Apollo HOSPITALS

APOLLO CRITICAL CARE

News | Views | Inspiration

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Foreward by CHAIRMAN

Message from Chairman Dr Prathap C Reddy

At first, we must be mindful that we are barely nine years away from the 'Leave No One Behind', transformative promise of the 2030 Agenda for Sustainable Development and its SDGs. This is an unequivocal commitment made by most of humanity to end discrimination and exclusion, and to reduce the inequalities that leave people behind. This commitment calls for unparalleled and unprecedented measures to bridge gaps and make high quality medical care accessible to all, whenever and wherever it is needed!

Further, the COVID-19 pandemic enormously stressed healthcare systems across the world and in 2020, the timely release of the Telemedicine Practice Guidelines by the Government of India enabled healthcare providers to deliver timely care, remotely. Leveraging technology, is a powerful way to augment limited resources, not only in semi-urban and rural India that lack expertise and resources, but also in urban medical facilities, which face temporary surges in patient flow.

Apollo Hospitals has been at the forefront of health care delivery and education. Our resolve to provide best in class care even during the pandemic was possible due to our excellent clinicians, nurses and the entire team. Furthermore, Apollo has continuously invested in training its teams in emerging developments and its trained man-power can be deployed physically and remotely via use of technology to conduct patient care duties.

Since March 2020, we have witnessed a tremendous demand for critical care and India stands humbled with the tireless service of its medical fraternity who have saved millions of lives from the impact of COVID-19. Now to leverage the force multiplier potential of tele-ICU's, Apollo Hospitals has initiated the 'Critical Care Integration and Transformation Programme'. It is commendable that Prof Ravi Mahajan, FRCA and Current President of The Royal College of Anaesthetists, and all the Senior Consultants are championing the effort to unify the ICU units within the network, that will enable a seamless link to share knowledge and expert advice, both within and beyond our hospitals. I am very pleased to see the tremendous work being put in by every member of the Critical Care Integration team and am confident that this endeavour will help us to touch many more lives.

Looking ahead we must consistently innovate to raise the bar in terms of care delivery, and our efforts must be in sync with the rapidly evolving domains of Tele-Health, Artificial Intelligence, Advanced Robotics, and 3D-Printing.

Dr Prathap C Reddy
Chairman & Founder, Apollo Hospitals,

Messages from MANAGEMENT

Dr Sangita Reddy

Joint Managing Director

Apollo Hospitals has always been at the cutting edge of care. The COVID pandemic has been both a test and an opportunity to demonstrate our integrated excellence. The role of critical care has become obvious to everyone and our mission is to ensure that world class critical care is uniformly available across the group. The new zeal to incorporate evidence-based care with compassion as well as modern technology has its roots at the very beginning of Apollo with Chairman's vision. The over 2500 ICU beds in the system are managed by expert Intensivists and supported by highly trained nurses and multidisciplinary team members. We are moving into regularly using AI and remote care wherever it is needed. This newsletter is a beginning to consolidate our efforts and share our learning between various units. It gives me great happiness to see that Apollo is delivering care to whoever needs it whether it is high flow oxygen for COVID pneumonia or ECMO for advanced lung disease. The future beckons and with the help of public and private enterprise we should be firmly on the way to a healthy India and beyond despite any medical challenges we may face.

Dr Hari Prasad

President

Apollo Hospitals has successfully navigated the extreme challenges of the COVID pandemic and delivered integrated and effective care as always. The COVID-19 pandemic challenged the health infrastructure of the country. There was tremendous pressure on critical care, but resilience and undiluted commitment of the intensivists ensured delivery of care of the highest standards given the circumstances. Innovation, agility, adapting to rapidly changing situations and dedication were on display in the most difficult conditions.

In the spirit of the transformation that has been seen across healthcare we have redoubled efforts to create an exceptional experience in critical care for all stakeholders. One important aspect of this process is regular communication and sharing of best practices as well as listening to the voices of thought leaders within our ecosystem and from global sources. Creating an integrated critical care network, leveraging our collective strength across the group will ensure that we take the speciality to a different level not only in the country but also build a global model for the same.

CRITICAL CARE

Creating opportunities....

Dr Ravi Mahajan

MD, DM, FCAI (Hon), FRCA

Director

Critical Care Integration & Transformation

Apollo Hospitals

Access to Critical Care expertise in remote areas and small hospitals or nursing homes remains a challenge. The Apollo Hospitals Group aims to make affordable world class medical care available to every citizen in India. Accordingly, the group has started an ambitious programme of Critical Care Integration and Transformation, and I am humbled with the privilege to lead this exciting programme.

Since March this year, guided by Dr Prathap Reddy and his leadership team including Dr Hari Prasad and Dr Anupam Sibal, we have embarked upon developing a network of Hubs and Spokes of various Critical Care Units all over India. The network will include all the units within Apollo Hospitals Group and will seek to partner with various nursing homes and hospitals outside of the Apollo Group.

Enabled by digital links and developments, the network will provide world class critical care to those patients who may otherwise not have the benefit of the expertise within their immediate reach.

In order to harmonise a system of referrals and consultations, we will implement the concept of 'levels of care' and the 'triggers' for escalation of care. We will also have many other developments on pan-India basis including educational programmes, protocols and SOPs, quality improvement initiatives and establishing a centre of excellence in critical care.

I am certain that this unique programme of Critical Care Integration and Transformation will position Apollo Hospitals Group among the world leaders in providing networked remote critical care. I strongly believe that this is the need for the present times and also going forward.

I will be very keen for you to join this interesting and timely development. Please contact me if you would like to share any new ideas or offer your help with this programme.

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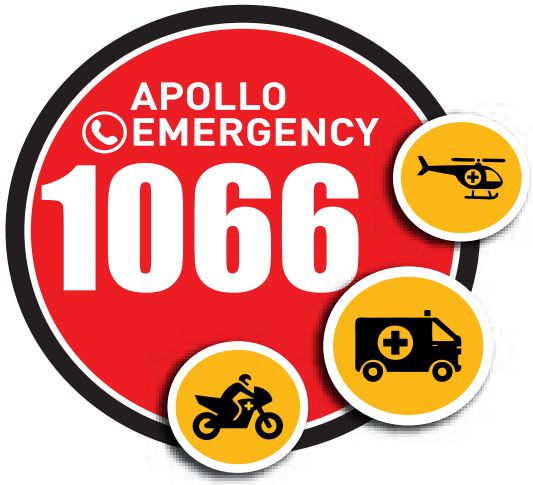

QUALITY METRICS

In the ICU-Why is it Critical?

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Quality of care in a hospitalized patient is the most often repeated principle of health policy in any institution worldwide, starting from the World Health Organization (WHO) to the smallest independent hospital. The definition of quality in health care has come a long way from the Donabedian definition of the 1980's and now is more patient centric as articulated by the WHO definition.

WHO defines quality health care as services are:

Effective: providing evidence-based health care services to those who need them.

Safe: avoiding harm to people for whom the care is intended.

People-centred: providing care that responds to individual preferences, needs, and values.

A critically ill patient is one who has a life-threatening multisystem process that can result in significant morbidity or mortality. Ensuring effective, safe, and patient centric care is of paramount importance in the intensive care unit (ICU). We as clinicians, administrators always tend to say and believe that we provided the best possible care to our critically ill patient.

This is subjective and the fact behind the matter however can be entirely different. For instance, not having a process of care for awakening a patient on sedatives while on a ventilator may lead to just a couple of days extra in the length of stay and very occasionally lead to infectious morbidity and very rarely to mortality. This to a clinician may not point anything abnormal with the perception of delivery of high quality of care but to the individual patient, it affects the cost and leads to increased morbidity and mortality. These quality measures like Length of stay (LOS),

Rates of Ventilator associated pneumonia (VAP) and mortality are visible, appreciated, and comparable and this defines best possible care more objectively. Quality measures are thus standards for measuring the performance of healthcare providers to care for patients in the ICU's. The standards for quality measures have been now well defined in the critical care setting also. We set about doing this in 2009 and published the guidelines from the Indian Society of Critical Care Medicine (ISCCM). Similarly, most of the international societies have also gone about setting up standards.

These standardized measures make measurement of care easy and more importantly it leads to an objective comparison between units, within a hospital and between hospitals. The quality measures that are used across the world in ICU's stretch across the three main domains i.e., safe, efficient, and patient centred care. In the critical care units, the quality indicators most often used in the domain of safety include Unplanned extubation/Readmission to the ICU/Incidence of VAP and other infections.In the domain of efficiency, we use ICU LOS, extubation failure rates, ICU mortality and other morbidities. To be patient centric the quality measure of patient and family satisfaction are used commonly.

These quality measures spanning the domains of safety, efficiency, and patient centric care are critical to the provision of quality care to the patient and we should strive to ensure delivery of objective quality rather than a subjective feeling of quality. Focusing on objective goals, analysing the reasons for failing to meet the standards and rectifying them is what makes a unit stand tall amidst the competition and be a beacon of quality care to the patient.

MASSIVE HEMOPTYSIS

In the ICU

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Abstract: The management of massive hemoptysis (MH) includes initial supportive care, including ICU admission and cardiorespiratory stabilization, with proactive efforts to identify and arrest the cause of bleeding. Available therapeutic modalities include bronchoscopic techniques, bronchial artery embolization (BAE), and emergent surgery

Introduction and Overview: Massive hemoptysis (MH) is a life-threatening emergency, with a high mortality rate ranging from 17.8 - 85%, with recurrence rates up to 36.1% usually in the first month. MH has various definitions due to lack of standardization, and for practical purposes is defined as any one large amount greater than 100-200 ml, or a cumulative amount greater than 500ml/24hrs usually with abnormal gas exchange and/or hemodynamic instability Common causes include lung cancer, bronchiectasis and pneumonia in the western world, and tuberculosis or its sequelae in the developing world. An overview of MH management includes the following - initial supportive care including ICU admission and cardiorespiratory stabilization, with simultaneous rapid efforts to identify and arrest the cause of bleeding. Available modalities include bronchoscopic techniques, bronchial artery embolization (BAE), and emergent surgery. Bronchoscopy helps to localize the bleeding site, administer local haemostatic agents and ablate endobronchial lesions. BAE is recommended for parenchymal bleeds, with an overall success rate of 85% and a recurrence rate of 10-33%.Surgery is challenging in these unstable patients with MH, and has a limited role in an emergent situation with a high mortality of 30-35%.

ICU aspects:

Patients with MH need ICU care for rapid assessment and stabilization, monitoring for deterioration and expeditious mobilization of tests and corrective measures.ICU care includes the basics of hemodynamic stabilization, with fluid resuscitation and endotracheal intubation as needed. The components of ICU care are as follows:

Airway aspects :

1. Intubation: With active hemoptysis, intubation with a large size endotracheal tube (ETT; size 8 or greater, if possible) is prudent to facilitate blood and clot extraction as well as allow bronchoscopy. This is combined with deep sedation and preferably neuromuscular paralysis to suppress the cough reflex. Double lumen ventilation is mentioned in literature for ongoing bleeding but not practically possible or helpful, as will not allow diagnostic bronchoscopy and impede clot clearance.

2. Ventilation: Extensive airway clot, parenchymal bleeds, pre-existing lung disease and hypoxic vasoconstriction can impair both oxygenation and ventilation. Ventilator strategies recommended are standard ones to optimize gas exchange, till definitive measures are implemented.

3. NIV and HFNC are not preferred and maybe detrimental.

4. Positional therapy with the patient lying bleeding side down (if possible to determine) helps to prevent soilage and 'spillover hypoxia' of the non-bleeding side.

Resuscitation aspects

5. This includes assessment for the extent of blood loss, presence of coagulopathy and culprit medications such as anticoagulants and antiplatelets, reversal with antidotes if possible and blood components accordingly. DDAVP (Desmopressin) for platelet dysfunction of renal failure maybe considered. Tranexemic acid is an antifibrinolytic agent which has been tried by intravenous, inhaled and bronchoscopic means with limited data and success.

6. Achieving hemodynamic stability with fluid resuscitation and packed RBC transfusion is important for both stabilization and preparing the patient for the next definitive step.

Determination of etiology:

Rapid assessment hand-in-hand with stabilization, consultation with a Pulmonary service and evaluation with a contrast computed tomography (CT) of the chest is recommended to identify bleeding foci and define the abnormal vasculature. All patients should be considered for early bronchoscopy for culprit area localization and possible therapy – bronchoscopy is easier to do if intubated. In obvious parenchymal causes of bleeding, BAE is recommended.

Role of bronchoscopy and surgery:

Bronchoscopy is an important tool in diagnosis and management of MH. In terms of diagnosis, it identifies endobronchial lesions and helps to localize the culprit bleeding segment (s). Therapeutically, it helps to clear blood clots, restore airway patency, and can be the definitive treatment modality using thermal (laser, electro-cautery) or cold therapy (cryotherapy) in endobronchial lesions.

Surgical options are mentioned but tough to implement in MH from both patient aspects and logistic issues. Emergency surgery for severe MH also carries a high mortality and is reserved for situations such as blood vessel or fistula rupture, or trauma.

Challenges:
A subset of patients with MH presents a big challenge – when cardiorespiratory instability does not allow transfer for BAE, there is a delay or higher risk of BAE due to azotemia/contrast issues/allergies, and failed BAE due to technical reasons (inability to find a culprit vessel, spinal artery origin from the culprit vessel). This represents a blind-spot in current MH management algorithms. Additionally,patients with diffuse alveolar hemorrhage (DAH) are not candidates for BAE or local therapies and proactive therapy targeting the underlying cause is needed. Idiopathic MH is another entity which has no definitive therapy.

The speed of hemoptysis often decides outcomes, as continuous large volume hemoptysis can be fatal within minutes. Hemoptysis with underlying structural lung disease also carries a worse prognosis.

Summary:
Proactive clinical assessment, interdisciplinary integration, rapid diagnostic testing, airway and hemodynamic stabilization and careful follow-up are the pillars of MH management. This is coordinated by the ICU for multiple aspects and is one of the highest mortality conditions unless treated appropriately with a multi-disciplinary approach.

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2.Fartoukh, M., et al.,Early prediction of in-hospital mortality of patients with hemoptysis: an approach to defining severe hemoptysis.Respiration, 2011.83(2): p. 106-114.

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DREAM ICU

Sleep in the ICU & we thought everyone is Awake all the time !

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An Intensivist's dream is to have an ICU with state-of-the-art technology, infrastructure and an opportunity to deliver the highest quality of care by practices based on current evidence-based medicine. Sleep is often not an area of focus in critical care. As a practicing Intensivist in the USA, I noticed that every person involved in the care and those receiving it have significant sleep problems, which often go unidentified. This was the driving factor for me to get formally board certified in Sleep Medicine to better address these issues and create a 'Dream ICU'.

Our patients in the ICU have disturbed sleep due to their underlying critical illness and also environmental factors including artificial light and noise. Focused history in these patients suggests that undiagnosed Obstructive Sleep Apnea is common and might have been a risk factor for their current illness particularly in patients with uncontrolled Hypertension, Diabetes and those with Cardiovascular diseases such as Coronary artery disease and stroke.
OSA affects 9% of women and 24% of the men in middle age population and 90% remains undiagnosed and may increase the risk of perioperative complications.Simple tools such as STOP-BANG questionnaire have a positive predict value of 78.4% and have been mandatory in pre-operative assessments in developed countries.
Over 60% of patients discharged from ICU report sleep disturbances during hospitalization. Sleep deprivation, fragmented sleep pattern with abnormal sleep architecture, Day-night disorientation and sleeping during daytime hours with a shift toward lighter stages of sleep at night are common in ICU patients. Poor sleep may contribute to brain dysfunction, of which delirium is a manifestation. The caregivers in the family are anxious and experience insomnia, irregular and fragmented sleep pattern. Not to forget - the members of ICU team may be chronically sleep deprived due to shift work and provider burn out.

What can we do to promote better sleep and create a 'Dream' ICU?

1.Educating the team on the importance of sleep and common sleep disorders. Symptoms of Caregiver Burnout, Insomnia, Depression/Anxiety, Sleep Apnea, Circadian rhythm disturbances, Restless Legs Syndrome are frequently overlooked and should be identified early and treated to prevent complications.

2.Assessment of sleep using subjective and objective tools – For patients and caregivers. Although Polysomnography is considered the gold standard for evaluating sleep, it is fraught with challenges in being performed in the ICU setting. Alternatives including Actigrapy, Bispectral Index may be considered as appropriate.

3.Address patient-related factors such as pain, stress and organ dysfunction.

4.Consider non-pharmacological approaches to promote sleep. This should particularly focus on appropriate lighting, having dedicated 'lights off' time and reducing noise.

It is also essential to plan patient care activities including diagnostics and procedures predominantly during the day and allow patients to rest at night to maintain circadian rhythm. Different ventilator modes, eye masks and/or earplugs,

massage, aromatherapy, acupressure and sound masking have all being studied to improve the quality of sleep and have shown variable results.

Various pharmacological interventions have been tested and are used although most of them have not consistently ensure good quality sleep in ICU. Melatonin which sounds intuitively appropriate through its effect on correcting circadian phase derangement is frequently used based on its low side effect profile and low residual daytime drowsiness.

A good sleep for the patients in ICU can overall help in recovery and should be meticulously addressed by every member of the multidisciplinary team.

CHALLENGE TO SEPTIC SHOCK

using blood purification therapies:

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Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection. Septic shock, the most severe complication of sepsis, carries a high mortality, despite standard therapies with potent antibiotics and extensive supportive care. The pathogenesis of septic shock is characterized by extensive production of inflammatory cytokines and bacterial toxin, endotoxin, which is known to be the most powerful sepsis trigger.

Blood purification therapies have been developed to modulate these immune responses. Several devices have a function to absorb inflammatory cytokines with different principles. These include CytoSorb, Coupled Plasma Filtration and Adsorption, AN69ST, oXiris, High cut-off membranes, and Hemofeel CH. oXiris is targeted at both cytokines and endotoxin. The principle of these devices is non-selective removal (1). Only Toraymyxin is selective endotoxin removal/adsorption therapy.

The device that is selected depends on what substances need to be removed. If you want to modulate cytokines, a cytokine removal therapy is useful. If you want to remove endotoxin, an endotoxin removal therapy is useful. If you want to remove both, oXiris can be a candidate. In general, a hemoperfusion cartridge has a higher adsorption capacity than a hemofilter such as oXiris.

As a target endotoxin is at the top of the inflammatory cascade. Endotoxin stimulates immune cells to produce cytokines. Among all the blood purification therapies mentioned above, evidence for the outcome is not sufficient. Among them, endotoxin removal therapy has been tested with randomized controlled trials. Meta-analysis shows survival benefits in endotoxin removal therapy (2).

Patient selection should be very important for these modalities. All of the devices have been used as supportive therapies. If organ failure irreversibly develops, it is too late. The initiation timing is always important and to know the correct timing, experience is crucial until evidence is established.

Sepsis patients are heterogeneous which is why it is very difficult to show evidence in this field. This is happening not only in blood purification therapies but also in drug usage.Currently, biomarkers and consensus experience can guide the devices to be selected for a septic shock patient. IL-6 and Endotoxin assay could be a biomarker for patient selection. New technology can clarify patient selection and initiation time in the near future.

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of Novel Clinical Phenotypes for Sepsis. JAMA. 2019 May 28;321(20):2003-2017.

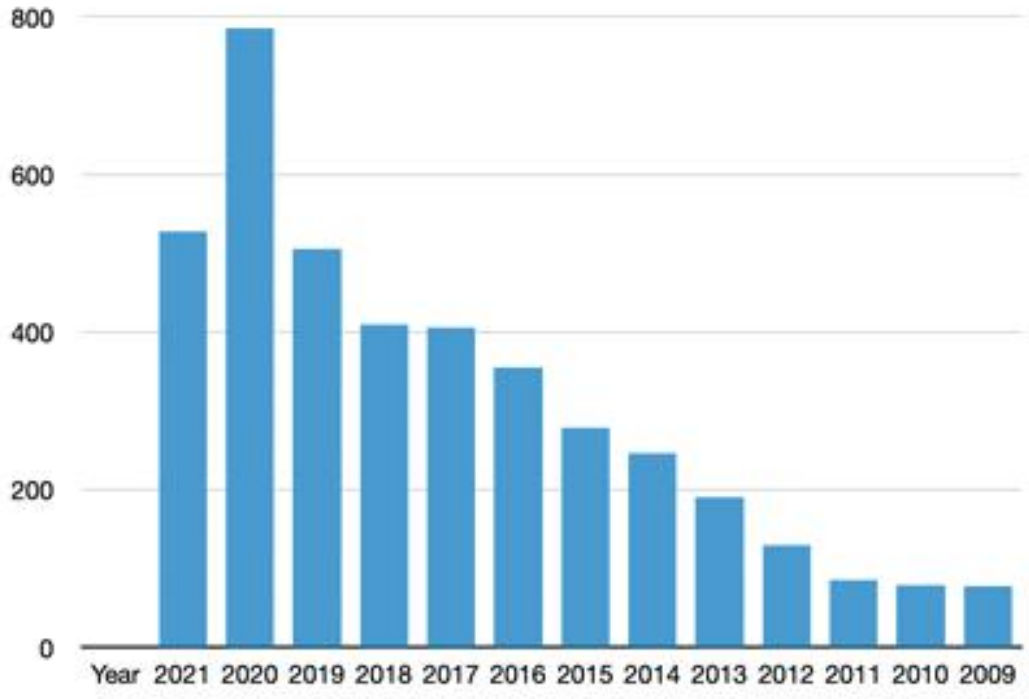
NEWS UPDATES

Compiled by Apollo Critical Care Teams

On June 10, 2021 a workshop was conducted pan India with the unique interaction betweeen management teams and providers including nurses and doctors. The aim was to reinvigorate the ongoing effortsto integrate and transform critical care. The challenges and opportunities brought forth by COVID were discussed . A plan for rapid and sustained implementation and growth was made. Since the workshop there has been tremendous prgress in creating a superlative model of critical care for the country.

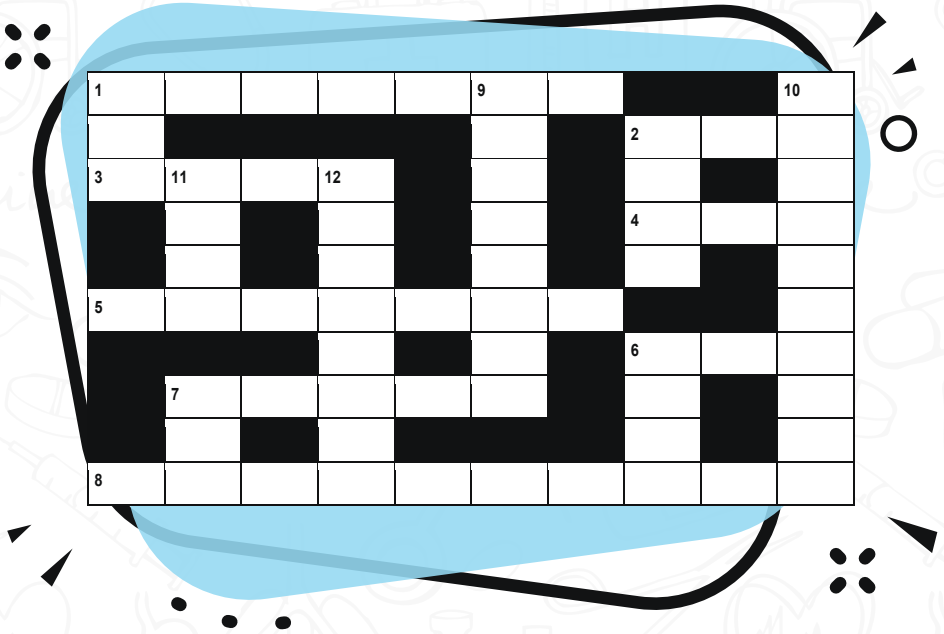
Publications:

The Apollo COVID management protocol has reached its 44 th edition and has been widely disseminated with the latest information .
Apollo Hospitals doctors have been prolific in publishing and especially in critical care with articles ranging from teleICU to artificial intelligence as well as critical care updates regularly .
The graph shows the result of PUBMED search terms “Apollo Hospitals” over the last few years . This year we are already at 527.



CROSSWORD

The Apollo Critical Care Crossword : It's easy and its quick- all are common words and abbreviations. Look out for answers in the clues themselves. Have fun !



Across

1. Essentially sweet : never be too low or too high [7]
2. Golf? Not today- for it is your heart I seek [3]
3. Lovely to sit on but if too high no solution so far[4]
4. She could manage the OP but you need a map backwards[3]
5. It may be hype but I see at the end the pox can leave you out of breath[7]
6. Its urgent and the message is the same anyway you look at it [3]
7. Positive or negative, a single change at the start can make you cry [5]
8. Close to the kidney and necessary for flight but at last the four are in a queue[10]

Down

1.Unconscious in Scotland - observe carefully as you see and talk [3]
2.You can do this in the document but dont spill blood [4]
6.The Indian woman is known for this although you may need to vent if you get it[4]
7.Dubai deals in this but everyone who stopped living may benefit too[3].
9.3 Across said it and 7 across is a part of it although its a liquid proposition [8]
10.You can't miss the clue but the earth is hot yet you let it build up to keep the pressure low [10]
11.Just a plain English word , in fact the single non medical clue in this crossword[4]
12.The smell of the mountain trees in the end wants you to slow down but you avoid the block [8]

ANSWERS

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