



A Decade of Critical Care Medicine in Nepal: Where Have We Reached?

Subhash P Acharya¹, Kabita Sitoula¹, Hem Raj Paneru¹, Shital Adhikary²

¹ Department of Critical Care Medicine, Maharajgunj Medical Campus, IOM, TUTH, Maharajgunj, Kathmandu, Nepal.

² Department of Pulmonology and Critical Care, Chitwan Medical College, Bharatpur, Chitwan, Nepal.

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First ICU in Nepal: Fifty years ago

The first ICU in Nepal started in 1973 at Bir Hospital as a five-bed medical ICU by King Mahendra who returned from Delhi after receiving treatment for some heart problem where he realized the need of ICU in Nepal.^{1,2} Ms. Rameshwori Shrestha, was known as the First ICU Nurse who worked in this ICU at Bir Hospital.³ This was the only ICU in the country for

Abstract

The first ICU in Nepal started in 1973 at Bir Hospital and now there are 1595 ICU beds in Nepal and 840 ICU Beds with ventilators but only 35 Intensivists and only 2.8 ICU Beds/100,000 population. Anesthesiologists are the main physicians working in ICU and almost all ICUs are open or semi closed. Society of Anesthesiologist of Nepal was established since November 1987 whereas after 2010 Nepalese Society of Critical Care Medicine was established. Nepal Critical Care Development Foundation was established in 2012 which started workshops & training for Nurses and also organizes various awareness programs on Sepsis Day and Hand Hygiene Day.

Critical Care Nurses Association of Nepal was established in 2016 and organizes CCN instructor training program and also critical care nurse training program that has certified more than 300 Critical Care Nurses.

Doctorate of Medicine in Critical Care Medicine was started at Institute of Medicine, Tribhuvan University as the first academic program in CCM from 2013 after which fellowship in CCM was started at National Academy of Medical Sciences (2020) and by NSCCM (2023). Masters in Nursing in Critical Care has been started from 2023 at Maharajgunj Nursing Campus, Institute of Medicine from 2023.

Nepal Intensive Care Research Foundation was established in 2020 and started ICU Registry which is now running in 19 ICUs and also working in research and clinical trials.

Although COVID has brought in huge investment in infrastructure and equipments, the parallel growth in trained human resources and implementation of standard of care is still awaited. The current need of Critical Care in Nepal is trained human

almost 20 years till 1992 when six bed mixed medical surgical ICU (TUTH ICU) and five 5 bed Coronary ICU (CCU) and additional 10 beds of high dependency units-Intermediate Cardiac Care Unit (ICCU) and Surgical ICU (SICU) was started at Tribhuvan University Teaching Hospital at Institute of Medicine (IOM). After this, slowly other ICUs started to arise and reached to current state^{1,2} In Nepal, Anesthesiologists were and still are the main physicians working in ICU along with other specialist as Society of Anesthesiologist of Nepal (SAN) was established since November 1987 and have been

Correspondence:

Subhash P Acharya, Department of Critical Care Medicine, Maharajgunj Medical Campus, IOM, TUTH, Maharajgunj, Kathmandu, Nepal.
Email: drsuvash@gmail.com

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working in developing anesthesia, critical care and pain medicine services and education in the country.⁴

Nepalese Society of Critical Care Medicine (NSCCM)

Under the leadership of founding president, Prof. Dr. Moda Nath Marhatta, NSCCM was established on 10 April 2010 with members from Anesthesiology, Internal Medicine, Cardiology – whoever was working in ICU as there were no trained Intensivist in the country. NSCCM also became a member of WFSICCM in 2018 and currently there are 160+ Life Members including Intensivist, Internists and Anesthesiologists. NSCCM has been organizing CME every month and organized its first conference in 2014 and since then in 2016, 2018 and in 2022 organized twenty second Asia Pacific Association of CCM (APACCM) Conferences in Nepal which was a massive event in Nepal as there were 700+ participants.^{2,5}

NSCCM also published NSCCM ICU Protocols in 2018 to start with basic management in ICU including Care Bundles (VAP, CAUTI, CLABSI), Vasopressors, Sedation, Analgesia, Glucose Control, Electrolyte Replacement, ABCDE, DVT, SUP, etc. and also recently published its second edition in December 2023.⁶

NSCCM is also organizing BASIC ICU course from 2014 which is a two days workshop from the BASIC Group from the Chinese University of Hong Kong (CUHK) and is usually for doctors and senior nurses. NSCCM has also endorsed Acute Care USG workshop since 2015 which is one day for doctors working in ICU.⁶

NSCCM also endorses few other workshops including CPR (2016), Beyond BASIC Airway Management (2017), Basics of Mechanical Ventilation (2022), Critical Care Nutrition (2022).

NSCCM has also been working in close collaboration with critical care societies from India (ISCCM) and other SAARC countries and also member of regional collaborations including Association of SAARC Critical Care Societies (ASAARCCS) and Asia Pacific Association of Critical Care Medicine (APACCM).⁶

Nepal Critical Care Development Foundation (NCCDF)

NCCDF was established in 2012 as not for profit, charitable organization.⁷ The main objectives of NCCDF were education and training of Nurses in ICU as there were very limited trainings for nurses working in ICU before that time. NCCDF started with BASIC for Nurses (CUHK) course which is a two-day course for fresh nurses since 2016 and then running other workshops including CPR for Nurses (2018), VAP Prevention (2018), Tracheostomy Care (2019) & Infection Prevention and Control (2017) workshops. These workshops are endorsed by Critical Care Nurses Association of Nepal (CCNAN) and are very low-cost, organized and managed independently by Nurses and has proven to be an example of self-sustainability and empowerment of nurses. NCCDF also manages poor patient funds and also organizes programs

for awareness of public in Sepsis Day (13 September) with events like Sepsis Walk, Sepsis Rally, Inter-ICU Sepsis Quiz and Hand Hygiene Campaign (5 May) every year. NCCDF also supports nurses to attend international conferences and meetings so that critical care nurses of Nepal could get the opportunity to present at various international platforms.^{5,7}

Critical Care Nurses Association of Nepal (CCNAN)

With increasing number of ICUs and nurses working in Critical Care, a need for professional organization was felt and Critical Care Nurses Association of Nepal (CCNAN) was established in 2016 and started with 40+ nurses and have now reached to 200+ life members.⁸ All nurses working in Level III ICU for at least one year or have certification in Critical Care Nursing can become life member of CCNAN. In 2017, CCNAN also started the first Instructor training (Critical Care Nurse Instructor Training Program) which was a six-month course equivalent to post graduate diploma which graduated 20 Instructors and these instructors became the one to teach and certify nurses with three-month critical care nurse training program (CCNTP) which has been conducted almost for 14 batches across the country since 2017 and graduated 300 + certified critical care nurses in the country. CCNAN also organized the First International CCN Conference in Kathmandu in November 2017 and also established the Regional Federation of CCN of SAARC (RFCCN-SAARC). India became the first president of RFCCN SAARC and organized a conference in Belgaum, Bengaluru in 2018 and again in 2019, Second Conference of RFCCN-SAARC was organized in Butwal, Nepal and the presidency of RFCCN-SAARC was handed over to Nepal.³ Since then, Ms. Laxmi KC and Ms. Kabita Sitoula are the current president and general secretary of RFCCN-SAARC respectively. CCNAN was also able to send its representative to attend the world congress in Sydney, Australia in 2019.⁸

Academic Programs in CCM in Nepal

Before 2013, there were no academic training programs in Nepal and so one had to go abroad to get trained in CCM. But in 2013, the first DM Critical Care Medicine (DM CCM) was started at Maharajgunj Medical Campus, Institute of Medicine, Tribhuvan University, in support and collaboration with Royal College of Canada International (RCCI, RCPSC) with great efforts from Dr. Laura Hawryluck, Dr. Redouane Bouali and Dr. Susan Brien. Till now there are four other institutions running DM CCM with around ten seats in 2022 but only five residents enrolled in the program.

National Board of Medical Specialties (NBMS) have been established under the Medical Education Commission (MEC) as per the Act from Parliament of Nepal and have started National Board Fellowship in CCM which is a three-year course and have recruited one student every year from 2021.¹⁰ Also, there has been a one-year clinical fellowship in CCM running at National Academy of Medical Sciences (NAMS) from 2020.

NSCCM has now established National Institute of Critical

Care Medicine (NICCM) in 2023 which has started a one-year long clinical fellowship in adult critical care from 1st January 2023 at three hospitals, Birat Nursing Home (Biratnagar), B & B Hospital (Kathmandu) and Manipal Teaching Hospital (Pokhara). This fellowship is focused to develop training programs and give opportunities for MD graduates to stay in their hometown and pursue their clinical career outside Kathmandu, which has been portrayed in various social media platforms as Master of Nursing Critical Care Outside Kathmandu (#CCOK).⁶

In Nursing, Masters in Critical Care Nursing has been started from 2023 at Maharajgunj Nursing Campus, Institute of Medicine, Tribhuvan University which is a two-year academic program to develop academic leadership in CCN and now has been extended to three institutions in the country, MNC, NAMS and Chitwan Medical College.⁹

Critical Care Services

Considering Clinical Services, Government of Nepal published Guidelines in 2014 and mentioned that of the total hospital beds, at least 5 percent should be the ICU beds, with one ventilator for two ICU beds (50%), nurse to patient ratio of 1:1 and separate isolation bed for patients with severe infectious disease. But, most of the government hospitals do not meet these criteria. Even the largest University hospital, Tribhuvan University Teaching hospital has less than 50 percent of the required critical care beds, and Nurse: Patient ratio of 1:2 to 1:3. Moreover, we do not have the exact statistics of the current status of ICUs across the country.¹⁰

As per survey done by NSCCM at the onset of COVID, there were total of 480 ICU beds in the country with around 260 ventilators. Government-owned hospitals had 150 ICU beds and Majority of these ICU beds were level I or level II and very few hospitals provide level III care. There were 800 Critical Care Nurses who were experienced (>1year in ICU) or Trained/Certified Critical Care Nurses (250+). There were only few hospitals which had Intensivist as head of ICU, In House coverage by consultant (MD) and very rare to have intensivist in Government Hospitals.¹¹ In another study by Neopane et. al., there were total 194 Hospitals with ICUs and total 1595 ICU beds in the country and 840 ICU Beds with ventilators. There was total 25 Intensivists in the country and 2.8 Beds/100,000 population.^{11,12} But after COVID, government of Nepal have added around 200 Level III ICU Beds and another 600 HDU beds across many public hospitals in the country.

By the end of December 2023, there are only around thirty-seven critical care physicians in Nepal out of which around ten have done their Doctorate of Medicine (DM) in CCM, another ten did Fellowship in CCM from India, around ten from Toronto, Canada and few others from different countries.

Considering additional services, ECMO services started in the country at 2008 at Sahid Gangalal National Heart Center for Cardiac Surgical patients while it was started in TUTH in 2017 for primary respiratory failure. Liver transplant ICU

was also started for the first time in TUTH in 2019. Deceased donation transplantation has started at Human Organ Transplant Center (HOTC) from 2017 for kidney and in 2023 for both kidney and liver.¹³

Research – Nepal Intensive Care Research Foundation (NICRF)

Research in Critical Care was in preliminary stages till 2019 but with the establishment of NICRF in 2020, which focuses on Collaborative Research, Nepal has been able to be involved in various multinational randomized trials including REMAP-CAP and MEGA-ROX.¹⁴ With the permission from National Health Research Center, NICRF established ICU Registry in 2019 and have enrolled more than nineteen ICUs of Nepal. The ICU registry, headed by Dr. Diptesh Aryal has provided a platform for multicentric, International Clinical Trials. Under the leadership of Dr. Diptesh Aryal and Dr. Hem Raj Paneru, NICRF is working to develop various education and training in research in critical care and critical care nursing.^{14,15} Several good publications have been published utilizing the deidentified patient data from the registry.^{16,17,18,19}

Current Challenges

The most common challenge faced in Nepal now is gaps in human resources, epidemiological data with ICU Capacity and a huge gap in implementation of standards of care. Our ICUs are also struggling for allied health care workers and require epidemiological data and publications which are very few.²⁰ Also, there are huge gaps in allocation of resources as access to ICU beds is difficult outside major cities and still based on affordability and personal connections.

Conclusion

Though Nepal has a very short history in CCM, there has been substantial growth in various aspects of critical care medicine in the last decade including service, education and trainings. With the advent of COVID, huge investment in infrastructure and equipment in ICU was done by government and other donors, but focusing on development of human resources in Critical Care and allied health care forces, more investment in clinical research, and efforts toward Patient Safety and Quality shall be the prime target for the coming decades.

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