | 2024 | Nursing Perspective on IBD | Webinar | Gastroenterology |
| 8. | 2024 | Trauma Care | Webinar | Emergency Medicine |

**YEAR - 2024-25**

## Income:

| Income (in Lakhs) | Grants | Donations | Project(s) related | Foreign Contribution | Testing | Others | Total Income (in Lakhs) |
|---|---|---|---|---|---|---|---|
| For R&D Activities | 0 | 388.74 | 0 | 0 | 0 | 3.08 | **391.82** |
| For Non R&D Activities | 0 | 86.89 | 0 | 0 | 0 | 22.70 | **109.59** |
| Total Income | **0** | **475.63** | **0** | **0** | **0** | **25.78** | **501.41** |

## Expenditure:

| Expenditure (in Lakhs) | Capital Expenditure | Revenue expenditure other than salaries | Salaries | Others | Total Expenditure (in Lakhs) | Percentage |
|---|---|---|---|---|---|---|
| For R&D Activities | 68.49 | 0 | 81.07 | 242.25 | **391.81** | **78.43** |
| For Non R&D Activities | 0 | 0 | 20.49 | 87.25 | **107.74** | **21.57** |
| Total Expenditure | **68.49** | **0** | **101.56** | **329.50** | **499.55** | **100.00%** |

### Research Infrastructure and Core Facilities

| Total Land & Building Area | Total Land area (in acres) | Total Built up area (in Sq.m) | Total Land & Building area for R&D | Total Land & Building area with Organization |
|---|---|---|---|---|
| 1600 sq.yards | 0.329 | 1337.80 | 2400 sft | 750 Sq. Yards |

| Sl. No | Equipment Type | Name of Particulars |
|---|---|---|
| 1 | HPLC | HemoCue |
| 2 | Gas Chromatography | HemoCue |
| 3 | PCR Machine | Qiagen |
| 4 | Elisa Reader and Washer | Bio-Rad |
| 5 | Flow Cytometry | BD |
| 6 | Immune Analyzer | Abbott |
| 7 | Hematology Analyzer | Stago |
| 8 | Serology  Analyzer | Abbott |
| 9 | Blood Gas Analyzer | Radiometer |
| 10 | Ultrasound with Probe | Samsung |
| 11 | -80 Deep freezer | Remi |
| 12 | -20 Deep freezer | Celfrost |
| 13 | 2-8$^{o}$ C Refrigerator | Celfrost |
| 14 | 12-24 Refrigerator | Celfrost |
| 15 | Cold centrifuge | Remi |
| 16 | Incubator | Bio-Technics |
| 17 | Auto Analyzer | Sysmex |
| 18 | Microscope | Motic |
| 19 | Water Bath | Bio-Technics |
| 20 | Shakers, Scales, Balances and Pipettes | Remi, Wensar, Wensar, Thermo |
| 21 | Fundoscopy | Remidio Innovative Solutions |

# FY 2024–2025

| Scientific Staff | Technical Staff | Administrative Staff |
|---|---|---|
| Dr. Vishnu Reddy | Metilda Richards | Mr. Madhu Kiran |
| Dr. B.V.C.S. Srinivasa Rao | Gangadhar | Ms. Jyothi |
| Dr.V Lakshmi | Manognya | Mr. Jeeven |
| Mr. B. Prasad | Sabha | |
| Mr. T. Lakshmaiah Naidu | Rahul | |
| Mr. Madhusudhan A. | Chandana | |
| Mr. Avula Venkaiah | Deepti | |
| | Hema | |
| | Shankar Nayak | |
| | Prashanth | |
| | Sowmya | |
| | Triveni | |
| | Bhavu Singh | |
| | Suresh | |
| | Aishwarya | |
| | Sowmya | |
| | Vadapally Bhavani | |

**General body members**

| S.No | Name | Designation |
|---|---|---|
| 1 | G Surender Rao | President |
| 2 | G Ravender Rao | Vice President |
| 3 | A Lingaiah | General Secretary |
| 4 | B Jagan Mohan | Joint Secretary |
| 5 | G Devender Rao | Treasurer |
| 6 | B Venkat Reddy | Executive Member |
| 7 | P Devender | Executive Member |

**Executive Committee / Governing Body**

| S.No | Name | Designation |
|---|---|---|
| 8. | G Surender Rao | President |
| 9. | G Ravender Rao | Vice President |
| 10. | A Lingaiah | General Secretary |
| 11. | B Jagan Mohan | Joint Secretary |
| 12. | G Devender Rao | Treasurer |
| 13. | B Venkat Reddy | Executive Member |
| 14. | P Devender | Executive Member |

**Research Advisory Board:**

| S. No | Name | | Designation |
|---|---|---|---|
| 12. | Dr. B Vijayakumar | General Physician, Yashoda | Chairperson |
| 13. | Dr. M V Rao | General Physician, Yashoda | Member |
| 14. | Dr. Jaydip Rai Chaudhuri | Neurophysician, Yashoda | Member |
| 15. | Dr. JJ Reddy | General Surgeon- | Member |
| 16. | Rukumani Mrudula | Neurophysician, CITI-Neurocenter | Member |

## Ethics committee

| S. No | Name | Designation | Internal/External Organisation |
|---|---|---|---|
| 1 | Justice L.Narasimha Reddy | Chairman/Legal Expert | |
| 2 | Dr.S.Manimala Rao | Member Secretary | |
| 3 | Dr. B. Sesi Keran | Member | |
| 4 | Dr.D.Govinda Das | Member | |
| 5 | Dr.Meena Hariharan | Member | |
| 6 | Dr.I.Dinakar | Member | |
| 7 | Sri.Borra Satyanarayana Murthy | Member | |
| 8 | Dr.K.Kiran Kumar | Member | |
| 9 | Sri.Thota Devidas | Member | |
| 10 | Sri.Srinivas Kondamalla | Member | |
| 11 | Dr.BVCS.Srinivasarao | Joint Sectetary | |


ANNUAL
REPORT
2023 - 2024
YAMER
YASHODA ACADEMIC OF
MEDICAL EDUCATION AND RESEARCH
Hyderabad

YAMER

# *Annual Research Report, 2023_2024*

## Research achievements and structured study summaries

**Yashoda Academy of Medical Education and**

**Research (YAMER)**

Not-for-profit registered society

## Research Projects completed: 2023-2024

**1.** De novo variants underlying monogenic syndromes with intellectual disability in a neurodevelopmental cohort from India
**2.** Genetic and phenotypic landscape of pediatric-onset epilepsy in 142 Indian families: Counseling and therapeutic implications
**3.** Non-COVID Admissions to the ICU After COVID Vaccination: A Multicenter Study
**4.** Computed tomography findings of COVID-19-associated pulmonary mucormycosis: Data from a multicenter retrospective study (Mucovi2), India
**5.** Safety attitudes, burnout and well-being among healthcare workers during the COVID-19 pandemic: an Indo-Pacific regional cross-sectional study
**6.** Practice Patterns and Management Protocols in Trauma across Indian Settings: A Nationwide Cross-sectional Survey
**7.** Comparison of hand hygiene compliance among healthcare workers in intensive care units and wards of COVID-19: A large-scale multicentric study in India
**8.** Echocardiographic parameters in COVID-19 patients and their association with ICU mortality: a prospective multicenter observational study
**9.** COVID-19 associated multisystemic mucormycosis from India: a multicentric retrospective study on clinical profile, predisposing factors, cumulative mortality and factors affecting outcome
**10.** Impact of conducting hand hygiene audit in COVID-19 care locations of India—A large-scale national multicentric study (HHAC study)
**11.** Outcome of COVID-19–Associated Acute Stroke: A Study from South India
**12.** Study of Blood Lactate Levels at Admission as a Predictor of Mortality and Morbidity in Critically Ill Children in a Tertiary Care Pediatric Intensive Care Unit
**13.** A Prospective Study on Screening of Congenital Heart Diseases Using Combined Pulse Oximetry and Clinical Examination in Neonates
**14.** Survival of Trial-Like and Non–Trial-Like Patients With Immunotherapy in Advanced Hepatocellular Carcinoma in Real World: A Collaborative Multicenter Indian Study (IMHEP)

## 1. De novo variants underlying monogenic syndromes with intellectual disability in a neurodevelopmental cohort from India

*European Journal of Human Genetics. 2024;32(10):1291–1298. DOI: 10.1038/s41431-023-01513-7.*

### Objectives

To delineate the clinical and molecular spectrum of syndromic intellectual disability caused by rare de novo variants in an Indian neurodevelopmental cohort, and to assess the practical diagnostic value of singleton exome sequencing in a resource-limited setting.

### Background

De novo pathogenic variants are an established cause of intellectual disability and complex neurodevelopmental syndromes, but most published genomic cohorts have come from high-income countries. Indian data are comparatively limited, and the most efficient testing pathway remains uncertain where trio sequencing, chromosomal microarray and repeated specialist investigations may be financially difficult. A locally generated genotype–phenotype dataset can improve diagnosis, counselling and recognition of population-specific or previously unreported variants.

### Methods

This was an ongoing, single-centre observational genomic cohort conducted in a medical genetics service in India between October 2019 and December 2022. The analytic population comprised 530 families with neurodevelopmental disorders were evaluated; 196 families (211 affected individuals) had syndromic intellectual disability, and the present analysis focused on 54 families comprising 55 affected individuals in whom rare de novo disease-causing variants were identified. Individuals were selected after detailed clinical evaluation and deep phenotyping using Human Phenotype Ontology terminology. The cohort included children with intellectual disability accompanied by dysmorphism, congenital anomalies, neurological findings or other syndromic features. Parental and sibling samples were obtained when available after informed consent and institutional ethics approval. Testing was chosen according to phenotype and resource availability. Some families underwent targeted molecular tests or chromosomal microarray before exome sequencing; others underwent Mendeliome, singleton exome or trio exome sequencing as the initial investigation. Candidate sequence variants were interpreted against phenotype and inheritance, validated by Sanger sequencing, and tested in parents to establish de novo status. Exome-based copy-number analysis was used when no explanatory single-nucleotide variant or indel was found, and clinically relevant copy-number changes were independently confirmed. Frequencies and proportions were calculated for diagnostic categories, variant classes and clinical features; genotype–phenotype concordance and segregation evidence were used for clinical interpretation under accepted variant-classification principles.

### Results

Among the 196 families with syndromic intellectual disability, 104 received a molecular diagnosis, corresponding to an overall diagnostic yield of 53%. Of these diagnosed families, 59 (57%) had a de novo cause, six had inherited autosomal-dominant or X-linked disease, 16 had autosomal-recessive disease and 23 had chromosomal disorders. The focused de novo cohort contained 55 affected individuals from 54 families, including 31 males and 24 females, with ages ranging from the neonatal period to 14 years. Six families were consanguineous, showing that consanguinity did not preclude a de novo diagnosis. Forty six distinct monogenic disorders involving 46 genes were identified. The molecular

findings comprised 51 single-nucleotide variants or small insertions/deletions and two pathogenic copy-number variants. Thirty-nine of the 53 disease-causing variants, or 74%, were reported as novel. Thirty variants were classified as pathogenic and 21 as likely pathogenic, while both copy-number variants were pathogenic. Twenty-four of the monogenic disorders had not previously been reported in the Indian population, materially expanding the documented national spectrum. The implicated genes encoded a broad range of biological functions, with strong representation of transcriptional and chromatin regulators, but also serine/threonine kinases, lysosomal enzymes, molecular motors, synaptic proteins, neuronal-migration machinery, adhesion molecules, structural proteins and signalling molecules. Approximately 72% of the de novo findings were obtained through singleton exome sequencing or Mendeliome testing rather than trio sequencing. Adding exome-based copy-number analysis increased the proportion of monogenic de novo diagnoses from about 55% to 57%, demonstrating a small but clinically useful incremental yield. The findings support phenotype-led singleton exome sequencing as a pragmatic first-line option when trio testing is unaffordable, provided that parental Sanger confirmation and careful clinical interpretation are subsequently performed. Taken together, these findings showed that de novo variants were a major contributor to syndromic intellectual disability in this Indian referral cohort

## Conclusion

Rare de novo variants were a major contributor to syndromic intellectual disability in this Indian referral cohort. Singleton exome sequencing, followed by segregation testing and copy-number analysis, provided a practical and productive diagnostic strategy in a resource-constrained setting.

## Key achievements

- Expanded the Indian catalogue of monogenic neurodevelopmental disorders by documenting 46 distinct syndromes, including 24 not previously reported in the Indian population.
- Demonstrated the practical value of singleton exome or Mendeliome sequencing in a resource-limited setting, while identifying a high proportion of novel disease-causing variants.

## Key highlights of the results

- 53% molecular diagnostic yield among 196 syndromic-ID families.
- 57% of diagnosed families had a de novo genetic cause.
- 46 disorders and 53 disease-causing variants were identified.
- 74% of the disease-causing variants were novel.
- Twenty-four disorders were reported in the Indian population for the first time.
- Singleton exome/Mendeliome testing detected about 72% of de novo findings.

## 2. Genetic and phenotypic landscape of pediatric-onset epilepsy in 142 Indian families: Counseling and therapeutic implications

*Clinical Genetics. 2024;105(6):639–654. DOI: 10.1111/cge.14495.*

### Objectives

To characterise the clinical and genetic spectrum of paediatric-onset epilepsy in Indian families and determine how molecular diagnosis can inform treatment selection, recurrence-risk counselling and reproductive options.

### Background

Childhood epilepsy is genetically heterogeneous and frequently occurs with developmental delay, movement abnormalities, dysmorphism or other neurological features. Genomic testing can end prolonged diagnostic investigations, refine syndrome classification and occasionally identify gene-directed treatment or drugs that should be avoided. Indian cohorts are especially important because consanguinity, recessive disease and access to testing differ from many predominantly European datasets.

### Methods

This was a prospective/ongoing clinical genomic cohort with retrospective analysis of accrued families conducted in medical genetics, paediatric and paediatric-neurology clinics in India from October 2019 through June 2023. The analytic population comprised 149 affected individuals belonging to 142 unrelated families with epilepsy beginning in the paediatric age range. Epilepsy was defined using International League Against Epilepsy criteria. Families with acquired causes such as stroke, trauma, brain tumour, neonatal hypoxic injury or central nervous system infection were excluded. A paediatric epileptologist reviewed seizure type, age at onset, electroencephalography, neuroimaging, developmental profile and syndrome classification. Testing followed a phenotype-driven strategy.
Highly suggestive presentations could receive targeted testing, repeat-primed PCR, methylation-sensitive MLPA or Sanger sequencing. Other families underwent chromosomal microarray, Mendeliome or exome sequencing, either as a first test or after negative targeted studies. Variants were validated and segregated in available relatives; exome data were also analysed for copy-number variants. We reviewed published evidence for gene-specific therapy and classified therapeutic implications as strong, emerging or sparse. We also translated each inheritance pattern into recurrence-risk counselling and considered prenatal or preimplantation genetic testing where appropriate. The principal outcomes were defined as follows: Primary descriptive outcomes were the proportion receiving a definitive molecular diagnosis, the spectrum of genes, disorders, variant classes and inheritance, the proportion with an identifiable epilepsy syndrome, and the number of molecular diagnoses with treatment or counselling implications. For analysis, Clinical and molecular variables were summarised as medians, ranges, counts and percentages.

### Results

The cohort included 149 affected individuals from 142 families; 59% were male and 32% of families reported consanguinity. Median age at clinical evaluation was approximately three years and median seizure onset was seven months. Infantile-onset epilepsy predominated: 118 of 149 individuals (79%) developed seizures in infancy, while 31 had childhood onset. Only five individuals had isolated or familial epilepsy; 144 (96%) had developmental, neurological or systemic comorbidity. Sixty-three of 142 families (44%) could be assigned a recognised epilepsy syndrome. Forty-eight were neonatal or

infantile syndromes and 15 were childhood syndromes. Infantile epileptic spasms syndrome was the largest subgroup, followed by early-infantile developmental and epileptic encephalopathy, epilepsy of infancy with migrating focal seizures, Dravet syndrome and genetic epilepsy with febrile seizures plus. A definitive molecular diagnosis was established in 74 of 142 families, a yield of 52%. Sixty different genetic disorders were represented: 55 monogenic disorders in 66 families, four chromosomal disorders in four families and one imprinting disorder in four families. Among monogenic diagnoses, 33 were autosomal recessive, 19 autosomal dominant and three X-linked dominant. Sixty seven clinically relevant variants, including 65 sequence variants, one copy-number variant and one triplet-repeat expansion; 35 of 67 were novel were detected. Variant classification comprised 27 pathogenic, 26 likely pathogenic and 14 variants of uncertain significance supported by the overall clinical context. Thirty-one genotypes were homozygous, six compound heterozygous, 22 de novo heterozygous, five inherited heterozygous and two had unresolved inheritance. Fifty-three genes were implicated. PRRT2 was most frequent, while TPP1 and STXBP1 each occurred in three families; several genes including SCN1A, ALG11, MECP2, CLN6, CACNA1A and KCNT1 recurred in two families. Molecular results had potential therapeutic relevance in 38 of the 74 diagnosed families (51%). Evidence was classified as strong in 15, emerging in 14 and sparse in about ten, indicating that not every theoretical precision-treatment option had equivalent clinical support. Counselling implications were substantial: autosomal-recessive families generally faced a 25% recurrence risk, inherited dominant conditions a 50% risk, and confirmed de novo dominant disorders usually a recurrence risk below 1%, while acknowledging possible germline mosaicism.

## Conclusion

Genomic testing produced a diagnosis in roughly half of these Indian families with paediatric-onset epilepsy and frequently altered counselling or therapeutic thinking. The study supports early phenotype-guided genomic evaluation, especially in infants with epilepsy plus developmental or neurological comorbidity.

## Key achievements

- Created one of the most detailed Indian genotype-phenotype datasets for paediatric-onset epilepsy, covering 142 families and 60 genetic disorders.
- Showed that genomic diagnosis can directly inform counselling and may provide gene-guided therapeutic implications for a substantial proportion of diagnosed families.

## Key highlights of the results

- 52% of families received a definitive molecular diagnosis.
- 79% of affected individuals had infantile-onset seizures.
- 96% had epilepsy with additional developmental or systemic features.
- Sixty genetic disorders and 53 implicated genes were documented.
- Thirty-five of 67 clinically relevant variants were novel.
- About half of diagnosed families had a potential gene-informed treatment implication.

## 3. Non-COVID Admissions to the ICU After COVID Vaccination: A Multicenter Study

*Cureus. 2024;16(10):e71534. DOI: 10.7759/cureus.71534.*

### Objectives

To examine the timing and diagnostic profile of non-COVID intensive-care admissions after COVID-19 vaccination and explore whether admission within 42 days of vaccination was associated with ICU mortality, length of stay or duration of mechanical ventilation.

### Background

During mass vaccination, serious illnesses will occur after vaccination by coincidence as well as through uncommon vaccine-related mechanisms. Temporal surveillance can identify signals, but a post-vaccination case series without an unvaccinated comparator cannot determine incidence or causality. The 42-day interval is often used in vaccine-safety analyses to define a biologically plausible risk window for selected adverse events.

### Methods

This was a retrospective multicentre cohort study conducted in four Indian intensive-care units between 1 April and 31 December 2021. The analytic population comprised 175 vaccinated patients admitted to ICU with non-COVID illnesses after screening 506 records. Patients had received at least one dose of a COVID-19 vaccine and subsequently required ICU admission for a non-COVID diagnosis. The most recent dose was used to calculate the vaccination-to-admission interval. Patients were categorised as admitted within 42 days or more than 42 days after vaccination. Age, sex, comorbidities, vaccine type, dose number, dates, admission diagnosis, APACHE II and SOFA scores, need for mechanical ventilation and clinical outcomes were recorded. Diagnoses were grouped into clinically meaningful categories, including sepsis, cardiovascular, cerebrovascular, gastrointestinal/mesenteric, neurological or neuromuscular and other conditions. The primary outcome was ICU mortality; secondary outcomes were ICU length of stay and duration of ventilation. The study followed STROBE principles, had ethics approval/waiver for retrospective data, and was registered in CTRI. The principal outcomes were defined as follows: The analysis compared mortality and resource-use outcomes between the two timing groups and explored associations of age, diagnostic category, disease severity and vaccination-to-admission interval with death. For analysis, STATA 15 was used. Continuous variables were compared with t tests or Mann–Whitney tests as appropriate and categorical variables with chi-square tests. Multivariable logistic regression adjusted for age, sex, comorbidity, admission diagnosis and APACHE II score.

### Results

Of 506 screened records, 175 patients met the study criteria. Mean age was 53.49±15.89 years and 61.14% were male. Seventy-three patients (41.7%) were admitted within 42 days of their latest vaccination and 102 after 42 days; the overall median interval was 55 days (interquartile range 25–85). Ninety-two patients had received one dose and 83 had received two. Covishield was recorded for 142 patients and Covaxin for 27, with vaccine information incomplete for a small remainder. Median APACHE II and SOFA scores were 17 and 7, indicating a substantially ill ICU population. Sepsis was the most frequent admission category, affecting 38.86%. Thromboembolic diagnoses included acute coronary syndrome in 7.43%, cerebrovascular accident in 7.43% and mesenteric ischaemia in 1.14%. Six patients (3.43%) had neuromuscular illness, including cases of Guillain–Barré syndrome and myasthenia gravis; intracranial bleeding occurred in 6.86%. Overall ICU mortality was 24.57% (95% CI

18.38–31.63). Crude mortality was 30.14% among those admitted within 42 days and 20.59% after 42 days, but this difference was not statistically significant (p=0.148). Median ICU length of stay was six versus seven days in the ≤42-day and >42-day groups (p=0.072), and median ventilation duration was four days in both groups (p=0.762). Thus, the prespecified timing groups did not show statistically significant differences in the principal resource-use outcomes. Non-survivors had a shorter vaccination-to-admission interval and much higher illness-severity scores. In adjusted analysis, each additional day between vaccination and admission was associated with slightly lower odds of death (adjusted odds ratio around 0.989–0.990), but residual confounding by acute illness and selection remains likely. Within the ≤42-day subgroup, mortality differed by age, with higher mortality among patients older than 66 years and those aged 35 years or younger (p=0.008). Mortality among cerebrovascular admissions was also prominent and clinically significant.

## Conclusion

The study documented serious non-COVID illnesses occurring after vaccination and found no statistically significant mortality difference between the prespecified ≤42-day and >42-day groups. The findings are hypothesis-generating and cannot establish vaccine causality.

## Key achievements

- Provided multicentre Indian data describing the spectrum and outcomes of non-COVID critical illness occurring after COVID-19 vaccination.
- Separated admissions by time from vaccination and identified clinical subgroups with high mortality, while recognising that the study could not determine vaccine-attributable risk.

## Key highlights of the results

- 175 non-COVID ICU admissions after vaccination were analysed.
- Overall ICU mortality was 24.57%.
- Mortality was 30.14% within 42 days versus 20.59% after 42 days, but the difference was not significant.
- Sepsis was the commonest admission diagnosis.
- Thromboembolic and neuromuscular diagnoses were observed.
- The retrospective cohort lacked an unvaccinated comparator and cannot estimate vaccine-attributable risk.

## 4. Computed tomography findings of COVID-19-associated pulmonary mucormycosis: Data from a multicenter retrospective study (Mucovi2), India

*Lung India. 2024;41(3):221–224. DOI: 10.4103/lungindia.lungindia_19_24.*

### Objectives

To describe chest CT findings at diagnosis in proven or probable COVID-19-associated pulmonary mucormycosis and compare imaging patterns by diabetes status, traditional risk factors and survival.

### Background

Pulmonary mucormycosis is an aggressive invasive fungal infection in which early imaging can prompt bronchoscopy, biopsy or surgery. During India's second COVID-19 wave, corticosteroid exposure and diabetes were frequent, but the radiological spectrum of pulmonary disease was less well documented than rhino-orbital disease. Cavitation, consolidation, reversed halo signs and vascular complications may overlap with COVID-19 pneumonia or bacterial infection.

### Methods

This was a secondary, retrospective imaging analysis of the multicentre MuCovi-2 study conducted in 25 centres in India from 1 January to 30 June 2021. The analytic population comprised 84 patients with proven or probable COVID-19-associated pulmonary mucormycosis and adequate CT data. COVID-19 was established by rapid antigen or RT-PCR testing, while mucormycosis was microbiologically or histopathologically confirmed and classified using published definitions. Patients with inadequate CT information were excluded. At diagnosis, CT abnormalities as present or absent, including cavity, consolidation, reversed halo or bird's-nest sign, pleural effusion, nodules, pneumothorax or hydropneumothorax, pulmonary/mycotic aneurysm and tracheobronchial involvement were recorded. Clinical variables included diabetes, corticosteroid exposure, absence of traditional risk factors, disease classification, management and outcome. Imaging was compared between patients with diabetes and those without traditional risk factors, between proven and probable disease, and between survivors and non-survivors. The principal outcomes were defined as follows: The primary outcome was the distribution of CT findings. Secondary analyses assessed whether particular radiological signs differed by host risk group or predicted survival. For analysis, Data were summarised as counts, percentages or means with standard deviations. Mann–Whitney, Fisher exact or chi-square tests were applied as appropriate, with $p<0.05$ considered significant.

### Results

The 84-patient cohort had a mean age of 53.8±12.5 years and was predominantly male (78.6%). Diabetes was present in 58 patients (69%), while 19 had no recognised traditional risk factor. Systemic glucocorticoids had been used in 65 of 79 patients with available data (82.3%), including inappropriate use without COVID-related hypoxaemia in 16 of 78 (20.5%). Pulmonary involvement was right-sided in 39.3%, left-sided in 26.2% and bilateral in 34.5%. Cavitation was the dominant CT abnormality, reported in 56 of 84 patients (66.7%). The reversed halo or bird's-nest sign occurred in 16.7%, consolidation in 13.1% and pleural effusion in 22.6%. Less frequent but clinically important findings included mycotic or pulmonary artery aneurysm in 4.8%, tracheal or bronchial mucormycosis in 4.8%, and more than ten nodules, halo sign, and pneumothorax or hydropneumothorax in approximately 2.4% each. Forty-three cases were classified as proven and 41 as probable. Bilateral disease was more frequent in probable than proven disease (48.8% versus 20.9%), whereas pleural effusion was more frequent in proven disease (34.9% versus 9.8%). Comparison by host factor showed few major

differences. Pleural effusion was less common among patients with diabetes than among those without traditional risk factors (19.0% versus 42.1%; p=0.04); other principal CT findings were broadly similar. Approximately 48.8% underwent surgery. Six-week survival was 54.4% and 12-week survival 50.7%. None of the individual CT abnormalities showed a statistically significant difference between survivors and non-survivors in this sample. The representative figure in the article illustrates the heterogeneity: consolidation with residual COVID-related ground-glass opacity and pneumomediastinum; a reversed halo pattern; a cavity with an air-fluid level; and a pulmonary artery aneurysm with pneumothorax. These examples reinforce that vascular and pleural complications can accompany more familiar cavitary disease.

## Conclusion

Cavitation was the commonest CT finding in COVID-19-associated pulmonary mucormycosis, while reversed halo signs, effusions and vascular complications occurred less often. Imaging should raise suspicion and guide sampling, but the CT pattern alone did not predict survival.

## Key achievements

- Developed a multicentre radiological profile of COVID-19-associated pulmonary mucormycosis in India.
- Cavitation is common but no single computed-tomography feature was sufficiently discriminatory for survival, reinforcing the need for microbiological or histopathological confirmation.

## Key highlights of the results

- 84 proven or probable pulmonary mucormycosis cases were analysed.
- Cavitation occurred in 66.7% of patients.
- Pleural effusion was present in 22.6%; reversed halo/bird’s-nest sign in 16.7%.
- Vascular aneurysm and tracheobronchial disease each occurred in 4.8%.
- No individual CT finding significantly separated survivors from non-survivors.
- Microbiological or histopathological confirmation remains essential.

## 5. Safety attitudes, burnout and well-being among healthcare workers during the COVID-19 pandemic: an Indo-Pacific regional cross-sectional study

*Singapore Medical Journal. 2023;64:667–676. DOI: 10.11622/smedj.2022014.*

### Objectives

To compare healthcare workers' safety attitudes across four Indo-Pacific countries during the early COVID-19 pandemic and identify demographic, occupational and psychological factors associated with a poorer safety climate.

### Background

Pandemic care placed healthcare workers under rapidly changing protocols, infection risk, workforce shortages and prolonged shifts. Safety culture and staff well-being are interdependent: exhaustion, disengagement, anxiety and depression may impair teamwork, communication and willingness to report problems. Cross-country measurement can reveal common vulnerabilities, although differences in sampling and health systems complicate direct ranking.

### Methods

This was a multicountry, multicentre cross-sectional online survey conducted in 23 hospitals in Singapore, Malaysia, India and Indonesia from 29 May to 13 July 2020. The analytic population comprised 3,163 healthcare-worker responses, with complete demographic data available for a slightly smaller analytic sample. Doctors, nurses and allied health professionals working in participating institutions were invited. Snowball recruitment was used in several countries, and the anonymous questionnaire was administered in English. The survey collected profession, country, institution, work area, redeployment, COVID-19 exposure, weekly work pattern and shift duration. Three validated instruments were administered: the Safety Attitudes Questionnaire, the Oldenburg Burnout Inventory and the Hospital Anxiety and Depression Scale. Safety Attitudes Questionnaire scores were converted to percentage-agree rates, with a score of at least 75 conventionally indicating a positive safety attitude. Burnout thresholds were applied separately for exhaustion and disengagement; HADS cut-offs identified probable anxiety and depression. The principal outcomes were defined as follows: The primary outcome was the total Safety Attitudes Questionnaire percentage-agree rate. Secondary outcomes included six safety domains and prevalence of burnout, anxiety and depression, together with independent occupational and psychological correlates. For analysis, Confirmatory factor analysis evaluated the survey structure. Country and subgroup comparisons used standard descriptive and inferential procedures. Mixed-effects multivariable regression included institution as a random effect and assessed factors independently associated with a positive total safety score.

### Results

The study obtained 3,163 valid Safety Attitudes Questionnaire responses. In the demographic dataset, approximately 26% were male; 31.7% were doctors, 53% nurses and 15.3% allied health professionals. Nearly 97% worked in public institutions, 18.1% had been redeployed, 30.6% worked more than five days per week, 12% reported shifts of 12 hours or longer and 18% directly treated patients with COVID-19. The proportion reaching a positive total safety-attitude score varied markedly: 51.0% among Indian respondents, 35.7% in Singapore, 15.0% in Malaysia and 3.3% in Indonesia. India recorded the highest positive rates for teamwork, safety climate, perceptions of management and working conditions, while Singapore performed best for stress recognition and Malaysia for job satisfaction. Burnout was common in every country. Disengagement thresholds were met by about 80.5% in Singapore, 85.6% in

Malaysia, 63.6% in India and 85.4% in Indonesia. Exhaustion thresholds were approximately 76.9%, 79.4%, 56.3% and 70.9%, respectively. Thus, India had the lowest burnout proportions in this sample but still more than half of respondents met each threshold. Probable anxiety was especially frequent among Indonesian respondents, at about 58.3%. Probable depression also affected substantial proportions; the India estimate was about 39%. These figures reflect screening scales rather than formal psychiatric diagnoses. In multivariable mixed-effects analysis, respondents from Malaysia and Indonesia remained much less likely than those from Singapore to report a positive total safety attitude. Meeting the disengagement threshold was associated with an odds ratio around 0.40, exhaustion around 0.58 and depression around 0.54 for a positive safety score. Shifts lasting at least 12 hours were independently associated with poorer safety attitudes, with an odds ratio around 0.70. This finding is operationally important because shift design is potentially modifiable, unlike many background demographic factors. The country differences should not be interpreted as definitive national league tables. Sampling routes, hospital mix, pandemic phase and response culture differed, and the percentage-agree threshold may behave differently across contexts. The more robust message is the consistent inverse relationship between well-being problems and perceived safety climate. The study supports organisational responses that combine psychological support with staffing, rest, shift-length management, leadership communication and reliable reporting systems. Individual resilience initiatives alone would not address the work-environment associations identified.

## Conclusion

Burnout, depression and prolonged shifts were independently associated with less positive safety attitudes during the pandemic. Healthcare organisations should treat workforce well-being and working conditions as core patient-safety interventions.

## Key achievements

- Delivered a large Indo-Pacific assessment of safety culture, burnout, anxiety and depression involving 3,163 healthcare workers in four countries.
- Identified modifiable organisational priorities-especially burnout, depression and shifts lasting 12 hours or more that were independently associated with poorer safety attitudes.

## Key highlights of the results

- 3,163 healthcare workers from 23 hospitals and four countries participated.
- Positive total safety attitudes ranged from 3.3% to 51.0% by country.
- Burnout thresholds were met by a majority in all four countries.
- Disengagement, exhaustion and depression independently predicted poorer safety attitudes.
- Shifts of 12 hours or longer were associated with a less positive safety climate.
- Cross-country figures require caution because recruitment was non-probability based.

## 6. Practice Patterns and Management Protocols in Trauma across Indian Settings: A Nationwide Cross-sectional Survey

*Indian Journal of Critical Care Medicine. 2023;27(1):38–51. DOI: 10.5005/jp-journals-10071-24384.*

### Objectives

To map trauma-care infrastructure, resources and management protocols across Indian hospitals and identify gaps associated with hospital type, size, city tier and availability of an Advanced Trauma Life Support-trained emergency physician.

### Background

Trauma is a major cause of premature death and disability in India. Outcomes depend not only on individual clinical decisions but also on organised teams, activation codes, imaging, blood-bank access, resuscitation protocols and trained personnel. National information on how these elements vary across corporate, government, private and nursing-home settings was limited.

### Methods

This was a nationwide, online, cross-sectional descriptive survey conducted in Indian hospitals surveyed from 21 April to 1 May 2022 through the Indian Society of Critical Care Medicine and medical networks. The analytic population comprised 483 unique hospital centres after removal of non-consenting and duplicate responses. The survey was addressed to clinicians familiar with trauma services in their institutions. Participation was voluntary. A multidisciplinary ISCCM trauma network committee developed, reviewed and validated the self-administered multiple-choice questionnaire. The instrument captured city tier, hospital ownership and bed capacity; presence of a trauma centre, multidisciplinary team, trauma code, trauma scoring system, ATLS-trained emergency physician and in-house blood bank; and protocols for CT imaging, eFAST, cervical collars, spine boards, fluids, blood products, analgesia, tranexamic acid, vasopressors, invasive and intracranial pressure monitoring, serial lactate and antioedema therapy. The principal outcomes were defined as follows: The study described national practice patterns and compared resource availability and protocol use across hospital categories. It also specifically examined whether having an ATLS-trained emergency physician was independently associated with key organisational and clinical practices. For analysis, Frequencies and percentages described survey responses. Chi-square or Fisher exact tests compared categorical variables. Covariates significant in univariate analysis entered multivariable binary logistic regression evaluating the impact of an ATLS-trained emergency physician. SPSS 21 was used and $p<0.05$ defined significance.

### Results

Of 508 responses, three declined participation and 22 were duplicate institutional entries, leaving 483 centres. Most were in tier-2 cities (304; 62.9%), followed by tier 1 (98; 20.3%) and tier 3 (81; 16.8%). Private hospitals formed the largest ownership group. A dedicated trauma centre was reported by 287 centres (59%), a multidisciplinary trauma team by 213 (44%), a formal trauma code by 195 (40%), a trauma score by 261 (54%), an in-house blood bank by 315 (65%) and an ATLS-trained emergency physician by 296 (61%). Only 158 centres (33%) routinely used whole-body CT at arrival, while the remainder favoured organ-specific imaging. eFAST was routinely used for all trauma patients in 271 centres (56%); roughly equal proportions of the remainder used it sometimes or never. Cervical collars were routinely used in 408 centres (85%), whereas spine boards were routinely used for in-hospital

transfer in 302 (63%). Tranexamic acid was routinely administered in 309 centres (64%). Early vasopressor initiation in the emergency department after two litres of intravenous fluid was reported by 335 centres (70%). Invasive monitoring was routinely used in 211 (44%), serial lactate in 292 (61%) and intracranial pressure monitoring in only 50 (10%). Mannitol was the most commonly selected antioedema agent. Significant variation was seen by ownership, bed capacity and city tier. Larger and corporate/government centres were generally more likely to report formal trauma infrastructure, blood-bank access, teams, codes and advanced monitoring than small hospitals or nursing homes.
Availability of an ATLS-trained emergency physician had an independent association with multiple desirable practices. The largest adjusted association was with routine eFAST use, about 2.91-fold, followed by a formal trauma code at 2.78-fold, a dedicated trauma team at 1.95-fold and use of trauma scores at 1.65-fold. The findings indicate that many centres possessed basic resources but that organised systems were inconsistent. Fewer than half had a dedicated trauma team or activation code, and advanced monitoring was uncommon. These are organisational gaps that cannot be solved solely by buying equipment. Because the survey did not link reported practices to mortality or disability, it cannot prove that any individual protocol improved outcomes in these centres. It nevertheless provides a national baseline for training, accreditation and trauma-system development. may be affected by sample selection, confounding, measurement error or limited statistical power.

## Conclusion

Indian trauma services showed substantial resources but marked variation in organised teams, codes, imaging and monitoring. ATLS-trained emergency physicians were strongly associated with several system-level practices, supporting wider training alongside institutional trauma governance.

## Key achievements

- Conducted a first-of-its-kind pan-India trauma-practice survey spanning 483 centres from different hospital sizes and city tiers.
- Identified the organisational influence of ATLS-trained emergency physicians and produced a national gap map for trauma teams, trauma codes, eFAST, scoring and monitoring practices.

## Key highlights of the results

- 483 centres participated in the nationwide survey.
- 59% reported a trauma centre, but only 44% a dedicated trauma team and 40% a trauma code.
- 61% had an ATLS-trained emergency physician.
- 56% routinely used eFAST and 33% routine whole-body CT.
- Only 10% routinely used intracranial pressure monitoring.
- ATLS-trained physicians were independently associated with eFAST, trauma codes, teams and scoring.

## 7. Comparison of hand hygiene compliance among healthcare workers in intensive care units and wards of COVID-19: A large-scale multicentric study in India

*American Journal of Infection Control. 2023. DOI: 10.1016/j.ajic.2022.09.028.*

### Objectives

To measure and compare hand-hygiene adherence in COVID-19 intensive-care units and non-ICU COVID wards across India, including differences by zone, institution type, professional category and each of the WHO Five Moments.

### Background

Hand hygiene is central to prevention of healthcare-associated infection, but compliance can deteriorate under workload, glove use and personal protective equipment. COVID-19 units created unusual pressures and opportunities for direct measurement. Distinguishing total adherence from complete adherence is important because a brief or incomplete hand rub may be recorded as an attempt but may not meet all recommended steps and duration.

### Methods

This was a prospective, multicentre observational audit conducted in 92 public and private healthcare facilities across India over six months. The analytic population comprised healthcare workers observed during 161,056 hand-hygiene opportunities in COVID ICUs and COVID wards. Participating facilities represented different regions, ownership models and teaching status. Trained auditors recorded naturally occurring opportunities rather than enrolling individual workers as research subjects. Audits were entered through the IBHAR mobile application, which was based on the WHO hand-hygiene observation tool. An opportunity was classified according to location, profession and WHO moment.
The study calculated hand-hygiene total adherence rate, which included complete and partial attempts, and complete adherence rate, which required the recommended technique and duration. Comparisons were made between ICU and ward settings and stratified by geographic zone, public/private status, teaching status, profession and hand-hygiene moment. The principal outcomes were defined as follows: The main outcomes were total and complete adherence percentages in COVID ICUs versus COVID wards. Secondary outcomes identified subgroups and moments with relatively high or low compliance. For analysis, Counts of opportunities and adherence proportions were calculated, with comparative tests and effect estimates used to assess differences across locations and categories.

### Results

A total of 161,056 hand-hygiene opportunities were documented across 92 facilities. Total adherence was higher in COVID wards than COVID ICUs: 61.4% versus 57.8%. Complete adherence showed the same pattern but was much lower in both locations, 28.8% in wards and 25.6% in ICUs. The gap between total and complete adherence indicates that many attempts were partial, too brief or did not contain all required steps. Thus, a simple record of whether hand hygiene occurred would substantially overstate fully correct practice. Private-hospital COVID wards achieved some of the highest rates, with total adherence of 68.1% and complete adherence of 38.3%. West-zone COVID wards also performed comparatively well, with total adherence of 70.2% and complete adherence of 36.8%. Cleaning or housekeeping staff in COVID wards showed better compliance than other professional groups in several comparisons. Professional patterns were not uniform across ICUs and wards, illustrating that role-specific workflow matters. Adherence was highest after tasks perceived as personally hazardous.

In COVID wards, WHO Moment 3-after body-fluid exposure had total adherence of 76.3%, followed by Moment 4 -after touching a patient - at 73.7%. Before-patient and after-environment moments were generally weaker. The consistently lower complete-adherence rate in ICUs may reflect more frequent opportunities, rapid sequential procedures, emergency interruptions, continuous glove use and higher patient acuity. The study did not directly measure which of these mechanisms explained the difference. Although wards outperformed ICUs, neither setting achieved an optimal complete-adherence level. Roughly three quarters of ICU opportunities and more than two thirds of ward opportunities did not meet full technique and duration criteria. The results support continuous audit with timely feedback, targeted education for low-performing moments and professions, adequate staffing and alcohol-hand-rub availability at the point of care. Because the study was observational, it did not demonstrate that the measured differences changed healthcare-associated infection rates.

## Conclusion

COVID wards had modestly higher total and complete hand-hygiene adherence than COVID ICUs, but correct complete technique remained low in both. Improvement programmes should focus on technique quality and low-performing workflow moments rather than counting attempts alone.

## Key achievements

- Established national benchmark data for hand-hygiene performance in COVID-19 ICUs and wards using 161,056 directly observed opportunities across 92 facilities.
- Demonstrated that complete technique adherence was far lower than partial or total adherence, providing a precise quality-improvement target for infection-control programmes.

## Key highlights of the results

- 161,056 opportunities were observed across 92 facilities.
- Total adherence: 61.4% in COVID wards versus 57.8% in ICUs.
- Complete adherence: 28.8% in wards versus 25.6% in ICUs.
- Private and west-zone wards recorded relatively high adherence.
- After-body-fluid and after-patient moments were strongest.
- The large gap between total and complete adherence signals incomplete technique.

## 8. Echocardiographic parameters in COVID-19 patients and their association with ICU mortality: a prospective multicenter observational study

*The Ultrasound Journal. 2023;15:38. DOI: 10.1186/s13089-023-00336-3.*

### Objectives

To describe early echocardiographic abnormalities in critically ill patients with COVID-19 pneumonia and determine which left- or right-heart measures were associated with ICU mortality.

### Background

COVID-19 critical illness can affect the heart through inflammation, thrombosis, ischaemia, pulmonary vascular load, hypoxaemia and treatment-related haemodynamic stress. Bedside echocardiography is repeatable and avoids transporting unstable patients, but acquisition is technically challenging during mechanical ventilation and infection-control precautions. Identifying prognostic parameters may help clinicians interpret cardiac involvement within the broader severity picture.

### Methods

This was a prospective, multicentre observational study conducted in four Indian intensive-care centres after ethics approval and trial registration. The analytic population comprised 573 adults with COVID-19 pneumonia admitted to ICU. Patients with confirmed COVID-19 pneumonia requiring intensive care were enrolled. Echocardiography was performed within 24–48 hours, with 95% completed within 24 hours, using a focused protocol suitable for pandemic practice. The examination assessed left-ventricular size and visual systolic function, ejection fraction where feasible, mitral inflow E and A velocities, tissue Doppler e', E/A and E/e', right-ventricular size and function, pulmonary pressures and other standard measures. Clinical data included age, sex, comorbidities, ventilation, vasopressor use, laboratory markers and illness severity. Sonographers followed local infection-control procedures. The principal outcomes were defined as follows: ICU mortality was the primary outcome. ICU length of stay and duration of mechanical ventilation were secondary outcomes. Echocardiographic variables were compared between survivors and non-survivors. For analysis, Regression models evaluated the association of individual echo parameters with mortality. Because several cardiac measurements are collinear, parameters were entered separately with adjustment for relevant clinical factors. Odds ratios, confidence intervals and p values were reported.

### Results

The cohort's mean age was 57.17±14.67 years and 68.6% were male. Centre contributions were uneven, with 459 patients from the largest site and 48, 35 and 31 from the other centres. On the first ICU day, 257 patients (45%) were invasively mechanically ventilated. At the time of echocardiography, 148 (25.83%) were receiving vasopressors, confirming that a substantial subgroup was haemodynamically unstable. Severe left-ventricular systolic dysfunction was identified in 8.7%. It was associated with higher ICU mortality, with an odds ratio of 2.48 (95% CI 1.058–5.807; p=0.037). This was the clearest clinically interpretable echocardiographic risk signal. Transmitral E velocity and tissue-Doppler e' were also statistically associated with mortality when analysed separately. The reported odds ratios were approximately 0.984 per unit for E and 0.897 for e', indicating that lower values—particularly lower myocardial relaxation velocity—were associated with greater risk. E/e', commonly used as an estimate of left-ventricular filling pressure, was not significantly associated with mortality. E/A ratio, troponin I and right-ventricular dilatation were similar between survivors and non-survivors in the main analyses. The lack of association for E/e' and selected right-heart variables shows that not every abnormality

useful in non-COVID cardiac assessment translated into prognostic discrimination in this cohort. Loading conditions, ventilation and measurement feasibility may partly explain this. Severe LV dysfunction remained uncommon, so it cannot serve as a sensitive screening test for all patients at risk. Its value is as a high-risk feature that should prompt integrated haemodynamic assessment rather than as a stand-alone mortality score. The study supports early bedside echocardiography when cardiac dysfunction, shock or pulmonary vascular stress is suspected.

## Conclusion

Severe early LV systolic dysfunction and lower diastolic tissue velocities were associated with ICU mortality, while E/e′ and several right-heart measures were not. Bedside echocardiography adds clinically relevant information but must be interpreted in the patient's haemodynamic and respiratory context.

## Key achievements

- Completed a large prospective multicentre echocardiographic study of 573 critically ill patients with COVID-19.
- Identified severe left-ventricular systolic dysfunction and lower mitral annular e′ velocity as clinically relevant mortality markers, while showing that several commonly considered parameters were not independently discriminatory.

## Key highlights of the results

- 573 ICU patients from four centres were studied prospectively.
- 45% were invasively ventilated on day 1 and 25.8% were on vasopressors during echo.
- Severe LV systolic dysfunction occurred in 8.7%.
- Severe LV dysfunction carried about 2.5-fold higher odds of ICU death.
- Lower e′ was associated with higher mortality.
- E/e′, troponin I and RV dilatation did not significantly distinguish outcomes.

## 9. COVID-19 associated multisystemic mucormycosis from India: a multicentric retrospective study on clinical profile, predisposing factors, cumulative mortality and factors affecting outcome

*Infection. 2023;51:407–416. DOI: 10.1007/s15010-022-01891-y.*

### Objectives

To describe the anatomical spectrum, predisposing factors, treatment and short-term mortality of COVID-19-associated mucormycosis and identify factors associated with death.

### Background

India experienced an unprecedented increase in mucormycosis during the second COVID-19 wave. Diabetes, severe hyperglycaemia and high-dose corticosteroids were repeatedly implicated, while outcomes differed by anatomical site and access to surgery. Multisystem data were needed because most reports concentrated on rhino-orbital disease.

### Methods

This was a multicentre retrospective cohort study conducted in three tertiary-care centres in southern India during April–June 2021. The analytic population comprised 217 patients with COVID-19-associated mucormycosis. Cases had recent or concurrent COVID-19 and a clinical, radiological and microbiological or histopathological diagnosis of mucormycosis according to institutional criteria. Records were reviewed for risk factors, anatomical extent, treatment and six-week outcome. Diabetes and glycaemic status, steroid and antibiotic exposure, transplantation and other immunosuppression, inflammatory markers, symptoms, imaging, microbiology, antifungal regimen and surgical procedures were noted. Disease was grouped as sinonasal, rhino-orbital, rhino-cerebral, rhino-orbito-cerebral, pulmonary, gastrointestinal, isolated cerebral or disseminated. The principal outcomes were defined as follows: The principal outcomes were six-week case fatality and cumulative probability of death. The study compared survival by anatomical site and assessed the influence of mechanical ventilation and surgery, including pulmonary resection. For analysis, Kaplan–Meier curves estimated cumulative mortality and log-rank tests compared sites. Univariate and multivariable Cox proportional-hazards models evaluated mortality predictors. Categorical treatment-outcome comparisons were also reported.

### Results

Among 217 cases, sinonasal disease was most frequent in 95 patients (44%). Orbital extension was present in 84 (38%), including rhino-orbital and rhino-orbito-cerebral patterns. Pulmonary disease occurred in 25 (12%), gastrointestinal in six (3%), isolated cerebral in two and disseminated disease in two. Diabetes and high-dose systemic corticosteroid exposure were the dominant predisposing factors. Approximately 80% had uncontrolled diabetes and 12% had diabetic ketoacidosis. Mean blood glucose at mucormycosis admission was about 273 mg/dL and mean HbA1c 9.4%, indicating prolonged poor glycaemic control. No patient was reported without a recognised predisposing factor. Other comorbidities included hypertension, coronary disease, chronic kidney disease and previous stroke, with a small number of renal-transplant recipients. The maxillary sinus was involved in 80%, ethmoid in 76% and sphenoid in 75%; 68% had all three sinuses involved. Intracranial extension was seen on imaging in 13%, with additional cranial-nerve involvement in some patients. Antifungal therapy commonly used an amphotericin formulation followed sequentially by posaconazole. Liposomal amphotericin was given for a median of approximately 17 days. Functional endoscopic sinus surgery

was performed in most sinonasal cases; orbital exenteration was required in a subset. At six weeks, 31 patients had died, a case-fatality rate of 14%. Cumulative probability of death rose from approximately 9.7% around day 10 to 14.4% at day 20 and 15.3% at day 30. Cerebral, gastrointestinal or disseminated mucormycosis carried about nine times the hazard of death compared with other sites in multivariable analysis. Pulmonary disease also had worse outcomes, although estimates were less precise. Among pulmonary cases, one of 16 patients who underwent lobectomy died (6%), compared with five of nine who did not undergo resection (55%; $p<0.001$). This striking contrast supports timely surgical assessment but is not a randomised comparison; operability itself is a major prognostic selection factor. Patients requiring mechanical ventilation during COVID-19 treatment had an estimated 55% higher mortality risk, but the association was only marginally significant. Extensive disease site remained the strongest adverse signal. The study's central clinical message is that early recognition, aggressive glycaemic control, appropriate antifungal therapy and multidisciplinary surgical management are crucial, particularly before cerebral, gastrointestinal or disseminated extension develops.

## Conclusion

COVID-19-associated mucormycosis most often involved the sinuses and orbit, but cerebral, gastrointestinal and disseminated disease had dramatically higher mortality. Prompt control of predisposing factors and coordinated antifungal and surgical treatment were associated with better outcomes.

## Key achievements

- Created a multicentre clinical and outcome profile of 217 cases of COVID-19-associated mucormycosis during India's second wave.
- Quantified the markedly higher risk associated with cerebral, gastrointestinal and disseminated disease and helped define groups requiring especially urgent multidisciplinary management.

## Key highlights of the results

- 217 cases from three tertiary centres were analysed.
- Sinonasal disease was commonest; pulmonary involvement occurred in 12%.
- Uncontrolled diabetes and high-dose steroids dominated the risk profile.
- Six-week case fatality was 14%.
- Cerebral, gastrointestinal or disseminated disease carried about nine-fold higher mortality risk.
- Pulmonary resection was associated with better survival, although treatment-selection bias is likely.

## 10. Impact of conducting hand hygiene audit in COVID-19 care locations of India—A large-scale national multicentric study (HHAC study)

*Indian Journal of Medical Microbiology. 2023;43:39–48. DOI: 10.1016/j.ijmmb.2022.09.002.*

### Objectives

To quantify national hand-hygiene adherence during the COVID-19 period, compare compliance across regions, institutions, professions, WHO moments and clinical areas, and assess how adherence changed over six months of repeated audit.

### Background

Repeated observation and feedback are core components of multimodal hand-hygiene improvement. During COVID-19, glove use, PPE, fear of exposure and workload could increase or reduce adherence. A national audit using a common digital instrument offered an opportunity to separate partial attempts from fully correct technique and to study sustainability over time.

### Methods

This was a nationwide, multicentre prospective hand-hygiene audit conducted in 92 Indian public/private and teaching/non-teaching healthcare facilities from June to December 2021. The analytic population comprised healthcare workers observed during 201,829 hand-hygiene opportunities over 231,076 minutes. Facilities providing COVID and non-COVID care participated. Observers captured opportunities involving doctors, nurses, housekeeping and other allied staff across ICUs and wards. The IBhar mobile application, based on the WHO audit tool, recorded location, profession, shift, glove use and WHO Five Moment. Complete adherence required all recommended steps and duration; total adherence included complete and partial performance. Monthly audit summaries enabled assessment of temporal trends. The principal outcomes were defined as follows: National complete and total adherence rates were the main measures. Secondary analyses examined geographic zone, ownership, teaching status, profession, moment, shift, sex, glove use and COVID versus non-COVID location. For analysis, Proportions, relative risks and odds ratios compared categories using standard categorical tests, with $p<0.05$ considered significant. Month-one to month-six changes were plotted by subgroup.

### Results

Across 201,829 opportunities, overall complete adherence was 27.3%, while total adherence was 59.7%. The 32.4-percentage-point gap shows that a large share of attempted hand hygiene did not meet full technique or duration requirements. West-zone facilities had the highest complete adherence at 37.5% and total adherence at 72.2%, followed by the south at 31.2% and 61.9%. East and north zones had lower complete adherence, 17.9% and 19.9%, and total adherence, 54.1% and 51.9%. Private institutions outperformed public institutions: complete adherence 32.4% versus 21.9% and total adherence 65.6% versus 53.6%. Non-teaching institutions also exceeded teaching institutions, with total adherence 67.7% versus 56.7%. Private non-teaching centres reached about 70.1% total adherence. Nurses had the highest profession-specific total adherence at 61.6%, with complete adherence 28.3%. Doctors, housekeeping and allied staff had lower or variable rates, although patterns differed across regions and institution types. WHO Moment 2, before an aseptic procedure, and Moment 3, after body-fluid exposure, had the highest total adherence at 71.8% and 72.1%, with complete adherence around 39%. Moment 5, after touching the patient's surroundings, was weakest: total adherence 45.1% and complete adherence 18.4%. Morning-shift adherence was highest, with

complete and total rates of 28.9% and 61.4%; night-shift rates were 22.7% and 55.5%. Opportunities performed without gloves had better adherence than those involving gloves, suggesting that gloves may have been treated incorrectly as a substitute for hand hygiene. Non-COVID areas had higher total adherence than COVID areas, 65.4% versus 57.8%. Non-COVID ICUs were highest at 68.1%, compared with 58.7% in COVID ICUs; the detailed area comparison also showed lower rates in COVID wards. Adherence generally improved from the first to sixth month of participation, although the national time plot showed a small decline in December and complex relationships with the falling COVID case load. Repeated audit therefore appeared capable of improvement but not guaranteed sustained performance. The study indicates that technique quality, environmental-contact moments, night shifts, public/teaching settings and COVID units deserve targeted interventions. It does not establish that audit alone caused every temporal improvement because there was no non-audited control group.

## Conclusion

Repeated national audit documented moderate total but low complete hand-hygiene adherence, with substantial variation across settings and moments. Continuous feedback and multimodal support are needed to sustain correct technique, especially in COVID areas and during Moment.

## Key achievements

- Generated a national hand-hygiene audit dataset exceeding 200,000 observed opportunities across 92 healthcare facilities.
- Showed that repeated electronic audit and feedback can improve adherence over time, while identifying persistent gaps in complete WHO-compliant technique.

## Key highlights of the results

- 201,829 opportunities were audited at 92 centres.
- Overall total adherence was 59.7%; complete adherence only 27.3%.
- West-zone, private and non-teaching facilities had higher rates.
- Nurses had the highest total professional adherence.
- Moments 2 and 3 were strongest; Moment 5 was weakest.
- Non-COVID ICUs outperformed COVID ICUs.

## 11. Outcome of COVID-19–Associated Acute Stroke: A Study from South India

*Neurology India. 2023;71(1):92–98. DOI: 10.4103/0028-3886.370457.*

### Objectives

To characterise stroke type and 90-day functional outcome in patients with acute stroke and concurrent COVID-19, and identify clinical, inflammatory, coagulation and virological predictors of poor outcome.

### Background

SARS-CoV-2 can be accompanied by inflammation, endothelial injury and hypercoagulability, all of which may trigger or worsen stroke. However, COVID-19 may also be incidental in patients with conventional vascular risk factors. Prospective measurement of biomarkers and functional outcome can identify risk markers without necessarily proving a direct causal mechanism.

### Methods

This was a prospective, single-centre observational cohort conducted in a tertiary hospital in South India during the COVID-19 pandemic. The analytic population comprised 110 consecutive COVID-positive acute-stroke patients drawn from 610 acute-stroke admissions. Acute ischaemic or haemorrhagic stroke with confirmed COVID-19 positivity was included. We recorded time from COVID symptoms to stroke and performed standard stroke-subtype evaluation. Clinical assessment included vascular risk factors, stroke type, TOAST-style ischaemic subtype and admission NIH Stroke Scale. Laboratory evaluation included C-reactive protein, D-dimer, LDH, procalcitonin, interleukin-6, ferritin and SARS-CoV-2 cycle-threshold value. Patients were followed for 90 days. The principal outcomes were defined as follows: Poor functional outcome was defined as modified Rankin Scale at least 3 at 90 days. In-hospital mortality was also analysed. Candidate predictors were compared across stroke subtype, death and poor outcome. For analysis, Categorical and continuous comparisons were performed with appropriate tests. Odds ratios and 95% confidence intervals were calculated. Variables associated with outcome entered multiple logistic regression; $p \leq 0.05$ defined significance.

### Results

During the study period, 8,960 patients were admitted with COVID-19, of whom 110 (1.22%) had concomitant acute stroke. These 110 represented 18% of all 610 acute-stroke admissions. Patients were predominantly male (72.7%) and mean age was 56.5±10.3 years. Median interval from COVID symptom onset to stroke was seven days and mean hospital stay about 13 days. Hypertension was present in 53.6%, diabetes in 37.2%, smoking in 27.2% and dyslipidaemia in about 26%. Thus, conventional vascular risk factors remained common despite the COVID context. Ischaemic stroke accounted for 94 cases (85.4%) and intracerebral haemorrhage for 16 (14.5%). Large-artery atherosclerosis was the largest ischaemic subtype, followed by cryptogenic and cardioembolic stroke. Mean admission NIHSS was 10.3. CRP was positive in 58.1%, D-dimer elevated in 36.3%, LDH in 35.4%, IL-6 in 33.6% and ferritin in about 35%. Elevated D-dimer was particularly frequent among cardioembolic cases, while CRP differed across subtypes. Poor 90-day outcome occurred in 58 patients (52.7%), including 27 in-hospital deaths (24.5%). Haemorrhagic and cardioembolic strokes were significantly associated with in-hospital mortality in unadjusted analysis. A COVID symptom-to-stroke interval of five days or less, CRP positivity and raised D-dimer, IL-6 and ferritin were associated with death and/or poor outcome. In multivariable analysis, reported independent predictors included symptom duration ≤5 days, CRP positivity, D-dimer (OR about 2.11), IL-6 (OR about 1.92) and ferritin (OR about 2.4). The abstract additionally reported cycle-threshold ≤25 as a strong predictor of poor

outcome. Because lower Ct generally reflects higher viral RNA concentration but is assay- and timing-dependent, it should not be interpreted as a universal quantitative viral-load cut-off. More than half the cohort had disability or death at 90 days, underscoring the severity of combined acute stroke and active COVID-19.

## Conclusion

COVID-positive acute-stroke patients had high 90-day disability and in-hospital mortality. Early temporal proximity to COVID symptoms and elevated inflammatory/coagulation markers identified a particularly high-risk subgroup, but do not by themselves prove causation.

## Key achievements

- Prospectively characterised COVID-19-associated stroke in a South Indian tertiary-care setting and documented 90-day functional outcome.
- Identified inflammatory, coagulation and viral-load-related markers associated with poor outcome, supporting early risk stratification of this high-risk neurological group.

## Key highlights of the results

- 110 COVID-positive strokes represented 18% of stroke admissions.
- 85.4% were ischaemic and 14.5% haemorrhagic.
- Poor 90-day outcome occurred in 52.7%; in-hospital mortality was 24.5%.
- Hypertension and diabetes were common conventional risk factors.
- CRP, D-dimer, IL-6 and ferritin were independent outcome markers.
- No COVID-negative control group was included.

## 12. Study of Blood Lactate Levels at Admission as a Predictor of Mortality and Morbidity in Critically Ill Children in a Tertiary Care Pediatric Intensive Care Unit

*Asian Journal of Pediatric Research. 2024;14(12):75–83. DOI: 10.9734/AJPR/2024/v14i12412.*

### Objectives

To assess admission blood lactate as a predictor of in-hospital mortality and morbidity in critically ill children and estimate a threshold that best discriminated survivors from non-survivors.

### Background

Lactate rises through tissue hypoperfusion, adrenergic stimulation, impaired clearance and altered cellular metabolism. In PICU populations it may provide rapid risk stratification, but a single value is not specific for shock and age, diagnosis and treatment influence interpretation. Locally derived thresholds may support triage if validated.

### Methods

This was a prospective, single-centre observational study conducted in the Pediatric Critical Care Department of NICE Hospital for Women, Newborns and Children, Hyderabad, from August 2022 to July 2023. The analytic population comprised 202 critically ill children aged one month to 18 years. Children requiring intensive monitoring for respiratory failure, mechanical ventilation risk, neurological or hepatic illness, cerebral malaria, trauma, major bleeding, coma, shock or haemodynamic instability were eligible. Children with inborn errors of metabolism or lactate-metabolism disorders, prior bicarbonate treatment or absent parental consent were excluded. History and examination were recorded at admission. A pre-heparinised venous blood-gas sample was analysed promptly using an ABL80 Flex analyser; lactate 0.6–1.5/1.6 mmol/L was treated as normal. Patients underwent continuous vital monitoring and four- to six-hourly clinical reassessment. Repeat tests and corrective treatment were provided according to clinical need. Organ dysfunction, sepsis markers, ventilation, inotrope requirement, length of stay and final outcome were recorded. The principal outcomes were defined as follows: The study related admission lactate strata to multiorgan dysfunction, ventilatory and inotropic support, positive sepsis markers, hospital stay and survival. Receiver operating characteristics were used to select a mortality cut-off. For analysis, SPSS 21 generated means, standard deviations, counts and proportions. Normality assessment, unpaired tests and chi-square/Fisher tests were used.
Sensitivity and specificity were calculated for candidate lactate thresholds, with $p<0.05$ considered significant.

### Results

Of 202 children, 118 were male and 84 female. Infants formed the largest age group, about 43% of the cohort. Admission hyperlactataemia above 1.5 mmol/L occurred in 141 children (70%), while 61 had lactate in the stated normal range. Among hyperlactataemic patients, 34% had values 1.6–2.5 mmol/L, 32% had 2.6–3.5 mmol/L, 12% had 3.6–4.5 mmol/L and 22% exceeded 4.5 mmol/L. More than half of hyperlactataemic cases were infants. Multiorgan dysfunction involving at least two systems occurred in 83 children and increased sharply across lactate strata. Only four children in the normal-lactate group had multiorgan dysfunction, compared with 29 of 31 children (93.55%) in the ≥4.6 mmol/L group. Fifty-five children required inotropic support. The requirement increased from about 3% at lactate 0.5–1.5 mmol/L to roughly 90% among those above 4.6 mmol/L. Overall, 79% required ventilatory support.
Every child in the highest lactate stratum reportedly required ventilation. Positive sepsis markers were present in about 51% overall and increased from 27% in the normal group to approximately 93% in the

highest stratum. Length of stay was also related to lactate, although early deaths complicated interpretation in the highest group. Around one third of children with lactate ≥4.6 mmol/L remained more than seven days, while the normal group more often had short stays. Survivors had a geometric mean admission lactate of about 1.2 mmol/L compared with 4.8 mmol/L among non-survivors. Survival declined progressively with increasing lactate; only about 3.5% of survivors belonged to the highest stratum. The selected cut-off was 4.05 mmol/L, with reported sensitivity of 93.6% and specificity of 89.7% for in-hospital mortality.

## Conclusion

Higher admission lactate was strongly associated with organ dysfunction, life-support requirements and mortality in this PICU cohort.

## Key achievements

- Demonstrated the feasibility of using admission lactate as an immediately available bedside risk marker in a heterogeneous paediatric intensive-care population.
- Proposed a clinically useful mortality threshold and documented a strong stepwise relationship between rising lactate, multiorgan dysfunction, ventilatory support and death.

## Key highlights of the results

- 202 critically ill children were enrolled prospectively.
- 70% had admission hyperlactataemia.
- Multiorgan dysfunction rose to 93.6% in the highest lactate group.
- All children with lactate >4.6 mmol/L required ventilatory support.
- Survivor versus non-survivor geometric mean lactate was 1.2 versus 4.8 mmol/L.
- Cut-off 4.05 mmol/L: reported sensitivity 93.6%, specificity 89.7%.

## 13. A Prospective Study on Screening of Congenital Heart Diseases Using Combined Pulse Oximetry and Clinical Examination in Neonates

*Pediatric Review: International Journal of Pediatric Research. 2024;11(4):66–72. DOI: 10.17511/ijpr.2024.i04.02.*

### Objectives

To evaluate pulse oximetry combined with cardiac clinical examination for early identification of congenital heart disease, particularly cyanotic disease, among asymptomatic term newborns before discharge.

### Background

Critical congenital heart disease may not produce an obvious murmur or visible cyanosis before ductal closure. Pulse oximetry can detect occult hypoxaemia and complements examination, but an accuracy study requires verification of screen-negative infants to calculate sensitivity and specificity. Small single-centre implementation studies mainly demonstrate feasibility and yield.

### Methods

This was a prospective hospital-based screening study conducted in the postnatal ward of Yashoda Hospital, Hyderabad. The analytic population comprised 224 asymptomatic term newborns. Term newborns in the postnatal ward were included after parental information and consent. Infants admitted to NICU at birth, preterm infants, prenatally diagnosed congenital heart disease and external congenital anomalies were excluded. Screening was usually performed between 24 and 48 hours using a GE monitor, with the infant quiet or asleep and the probe applied to the right hand. Saturation below 90% led to echocardiography; readings of 90%–94% were repeated after six hours and persistent values below 95% led to echocardiography. Simultaneous cardiac examination assessed tachycardia, tachypnoea, central cyanosis and murmur. Any positive clinical examination also triggered echocardiography. The principal outcomes were defined as follows: The study reported the proportion with positive pulse oximetry or examination, echocardiographic diagnoses, cyanotic versus acyanotic defects and overlap between screening methods. For analysis, Data were entered in Excel and analysed descriptively in SPSS 16. Categorical variables were presented as counts and percentages and quantitative variables as means and standard deviations. Because screen-negative newborns did not all receive echocardiography, sensitivity and specificity could not validly be calculated.

### Results

Among 224 newborns, 51.3% were female and 48.7% male. All were term. About 70.1% weighed 2.5–3.0 kg, 25.4% weighed 3.1–3.5 kg and 4.5% exceeded 3.5 kg. Caesarean delivery was common, at approximately 79.9%. Clinical examination found tachycardia in 4.0%, tachypnoea in 3.6%, cyanosis in 4.0% and a murmur in 6.7%. Fifteen newborns (6.7%) were considered clinically screen-positive. Pulse oximetry was below 90% in 12 newborns (5.4%), 91%–94% in five (2.2%) and at least 95% in 207 (92.4%). Therefore, 17 newborns (7.6%) were pulse-oximetry positive using the <95% threshold. Echocardiography identified structural congenital heart disease in 15 screen-positive newborns, including 12 acyanotic lesions and three cyanotic lesions. The cyanotic diagnoses were tetralogy of Fallot, pulmonary stenosis and tricuspid atresia, one case each. The 15 clinically positive infants all had an echocardiographic lesion, while two of 17 pulse-oximetry-positive infants had structurally normal hearts. Positive predictive value for any CHD among pulse-oximetry positives was therefore about 88%, but this selected verification design can inflate apparent performance. All three cyanotic lesions were

detected by both clinical examination and pulse oximetry. Their reported saturations were around 86%–89%, and murmur/cyanosis were present on examination. Acyanotic diagnoses included atrial septal defects, patent ductus arteriosus, ventricular septal defects, patent foramen ovale and combinations. These findings illustrate that low saturation is not restricted to classic critical cyanotic disease, but the clinical significance of small defects varies. The sensitivity, specificity and negative predictive value could not be calculated because the 207 screen-negative newborns did not undergo echocardiography and were not systematically followed. A normal screen therefore could not rule out CHD. The practical contribution is demonstration that combined bedside screening was feasible after 24 hours and led to early echocardiography in 17 infants.

**Conclusion**

Combined pulse oximetry and clinical examination identified three cyanotic and several acyanotic heart defects before discharge. Because screen-negative infants were not verified, the study supports feasibility and complementary ECG.

## Key achievements

- Demonstrated a feasible combined neonatal screening pathway using pulse oximetry and clinical examination in a postnatal ward.
- Detected clinically important cyanotic and other structural congenital heart diseases among apparently asymptomatic term newborns, supporting earlier echocardiographic referral.

## Key highlights of the results

- 224 asymptomatic term newborns were screened.
- 17 (7.6%) had pulse saturation below 95%; 15 were clinically positive.
- Fifteen structural CHDs were found on echocardiography.
- Three cyanotic lesions were identified: TOF, pulmonary stenosis and tricuspid atresia.
- Two pulse-oximetry-positive infants had normal echocardiograms.
- Sensitivity and specificity could not be calculated without testing screen-negative infants.

## 14. Survival of Trial-Like and Non–Trial-Like Patients With Immunotherapy in Advanced Hepatocellular Carcinoma in Real World: A Collaborative Multicenter Indian Study (IMHEP)

*JCO Global Oncology. 2023;9:e2300215. DOI: 10.1200/GO.23.00215.*

### Objectives

To compare real-world survival after immune-checkpoint inhibitor therapy between advanced hepatocellular-carcinoma patients who resembled pivotal-trial populations and those excluded by poor liver function, performance status, main portal-vein thrombosis or prior systemic therapy.

### Background

Immune checkpoint inhibitors have improved advanced HCC outcomes in selected trial populations, generally with Child–Pugh A liver function, good performance status and restricted portal-vein involvement. In routine practice, clinicians treat substantially less fit patients, but efficacy and tolerability may not reproduce trial results. Indian multicentre data can inform expectations and selection.

### Methods

This was a retrospective collaborative multicentre cohort conducted in 11 Indian institutions, including patients treated from January 2017 through January 2022. The analytic population comprised 133 patients with adequate data from 149 entered records. Patients had radiologically or histologically confirmed unresectable HCC, received at least one ICI dose in first or later line, had at least one post-treatment response assessment and documented treatment dates. Patients who did not receive immunotherapy were excluded. An anonymised standard form captured demographics, aetiology, Child–Pugh class, BCLC stage, ECOG performance, cirrhosis, varices, portal-vein thrombosis, extrahepatic disease, AFP, prior therapy, ICI regimen, liver-directed treatment, adverse events and outcomes. 'Trial-like' patients received first-line ICI, had Child–Pugh score ≤6, ECOG 0–1 and no VP4 main portal-vein thrombosis. Anyone failing at least one criterion was 'trial-unlike'. The principal outcomes were defined as follows: Primary outcome was overall survival, with emphasis on 12-month survival. Secondary outcomes included progression-free survival, prognostic factors, treatment cessation and adverse events. For analysis, Kaplan–Meier methods estimated OS and PFS; log-rank tests compared groups. Variables significant in univariate analysis entered multivariable Cox regression. SPSS 20 was used.

### Results

Median age was 61 years, 87% were male and 81% had BCLC stage C disease. NASH was the commonest reported aetiology (34%), followed by hepatitis B, cryptogenic disease, hepatitis C and alcohol. Child–Pugh A liver function was present in 63%; the remainder had B7 or B8–9 disease. ECOG 2–3 occurred in about 23%. Portal-vein thrombosis was present in 52%, including main portal-vein thrombosis in 33 patients (25%). Atezolizumab–bevacizumab was used in 88 patients (66%), nivolumab in 44 (33%) and pembrolizumab in one. Sixty-five per cent received ICI first line; 35% had prior systemic therapy. Only 31 patients (23%) met all trial-like criteria, while 102 (77%) were trial-unlike. At median follow-up 13.8 months, 73 patients had died. Median OS for the full cohort was 8.2 months, 12-month OS 33.4% and two-year OS 28.2%. Median PFS was 3.5 months. Sixteen patients remained on ICI at data cut-off. Trial-like patients had markedly superior OS: median not reached and 12-month OS 57.9%, compared with median 7.6 months and 12-month OS 24% in trial-unlike patients (p=0.005). PFS did not

differ significantly, 4.3 versus 3.5 months (p=0.13). Univariate OS was better with Child–Pugh A/B7 than B8–9, BCLC B than C/D, ECOG 0–1 than 2–3 and absence of main portal-vein thrombosis. Main thrombosis was associated with median OS about four months versus 8.6 months with branch thrombosis and 9.7 months without thrombosis. In multivariable analysis, better Child–Pugh status remained favourable (HR about 0.567), while main portal-vein thrombosis independently predicted worse survival (HR about 2.006). Performance status and BCLC stage lost statistical significance after adjustment. Treatment-related adverse events were reported in 92%, most often fatigue (51%) and nausea/vomiting (22%); immune-related hypothyroidism occurred in 6% and other immune endocrine effects in 4%. Only 3% stopped treatment because of an immune-related event, suggesting tolerability was generally manageable. The study does not establish that ICI was ineffective in trial-unlike patients because there was no comparator and their baseline prognosis was far worse. It demonstrates that survival expectations from pivotal trials should not be transferred uncritically to patients with decompensated liver function, poor performance or main portal-vein invasion.

## Conclusion

Real-world trial-like Indian patients achieved survival broadly consistent with clinical trials, whereas trial-unlike patients had substantially poorer OS. Child–Pugh status and main portal-vein thrombosis were the most robust independent prognostic factors and should shape counselling and treatment selection.

## Key achievements

- Built an 11-institution Indian real-world dataset describing immunotherapy outcomes in advanced hepatocellular carcinoma.
- Demonstrated the major survival gap between trial-like and trial-unlike patients and identified main portal-vein thrombosis as a powerful adverse prognostic factor.

## Key highlights of the results

- 133 patients from 11 Indian institutions were analysed.
- Only 23% were trial-like; 77% had at least one trial-exclusion feature.
- Overall median OS was 8.2 months; 12-month OS 33.4%.
- 12-month OS was 57.9% trial-like versus 24% trial-unlike.
- Main portal-vein thrombosis independently doubled mortality hazard.
- Treatment was generally tolerable, but adverse baseline biology dominated survival.

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2) Mohanan PP, Jariwala P. HOW did GLP-1RAs bring about a paradigm shift in the guidelines of managing T2DM: A path to gluco-cardio Centricity. Indian Heart J. 2023 Jan-Feb;75(1):1-8. doi: 10.1016/j.ihj.2022.11.010. Epub 2022 Nov 24.
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4) Kanneganti A, Tan BYQ, Nik Ab Rahman NH, Leow AS, Denning M, Goh ET, et al. Safety attitudes, burnout and well-being among healthcare workers during the COVID-19 pandemic: an Indo-Pacific regional cross-sectional study. Singapore Med J. 2023 Nov;64(11):667-676. doi: 10.11622/smedj.2022014.
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8) Dhandapani S, Rajshekar D, Priyadarshi K, Krishnamoorthi S, Sundaramurthy R, Madigubba H, et al. Comparison of hand hygiene compliance among healthcare workers in Intensive care units and wards of COVID-19: A large scale multicentric study in India. Am J Infect Control. 2023 Mar;51(3):304-312. doi: 10.1016/j.ajic.2022.09.028. Epub 2022 Oct 9.
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12) Dey M, R N, Nikiphorou E, Sen P, Saha S, Lilleker JB, et al. Higher risk of short term COVID-19 vaccine adverse events in myositis patients with autoimmune comorbidities: results from the COVAD study. Rheumatology (Oxford). 2023 May 2;62(5):e147-e152. doi: 10.1093/rheumatology/keac603.
13) Chaudhuri JR, Sharma VK, Mridula KR, Anjanikumar D, Bandaru VCS. Outcome of COVID-19–Associated Acute Stroke: A Study from South India. Neurol India 2023;71:92-98
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**Workshops and Trainings:**

| S.No | Year | Event | Event Type | Specialty |
|---|---|---|---|---|
| 1. | 2023 | CME Program for Medical Officers | CME | General Medicine |
| 2. | 2023 | Research Methodology Workshop | Workshop | Clinical Research |
| 3. | 2023 | Evidence Based Medicine | CME | General Medicine |
| 4. | 2023 | ACLS Provider Course | Training | Emergency Medicine |
| 5. | 2023 | BLS Provider Course | Training | Emergency Medicine |
| 6. | 2023 | ECMO Training | Hands-on Workshop | Critical Care |
| 7. | 2023 | Mechanical Ventilation Workshop | Workshop | Critical Care |
| 8. | 2023 | Trauma Course | Course | Emergency Medicine |
| 9. | 2023 | Ultrasound Workshop | Workshop | Radiology |
| 10. | 2023 | Clinical Trial Workshop | Workshop | Research |
| 11. | 2023 | Medical Education Program | Workshop | Medical Education |
| 12. | 2023 | Nursing Education Program | Workshop | Nursing |
| 13. | 2023 | Infection Control Workshop | Workshop | Infection Control |
| 14. | 2023 | Fellowship Academic Session | Academic | Multi-specialty |
| 15. | 2023 | Grand Rounds | Academic Session | Multi-specialty |
| 16. | 2023 | Resident Teaching Program | Teaching | Medical Education |
| 17. | 2023 | AI in Healthcare Seminar | Seminar | Digital Health |

**Conference:**

| S.No. | Year | Event | Event Type | Specialty |
|---|---|---|---|---|
| 1. | 2023 | ICU Update | Symposium | Critical Care |
| 2. | 2023 | Oncology Symposium | Symposium | Oncology |
| 3. | 2023 | Transplant Update | Conference | Transplant Medicine |

**YEAR - 2023-24**

## Income:

| Income (in Lakhs) | Grants | Donations | Project(s) related | Foreign Contribution | Testing | Others | Total Income (Lakhs) |
|---|---|---|---|---|---|---|---|
| For R&D Activities | 0 | 706.23 | 0 | 0 | 0 | 2.11 | **708.34** |
| For Non R&D Activities | 0 | 50.03 | 0 | 0 | 0 | 16.15 | **66.18** |
| Total Income | **0** | **756.26** | **0** | **0** | **0** | **18.26** | **774.52** |

## Expenditure:

| Expenditure (in Lakhs) | Capital Expenditure | Revenue expenditure other than salaries | Salaries | Others | Total Expenditure (in Lakhs) | Percentage |
|---|---|---|---|---|---|---|
| For R&D Activities | 540.20 | 0 | 48.03 | 120.10 | **708.33** | **92.03** |
| For Non R&D Activities | 0 | 0 | 6.96 | 54.43 | **61.39** | **7.97** |
| Total Expenditure | **540.20** | **0** | **54.99** | **174.53** | **769.72** | **100.00%** |

## Research Infrastructure and Core Facilities

| Total Land & Building Area | Total Land area (in acres) | Total Built up area (in Sq.m) | Total Land & Building area for R&D | Total Land & Building area with Organization |
|---|---|---|---|---|
| 1600 sq.yards | 0.329 | 1337.80 | 2400 sft | 750 Sq. Yards |

| Sl. No | Equipment Type | Name of Particulars |
|---|---|---|
| 1 | HPLC | HemoCue |
| 2 | Gas Chromatography | HemoCue |
| 3 | PCR Machine | Qiagen |
| 4 | Elisa Reader and Washer | Bio-Rad |
| 5 | Flow Cytometry | BD |
| 6 | Immune Analyzer | Abbott |
| 7 | Hematology Analyzer | Stago |
| 8 | Serology Analyzer | Abbott |
| 9 | Blood Gas Analyzer | Radiometer |
| 10 | Ultrasound with Probe | Samsung |
| 11 | -80 Deep freezer | Remi |
| 12 | -20 Deep freezer | Celfrost |
| 13 | 2-8° C Refrigerator | Celfrost |
| 14 | 12-24 Refrigerator | Celfrost |
| 15 | Cold centrifuge | Remi |
| 16 | Incubator | Bio-Technics |
| 17 | Auto Analyzer | Sysmex |

| | | |
|---|---|---|
| 18 | Microscope | Motic |
| 19 | Water Bath | Bio-Technics |
| 20 | Shakers, Scales, Balances and Pipettes | Remi, Wensar, Wensar, Thermo |
| 21 | Fundoscopy | Remidio Innovative Solutions |

# FY 2023–2024

| Scientific Staff | Technical Staff | Administrative Staff |
|---|---|---|
| Dr. Vishnu Reddy | Metilda Richards | Mr. Madhu Kiran |
| Dr. B.V.C.S. Srinivasa Rao | Gangadhar | Ms. Jyothi |
| Dr.V Lakshmi | Manognya | Mr. Jeeven |
| Mr. B. Prasad | Sabha | |
| Mr. T. Lakshmaiah Naidu | Rahul | |
| Mr. Madhusudhan A. | Chandana | |
| Mr. Avula Venkaiah | Deepti | |
| | Hema | |
| | Shankar Nayak | |
| | Prashanth | |
| | Sowmya | |
| | Triveni | |
| | Bhavu Singh | |
| | Suresh | |
| | Aishwarya | |
| | Vadapally Bhavani | |

**General body members**

| S.No | Name | Designation |
|---|---|---|
| 1 | G Surender Rao | President |
| 2 | G Ravender Rao | Vice President |
| 3 | A Lingaiah | General Secretary |
| 4 | B Jagan Mohan | Joint Secretary |
| 5 | G Devender Rao | Treasurer |
| 6 | B Venkat Reddy | Executive Member |
| 7 | P Devender | Executive Member |

**Executive Committee / Governing Body**

| S.No | Name | Designation |
|---|---|---|
| 8. | G Surender Rao | President |
| 9. | G Ravender Rao | Vice President |
| 10. | A Lingaiah | General Secretary |
| 11. | B Jagan Mohan | Joint Secretary |
| 12. | G Devender Rao | Treasurer |
| 13. | B Venkat Reddy | Executive Member |
| 14. | P Devender | Executive Member |

**Research Advisory Board:**

| S. No | Name | | Designation |
|---|---|---|---|
| 12. | Dr. B Vijayakumar | General Physician, Yashoda | Chairperson |
| 13. | Dr. M V Rao | General Physician, Yashoda | Member |
| 14. | Dr. Jaydip Rai Chaudhuri | Neurophysician, Yashoda | Member |
| 15. | Dr. JJ Reddy | General Surgeon- | Member |
| 16. | Rukumani Mrudula | Neurophysician, CITI-Neurocenter | Member |

**Ethics committee**

| S. No | Name | Designation | Internal/External Organisation |
|---|---|---|---|
| 1 | Justice L.Narasimha Reddy | Chairman/Legal Expert | |
| 2 | Dr.S.Manimala Rao | Member Secretary | |
| 3 | Dr. B. Sesi Keran | Member | |
| 4 | Dr.D.Govinda Das | Member | |
| 5 | Dr.Meena Hariharan | Member | |
| 6 | Dr.I.Dinakar | Member | |
| 7 | Sri.Borra Satyanarayana Murthy | Member | |
| 8 | Dr.K.Kiran Kumar | Member | |
| 9 | Sri.Thota Devidas | Member | |
| 10 | Sri.Srinivas Kondamalla | Member | |
| 11 | Dr.BVCS.Srinivasarao | Joint Sectetary | |