

Volume V, 2021

# mindfocus

Healthcare technology for a better tomorrow

- **Mindray Partners with Stanley Medical College**  
To enable advanced technologies  
In radiology
- **Aarthi Scans & Labs is building confidence in Mindray technology**
- **Mindray launches Resona I9**  
Ultrasound system, Revolutionizing  
General imaging

VIREN  
SHETTY

Executive Director and Group COO,  
Narayana Health

A MAN WHO BELIEVES THAT  
FUTURE OF HEALTHCARE  
IS DIGITAL

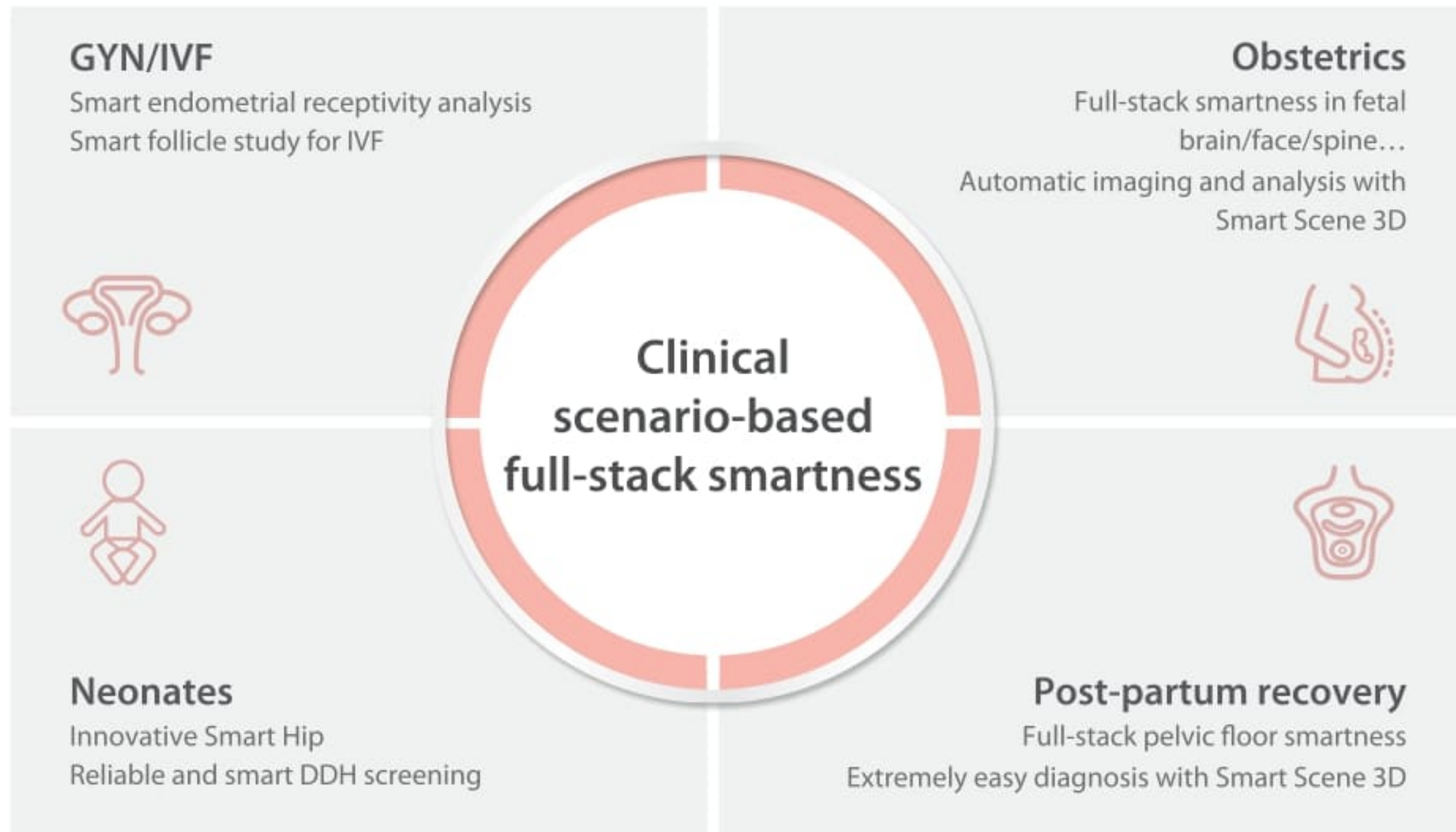
**mindray**  
healthcare within reach

[www.mindrayindia.com](http://www.mindrayindia.com)

# Nuewa I9

Diagnostic Ultrasound System

## Innovation, in every facet



23.8" bezel-less full screen monitor

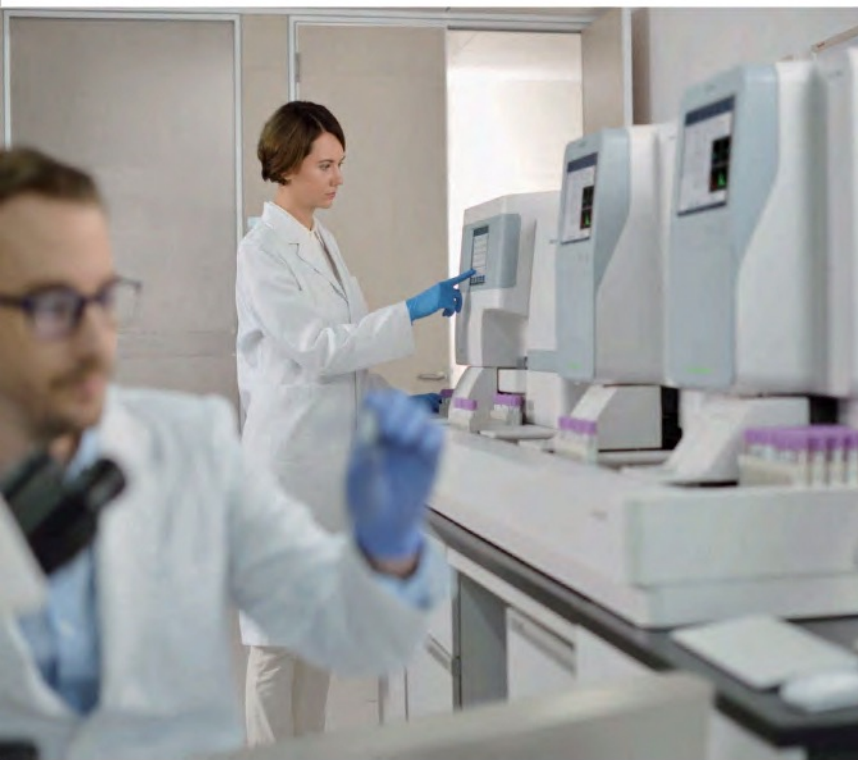
26dB super-silent design  
Long-life battery with auto indication



15.6" touchscreen with scenario-based 3D/4D interaction

iConsole: intelligent control panel  
Full-space floating adjustment





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Mindray is proud to have been a **key contributor** to provide cost-effective products to government and private hospitals and help cope with the rising challenges. Mindray is all set to take the next leap in healthcare transformation in India.

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**W**e are happy to share yet another volume of MINDFOCUS, our In house magazine that is to build professional connections within the medical community & a platform to exchange scientific information and best practices in healthcare. I anticipate that you would find this volume as interesting as the previous ones.

First and foremost, I impart my deepest gratitude to all healthcare professionals and organizations for their expertise & commitment to fight against COVID-19. I also extend my earnest sympathies to all those affected by the impact of pandemic.

COVID-19 pandemic had incurred humanitarian, financial and social costs. Though year 2021 was full of challenges and qualms, Mindray could serve & provide the support needed to healthcare professional for demand of life-saving devices.

Healthcare became more important than ever during the pandemic. The pandemic situation seems to have improved a bit over the last few months through self-discipline and immunization programme but we still need to follow the pandemic guidelines. We all know that crisis offers opportunities for growth which can be achieved through supple business strategy along with a dedicated team. Mindray India team, during the pandemic, was determined to fight against COVID-19 and supported healthcare professionals. I have never felt so proud but to see how the team has come out more resilient from the crisis and displayed immense promise for the future.

We believe in embracing the changes and hence have adopted a growth strategy driven by technological innovations, specialised supply chain, digital advancements and improved customer relationships.

Mindray is proud to have been a key contributor to provide cost-effective products to government and private hospitals, and help cope with the rising challenges. Mindray is all set to take the next leap in healthcare transformation in India. We assure you that we will continue to remain the trusted partners for a Healthier Bharat!

I wish you & your families a healthier and safer 2022. Thank you all for your unwavering support.

A handwritten signature in black ink, appearing to read 'Dean Zhang'.

Dean Zhang

**Dean Zhang**  
Managing Director,  
Mindray Medical India Pvt. Ltd.

# mindray

## 30<sup>TH</sup> | 1991-2021 TOGETHER STRONGER FURTHER

**1991**  
Mindray was founded in the Financial Center on Tazhi Road, Shekou, Nanshan District, Shenzhen.

**1993**  
China's first self-developed multi-parameter patient monitor  
MEC-509 Patient Monitor

**1995**  
China's first auto chemistry analyzer  
BS-300 Clinical Analyzer

**1997**  
Mindray achieved formal ISO 9001 certification of all products in the medical device field, becoming the first Chinese medical device manufacturer to pass ISO 9001 certification.

**1998**  
China's first portable multi-parameter patient monitor  
BSX 6000i

**1998**  
China's first semi-automatic 3-part hematology analyzer  
BC-2000 Hematology Analyzer

**2000**  
Received a CE Mark certified by TÜV, conforming to international export standards.

**2002**  
China's first auto hematology analyzer  
BC-3000 Hematology Analyzer and Reagents

**2002**  
China's first digital B/W ultrasound system  
DP-5000

**2003**  
China's first auto chemistry analyzer  
BS-300 Clinical Analyzer

**2003**  
China's first self-developed high-end modular multi-parameter monitor  
Bioscience T-Series Patient Monitor

**2004**  
FDA  
China's first self-developed color doppler ultrasound system  
DC-6 Ultrasound System

**2006**  
China's first self-developed high-end modular multi-parameter monitor  
Bioscience T-Series Patient Monitor

**2006**  
China's first self-developed cart-based color doppler ultrasound system  
DC-6 Ultrasound System

**2006**  
Listed on the New York Stock Exchange as the first Chinese medical device company. Debuted from the US stock market after completing a privatization deal in 2016.

**2006**  
Established National Engineering & Research Center for Medical Diagnostic Device certified by Ministry of Science and Technology.

**2007**  
Mindray Biotechnology R&D won the State Science and Technology Progress Award.

**2007**  
Established R&D Center in the United States.

**2008**  
Approved Chemicals contract in selling that will allow us to be competitive in the foreign market.

**2009**  
Mindray LDC-C Chemistry Reagent Kit

**2010**  
mindray  
Initiated the rebranding strategy with the new company logo.

**2010**  
China's first self-developed diphasic defibrillator/monitor  
Sireffort DC Defibrillator/monitor

**2011**  
China's first high-speed Biochemistry 5-part hematology analyzer  
BC 6000

**2011**  
China's first self-developed middle and high-end cart-based color doppler ultrasound system  
DC-8

**2011**  
Mindray's new #2 building and park were put into use.

**2012**  
China's first ultra high-speed auto chemistry analyzer  
BS-3000 Chemistry Analyzer and Reagents

**2013**  
The first anesthesia workstation with fully digital flowmeter developed in Asia  
A7 Anesthesia Workstation

**2013**  
China's first self-developed high-end color doppler ultrasound  
Resona 7 Ultrasound System

**2013**  
China's first mobile DR  
Mobile DR System

**M**indray's beginning of its unstoppable journey in 1991 coincided with the rapid urbanization of China. The large wave of migration posed a significant challenge to China's healthcare system, as patients couldn't access proper healthcare due to the lack of modern medical devices.

This was when Li Xiting, Cheng Minghe and Xu Hang decided to step up. With a strong passion for applied science and a mission to make the best of healthcare accessible to all, these three biological engineering experts established a company to explore possibilities in medical innovations. It took them great efforts to come up with the first independently developed patient monitor – MEC-509. After toiling away for months, they finally launched the patient monitor in 1993. The product received an overwhelming response and triggered a series of medical innovations that would transform healthcare worldwide.

Over the past 30 years, we have established our position as a global challenger that keeps moving forward. With strong determination, we persist in focusing on the medical device industry, enhancing R&D investment, adhering firmly to high quality and compliance standards and collaborating with the best in the business. It is such persistence that makes the Mindray we know of today.

Mindray India business operation started in 2007, Mindray has achieved sustainable and satisfactory growth in these years. In a very short span of time, Mindray has established a network of sales and support teams in India, with all major cities of India having their representatives.

We share the common objective of making the patients' health and well-being a top priority and creating the best value for our customers. By profoundly understanding different clinical scenarios, we offer modalities and solutions to drive efficiency and optimize management. With our reliable products, close services and compatible IT platforms, we will provide a better choice to care providers for the years ahead.

Together with our clients and partners, we will strengthen our collaboration, further our path in advancing technology and build a healthier world.

**2014**  
China's first integrated modular chemistry and chemiluminescence immunoassay analyzer system, China's first complete patented cellular analysis line

**2015**  
The world's first rotatable large-screen patient monitor

**2016**  
First high-end DR

**2018**  
Listed on the Growth Enterprise Market of the Shenzhen Stock Exchange

**2018**  
Mindray's Ultrasound R&D won the State Technological Innovation Award

**2019**  
Chemiluminescence Immunoassay Kit - Procalcitonin (PCT) Reagents

**2019**  
HylED X Series LED Surgical Lights

**2019**  
BoneHeart C Series AED

**2020**  
Mindray's Ultrasound R&D won the China Patent Gold Award

**2020**  
Wuhan R&D Center was established in Guangzhou

**2020**  
The world's first real-time whole-head quantitative non-invasive & wireless anesthesia system

**2020**  
BoneFusion n Series infusion system

# VIREN SHETTY



He has completed his Masters' in Business Administration from Stanford Graduate School of Business in 2012. He is taking care of strategy & planning of Narayana Health. He believes that Healthcare should be affordable and accessible for all. His focus is to provide holistic healthcare to all with the help of technology like AI and quality care.

Executive Director and Group COO, Narayana Health



In this interview, he discussed impact of COVID – 19 on Healthcare scenario, digitization, latest advancements and infrastructural challenges.

### **HOW COVID-19 IMPACTED HEALTHCARE SCENARIO IN INDIA AND WHAT NEW STRATEGIES WERE INTRODUCED BY NARAYANA HRUDAYALAYA FOR BETTER PATIENT CARE?**

This Pandemic will have an indelible effect on our healthcare systems, it has become an eye opener in many aspects of healthcare system, particularly overall readiness for sudden demand. We believe pandemic will act as a catalyst to accelerate innovation in healthcare. One thing we learned during the pandemic is emphasis on remote care and technology advancement is need of hour. We have drastically expanded the scope of our remotely managed ICUs.

In spite of many COVID-19 protocols and manpower limitation, we had technologically advanced equipment to fully integrate into mobile operating systems, which enable our doctors to coordinate with patients across multiple locations.

We had a huge requirement of ventilators during pandemic and Mindray fulfilled our requirement to treat a lot of the COVID-19 patients.

### **HOW DIGITIZATION CAN BE HELPFUL IN DATA ANALYSIS OR COMBATING INFECTIOUS DISEASE OUTBREAK? HOW NARAYANA HRUDAYALAYA IS DIGITIZING HEALTHCARE LANDSCAPE IN INDIA?**

We believe health care will be transformed by digitization.

For example, in the past two years of pandemic, we had access to massive amount of clinical data. Maintaining patient privacy & confidentiality, if these data are utilized properly through technological advancement like AI applications, it could predict, prevent & diagnose many diseases. It can also reduce healthcare expenses.

Hence, we have made huge investments in developing tools like electronic medical records, hospital management system and predictability in terms of re-scoring all these technologies. We are building these technologies in-house because we believe all these tools are going to transform the way patient is taken care of.

“

We believe health care will be transformed by digitization.

”

Healthcare will become safer with all these technologies.

We have huge number of patient data, which is again a great opportunity to develop collaboration between distinguished healthcare establishments in Asia to exchange clinical information like image analysis & understanding treatment protocol. This will enable us to publish a lot of clinical research papers specifically developed for Asian population.

### **WHAT ARE THE INFRASTRUCTURAL CHALLENGES THAT NEED TO BE ADDRESSED?**

We need an adequate number of skilled workforce and once you have an adequate number of doctors working in tier 2 tier 3 cities the quality of healthcare they receive will be much better

Rapid expansion promptness displayed by China gave us a lot of inspiration and we were able to build 200 bed ICUs for treating the huge surge of patients.

In future, we will be more equipped to deal with any infectious disease spread.

### **WHAT ARE YOUR OPINION ON MINDRAY'S SERVICE & CONTRIBUTION DURING COVID-19 OUTBREAK?**

We believe that your products what we are using are excellent and they're very flexible and the service is very good so we buy them. We appreciate that Mindray is facilitating scientific research between renowned institutes during pandemic. We look forward to Research & clinical collaboration with international hospitals. We will interact with them to unlock the new field i.e. COVID-19 medicine and hopefully we should be able to collaborate to make health care safer and affordable.

# MINDRAY

LAUNCHES NEW

# MC-80

**AUTOMATED DIGITAL CELL MORPHOLOGY ANALYZER**

## **MC-80** Automated Digital Cell Morphology Analyzer

More  
clarity

More  
intelligence

More  
productivity



## TAKING MORPHOLOGY ANALYSIS TO THE NEXT LEVEL

**M**indray has launched the new MC-80 Automated Digital Cell Morphology Analyzer, a revolutionary cell morphology system that provides more clarity, more intelligence and more productivity for morphological analysis. Combining MC-80, Mindray's hematology solution will revolutionize the high-end hematology segment.

Morphological review of blood cells is a crucial procedure following hematology analysis. Most laboratories need to re-examine more than 30% of their blood samples, but find traditional microscopic review labor-intensive and time-consuming. Automated digital cell morphology analyzers are now available on the market, but providing clear and accurate cell images comparable to the microscope remains a fundamental challenge.

Mindray's new MC-80 is taking digital morphology analysis to the next level, delivering clearer images which are able to capture abnormalities in more detail. With advanced algorithms, the analyzer enables better identification of different cells with high throughput, resulting in greater productivity.

"We have spent eight years developing and optimizing the product by collaborating with over 200 top hospitals worldwide. Meanwhile, we have applied for over 100 patents and solved many problems, some of which had been considered insurmountable in automated digital cell morphology analysis," commented Huan Qi, Director of Clinical Research, Medical Affairs; and Director of Upstream Marketing, IVD, Mindray.

The MC-80 provides more in morphology

### More Clarity

Equipped with advanced multi-layer fusion technology, the MC-80 reproduces the pathological features of cells with clear and authentic images, which helps pathologists to detect abnormal cells more easily and make a quicker diagnosis.

### More Intelligence

The MC-80 facilitates a smart process and less manual intervention by analyzing the smear in an optimal mode according to the results from hematology analyzers. Its advanced algorithms offer reliable cell pre-classification and pre-characterization, and the high-speed

“

We have spent eight years developing and optimizing the product by collaborating with over 200 top hospitals worldwide

”

FLY-MODE ensures fast and accurate PLT clump identification.

### More Productivity

With the remote review function, pathologists are able to review results from multiple locations. The high throughput of 60 samples per hour helps shorten the turnaround time, especially for large-sized laboratories. This greatly enhances diagnostic efficiency and ensures a faster delivery of results to patients. Mindray is committed to providing high quality, reliable IVD solutions to empower trust, delivering accurate results while meeting laboratories' demands on efficiency worldwide.





# FOR THE PATIENTS BEHIND THE SAMPLES



Fascinated by the rich information provided by blood analysis diagnostics at the beginning of his medical career, he decided to dedicate himself to this field.

**Dr. Anil Handoo**  
Senior Director of Laboratory and Research  
at BLK-Max Super Speciality Hospital

**Dr. Tina Dadu**

Chief Hematology and  
Molecular Bio Pathology Consultant  
at BLK-Max Super Speciality Hospital

**B**LK-Max Super Speciality Hospital is one of the oldest hospitals in Delhi. It is home to the busiest hematology laboratory and the largest marrow transplant center in India. Dr. Handoo and Dr. Dadu witnessed the development of In-vitro diagnostics (IVD) technology and equipment in India during their time at the hospital. India is a highly competitive, tempting market for domestic and international medical device companies. It took time for Mindray to build brand recognition there.

First time Dr. Handoo was invited to join a dengue research project initiated by Mindray India, he gave keynote presentations at industry exchange events, which deepened his understanding and trust in Mindray. This was similar to Dr. Dadu's first impression of Mindray. She said, "But when I first used Mindray's hematology analyzer, my experience told me this product would significantly improve our work efficiency and results."



Labs with Mindray devices are benefitting from innovations in automation. Smaller modular devices with smarter systems improve analysis efficiency and credibility for lab staff. Unlike independent medical labs, in-house labs of hospitals not only provide analytical data but also give diagnostic results with a comprehensive view of patient data, including lab data and clinical data. "In the past, we had quite a few cases of misdiagnosis, sometimes as serious as frequent cancer diagnoses." Besides, labs not only need to deliver quality and quantity, they need to deliver them efficiently. Most test results need to be ready within two hours same day. That's why IVD is never just about data. It's about the treatment options and hopes of each patient. Sharing the vision of caring for life, the Mindray India team provided strong hardware and software support for BLK Hospital. Dr. Handoo took CAL8000 as an example. This device

analyzes 400 samples each hour, making their workflow much easier. The automated system integrates multiple analytic dimensions and reduces human intervention, so that valuable resources can be put into more important research work.

Just like medical practitioners in other parts of the world, BLK-Max Super Speciality Hospital and Dr. Handoo's team went through great challenges during the COVID-19 pandemic. BLK-Max Super Speciality Hospital and Mindray have jointly organized CUBE, a hematology summit, for four consecutive years, which has considerable influence on the Indian medical sector. Given successful cooperation in the past, Dr. Handoo's team sees the Mindray India team as an important partner for clinical practice and research. They look forward to benefitting more patients with their joint concerted efforts.



# RESUSCITATION IN INDIA

## Dr. SSC Chakra Rao

Chairman,  
Indian Resuscitation Council



Indian Resuscitation Council started working from April 2017. A survey revealed that less than 2% of population in India are aware of Cardio Pulmonary Resuscitation (CPR). 4280 people per one lakh population have succumbed to sudden cardiac arrest which can be preventable to certain extent. No research has been done in the subcontinent. There are many barriers like different religions, languages, customs, superstitions, myths and disbelieves. We don't have awareness about Good Samaritan Law. There is non-availability of Automated External Defibrillator (AED) at community and commercial places especially in area of gatherings like malls, shopping complexes and apartments.

An AED is a machine that is used to treat sudden cardiac arrest. It's a sophisticated, yet easy-to-use, medical device that can save the patient, till he/she reaches the hospital. AED sends an electric shock to the heart of a person in cardiac arrest and restores a normal heart rhythm.

CPR is a lifesaving technique that is used when someone's heart stops beating. CPR with hard and fast chest compressions are recommended. During the emergency, the systematic way of awakening the victim is looking for safe scenarios, should be away from drowning, toxic fumes, electrocution and fire. Systematic approach to awaken the victim is to call loud for help, activate the Emergency Medical system by calling 108, giving all the information about you, the victim, address and number of victims involved and ask them to bring an AED on the speaker phone. Don't waste your time. Start chest compression keeping the interlocked heels of your both palms on the center of the chest, exactly on the breast bone. Do a quality CPR with 120 compressions per minute, 5-6 cms depth and adequate recoil. The ventricles of the heart will be compressed between the breast bone (sternum) and the vertebral column which will facilitate the blood to reach the circulation of brain. Go on doing uninterrupted. 30 compressions each with two breaths with a barrier device like an Ambu bag. So every second two compressions. When the help arrives, change yourself and entrust compressions to him. Never stop. If the AED arrives give shock in shockable rhythm. Shift the victim to the nearest medical facility in recovery position observing the victim every two minutes.



Ensure Safe place  
Check Response,  
Tap on shoulder from front and ask loudly



Shout for help



Call 108 or local emergency number

#### Identification of Position and placement of Hands for Chest Compression






## Effective Cardiopulmonary resuscitation (CPR)

**Chest Compression**

- ▶ 30 compressions at one set
- ▶ Chant the count loudly 1,2,3,4.....30
- ▶ Maintain the speed and number of chest compressions
- ▶ If more than one person, interchange every 5 cycles



**Placement of Hands for Chest Compression**

**Position of Rescuer**

- ▶ Elbows straight
- ▶ Shoulders above the victim's chest
- ▶ Fingers interlocked

### Check the response

**Responsive victim**

Victim moving, coughing or vocalizing  
Place Victim in lateral position

**Non responsive victim**



Use an AED



## BeneHeart C Series AED

Smart voice prompts based on rescuers' proficiency

Remove clothing from patient's chest.



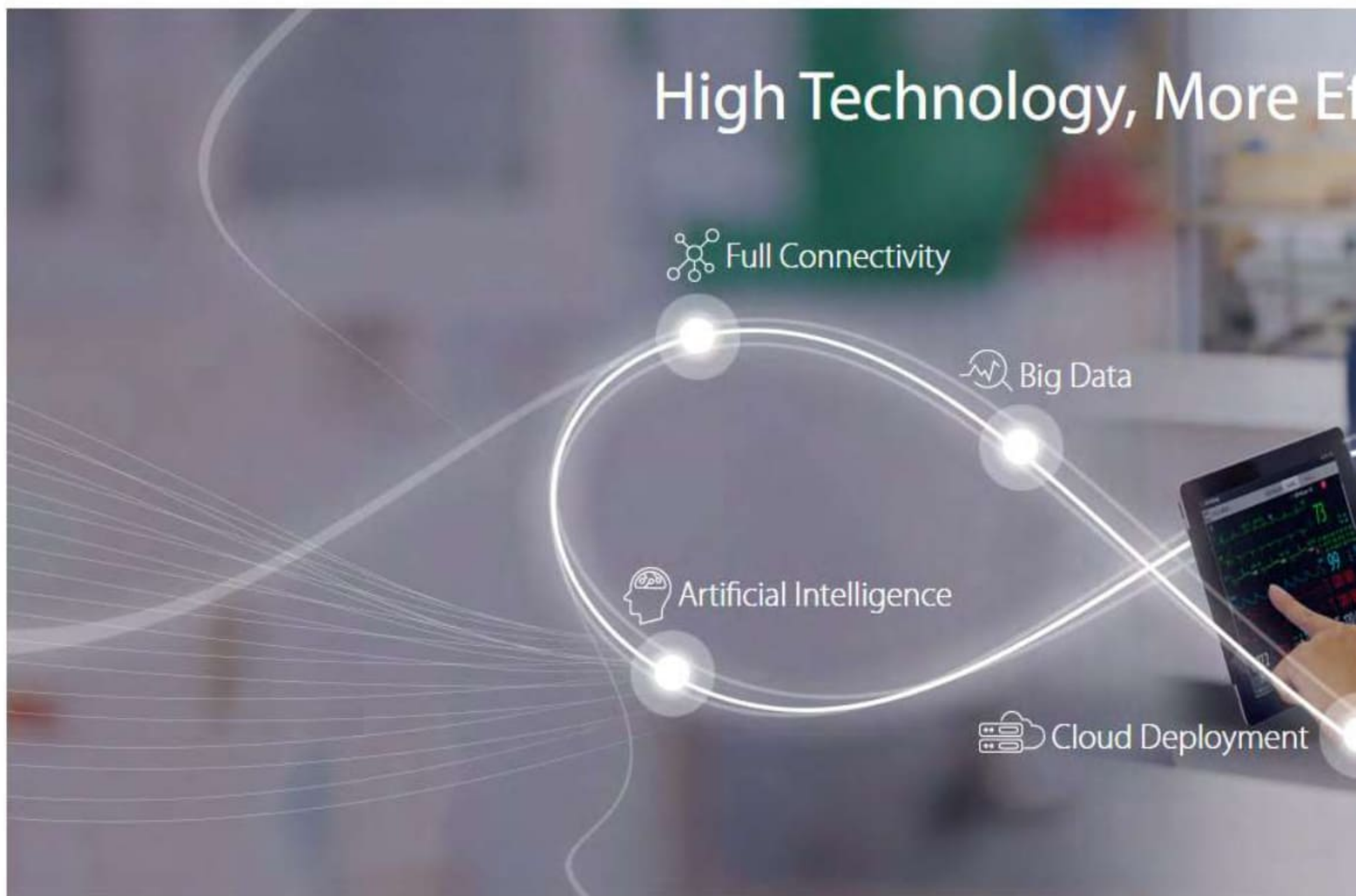
Skilled rescuer



Remove pads package from lid of AED. Tear open package. Apply pads as shown on pads.



Unskilled rescuer



# High Technology, More Efficiency

Full Connectivity

Big Data

Artificial Intelligence

Cloud Deployment

## **m**-CONNECT

High Technology,  
More Efficiency

Mindray has introduced a new universally connected platform called M-Connect to enhance patient monitoring.

The M-Connect IT solution unlocks the potential of individual patient monitoring to create a universal central monitoring platform, offering greater visibility, streamlining workflow and improving clinical decision making. And with patient privacy assured through advanced cyber security technology, clinicians can focus on delivering accountable and reliable care. The M-Connect platform features various integrated IT solutions, will help connect patients, health providers, devices, and healthcare systems for improved visibility, streamlined workflows, and enhanced clinical decision-making.

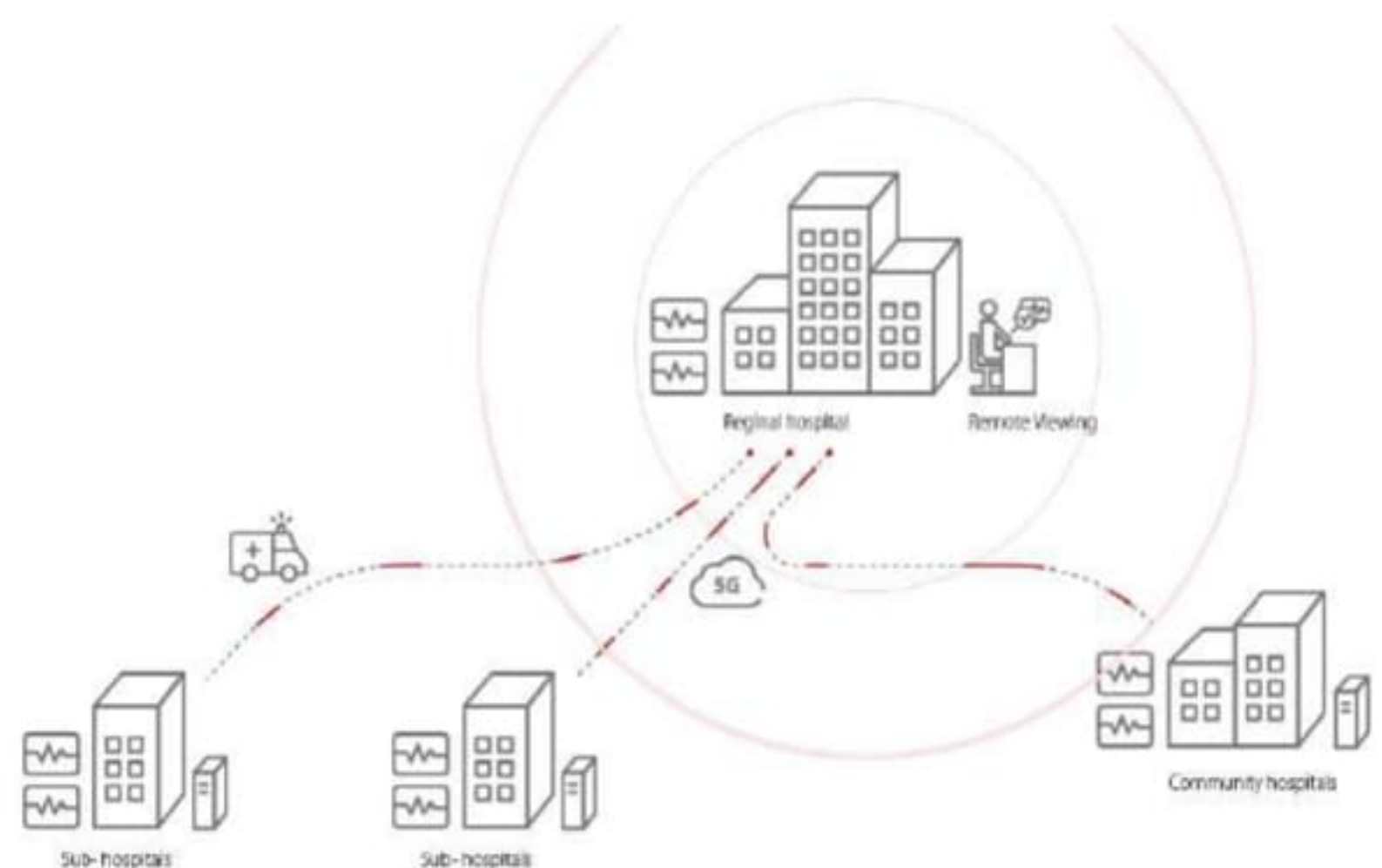
M connect solutions are expected to allow

# Efficiency



clinicians to access patient data anytime and anywhere. It is intent to enhance clinical decision-making and workflows to support clinicians efficiently deal with adverse events and diagnose and treat patients. It has IoT (M-IoT) technology, the universally connected platform is designed to gather information from all connected medical equipment.

The M-connect IT solution links the entire pre-hospital, intra-hospital and inter-hospital journeys of each and every patient, for seamless transfers and faster remote guidance.



# An Approach To Emergency Bedside Lung Ultrasound



**Dr. PM Venkat Sai**  
M.B.B.S., D.M.R.D.,  
D.N.B. (Radiology)  
Ph.D., F.I.C.R.

Professor and  
Head Of Clinical Services (HOCS)  
& Senior Consultant at  
Sri Ramachandra Institute of  
Higher Education and  
Research (SRIHER )  
Sri Ramachandra University,  
Porur, Chennai.

**T**he utility of computed tomographic imaging in lung pathologies is undisputed. However, lung ultrasound (LUS) is very useful in emergencies, where time is of the essence. Thorax and lung ultrasound has gained importance in daily routine which is especially true in the setting of Point of Care Ultrasound examination (POCUS)<sup>1</sup>. Furthermore, the portability of the equipment, which allows for even bedside examination, the comfort of the patient, repeatability, and reduced cost is the true strength of this imaging technique. It is done bedside immediately after a physical examination and before echocardiography in critical care.

Lung ultrasound is often described as interpretation of artefacts and can be performed rapidly in critically ill patients. The purpose of lung ultrasound is to look for lung sliding, anterior lung rockets, posterior and/or lateral alveolar and/or pleural syndrome (PLAPS).

The preset requirement for doing lung ultrasound are to use 5 MHz convex probe, single focal point kept on a pleural line, highest frame rate, reduced dynamic range, off the compound and harmonic imaging. Low mechanical index store freeze images and video clips in DICOM format.

**Lung examination** – Patient supine, transducer placed in sagittal, coronal and M mode for lung sliding or PLAPS point for pleural effusion.

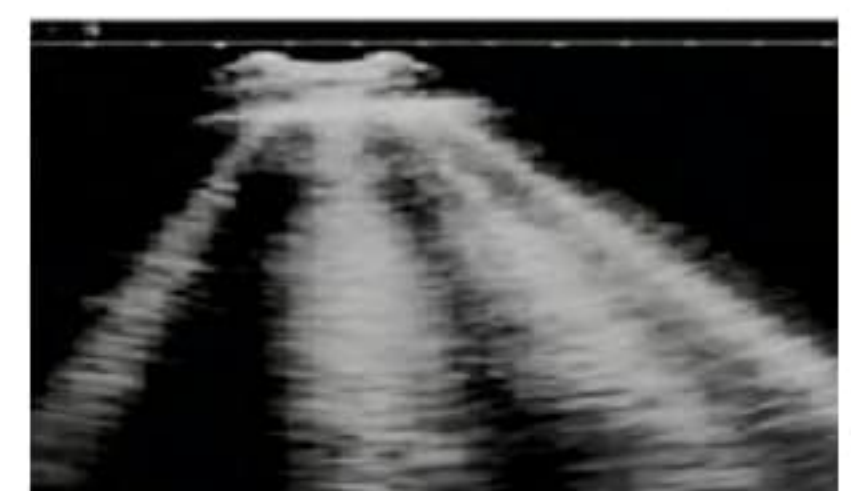
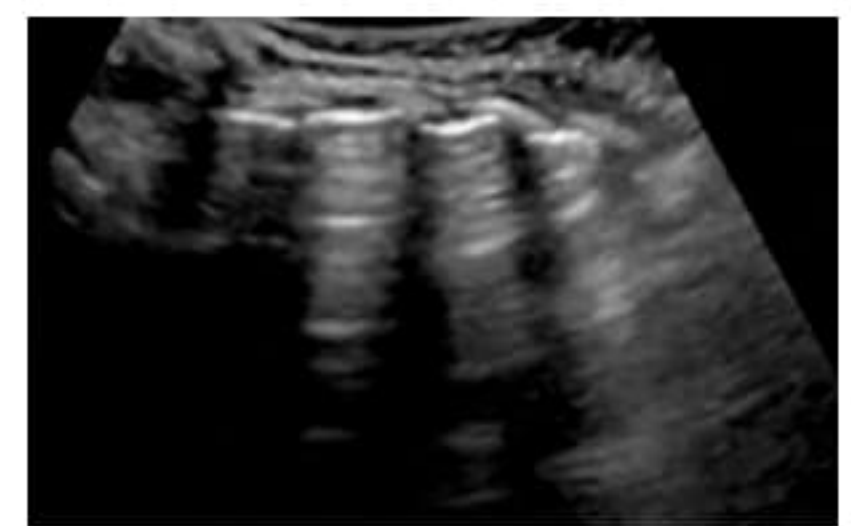
## FINDINGS

**A-lines** – Classic reverberation artefact, horizontal hyperechoic lines deep to the pleural line. These waves are reflected strongly by tissue/air interface and reverberate or bounce back and forth between the transducer and lung surface – bat sign. The bat sign – posterior acoustic shadowing of the ribs are the wings of bat and hyperechoic belly – pleural line represents the bat.

**B lines** – correlates with interstitial oedema. They are comet tail artefacts, arising from pleural line, hyperechoic, laser beam like an artefact, long, without fading, erasing A-lines moving with lung sliding.

B lines present in any disease affecting the interstitial, interlobular septa surrounded by alveolar air. B lines are likely to represent fluid or fibrosis. Air in alveoli and water in the interlobular septa causes the sound to reverberate to and fro between the septa creating the line for each reverberation which combines to form B lines.

Two B lines – comet-tail artefact. Two or three B lines – lung rockets in interstitial syndrome. Three or four B lines indicate septal rockets due to edematous subpleural interlobular septa. B lines correlate with kerley B lines on chest Xray. Diffuse B line patterns represent



cardiogenic or noncardiogenic pulmonary oedema or pneumonitis. Focal multiple B lines present posterolaterally in a normal lung seen in pneumonia, atelectasis, lung contusion and pulmonary infarcts. At least seven B lines are called ground glass rockets.

**C-lines** – concave or curvilinear in shape, centimeters in size, represents alveolar consolidation.

**Lung sliding** – During normal respiration or mechanical ventilation, the visceral pleural moves against the parietal pleura. A subtle sparkling to and fro movement artefact called lung sliding. Lung sliding can be confirmed using M-mode. In the presence of lung sliding, the seashore phenomenon occurs. Subcutaneous tissue above the pleural line generates the horizontal straight line, there will be a sandy appearance below the pleural line created by the movement of the lung sliding.

### INDICATIONS:

Evaluate the critically ill patients who are experiencing severe shortness of breath, different pathologies have a distinct sonographic appearance.

Severe shortness of breath –

Causes – pneumothorax, alveolar interstitial oedema, pneumonia, pleural effusion and acute respiratory failure have a distinct sonographic appearance.

1. Pneumothorax - presence of A-line, no B lines, absent lung sliding, lung point may be identified. Air – being non-dependent will collect anteriorly in a supine patient. M mode – lung point sign appears at the precise line where the seashore sign shifts to stratosphere/barcode sign – very specific sign of pneumothorax.

2. Alveolar interstitial syndrome<sup>2</sup>

B lines 7mm apart indicate thickened interlobular septa and ultrasound equivalent to Kerley B lines.

B lines 3mm apart correlate with ground glass opacities. Better appreciated in the mid axillary anterolateral intercostal scans.

3. Pneumonic consolidation

Early pneumonia – B lines are tiny areas of subpleural consolidation.

Tissue like sign – shred sign – alveolar consolidation

4. Lung sonography in acute respiratory failure

A-lines transformed into B lines at a pulmonary artery occlusion pressure threshold of 18mmHg at the anterior chest wall in a critically ill patient. B lines appear with interstitial oedema.

The bedside lung ultrasound in emergency (BLUE) protocol for immediate diagnosis of acute respiratory failure and fluid administration limited by lung sonography (FALLS).

Protocol of management of acute respiratory failure – BLUE protocol was designed to assess the acute respiratory failure in spontaneously breathing patient.

Lung ultrasound is a visual stethoscope and limits one-third of urgent bedside radiograph and two-thirds of urgent CT scan.

The characteristic findings of Lung ultrasound in COVID pneumonia –

A. Thickening of the pleural line with irregularity.

B lines in a variety of patterns including focal, multifocal and confluent.

C. Consolidation in a variety of patterns including multifocal, small, non-translobar and translobar with occasional mobile air bronchograms.

D. Appearance of A-line during the recovery phase.

Lung USG in COVID 19 patients for rapid assessment of severity, to track the evolution of the disease, to assess the varying degree of interstitial syndromes and alveolar consolidation and deciding to wean the patient from ventilatory support.

### LIMITATION :

Lung ultrasound cannot detect the lesion that is situated deep within the lung.

### CONCLUSION

Promising bedside diagnostic technique. Used to follow up on disease progression and therapy. Very useful in the severely dyspneic patient.

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**F**or 30 years, we at Mindray have been striving to bring better healthcare for people across the globe. As we relentlessly advance healthcare technology through Innovation, it has helped us create many firsts in the industry.

# MINDRAY INDIA LAUNCHES RESONA I9

Through our worldwide R&D centers, we are constantly listening to global clinical requirements and providing keen insights bringing ground-breaking concepts to life as working prototypes.

Resona ultrasound series, one of classic success in transforming customer experience through innovation with high diagnostic confidence.

Resona I9 is latest addition developed with global customer insights and their pain points, providing comprehensive clinical solutions for dedicated applications. It delivers innovations that give users extreme clarity, outstanding intelligence, and enhanced diagnostic confidence.

At its core, Infinite Imaging Solutions Powered by ZST +

The ZST + platform is an extraordinary innovation, representing an ultrasound evolution. Transforming ultrasound metrics from conventional line -by-line beam-forming to channel data based processing to acquire 90 percent more echo data at speeds of up to 10 times faster than conventional systems. It overcomes the traditional trade-off limitation among spatial resolution, temporal resolution, and tissue uniformity. The results are crystal clear images with exceptional temporal accuracy in even most difficult patients bringing diagnostic confidence to all imaging challenges. ZST opened host of new clinical applications that are never available before.

Frost & Sullivan, USA rated ZST technology “The next Industry standard method of generating ultrasound images. Two generations ahead of current digital beam formation technology”

Resona I9’s iConsole control panel features a breakthrough design and adaptive layout for different clinical scenarios. Its E-ink keys are customizable for functions that are most frequently used during scans, while the full-space floating control panel can be adjusted for better space utilization allowing Resona I9 to easily meet various scanning needs for patients. These revolutionary design elements enable new possibilities for ultrasound exams and improve workflow efficiency from the beginning.

The solution’s high frame-rate (HiFR) STE delivers consistent shear waves and precise tissue stiffness access to bring more sensitive motion detection for greater stability and accuracy during scans. Resona I9 is also equipped with Smart Breast and Smart Thyroid automatic standard lesion analysis, which shortens examination times for more effective scanning.

Resona I9’s Intelligent applications provide a solution to unleash the potential of medical services. In various medical diagnostic scenarios, intelligent applications free clinicians by undertaking the most tedious and repetitive tasks so doctors can focus more on patient care. It also brings more standardized quality control management, making up for the talent shortage.



**M. C. Ekambaram**  
Product Manager - Radiology  
Mindray Medical India Pvt. Ltd.

# Resona I9

Diagnostic Ultrasound System

## Innovation, in every facet



### Infinite imaging solutions



#### ABD

HIFR STE for liver stiffness quantification  
Smart HRI for easy assessment of liver steatosis



#### Vascular

V Flow for complex hemodynamics evaluation  
Precise hardness analysis of carotid wall



#### Small parts

Smart and accurate breast/thyroid lesion analysis  
Complete elastography solution



#### Cardiology

Auto EF for easy cardiac function evaluation  
Quantitative evaluation of myocardial movement



#### MSK

Elastography for tendon stiffness assessment  
CPP for flow analysis of rheumatic arthritis



#### Urology

Superior image with bi-plane transducer  
UWN\* CEUS for prostate cancer diagnosis

23.8" bezel-less full screen  
15.6" touchscreen with intuitive interaction

iConsole: intelligent control panel  
Full-space floating adjustment

Powered by **ZST+**

26dB super-silent design  
Long-life battery with auto indication  
Just fold and go with min 1 meter height



# MAKING AFFORDABLE DIAGNOSTICS A REALITY WITH MINDRAY TECHNOLOGIES

## **Govindarajan V**

Founder and CEO of Aarhi Scans & Labs



### **Affordable Healthcare**

Aarhi Scans and Labs was founded by Mr. Govindarajan in the year 2000 and is currently managed by a Team of Radiologists – Dr. Prasanna Vignesh, Dr. Aarhi Prasanna, Dr. Arun Kumar Govindarajan and Dr. Rajkumar.

“We will continue to provide high quality and reliable imaging services at the most affordable cost and the association with Mindray India will help to accomplish the mission.



# AARTHI SCANS & LABS AND MINDRAY

An Alliance to provide affordable diagnostics services



AARTHI SCANS & LABS  
CONTINUES TO PLACE ITS  
TRUST IN MINDRAY INDIA, A  
FAST GROWING INNOVATOR IN  
MEDICAL TECHNOLOGY

## **Affordable screening is a possibility**

Aarthi Scans & Labs, a renowned multi-center diagnostic chain headquartered in Chennai, recently expanded its diagnostic capabilities through the acquisition of cutting-edge imaging technologies, including artificial intelligence in imaging practice. Aarthi Scans & Labs was established in 2000 and quickly gained a reputation for providing affordable diagnostic services to the general public. The imaging centres are located in ten states and average 5000 patient visits per day, with the highest volume of MRI scans performed daily in India. The centre offers a range of primary to advanced diagnostic tests, and all labs are equipped with MRI, CT, ultrasound scan, Xray, mammogram and OPG capabilities as well as laboratory facilities. All diagnostic services are offered at a 'one India, one price' rate.



### Low cost screening for the masses

Founder Mr. Govindarajan is thrilled with the expansion of Aarthi Scans & Labs and ensures that the diagnostic business will continue to give services to society at the most affordable cost compared to any other centre in the country. As a NABH, NABL, and ISO-certified diagnostic centre, Aarthi Scans & Labs has a nationwide network of 36 fully equipped diagnostic centres. With a low-cost structure, the lab is committed to keeping up with technological advances in medical imaging and diagnosis. The national diagnostic chain has the biggest number of MRI facilities in India, with 40 MRI units spread across 10 states. MRIs will be available in 15 states by 2025, which is a more ambitious goal.

### Trust leads to the path of success

Aarthi Scans & Labs continues to place its trust in Mindray India, a fast growing innovator in medical technology. The performance of Mindray Ultrasound technology installed throughout the years has been outstanding, enabling Aarthi Scan to provide superior and faster diagnostic services. Mr. M.C. Ekambaram, Product Manager, Radiology, Mindray, stated that Aarthi scans have continued to install Mindray ultrasound since 2017 because it provides superior technology with shared service applications and advanced capabilities that are ideal for performing complex to high volume scans on a daily basis. Mr. Ashwani Raina, Director UIS Mindray India,



"We will continue to provide the advanced diagnostic imaging & lab testing technology at affordable costs and the association with Mindray India will help to accomplish our mission"



**Dr. Arunkumar Govindarajan**  
Director  
Aarthi Scans & Labs



is overjoyed to join the centres' cause with this latest expansion. Mr. Raina added that by blending superior imaging, intelligent apps, and intuitive workflow, Mindray's technology will raise radiologists' diagnostic confidence, resulting in improved patient care. We appreciate the center's confidence and trust in this recent acquisition.

### Innovation for a healthier future

Mr. Govindarajan said that without support from Mindray India, which has provided high-quality and reliable imaging devices at a reasonable price, it would not have been possible to promote the cause of affordable diagnostics. "With Mindray India on our side, we have confidence in our capacity to accomplish our purpose; we have faith in the company, and they contribute significantly to our success," he concluded.

Mr. Govindarajan believes that "the cost of diagnosing an illness should not deprive a patient to the point of treatment becoming costly, and that this is a vision worth fighting for". Aarthi Scans & Labs is committed to building a novel sustainable approach that will improve early diagnosis and outcome. Mindray, a medical developer, is an ardent advocate of such efforts, as the company was built on the basis for accessible healthcare in the modern world. Continuous innovation and philanthropic collaboration enables us to achieve the universal goal of healthcare for all.



**Dr. Aarthi Prasanna**  
Director  
Aarthi Scans and Labs

"With Mindray India on our side, we are confident in our ability to accomplish our mission; we have faith in the company & they play a significant role in our success"

# OPTIMAL UTILIZATION OF MECHANICAL VENTILATOR AT TERTIARY CARE HOSPITAL DURING COVID-19 PANDEMIC

Mr. Deepak Agarkhed, Dr. Anand B. M., Dr. Madhusudan R., Dr. Sreekanth Shetty, Dr. Bevin Dsilva, Mr. Biken Sakra World Hospital, Bengaluru



India is one of the top countries having more deaths so far due to COVID-19 pandemic. Bangalore city too witnessed an average of 12 COVID-19 deaths a day in first wave and 96 COVID-19 fatalities a day in second wave. Indian healthcare system was under severe challenges including bed availability, Oxygen consumption and medical equipment due to unprecedented surge of COVID-19 patients



**Deepak Venkatesh Agarkhed**

Associate Vice President  
Sakra World Hospital

Sakra World hospital, Bengaluru is tertiary care hospital that has 300 bed capacity. During the mid of April 21 till first week of Jun 21 COVID-19 cases increased drastically as shown in the graph. The average length of patient too increased from 4 to 7.1 days on account of COVID-19 patients thereby creating shortage of bed availability for needy patient. The resources required to serve increased COVID-19 patient load was challenging especially materials and equipment.

Graph showing pattern of inpatient COVID-19 patient at Hospital



The COVID-19 pandemic mainly affects patient lungs. The necessity of oxygen, usage of mechanical ventilator and CT scanner becomes need of hour during this pandemic. The medical equipment management had become major focus during COVID-19 time especially for patient treatment and recovery like mechanical ventilator & BIPAP units. This article is highlighting how in peak COVID-19 pandemic situation hospital team has tried to tackle shortage of intensive care beds wherein patient required mechanical ventilator.

Waiting for ventilator for needy patient, Unnecessary motion of staff, rework of staff to connect patient circuit on ventilator and delayed transportation is MUDA (waste) which compromised or delayed patient who needs ventilator in the hospital. The location of Intensive care is scattered across the high rise building and managing timely usage of ventilators in required ICU was real challenge to hospital COVID-19 task force.

Although hospital had 50 % Intensive care units (ICU) beds having mechanical ventilator, with surge in COVID-19 especially in May & June 21, there was sub optimal utilization of Ventilators at the start of second wave of COVID-19 pandemic. Before start of COVID-19 pandemic medical equipment in general and ventilator, BIPAP in particular were allotted to various ICU & ward based on user requirement. To transfer equipments from one area to another, there was undue delay since approval at various levels were needed. The time to shift from one ICU to another ICU was involving lot of paper work and time consuming. Due to possibility of essential elective surgery, there was need to keep few ventilators on standby mode. Unfortunately, no team either nursing, medical administration or clinical engineering has owned the responsibility to this critical process of timely resource sharing and quickly utilizing a needy patient.

Best Practices

The repeated delay in ventilator shifting and undue escalation of this problem at various level led to discussion at COVID-19 task force meeting. After analyzing root cause of lack of ownership for medical equipment transfer &

tracking process, the management has given both authority and responsibility to associate Vice president (AVP) to take lead and quickly adopt workable solutions for best utilization of equipment especially ventilator.

**5-Why Analysis**

Problem: Sub optimal utilisation of Mechanical ventilator during COVID - 19

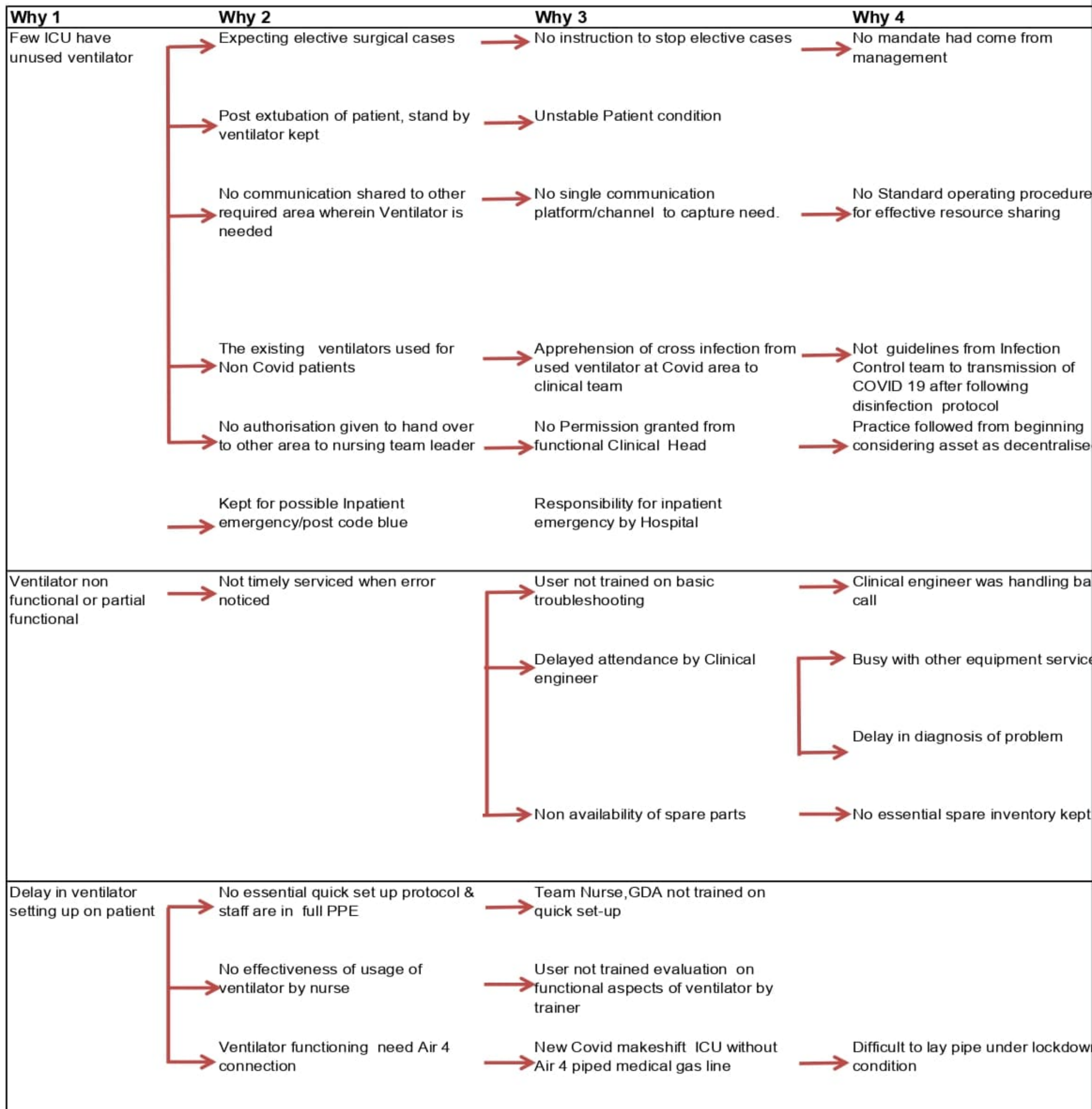


Table showing 5 Why analysis conducted by Hospital quality team to understand root causes for sub optimal ventilator utilization

## 5 WHY analysis tool to understand root causes for sub optimal utilization of ventilators.

Why 5	Root Cause	Recurrence Prevention
→ Delayed input from Covid Task force not to take elective patient	Balancing workload of emergency & elective surgical patient	Management team to inform Surgeons based on input from task force.
→ Need for peak ventilator utilisation was never witnessed	No common platform share all ventilator information & No one person was process owner	Creating WhatsApp group & capturing twice a day on all ventilator status & process owner will monitor Ventilator movement.
→ No enforcement of guidelines from Infection committee & communication to all Clinical team	No one person was responsible for ventilator management	Senior person from management was made responsible & accountable
→ No enforcement of guidelines from authority.	No one person was responsible for ventilator management	Senior person from management was made responsible & accountable
→ No concept of Total Productive maintenance	No delegation of basic work to nursing	Process of keeping stand by ventilator was stopped during Covid time
→ Priority service for critical equipment not understood	Call prioritisation	Train on concept of total productive maintenance including Video call
→ Not trained on advanced trouble shooting	Untrained on advanced trouble shooting	Identification of critical life saving equipment
→ Earlier low utilisation of ventilator & enough spare ventilators on ground	Low utilisation of ventilator	Training provided to all clinical engineers on ventilator
	Earlier Pandemic type emergency was never witnessed	To keep minimum spare parts, consumables
	Effective training of staff at ICU on ventilator usage	Training all nursing & GDA staff on ICU for quick setting up of ventilator for next patient
	Non availability of turbine based ventilator	Video on usage made available on Intranet including quick start
		Procured few turbined based ventilator

The Hospital quality assurance team to understand root causes for sub optimal ventilator utilization with help of all stake holders through 5 WHY analysis tool and recommended to have senior management member as process owner for Ventilator management.

The following improvement ideas were adopted by Associate Vice President (AVP) with help of COVID-19 task force for better, quick change over of ventilator without compromising on uptime of equipment.

- **Total productive maintenance (TPM)** concept was adopted through training all Clinical engineers on troubleshooting on COVID-19 related critical equipment.
- The critical spare parts, accessories needed for equipment were procured extra and kept in hospital without waiting for supply chain lead time.
- User group was trained on identifying error code and communicating to Clinical engineer through phone or video call.
- The **cleaning & disinfection** of equipment based on OEM protocol was strengthened to reduce risk of spread of COVID-19 through Ventilator and its accessories. Maximum disposable items were being used like patient circuit and special precautions were taken to disinfect parts that come in contact with patient like flow sensor.
- Most of the troubleshoots were resolved by Clinical engineering team **remotely** and only for absolute need, engineer used to enter COVID-19 area with proper protection kit.
- The instruction manual, service manual and video on operation of equipment was uploaded in Hospital Intranet for ready reference.
- **SMED (Single Minute Exchange of Dies)** concept of LEAN Manufacturing method adopted to reduces the time required to change over equipment like ventilator from one patient to another.
- The biggest challenge was ensuring that unused equipment is quickly moved to required area without delay as there was tendency of holding equipment in specific area in anticipation of its need for any patient. This is about those areas wherein they expected surgeries may happen to result in possible ventilator needs.
- The closed social media group was created

which included intensivist, surgeon, nursing and Clinical Engineering team. Twice in day, the status of areawide ventilators physically present, on use on patient and in stand by mode for patient besides ventilator needing maintenance was shared in closed group.

- On daily basis the location wise equipment availability, its usage was closely monitored by Associate Vice President with help of biomedical engineer and nursing staff.
- The care was taken to avoid mixing of ventilator in COVID-19 area from non Covid area although disinfection protocol was followed as per OEM norms.
- With still elective surgeries and emergency surgeries performed at hospital, few ventilators were in standby mode. This issue was addressed with clinical team through sharing stand by ventilators among various clinical specialties.
- Based on ventilator patient surge in number, additional set of ventilators were quickly procured and installed. Mix of ventilators turbine based (without compressor gas input) and another one taken for flexibility in usage across hospital as few ward beds were converted to ICU capabilities but without central compressed air lines.
- The ventilator modes of application were refined based on patient critical condition .The monitoring also involved is ventilator is invasive or non-invasive mode to ascertain possible replacement of BIPAP exchange of ventilator based on advice of intensivist.
- The decision to shift ventilator from one area to another was purely based on patient clinical requirement.
- During last few weeks of 2<sup>nd</sup> wave of COVID-19, there was increase in need for patient who have recovered from COVID-19 but still needing assistance of mechanical ventilation in Non Covid area.
- After due diligence with anesthesia team and service providers, anesthesia ventilator was used for few patients to address shortfall of mechanical ventilator.

The result was evident as there were only two breakdowns on ventilators with 0.1 % downtime and needless to say that there was maximum 100 % utilization of equipment with quick changeover from one patient to another. The transparency in usage of ventilators resulted in no unnecessary row among stakeholder.





Needless to say, precious lives of patient were saved through Lean concept to tackle MUDA i.e. waste of rework, motion, transportation and waiting.

The following lessons were learned during this 2<sup>nd</sup> COVID-19 wave pandemic concerning asset management.

- The equipment management process can't be viewed in isolation by Clinical engineering, nursing, clinician. The cross functional coordination is necessary as hospital processes cut across barriers of functional departments.
- The asset sharing in the shortest time is mandatory. The hospital is decided to adopt centralized medical equipment storage and distribution.
- The hospital had noticed that since their existing ventilators needed Air 4 bar for its function, in quick time interval it was difficult to commission existing area to ICU as pipeline for Air 4 needs to be laid. It is better to have combination of turbine-based ventilators along with current set of

ventilators.

- The virtual training & maintenance is way forward for user group and clinical engineers.
- Systematic planning and procuring of inventory and strict infection control practice gives dividend of improving uptime and safety to patient & staff.

The experience of best usage of life saving ventilator with minimum downtime and quick transfer and connection to required patient by trained staff taught hospital team that Kaizen i.e. continuous improvement in process based on demand is the best way to improve the quality of patient care and improvement. The Kaizen can be only achieved through application of thinking hat from various stake holder and executed under able process owner.

**S**V Series ventilators (SV300/SV600/SV800) have proven its capability of providing complete and reliable support for patients with severe respiratory failure.

### SV300

It is small yet powerful ventilator, which has been widely favored and come into the limelight as a 'warrior at the forefront in battling COVID-19'. With latest upgrade the performance of SV300 is enhanced for better patient management on one device.

**Neonatal Ventilation-** Providing care to the smallest of patients with our newest Thermal Type Flow Sensors (both reusable and disposable) and tidal volume as low as 2ml making it suitable for all patient population including neonates.

IT solution to integrate between ventilators, and other devices used in ICU like syringe pumps, patient monitors and directly communicate to Hospital Information System by supporting HL-7 protocol.

PSV-S/T mode Pressure support ventilation Spontaneous/Timed ventilation has enhanced the capabilities of Non-Invasive Ventilation. This newly added mode in NIV helps to manage breath cycle during excessive leakage by terminating the breath in timely fashion as the Time of pressure rising and pressure support level are set by the user.

Emergency ventilation mode CPRV refers to cardiopulmonary resuscitation ventilation. Improvement in CPRV mode with advanced electronic Impedance threshold device (eITD technology) will help clinicians to quickly set ventilation mode while performing CPR during cardiac and respiratory arrest and evaluate the quality of CPR through relevant feedback from SV 300 ventilator.

**Intelli cycle Pro-** We have taken trigger sensitivity of our SV series ventilators to the next level by enhancing Intelli cycle to Intelli Cycle Pro. The intelligent feature helps to improve the performance of the ventilator providing more comfort to patient by effectively synchronizing patient spontaneous breaths with ventilator

**PulmoSight-** Displays the pictorial representation of the Lungs the clinicians can easily see changes

# SV SERIES VENTILATORS UPGRADE



**Megha Sharma**

Assistant Product Manager - Ventilators  
Mindray Medical India Pvt Ltd

in the respiratory mechanics like resistance and compliance of the Lungs through color and shape change from a distance without having to look in measured values. The brightness and darkness of lung diagram represents the inspiratory and expiratory process making it easy for the patient care group to better analyze patients without having to be at the bed side.

**Disposable valves-** It is intergraded with flow sensor; it reduces the installation and eliminates disinfection process and cost while providing the same precision and performance as our reusable valves.

### SV 600 & SV 800

**AMV sight optimization-** new upgrade in Adaptive Minute Ventilation Sight (AMV) intuitive design will assist clinician a real time display of monitored values to make better decisions for patient.

**Auxiliary Pressure monitoring-** Auxiliary pressure monitoring feature is used as an indicator of Ventilator induced Lung injury. This feature which calculates esophageal pressure is now added to SV 600 with Lung protection parameters like Driving pressure, Mechanical power (only available in SV 800), Chest wall compliance and lung compliance along with Pes-esophageal pressure catheter positioning tool simplifying the catheter positioning process.

**Driving Pressure-** It is the pressure which is responsible to draw volume of gas into the lungs. The lesser the pressure the better it is for the patients as higher pressure causes barotrauma and damages the lung

**Mechanical Power-** We needed better predictor of Ventilator induced Lung injury but the estimation of VILI involves complex formulas. Mechanical power is a parameter which formula includes all the factors causing VILI viz Pressure/ Volume/PEEP/Flow/Rate/Resistance/Compliance and hence it reflects a better prediction of any injury caused to patients by the ventilator.

With our new product upgrades, we are accelerating towards providing safer, decisive, and efficient ventilators which will assist clinicians to understand patient's real time condition and at the same time guide the healthcare provider to take necessary steps to better manage crisis of ventilated patients.



# SV Series Ventilators

Upgrade

**See more and do more**  
by smartly detecting and adapting  
to the ever changing conditions of the  
patient.

## COVID 19 REITERATE : NEED OF A POWERFUL NIV VENTILATOR IN YOUR ICU



**Manju Goyal**

National Product Manager, Life Support  
Mindray Medical India Pvt. Ltd.



COVID-19 has affected each one of us in multiple ways and our healthcare system is fighting in this war at front foot for humankind tirelessly. COVID-19's changing variants have forced clinicians to use different treatment patterns, and as a result new ways are being tested, approved, and being used as the pandemic progresses. One of them is the ventilator's role and the way it is being used in treatment of this disease.

During the first wave of COVID-19 it was believed that a traditional invasive ventilator is a mandatory tool to support severely ill patients who developed acute respiratory distress syndrome (ARDS) and required respiratory support. With more data and analysis coming out related to respiratory support device, it is now being realized that NIV and HFNC (high flow nasal cannula) may be more useful tools at the early stages of the disease. NIV at earlier stage may reduce the chances of intubation required at later stage and can avoid associated problems of invasive ventilation. NIV usage has its own additional advantages in any ICU setup and it becomes a more viable and powerful tool for temporary COVID-19 setups working with less staff and limited resources.

For patients who require high flow of oxygen, traditional O<sub>2</sub> therapy demonstrates its limitations. In such cases, the usage of HFNC or HFOT (high flow oxygen therapy) can play a vital role, as it offers high flow of oxygen with oxygen titration facility and avoids many complications such as airway inflammation, increase of airway resistance, and impairment of mucociliary function, possibly impairing secretion clearance. HFNC also decreases energy expenditure and is helpful particularly in the cases of acute respiratory failure. The primary strategy for COVID-19 patients is supportive care, including oxygen therapy for hypoxemic patients, in which HFNC is found to be more effective in improving oxygenation and thereafter NIV.

While the healthcare system is preparing for the third wave of COVID-19 as a precaution measure for children and infants, we can possibly look for such respiratory support devices which can support from HFNC to NIV and invasive ventilation and can be more effective at any stage of respiratory support needed.



Care for patients' every breath with  
**safe and powerful  
ventilation**

**Mindray ventilation technology**

Integrating multiple ventilation modes  
into one machine

# HAEMATOLOGICAL PARAMETERS AND COVID PROGNOSIS



**Dr. Pradeep Singh Suri**  
M.B.B.S, M.D.(Path.) MBA (HCA), FMS, Delhi  
Director  
Dr. Suri Lab Pvt. Ltd.

## INTRODUCTION

Since CBC testing is among one of the most basic tests ordered for any patients, it would be really helpful if any substantial correlation can be established between present day established inflammatory markers and parameters available on a hematology analyzer.

Among established inflammatory markers, CRP is the most suitable marker for anticipating the aggravation probability of non severe covid 19 patients with levels on an average of 20-50 mg/L. Elevated CRP levels are observed in upto 86 % of severe covid patients making it a useful marker for monitoring disease severity. Ferritin being an acute phase reactant and also involved in iron metabolism has a significant prognostic value in covid 19 patients. However one ferritin value is not enough to determine. It has to show a serially rising trend which could even denote cytokine storm. Interleukin- 6 (IL- 6) appears as a potential predictor for the development of hypoxemia in covid 19 patients with a concentration of 24 pg/ml at initial assessment showed excellent sensitivity and good specificity on various

studies. Lactate dehydrogenase (LDH) elevated levels are associated with six fold increase in odds of developing severe disease and sixteen fold increase in odds of mortality in severe covid-19 patients. D-Dimer correlates well with the rise in other inflammatory markers and is also more meaningful for prognosis of survival at a cutoff of 2.025 mg/L.

Looking at the above context we tried to evaluate various hematological markers against established markers.

**OBJECTIVES**

1. To establish correlation between hematological parameters and known inflammatory markers used in COVID-19 positive patients.
2. Try to establish most useful hematological parameters that can be used for covid-19 prognosis.

**METHOD**

1. Patients who were RT PCR Positive for COVID-19 were selected in the scope of study
2. Patients who had not got CBC and all five inflammatory markers were excluded from this group
3. Patients were asked for history of corticosteroid intake and group further filtered to include only those who had not taken steroids till then 507 patients remained at this stage.
4. The CBC parameters were measured and unpaired T-test was performed against each of the inflammatory markers which were divided into two groups. Most of the patients were monitored for hospital admission.

PARAMETERS	Mean when IL 6 <24	Mean When IL 6 >24	PARAMETERS	Mean LDH <350	Mean When LDH >350	PARAMETERS	Mean when CRP < 20	Mean when CRP >20
Lymph#	1.8	1.3	Lymph#	2	1.3	Lymph#	1.9	1.2
Neut#	5.5	6.2	Neut#	5.2	6.5	Neut#	5.4	6.3
RDW CV	14.3	14.3	RDW CV	14.2	14	RDW CV	14.3	14.2
RDW SD	43	43.9	RDW SD	42.12	42.68	RDW SD	43.13	43.13
IPF	6.7	7.4	IPF	6.8	7.5	IPF	6.7	7.3
Neut Y	477	525	Neut Y	473	526	Neut Y	479	520
NLR	4	6.2	NLR	3.5	7.3	NLR	3.7	7.2
IMG	0.46	0.36	IMG	0.44	0.38	IMG	0.47	0.35
HFC	0.33	0.53	HFC	0.36	0.48	HFC	0.33	0.51
IRF	11.5	10.4	IRF	10.6	12.4	IRF	10.9	12.3
MONO Z	1379	1402	MONO Z	1385	1412	MONO Z	1378	1403

PARAMETERS	Mean when Ferritin <300	Mean when Ferritin >300	PARAMETERS	Mean when D DIMER <1	Mean when D DIMER >1
Lymph#	1.8	1.3	Lymph#	1.7	1.7
Neut#	5.4	6.5	Neut#	5.5	6.5
RDW CV	14.3	13.9	RDW CV	14.2	15.3
RDW SD	43.3	42.3	RDW SD	42.9	44.8
IPF	6.7	7.3	IPF	6.8	7.8
Neut Y	480	514	Neut Y	481	507
NLR	4	6.7	NLR	4.4	5.9
IMG	0.4	0.62	IMG	0.43	0.56
HFC	0.31	0.6	HFC	0.36	0.4
IRF	11.2	11.4	IRF	10.8	16.5
			MONO Z	1384	1376

**RESULT**

Absolute Lymphocyte Count, Absolute Neutrophil Count , Neutrophil Lymphocyte

Ratio (NLR) and HFC (High Fluorescence Cells) were the best prognostic markers showing excellent correlation with most of the inflammatory markers.

NLR was the most efficacious marker amongst the various parameters analyzed with a cutoff of 4 being a robust cutoff to differentiate mild from moderate and severe COVID infections as long as the patients have not taken steroids.

Immature Reticulocyte Fraction showed excellent correlation with D-Dimer but not with other inflammatory markers. This could be a topic for further research.

# MINDRAY

PARTNERS WITH  
STANLEY MEDICAL  
COLLEGE and HOSPITALS  
TO ENABLE ADVANCED TECHNOLOGIES  
IN RADIOLOGY





**M**indray, a global leading medical solution provider, has partnered with Tamil Nadu-based Stanley Medical College and Hospitals to support academic training and research publications.

An agreement has been signed on September 8th, 2021 between Stanley Medical College and Hospitals and Solokraft Industries (Channel Partner of Mindray UIS) under the guidance of Mindray India. This 2-years collaborative and research partnership agreement envisages advanced clinical application training which is commonly not yet available. This collaboration is Mindray's commitment to educate and train radiologists in government hospitals on the advanced clinical applications like liver stiffness evaluation, MSK imaging as an alternative to expensive MRI & fetal anomaly studies. Additionally, research articles will be published based on data generated by these applications.

The agreement signing ceremony was held at the hospital in presence of Dr. Amarnath C. (HOD Radiology Stanley Medical College) Mr. Ashwani Raina (Director – Mindray India UIS), Mr. Suresh Jain (CEO, Solokraft industries), Mindray representatives, and Radiology staffs of Stanley Medical College and Hospitals.

Stanley hospital, established in 1780, is one of the oldest centers for medical education in India. The College is associated with the well-known Government Stanley Hospital which has 1280 beds for in-patient treatment. The hospital has an out-patient attendance of around 5000 patients per day. Surgical Gastroenterology, Urology and the Institute of Hand Rehabilitation and Plastic Surgery (IRRH & DPS) of the Stanley Medical Hospitals are one of the best in Southeast Asia. Headed by renowned Dr. Amarnath C with a team of 40 teaching PG students, the Radiology department of Stanley Medical College and Hospitals is rated amongst the top 10 in India.

This unique project, jointly conceptualized by Dr. Amarnath C and M.C. Ekambaram (Product Manager Radiology - MRIN), is expected to empower radiologists in Tamil Nādu on applications like SW Elastography, Vascular, MSK/Intervention, Contrast imaging for better treatment as compared to expensive conventional fibroscan, MRI/CT. It helps them understand and practice advanced ultrasound applications and benefits the entire community, especially the economically weaker section.

Resona I9, the general imaging diagnostic ultrasound system installed at Stanley Medical College and Hospitals by Solokraft industry, is equipped with Mindray's cutting-edge breakthrough ZST technology to support this collaboration excellently. It enables exceptional image quality for infinite imaging solutions. Resona I9 also offers Smart Breast and Smart Thyroid automatic standard lesion analysis, which shortens examination times for more effective scanning.

With deep insights into unmet clinical needs, Mindray aims to provide a comprehensive solution to Stanley Medical College and Hospitals for accurate diagnosis and better patient care across Tamil Nadu.

Mindray takes great pride in these initiatives being committed to a healthier Bharat.



## A MODERN ERA SURGICAL LIGHTS **HAS MUCH MORE TO EXPERIENCE** THAN JUST ILLUMINATION

**W**hen we think about an OR room we assume that a surgical light is required to give required illumination to visualize the cavity properly so that surgeon can perform surgery well. A few years ago it was true to much extent with halogen lights giving required illumination and maneuvering. But after LED lights entered into surgical lights we are into different era of endless possibilities and thinking much beyond basic need. The development has happened in all areas from aesthetics to designing for laminar flow compatibility. A lot of parameters are helping buyers to choose the best fit light depending on their specialization of operation and not compromising on their actual requirement.



For instance, high illumination may not be the most important parameter required for deep cavity surgery but depth of illumination may be first and basic parameter you will need to perform that surgery. For a teaching institute the live data stream of surgery outside OR may be the differentiator and so on.

While choosing any surgical lights one more aspect can be looked at which is Surgeon eye comfort as working for long hours on such a high illumination cause eye fatigue, which is inevitable as illumination is also mandatory to visualize

the surgical site. Now industry has brought such technologies to reduce the contrast between surgical site and near surroundings so that while working for long hour's eye stress is reduced. It definitely improves the efficiency of surgeons.

One more situation we need to consider while choosing surgical lights for complex surgeries where group of surgeons and nurses work simultaneously to perform surgery. In such cases the lights illumination at site get compromised

to much extent as light is blocked by their heads. In such cases surgeons used to adjust OT light head frequently to find the best possible

illumination. But this issue has also been addressed with much efficacy by synchronizing the satellite light dome illumination with main dome to provide required illumination at actual site without increasing temperature at Surgeon head. This technology has evolved over many years and has been established as perfect solution to surgeon needs in these kind of surgeries.

These modern era lights brings utmost comfort to surgeons and further stabilishes that technology is meant for helping them to work with more efficiency without compromising on their basic needs.

# HyLED X Series

LED Surgical Lights

Lighten your work



DESIGN  
AWARD  
2020



reddot winner 2020



## Multi-Patch Superposition Technology (MPST)

Homogeneous light field even when blocked by the surgeon's head



## iRelax™

Eye-Relaxing Light reduces the sensitivity of surgeons to the illumination of surgical light & reduce their visual fatigue

**“If adversity was truly bad,  
warriors wouldn’t rise from it.”**

-Matshona Dhliwayo

## Trusted partner for healthier Bharat

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