

# **Critical Care Medicine**

## **About the Department:-**

The Department of Critical Care Medicine was created in Jan 2014 to streamline the working of the ICU's at Bharati Vidyapeeth (Deemed to be University) Medical college's Bharati hospital & Research Centre and create an academic environment for research and education.

The department is well equipped and provides services for around 4500 critically ill patients every year. The medical emergency and code blue team from the department of critical care medicine provides outreach services for critically ill patients in other parts of the hospital. We also monitor several quality indicators and conduct audits to provide quality health care for ICU patients.

A number of training programs are conducted on an ongoing basis for undergraduates, postgraduates and nurses. Department has been granted permission for conducting DM Critical care by MOH&FW, Vide reference- U-12012/14/2016-ME-1

During the COVID 19 pandemic, the department of critical care medicine has treated over 2000 critically ill patients. We have also provided training for acute care in Covid 19 for more than 500 healthcare professionals all over the state of Maharashtra as part of JHPIEGO and Government of Maharashtra DGHS joint collaboration,

## **Facilities**

1. Tertiary level Adult Intensive Care Unit with approximately 5000 admissions per year.
2. Round the clock coverage with trained Intensive care specialists.
3. 60 bedded units equipped with multiparameter monitors, Central Oxygen, air, suction/  
Dual UPS and Generator backup.
4. 40 ventilated beds (Vela Comprehensive, Avea, Bella Vista, NOCARCC), 20 HFNC's.
5. 6 Dedicated NIV ventilators, 4 Transport Ventilators.
6. 7 Isolation room.
7. Advanced Ventilator facilities like High Frequency Oscillator, AVEA- Trans pulmonary pressure monitoring, GE Carescape R860 with metabolic cart.
8. Advanced monitoring facilities such as Invasive hemodynamic monitoring, cardiac output, Capnography, BIS, Bedside EEG.
9. ECMO (Maquet) facility.
10. 100 Syringe pumps
11. 5 Defibrillators,
12. 4 Transvenous pacemakers
13. Intra-aortic balloon pump (stationed in cath lab)
14. Difficult airway carts in each unit
15. Dedicated Bedside X-ray (SHIMADZU) and Echocardiography/ US (Sonosite) with Point of care X-Ray system (REGUS 190) stationed in ICUs
16. Dedicated Ultrasound Machine in each ICUs (Philips HD 5, Philips Innosite)
17. Dedicated Bronchoscope (Olympus)
18. Point of care lab- ABG, Lactates and Electrolytes
19. ICU Dialysis facility (4 Dialysis Machines- Fresenius 4800, 5800S, ART Plus and Ultra touch 1000) with dedicated RO unit
20. In house resuscitation services- CODE BLUE for the hospital/ MEWS team
21. Stroke / MI/ Sepsis/ Trauma Codes
22. 24 hour available Speciality backup, Laboratory and radiological facilities- CT/MR.
23. Advanced Simulation Skills lab with Sim Man 3G and other basic manikins

## **Achievement & Awards-**

### **Dr. Shivakumar Iyer (Prof. & Head)**

1. Past President, Indian Society of Critical Care Medicine (ISCCM)
2. Awarded Fellowship of “Indian Society of Critical Care Medicine” (2010)
3. Member of the BASIC steering committee (2009 onwards)
4. Past ISCCM Certificate Course Coordinator, ISCCM
5. Past Vice President ISCCM, Past Chairperson ISCCM Pune Branch
6. ISCCM National representative for CoBaTrice (Competency based training in Intensive care in Europe) study,
7. Organizing Secretary PENSA (Parenteral & Enteral Nutrition Society of Asia) 2003 held in Goa in November 2003.
8. Speaker for various National and International Conferences like, ISCCM- Criticare, ESICM, Asian Intensive Care, IPACCM, ASMIC, and WFISCCM.
9. Adjunct Assistant Professor, Department of Anaesthesia and Critical Care, Prince of Wales Hospital, Chinese University of Hong Kong. Hong Kong
10. Commonwealth Scholarship (Commonwealth scholarship commission, UK) for distance learning MSc Palliative Medicine at Cardiff University, Wales.

## **Best Papers and Posters awarded –**

### **Dr Prashant Jedge:**

1. Outstanding international Abstract award at the 39<sup>th</sup> KSCCM annual congress and acute critical care conference 2019.

Title: Prospective Observation study of High flow nasal oxygen therapy and non-invasive Positive pressure ventilation in patients with acute hypoxemic respiratory failure.

### **Dr Shambhavi:**

1. First prize in Oral paper presentation “Bridging the evidence practice gap in acute coronary syndrome- a clinical audit” at MAHA –EM 2020.
2. Selected for Young talent- CRITICARE 2020, Hyderabad.

Topic: Root Cause Analysis.

3. Prize for e poster at CRITICARE2020 “Taking critical care to remote areas – an online training initiative.”

### **Dr Nishant Agarwal:**

1. First prize at SNCC 2020 FOR Oral paper presentation  
“Experimental chest X- Ray scoring system for determining patient outcomes in COVID 19 Patients”
2. Consolation prize for ISCCM day poster presentation – “Critical Care Warriors at the frontline with patient advocacy”

### **Dr Venkatesh Satri:**

1. First prize in case series category for case series in Strychnine poisoning in MAHA EMCON 2020.

## **Teaching Learning –**

### Departmental Training Programs:-

1. DM Critical care training Program.
2. Structured training program for Residents from Anaesthesia, Medicine, Surgery, Pulmonary Medicine and Emergency medicine on rotation to ICU (BASIC).
3. Critical care nurses training program (BASIC for Nurses).
4. Junior Residents Induction program- Annually  
Two day Induction program for all post graduates covering modules on resuscitation skills, Hand hygiene and communication.
5. Basics of Infection Control Workshop – annually in conjunction with Infection Control Department. One day workshop with focus on Infection prevention and treatment with modules on hand hygiene, PPE, Prevention Bundles, Isolation precautions, Collecting cultures, Interpreting Antibiograms and case based discussions for community acquired and hospital acquired Infections
6. Nurses In-service training program - Ongoing basis  
Three days (12 hours) induction program followed by 6 weeks in-service competencies assessment with Log book, 6 monthly review of competencies.
7. Acute care training program “Very BASIC” (Simulation based training in acute care competencies) done for all undergraduates(8<sup>th</sup> semester) since 2012 onwards.
8. In Hospital BLS-D (Basic Life Support with defibrillation) training course for clinical and nonclinical staff.
9. ACR (Advanced Cardiac resuscitation) Workshops for critical care areas, ER and OT staff.
10. “MAHA-ACT”, acute care training program for Covid 19 in collaboration with JHPEIGO and DGHS, Maharashtra.  
(<https://ecokrypt.com/dashboard/course/detail/6052a8cda64ab23952ce47e9/Maha--ACT--Maharashtra-Acute-Care-Training--Project-Manual-for-COVID-19>)

## Publications last 5 years

Sr No	Title	Author	Journal	Citation Index	Year
1.	Intensive Care In India In 2018-2019: The Second Indian Intensive Care Case Mix And Practice Patterns Study	Jigeeshu Divatia, Yatin Mehta, Deepak Govil etal Dr Jignesh Shah, Dr Prashant Jedge – Site PI	IJCCM Ahead of print	Pubmed	2021
2.	Direct Medical Cost Analysis In Indian Covid-19 Patients Requiring Critical Care Admission	Kamini Reddy, Shivakumar Iyer, Monidipa Chowdhury, Naveen Yerrapalem, Neeraja Pasalkar, Prashant Jedge, Jignesh Shah	IJCCM Accepted for publication	Pubmed	2021
3	The utility of a modified technique for lower respiratory tract sampling in COVID-19 ICU and review of diagnostic approaches in suspected ventilator associated pneumonia	Anita Anokar Prashant Jedge Jignesh Shah Samruddhi Chougale	Critical Care Innovations  Accepted for publication	DOAJ	2021
4	Experimental Chest X-ray Scoring System for Determining Patient Outcomes in COVID Patients	Nishant Agrawal, Samruddhi DhanajiChougale, Prashant Jedge, S. Iyer	JCDR. Accepted for publication	DOAJ	2021
5	Prospective Observational Study of High Flow Nasal Oxygen Therapy And Non Invasive Positive Pressure Ventilation In Patients With Acute Hypoxemic Respiratory Failure	Prashant Jedge, Jignesh Shah, Sampada Kulkarni, Shivakumar Iyer	Indian Journal of Respiratory Care 2012;10:201-5	DOAJ, Emerging Sources Citation Index, Web of Science	2021
6	Running out of vascular access in CKD patients- a case report on translumbar dialysis catheter	Nishant Agrawal, YadavWaghajiMunde, Jignesh Navinchandra Shah, Prajakta Sunil Lanjewar, Sunil Jawale	Indian Journal of Vascular and Endovascular Surgery. Accepted for publication	Pubmed	2021
7	Early and high SARS-CoV-2 neutralizing antibodies are associated with severity in COVID-19 patients from India	Shrivastava, Shubham; Palkar, Sonali; <b>Shah, Jignesh</b> ; Rane, Prajakta; Lalwani, Sanjay; Mishra, Akhilesh; Arankalle, Vidya	American Journal of Tropical Medicine & Hygiene Doi:10.4269/ajtmh.21-0014	Pubmed	2021
8	Stress levels and its determinants among staff	Vishwanath Patil, Jignesh shah	Indian Journal of Critical Care	Pubmed	2021

	(doctors and nurses) working in critical care unit	Shivakumar Iyer	Medicine Accepted for publication		
9	Off- label drug prescription pattern and related adverse drug reactions in the medical intensive care unit	Asawari Raut, Kavita Krishna, Utkarsha Adake, Apurva Sharma, Anitta Thomas Jignesh Shah	Indian Journal of Critical Care Medicine Accepted for publication	Pubmed	2021
10	Strychnine poisoning- case series of survivors	Venkatesh Satri, Prashant Jedge, Shivakumar S Iyer, Dharanindra Moturu, Jignesh N Shah	Journal of the Indian Society of Toxicology Vol 16, issue 2 ; Jul-Dec 2020	Medline	2021
11	Epidemiological Characteristics Ventilator Management and Clinical Outcome in Patients Receiving Invasive Ventilation in Intensive Care Units from 10 Asian Middle – Income Countries (PRoVENT-iMic): An International Multicenter, Prospective Study	Luigi Pisani <sup>1,2</sup> , Anna Geke Algera <sup>2</sup> , Ary Serpa Neto <sup>3,2</sup> , Areef Ahsan <sup>4</sup> , Abigail Beane <sup>1</sup> , Kaweesak Chittawatanarat <sup>5</sup> , Abul Faiz <sup>6</sup> , Rashan Haniffa <sup>3</sup> , Seyid Mohammad Reza Hashemian <sup>7</sup> , Madiha Hashmi <sup>8</sup> , Hisham Ahmed Imad <sup>9</sup> , Kanishka Indraratna <sup>10</sup> , <b>Shivakumar Iyer</b> <sup>11</sup> , Gyan Kayastha <sup>12</sup> , Bhuvana Krishna <sup>13</sup> , Tai Li Ling <sup>14</sup> , Hassan Moosa <sup>15</sup> , Behzad Nadjm <sup>16</sup> , Rajyabardhan Pattnaik <sup>17</sup> , Sriram Sampath <sup>13</sup> , Louise Thwaites <sup>18</sup> , Ni Ni Tun <sup>19</sup> , Nor'azim Mohd Yunus <sup>20</sup> , Salvatore Grasso <sup>21</sup> , Frederique Paulus <sup>2</sup> , Marcelo Gama de Abreu <sup>22</sup> , Paolo Pelosi <sup>23,24</sup> , Nick Day <sup>25,1</sup> , Nick White <sup>25,1</sup> , Arjen M Dondorp <sup>25,1</sup> , Marcus J Schultz <sup>26,2,25,1</sup> , For The PRoVENT-iMiC Investigators Moru And The Prove Network	An International, Multicenter, Prospective Study. Am J Trop Med Hyg. 2021 Jan 11.	Google Scholar, Pub Med	Jan 2021
12	Repurposed Antiviral Drugs for Covid-19 —Interim WHO	N Agrawal, S Iyer, K Reddy, S Rege, J	The New England Journal of	Cross Ref, PubMed	Feb 2021

	Solidarity Trial Results	Shah(Site investigators)	medicine		
13	Cost of medical management of patients in intensive care unit in a tertiary care teaching hospital, Pune, India	Achsah Anna Mathew, Jainam Narendra Karsiya, Neel Kiran Patel, Dharmik Anil Limbachiya, Jignesh Navinchandra Shah1 , Atmaram P. Pawar2 , Prasanna R. Deshpande	MGM J Med Sci 2021;8:268-76.	DOAJ	2021
14	An out of the ordinary case report of ticagrelor furthering rhabdomyolysis induced by atorvastatin	Nishant Agrawal, Shivakumar Iyer, Jignesh Shah, Prashant Jedge	International Journal of Science and Research	ResearchGate Impact Factor (2018): 0.28   SJIF (2019): 7.583	2020
15	Dietary Fiber: Is It Hype or Useful?	Shivakumar Iyer	Indian J Crit Care Med 2020 Nov;24(11):1014.  doi: 10.5005/jp-journals-10071-23655.	PubMed, Cross Ref, Google Scholar	Nov 2020
16	Fractured Guidewire of Hemodialysis Catheter	Prashant Jedge, Jignesh Shah, Shivakumar Iyer, Vishwanath Patil	International Journal Of Scientific Research Volume 9, Issue 8, August 2020	Cross Ref Google scholar Indian Citation Index Index Medicus	Aug 2020
17	Our Experience of Tracheostomy in COVID -19 Patients	Prasun Mishra, Prashant Jedge,  Maitri Kaushik, Purva Artham	Indian J Otolaryngol Head Neck Surg <a href="https://doi.org/10.1007/s12070-020-02036-z">https://doi.org/10.1007/s12070-020-02036-z</a>	PubMed, Cross Ref, Google Scholar, PMC free article	Aug 2020



18	Effect of Academic Detailing on Improvement in Venous Thromboembolism Prophylaxis for Critically Ill and Surgical Patients in a Tertiary Care Teaching Hospital	Bijoy Kumar Panda, Vinod Kumar, MN Ketkar <sup>1</sup> , Jignesh Shah <sup>2</sup>	Indian Journal of Vascular and Endovascular Surgery Volume 7 Issue 1, Jan – March 2020	Cross Ref, Google Scholar, PubMed	March 2020
19	Evaluation of admission serum magnesium levels in patients with septic shock and its correlation with outcome	Akshay R. Khare, Vishwanath C. Patil, Jignesh N. Shah, Shivakumar S. Iyer	Int. J. Adv. Med.2020 Jan7(1):155-160	Index Copernicus Index Medicus for South-East Asia Region (WHO) ScopeMed Journal Index J-Gate Google Scholar CrossRef Directory of Science	2019
20	Effect of a Recombinant Human Soluble Thrombomodulin on Mortality in patient with Sepsis Associated Coagulopathy The SCARLET ET Randomized Clinical Trial	Shivakumar S. Iyer Site PI	JAMA 2019 May 28;321(20):1993-2002. doi: 10.1001/jama.2019.5358.	Pub med	2019
21	Review of code blue system and audit	<b>Patil VC</b> , Shah JN, Jedge PP, Patil SV	Int J Res Med Sci. 2019 May;7(5):1809-1812	Index Copernicus Index Medicus for South-East Asia Region (WHO) ScopeMed CrossRef Google Scholar Ulrichsweb Journal	2019

				Index J-Gate Directory of Science	
22	Identification and Assessment of Potential Drug-Drug Interactions in Intensive Care Unit Patients.	Wagh BR, etal, Iyer SS	Indian J Crit Care Med 2019; 23(4):170–174.	PubMed, Pro Quest, EMBASE, Scopus, EBSCO, HINARI, Google Scholar, ESCI	2019
23	Knowledge and attitude regarding organ donation among relatives of patients admitted in ICU	<b>Patil S.V.</b> , Ostwal N.B., Patil V.C., Gothankar J.S.	Public health Rev: Int J Public health Res 2019;6(3):89- 95.doi:10. 17511/ijphr.2019.i 3.01.	Index Copernicus Science central, <u>INDIANSci ence.in</u> , J-Gate Indexing, Google Scholar	2019
24	Stratification of patients with emergency severity index and effects of its implementation on the outcome in emergency department of tertiary care hospital 2018	Sada EC etal, S. Iyer, J. Shah	International Journal Of Scientific Research Volume-7   Issue-3   March-2018	PubMed, Index Copernicus, Google Scholar, Research Gate, ICI, ICMJE, Open J- Gate, INDIANSci ence.in, ISI, Cite Factor	2018
25	Definition of Terms Used in Limitation of Treatment and Providing Palliative Care at the End of Life: The Indian Council of Medical Research Commission Report	Naveen Salins <b>Shivakumar Iyer</b> etal	Indian J Crit Care Med. 2018 Apr; 22(4): 249–262	PubMed, Pro Quest, EMBASE, Scopus, EBSCO, HINARI, Google Scholar,	2018

				ESCI	
26	<p>PRactice of VENTilation in Middle-Income Countries (PRoVENT-iMIC):</p> <p>rationale and protocol for a prospective international multicentre observational study in intensive care units in Asia</p>	Luigi PisaniSS Iyer etal,	<p>BMJ Open</p> <p>2018; 8: e020841.</p> <p>doi:10.1136/bmjopen-2017-020841</p>	<p>PubMed Central, Web of Science Core Collection: Science Citation Index Expanded, MEDLINE (Index Medicus), , Scopus, Embase (Excerpta Medica), DOAJ, Google Scholar</p>	2017
27	<p>Current challenges in the management of sepsis in ICUs in resource-poor settings and suggestions for the future</p>	Schultz , Iyer SS etal	<p>Intensive Care Med. 2017 May;43(5):612-624</p>	<p>PubMed/Medline, Science Citation Index/Journal Citation Report</p>	2017
28	<p>Near-Peer Teaching Program for First Year Residents in Medicine</p>	<p>Krishna,K etal,</p> <p>Iyer S ,</p> <p>Jedge P.</p>	<p>South-East Asian Journal Of Medical Education</p> <p>Vol.11,no. 1, 2017</p>	<p>IMSEAR, Google Scholar, ResearchBib, Free Medicus, Open Science Directory. DRJI, ICMJE</p>	2017
29	<p>Withholding and withdrawal of life sustaining treatments in low</p>	J Phua etal, Dr. Jignesh	<p>Intensive Care Med. 2016 Jul;</p>	<p>PubMed/Medline,</p>	2016

	middle income versus high income Asian countries and regions	Shah.(Collaborator )“	42(7):1118-27.	Science Citation Index/Journal Citation Report	
30	Dengue infection with multiorgan dysfunction: SOFA score, arterial lactate and serum albumin levels are predictors of outcome	Sameer Jog <sup>1</sup> , ShirishPrayag <sup>2</sup> , Prasad Rajhans <sup>2</sup> , KapilZirpe <sup>2</sup> , Subhal Dixit <sup>2</sup> , LalithaPillai <sup>2</sup> , <b>Jignesh Shah<sup>2</sup></b> , etal	Intensive Care Med 2015 Nov;41(11):2029-30	PubMed	2015
31	Comparison of Conventional and Simulation-based Teaching Methods in Blood Pressure Measurement	GR Godbole, EC Sada, S Iyer, AR Josh	Journal of Research in Medical Education & Ethics 5(2):176		January 2015
32	Ten major priorities for intensive care in India	JVDivatia <sup>1</sup> , <b>Shivakumar Iyer</b>	Intensive Care Med	PubMed	Aug 2015

### Textbook chapters

Sr. NO	Book Name	Chapter Name	Author Name
1	Workbook on Renal Replacement Therapy in ICU	Drug Dosing on Renal Replacement Therapy	Jignesh Shah, Vishwanath Patil
2	Case- based Review in Critical Care Medicine	Acute Exacerbation of Chronic Obstructive Pulmonary Disease	Jignesh Shah etal
3	Critical Care Update 2019	End of life Practices in India : An update	Shivakumar Iyer, Jignesh Shah
4	Critical Care Medicine MCQs Practice Book 2nd Edition	End of Life / Ehics / Transplant	Jignesh Shah Moturu Dharanindra
5	Critical Care Medicine MCQs Practice Book	Renal Fluids and Electrolytes	Shivakumar Iyer / Dharanindra Moturu
6	Yearbook of Anesthesiology- 8	End of Life care in India: Problems and Solutions	Raj Kumar Mani , Shivakumar Iyer
7	Textbook of CRITICAL CARE Including Trauma	Approach to Unconscious Patient	Shivakumar Iyer, Jignesh Shah

	and Emergency Care		
8	Workbook on Hemodynamic Management	Managing Hypertensive Emergencies and Crisis	Jignesh Shah, Prashant Jedge
9	Critical Care Update 2018	Value of the Anion Gap in Critical Illness	Shivakumar Iyer
10	Principles of Critical Care in Obstetrics	Respiratory Monitoring and blood gas physiology	Shivakumar Iyer, Jignesh Shah
11	Critical Care Update 2017	Ethical issues in Resource Allocation for Critical Care in Resource- limited Countries	Shivakumar Iyer
12	Medicine update 2016-2	Scoring System in Critically ill : Does it help in Prognostication	Shivakumar Iyer, Jignesh Shah
13	Textbook of Emergency Medicine	Mechanical Ventilation	Shivakumar Iyer, Jignesh Shah
14	Clinical Medicine Update (Vol XV)	Antibiotic use in an intensive care setting	Jignesh Shah
15	Critical Care Update 2010	Serotonin Syndrome	Shivakumar Iyer, Jignesh Shah
16	Basics of Clinical Nutrition	Nutrition and Cardiovascular Disease	Shivakumar Iyer
17	ICU PROTOCOLS A Stepwise Approach	Acute febrile Encephalopathy	Shivakumar Iyer, Jignesh Shah
19	ICU PROTOCOLS A Stepwise Approach	Subarachnoid hemorrhage	Shivakumar Iyer, Jignesh Shah Kiran Vadapalli
20	ICU PROTOCOLS A Stepwise Approach	Coma	Shivakumar Iyer Kayanoosh Kadapatti

## **Collaborations-**

“MAHA-ACT”, acute care training program for Covid 19 in collaboration with JHPEIGO and DGHS, Maharashtra.

(<https://ecokrypt.com/dashboard/course/detail/6052a8cda64ab23952ce47e9/Maha--ACT--Maharashtra-Acute-Care-Training--Project-Manual-for-COVID-19>)

## **Research :-**

1. Participated as center for ICMR WHO SOLIDARITY trial.
2. Contributed to many multicenter clinical trials such as

### International

- a. PRoVENT iMiC
- b. SCARLET trial
- c. “ACME Collaboration” studies

### National

- a) INDICAPS I & II
- b) AQCH trial in COVID
- c) ISCCM Pune- PICASO study
- d) IPRI Pune – DIMODS study
- e) ISCCM HERMES trial

3. Multiple investigator initiated studies and publications (Publication list)

## **Ongoing activities:-**

- MAHA –ACT : Acute care training (COVID) program in collaboration with Government of Maharashtra and JHPIEGO
- Solidarity Plus trials

- Investigator initiated studies