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THE UNSUNG HEROES OF COVID-19

CONTENTS

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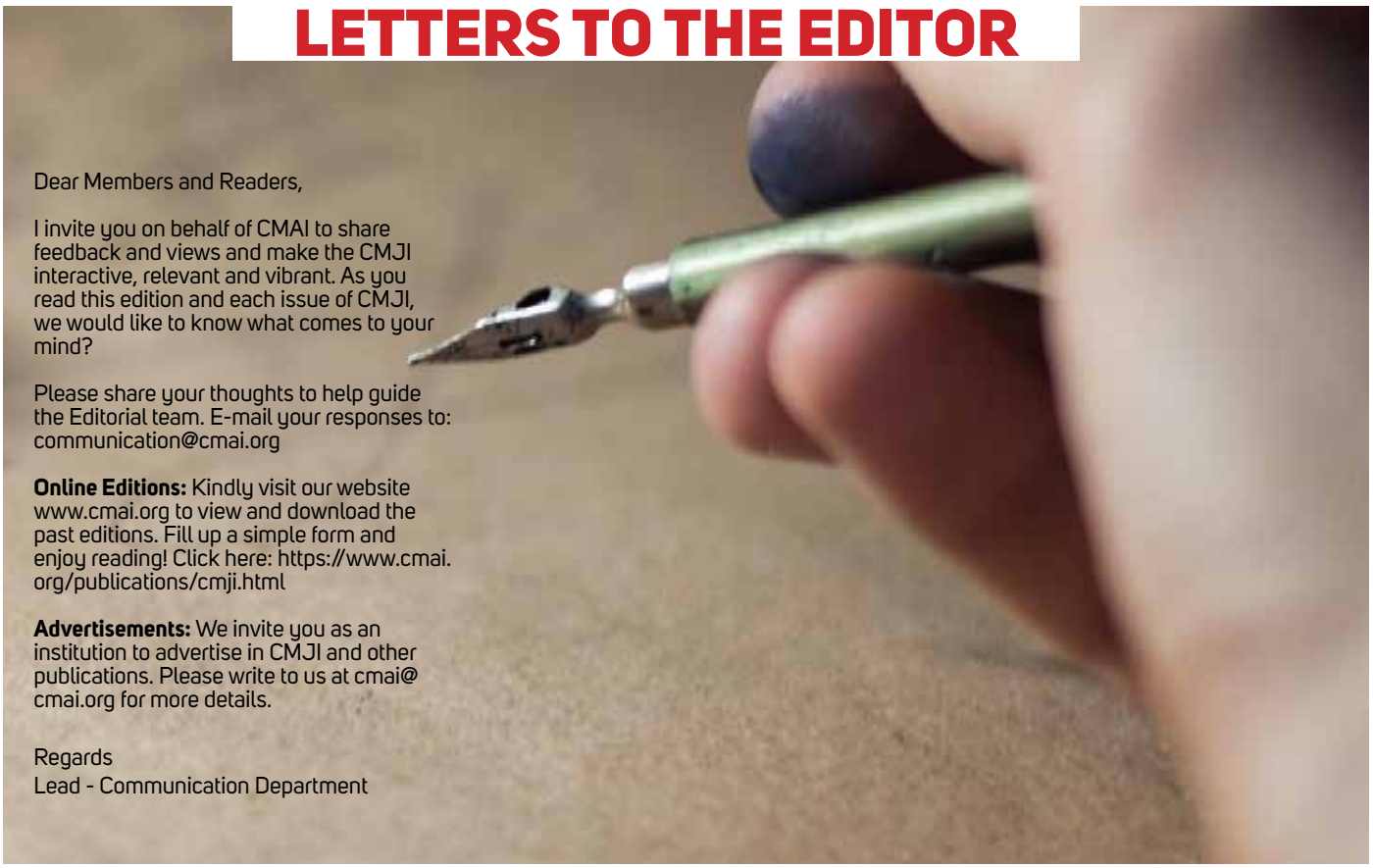
LETTERS TO THE EDITOR



Dear Members and Readers,

I invite you on behalf of CMAI to share feedback and views and make the CMJI interactive, relevant and vibrant. As you read this edition and each issue of CMJI, we would like to know what comes to your mind?

Please share your thoughts to help guide the Editorial team. E-mail your responses to: communication@cmai.org

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Regards
Lead - Communication Department

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SPECIAL ARTICLES: CMAI welcomes original articles on any topic relevant to CMAI membership - no plagiarism please.

- Articles must be not more than 1500 words.
- All articles must preferably be submitted in soft copy format. The soft copy can be sent by e-mail; alternatively it can be sent in a CD by post. Authors may please mention the source of all references: for e.g. in case of journals: Binswanger, Hans and Shaidur Khandker (1995), 'The Impact of Formal Finance on the Rural Economy in India', Journal of Development Studies, 32(2), December. pp 234-62 and in case of Books; Rutherford, Stuart (1997): 'Informal Financial Services in Dhaka's Slums' Jeoffrey Wood and Ifftah Sharif (eds), Who Needs Credit? Poverty and Finance in Bangladesh, Dhaka University Press, Dhaka.
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- Every effort is taken to process received articles at the earliest and these may be included in an issue where they are relevant.
- Articles accepted for publication can take up to six to eight months from the date of acceptance to appear in the CMJI. However, every effort is made to ensure early publication.
- The decision of the Editor is final and binding.

LETTERS

- Readers of CMJI are encouraged to send comments and suggestions (300-400 words) on published articles for the 'Letters to the Editor' column. All letters should have the writer's full name and postal address.

GENERAL GUIDELINES

- Authors are requested to provide full details for correspondence: postal and e-mail address and daytime phone numbers.
- Authors are requested to send the article in Microsoft Word format. Authors are encouraged to use UK English spellings.
- Contributors are requested to send articles that are complete in every respect, including references, as this facilitates quicker processing.
- All submissions will be acknowledged immediately on receipt with a reference number. Please quote this number when making enquiries.

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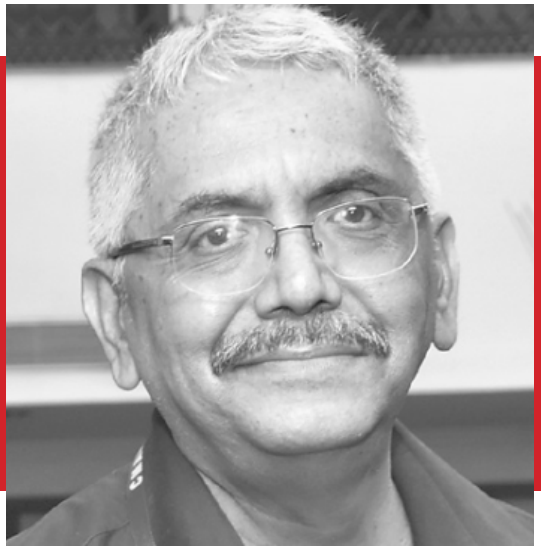
EDITORIAL



The Covid-19 Pandemic has taken much from us. Nobody ever imagined that we would have to live through such a calamity. However, this issue focusses on finding that silver lining in our collective experiences, both at hospitals and at home. I too have faced some very critical situations through the pandemic working at the hospital, but, nothing in comparison to our frontline healthcare workers have battled immense and unprecedented pressures while putting their own lives and of their loved ones at risk. We have therefore contributed to the appropriate theme of this edition of Christian Medical Journal of India as **"The Unsung Heroes of Covid-19".**

The devotional written by **Pastor Sandeep Christian**, about the lives of our Pastors and Chaplains who as spiritual first responders also went through a challenging season. With their life and words, our pastoral community continued to help congregations believe in this truth. Another article on **"The Power of Collaboration"** shares with us how the Christian response from our streets and homes broke away all barriers. Many initiatives of art, music, helplines, care centres and so much more came up with a single hope to help allay all fears about the pandemic.

Two male nurses, from **Baptist Christian Hospital** give an account of the challenges of the Nursing Community. We are grateful that they have shared with us their vulnerabilities and the true strong character in which we all believe. Dr Dhiran from **CSI Campbell Hospital** has authored an article on "When the only shelter of support and protection is insecure & anxious". This will help you gain access to inside the medical team's critical planning and anxieties. A detailed account of how the **National Council of Churches in India (NCCI)** reached out to the migrant population during the lockdowns will make you feel proud of how our mission organisations are doing everything in their capacity to help the poor and needy.

We made an attempt to share clinical based articles for our member readers. We thank **Dr George John** a retired Professor of Medicine and Head – Critical Care, CMC Vellore for preparing and sharing the same in form of a quiz with the editorial team.

Best Wishes,

Dr Christopher D Moses | Editor - CMJI

THROUGH THE SMOKE OF A PAINFUL SEASON, AROSE HEART-WARMING NARRATIVES

PASTOR SANDEEP CHRISTIAN

A pastor, in many ways is a spiritual first responder. His life is a tough one. He gets to shepherd a group of people through all the seasons of their life. Some of these people love him, while others do not. Most of them will have advice on how he can be better at his ministry or his personal life. His calling requires him to be deeply relational and, on most days, he is immensely concerned for all those whom God has put in his charge.

He knows that he will give an account for these people. So, he walks the tightrope of ministry life. He performs the act of balancing sermon preparation time, house visits, leadership development, budgeting, vision casting and checking, staff development initiatives, elder and deacon developments initiatives, oversight to various ministry arms of the church, home group material development and oversight, administrative issues, networking with other pastors and churches, event planning and management etc. milestones of life. He mourns alongside the coffin of a member, a friend who has gone ahead to glory.

COVID-19

Into this incredible cauldron of a life calling came the unexpected news of Covid. The government suddenly deemed all this as non-essential work. Even so, both he and his congregation

understood immediately how essential his work was. I remember when the news broke that the nation would be in lockdown. There were phone calls that had to be made so that we could have some plan about how to ensure we would keep meeting together. But just moving the service to an online mode was not the answer. We needed to plan to help people feel connected in a very disconnected and isolated time. People were scared. Some were already mourning.

Where we would have gone for a house visit and sat alongside a person to encourage them, we were now relegated to trying to create this encouragement over a phone call. Often, the medical emergency phone call would be to us first.

SUDDENLY, THE DESPERATE CALLS FOR A SUPPLY OF OXYGEN FOR A STRUGGLING CHURCH MEMBER, BECAME PART OF THE MINISTRY PORTFOLIO OF A PASTOR.

The toughest were the numerous socially distanced funerals. One particularly difficult instance for me was having to stay home and watch the live streamed funeral of a dearly loved church member and friend. Only 5 people were allowed, so only one of us pastors could attend.

It became a difficult season. Sermons, worship times, services had to be recorded. But the phones and laptops were being used by kids who were now studying from home. Some stayed up late nights to do these recordings as this was the only time of quietness in the house.

Some pastors used the Zoom platform for their service. They would have to preach to many blank screens not knowing if the people on the other side were there, the entire time. Others, with congregations from a lower income group were left floundering in a church world that suddenly went digital. Each battled their own fears for themselves, their families, and their congregations.

HOW DO I KEEP MY FAMILY SAFE WHILE ENSURING MY CONGREGATION IS WALKING WITH THE LORD THROUGH THESE TIMES?

Many found some form of answers to these questions.

But many pastors did not.

Many pastors lost their own physical battle to Covid through these times. Others lost their own wife or their child.

In a season rife with fear and sorrow, pastors had to hold on to hope unlike any other time of their life. With one hand they had to hold on to hope and the Lord, and with the other they had to reach out to their congregation and hold them in faith.

They needed to strongly believe Psalm 23:4 –

"THOUGH I WALK THROUGH THE VALLEY OF THE SHADOW OF DEATH, YOU ARE WITH ME…".

With their life and words, they needed to help their congregations believe this truth as well.

Covid brought heart-breaking narratives with it.

The world experienced amounts of sorrow and fear that we never expected to. The constant barrage of fearsome news from far, and desperate text messages from near only filled us with greater levels of sadness and helplessness.

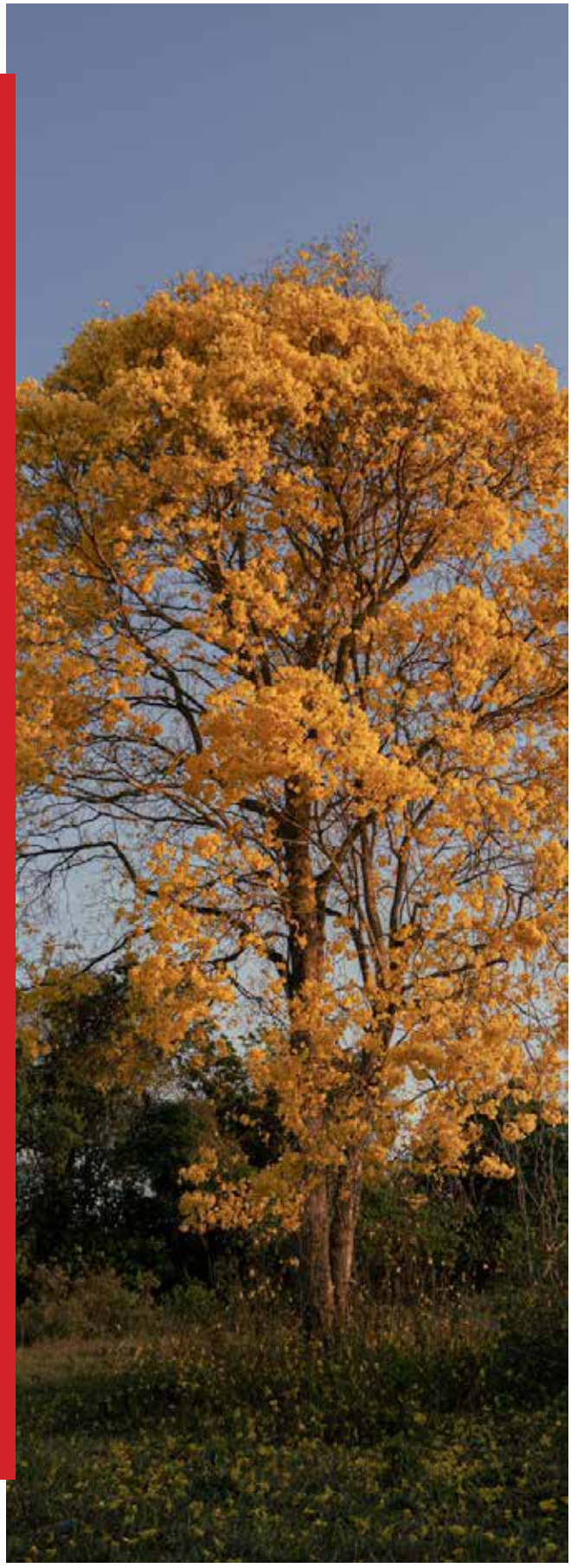
Yet, through the smoke of a painful season there also arose many heart-warming narratives;

- In A Time Of Sorrow And Despair, Pastors Whose Timely Phone Calls Brought Comfort And Strength

- In A Time Of Isolation And Discouragement, Pastors Whose Tireless Efforts To Record Or Deliver Sermons Brought Perspective And Even Joy

- In A Time Of Fear And Disconnect, Pastors Who Visited And Prayed While Being Socially Distanced Brought Relationship And Community

- In A Time Of Unprecedented Physical Need, Pastors Who Not Only Prayed Unceasingly But Also Rallied To Meet These Needs Of Oxygen, Medicines, Or Food, Brought Love And



Care.

- In A Time Of Death, Pastors Who Mourned And Cried But Also Helped Their People Fix Their Eyes On Jesus, And Brought Hope.

I CELEBRATE THESE STORIES. I SEE IN THEM SHEPHERDS WHO LOVED THEIR SHEEP AS JESUS, THE GOOD SHEPHERD, LOVES THEM.

I SEE IN THEM MISSIONARIES WITH AN UNRELENTING PASSION TO LOVE JESUS, FEED HIS SHEEP AND REACH THEIR WORLD WITH AN ETERNAL HOPE.

The governments may have branded their work as non-essential, but they knew better. The truth is in many ways, they saw in this season the true importance and essential nature of their work, their choices, their struggles, and their life. Their labour might not be recognised, and they will most likely remain unsung heroes of the time. But they wont mind.

THEY KNOW THAT IT WAS THE LORD'S GRACE THAT STRENGTHENED THEM.

THEY KNOW IT WAS THE LORD'S SPIRIT THAT ENABLED THEM.

THEY KNOW THAT EVERY LABOUR OF THEIRS IS UNTO THE LORD.

THEY DO NOT SEEK THE APPROVAL OF MAN (GAL 1:10) AND ARE NOT LAYING UP FOR THEMSELVES EARTHLY REWARDS (MATT 6:19).

They know their reward is in heaven and even there, they will lay their crowns at the feet of the God who walked with them here.

Pastor Sandeep Christian

THE POWER OF COLLABORATION - CHRISTIAN RESPONSE TO THE COVID PANDEMIC

THE DELHI MOVEMENT

A year ago the residents of Delhi were hit hard with the deadly second wave of COVID-19. Frontline workers, medical staff and hospitals were burdened beyond their capacity as daily cases and death count spiralled. The daily count touched 28,000 cases and 200-400 fatalities. 109 doctors succumbed in the second wave in Delhi itself, the highest in the country. Many died because of shortage of oxygen and lack of adequate medical facilities. Doctors and nurses were overwhelmed, it was a very painful and heart-breaking time.

At this time of crisis many communities in the city sprang into action. Individuals, Churches and Christian organizations across NCR stepped up and took initiatives to meet the crisis too.

It was heartening to see walls of hostility come down and genuine collaborative efforts birthed to serve the city. Below are a few initiatives taken by different people but collaborated in unity.

PRAYER INITIATIVES

DELHI ARISE

People were vulnerable and broken, they needed time to come to God and find peace. Delhi Arise was a collaborative initiative of multiple worship leaders and musicians from across churches.

Every evening hundreds joined over Zoom for a time of worship and prayer.

These worship sessions went on for over 7 months, with people from across the nation and even beyond joining in.

Many testified of experiencing the healing and comforting hand of the Lord.

FASTING & CHAIN PRAYER:

In the first two months of the Pandemic combined prayer was conducted over Zoom. Over 2500 people from across churches, organizations and cities joined to pray in different slots for the 12 hours chain prayer through the day. The prayer slots were facilitated by leaders from different churches and conducted in Hindi and English.

THE PEOPLE FELT THEY WERE PART OF A MOVE OF GOD.

PRAYERLINE:

A few people saw the need for an ongoing online prayer line. In collaboration with a big Christian media house over 60 volunteers from different churches joined in a 24/7 prayer line. This again was a sign of greater unity as the media house volunteered to drop their branding and move ahead as a united effort of christians in the city. This was further enhanced with volunteers from Mumbai and Chennai joining as volunteers too.

Upto 1000 calls are received every month. This united effort is meeting the need of hurting people till today.

HELPLINES

MENTAL HEALTH COUNSELING

Five Christian organizations involved in counselling and providing mental health support came together to set up a joint website called WECARE HELPLINE. This gave access to people for counselling support through phone and chat.

Apart from this 5 seminars were conducted to address mental health issues over Zoom. Altogether 354 attended these online sessions and equipped themselves at this time of crisis.

MEDICAL HELPLINE

At the very start of the second wave a group of around 24 Christian doctors got together and created a medical helpline to serve all the people in the city and beyond. The doctors joined the online prayer session and asked the united christian community to pray for their services, they wanted it to be a combined initiative, something we are all doing together rather than just the doctors.

A standard treatment protocol was created which was followed strictly by all the Doctors. The Protocol was constantly updated as evidence emerged.

All the Volunteers (Medical) were given proper orientation on the protocol. Regular feedback sessions were held along with all the volunteers which contributed to collective learning. Soon logistics support was added to the medical consultation. Around 3000 people benefited from the initiative during the COVID second wave.

ESSENTIAL AID - MARGINALISED

Apart from the huge medical challenges, the pandemic created job loss, food insecurity and economic vulnerability for thousands of urban informal workers, daily wage earners and migrant workers in Delhi NCR. Many families lost their breadwinners leaving many widows, orphans and the elderly, severely affected by the pandemic.

A team of over 80 volunteers from multiple churches and organizations responded to meet the non-medical needs on the ground. Locations were identified and basic essentials were made available to 10,000 families.

IT WAS AGAIN HEARTENING TO SEE THE UNITY AS WELL AS THE WILLINGNESS OF THE VOLUNTEERS TO GO OUT IN SPITE OF HUGE PERSONAL RISK.

AID TO DECEASED PASTORS' FAMILIES

A study showed that a staggering number of Christian workers died due to the pandemic. Delhi NCR alone saw over 30 pastors succumb to the virus.

Families of church leaders who were not part of any governing body, denomination

or network were severely hit as they had no insurance nor bank balance. The immediate concern was the plight of these families.

A couple of Christian business leaders and some city church leaders came alongside these families to pray and provide emotional and financial support. A team came together from across churches to raise funds, help gather information, engage and disburse the funds to the hurting families. 45 families received significant financial support over this time.

COVID CARE CENTER

The surge in cases deeply affected the hospitals and medical staff, who were operating well over their capacity. Shortage of beds, no oxygen cylinders nor concentrators and a shortage of medicines were hard to handle. Each moment was heart-wrenching as the city was reeling under despair, distress and death.

One call from a distressed city leader initiated a coming together of a school owner, a senior doctor, a couple of church and nonprofit leaders.

A makeshift Covid Care Centre was set up in a school in Dwarka where 42 patients were successfully treated medically. They also received emotional and spiritual nurture with soothing spiritual songs, genuine personal interaction and prayer. All these were well received and appreciated by the patients.

The school leaders and staff serve diligently along with over 50 volunteers from organizations and churches who were trained in a day to serve as Bed monitors as shortage of nurses continued in the city. Once again we saw followers of Jesus winning the victory over fear and serving the needy.

The centre geared up for any possible next wave, but Delhi did not have any further significant Covid issues.

Where did all the funds come from? Which entity or network handled the administration you may ask?

The unity and trust was high and we did not need any central organisation.

Five different Christian organsations received the funds in their accounts and administered the collaborative initiatives under their set up. It all worked out well and built another level of trust in the city. Surely this is the Lord's doing

The city and its leaders learnt important lessons. Here are a few:

There is immense power when chirstians drop their differences and collaborate.

Churches, non profit organisations and businesses all have a significant role to bless the city. None is greater than the other.

No single church, organisation or network can bring genuine transformation.

The need is not neccessarily another network but a spirit of genuine respect and unity.

Everyone is important and every christian can be part of a dynamic fluid movement of God

SINCE THERE IS POWER IN COLLABORATION, WE NEED TO TAKE PROACTIVE STEPS AND NOT WAIT FOR ANOTHER CRISIS TO BRING US TOGETHER.

A new sense of creating a pathway to move forward is taking shape in the national capital region and we would love you to pray that the christians in the city will bring great impact and bless the city.

Thank you

An article written by an anonymous north Indian christian leader celebrating the unsung heroes of the faith. Not mentioning the names of individuals, leaders, churches or organisations in this article is intentional as we want to highlight and celebrate our collaboration and unity.

STRONG CHARACTER OF THE NURSES, WE WITNESSED DURING THE PANDEMIC

BAPTIST CHRISTIAN HOSPITAL, TEZPUR, ASSAM

Baptist Christian Hospital (BCH) is a fellowship of individuals that contribute to the transformation of communities in Assam and Arunachal Pradesh with a focus on the poor and the marginalized through holistic, appropriate health care, training, research and community development.

The hospital was set up in 1954 as a small dispensary and slowly grew to be the best health care provider in this part of Assam.

The current team of 347 personnel are dedicated to quality health care at an affordable cost.

During Covid-19

The Government of Assam permitted us to start the Covid-19 ward in the second phase of COVID-19 19 Pandemic in the month of May 2021.

We set up a 26 bedded Covid-19 ward which included 2 bedded semi ICU.

Electrical and other maintenance repairs were undertaken before starting the ward. One medical officer, 1 Nurse in charge, 3 – 5 nurses and 1 support staff was on duty in each shift.

Our roles and responsibilities were:

Facilitate the admission, discharge and referral of Covid-19 patients admitted in Covid-19 ward.

Documentation of line list as per the State government line

list and to be sent at 3 pm everyday.

Manage the day to day running of Covid-19 ward, staff assignment, stock maintenance, PPE protocols, infection control, Hygiene and cleanliness and coordinate the support services in the ward such as provision of diet, Housekeeping, maintenance needs, medical gas requirements etc.

EXPERIENCE IN COVID-19 MANAGEMENT

BCH is a 130 bedded hospital located in Sonitpur district in Assam. There are 1798 villages in this district which has a population of 21,12,184 (2020 census)

The Patients from Sonitpur District, Biswanath District, Nagaon District, Darrang district and the neighbouring districts from Arunachal Pradesh visits our hospital for regular treatment and care.

We had approximately 700 patients who were moderate to severely affected were admitted in our Covid-19 ward from all the above mentioned districts from May 2021 to December 2021.

We had almost 10 patients died and around 30 to 40 patients referred to higher centre. Rest of the patients had recovered well and got discharged. Many patients gave a positive feedback about the treatment and care received by them at BCH.

PRESSURE FACED DURING THE SET UP FOR COVID-19

Covid-19 ward was set up within the hospital premises. One of the ward was converted into Covid-19 ward.

There were challenges in setting up the ward. Once the suitable location was identified, there were lot of maintenance related repairs had to be done to ensure the heavy equipment such as Ventilators, monitors, oxygen concentrators, centralised oxygen supply etc. can be used without any problems.

The pressure was there to adopt to the changing policies and protocols from the local government related to admission, referrals, death, reporting etc.

Pressure was there from the patients' relatives as they were not allowed to stay with the patient as our set up was a general ward. Nurses were patient enough to clarify all their queries and the treating team communicated them periodically about the patients' progress and plan of care.

Another pressure is the workload for the nurses and doctors. It was a heavy workload with no time for relaxing and also wearing PPE in hot weather conditions.

Majority of the Covid-19 patients were under geriatric age group. There were lot of challenges to treat them and meeting their needs.

There were lot of fear about death and stigma associated with this Covid-19 among the patients. Many patients worried a lot about their recovery.

Staff worked in Covid-19 ward had to face lot of challenges outside the duty hours within their family, neighbours etc.

MOST DIFFICULT DAY OF MY LIFE TILL DATE

It was a tough time for me when my mother got affected with Covid-19 and admitted in the same ward. At the same time my wife was 4 months pregnant. It was a really challenging situation with lots of responsibilities both in work place and at home.

It was really difficult to take care of my mother along with several other patients who were critically ill. By the grace of God, my mother recovered well without any complications.

There was a strong demand for beds as there were lot of patients affected with Covid-19 during the month of May 2021. We had almost full bed occupancy for almost 3 to 4 months. Gradually the patient numbers started decreasing from the month of October 2021

We realised and experienced the God's healing right from the first day of our Covid-19 ward as there were many patients who were critically ill got recovered without any complications.

NURSE AND THEIR ROLE IN HEALING

The Nurses play a major role in healing of any patient admitted in the hospital. In this set up, our nurses played a dedicated role in caring the patients as patients' families were not with the patients.

- Carrying out the treatment orders for the patients for their healing

- Communicating with the families of the patients and attending their queries and concerns

- Support the patients physically as many were critically ill and also elderly who were dependent.

- Counsel the patients and supported them spiritually as many patients were in fear of the disease and the complications.

- Ensure the total care is provided such as hygiene, feeding and elimination needs etc.

WORK OF NURSES IN THE MIDST OF CHALLENGES

COVID-19 19 pandemic has taught every human being that any unprecedented situation can come upon anyone at any point of time. Everyone needs to be ready to face the situation and cannot hide themselves.

- The Nurses who were posted in Covid-19 ward were periodically oriented about the policies and protocols through a separate WhatsApp group and also through other means.

- There was a continuous self-module training on various aspects related to Covid-19 care and management. The nurses were trained in all the updated treatment plans.

- The nurses equipped themselves to trouble shoot any issues arising in the equipments especially ventilators and handle them efficiently.

- The nurses played a major role in communicating with the families of patients and make them understand the progress of patients. It was difficult as there were lot of uncertainties about the patients' condition.

- There was an excellent collaboration and team work to manage the workload. The working team were provided refreshments in every shift. We had prayers in every shift especially every morning with the medical Director and Nursing Superintendent visiting the ward and praying with the team.

LESSONS FROM COVID-19 AS A NURSE

The True nature or character of the Nurses were witnessed during this pandemic. God has given the gift of commitment, strong minds and dedication to all the nurses in this world. They can rise up to the expectation and needs during any occasion like this as they are called for this purpose.

This COVID-19 also has taught us that there are lots of helping hands and supporting minds are available surrounding us. As a Nurse we were supported by lots of organizations by providing the needed resources to manage the Covid-19 patients. Without the necessary resources, it was not possible to extend our care to our patients.

WORD OF ADVICE /PRAYER FOR NURSES WORKING IN COVID-19 WARD

Stand as Daniel to face the challenges, trails and temptations that come across in our life. Daniel stood strong in faith and he had overcome all the problems he faced. Nurses had to stay strong and white to ensure that they are used as a weapon in GOD's hand. If we are not in his hand, we are nothing.

We are a weapon in GODS hand. Remember this and keep serving.

Mr. Tennyson Sanga, GNM Staff Nurse is working in the hospital for past 12 years. He was given the responsibility to manage the Covid-19 ward.

Mr. Firoz Kumar is a Post basic BSC Nursing staff working in hospital for the past 13 years. He too was given the responsibility to manage the Covid-19 ward.

WHEN THE ONLY SHELTER OF SUPPORT AND PROTECTION IS INSECURE & ANXIOUS

DR DHIRAN SHOWRI

Covid-19 CORONA VIRUS DISEASE – 2019 is a fast-spreading viral illness that attacks the respiratory system causing SEVERE ACUTE RESPIRATORY ILLNESS and leading to death in about 1%. And those who died were usually of elderly with pre-existing diseases. The variant was not deadly and we were not vaccinated. We learned that N95 Masks and PPE Kits, Hand Sanitization helped.

At CSI Campbell Hospital, many of the staff was infected. Then their families followed.

Staff was unable to stay in their rented accommodation. The hospital as a family provided food and accommodation. Soon our Legendary Doctor, whom we call the “Iron Lady” Dr. Helen Davidson, was infected, and by God’s grace, she recovered.

Soon Hospital finances collapsed, and there was a scarcity in human resources to treat even Non-COVID-19 patients.

The Medical Superintendent, Dr. Augustine Raj, and 3 of the 4 Medical officers had the infection. They had to be quarantined for 14 days. The impact the virus created was extreme physically and emotionally.

2021- FEBRUARY – MARCH

Just when we started to feel everything to be normal, again, slowly we started witnessing COVID-19 suspects. We had several Committee Meetings, and permissions from the State

Government to be prepared for the SECOND WAVE OF COVID-19.

This time we have to be equipped to manage both COVID-19 and Non-COVID-19-patients in separate ways.

We were in fear, but our Medical Superintendent, Dr. Augustine Raj still had the courage and strength and he took up the challenge.

ITS ALL ABOUT THE TEAM

We have divided our works and established an emergency control room and assigned roles.

Dr. Augustine Raj: Public Safety

Dr. Prathysha: Pharmacy and Logistics

Mr. Joel Swaroop: Nursing and paramedics & PROs

Ms. Shirley Joyce: Human Resources

MEDICAL OFFICERS:

Dr. Eunice, Dr. Priya, Dr. Dimple, Dr. Naveen and myself.

MARCH 2020 – THE RAGE

Even though we had some knowledge and experience with the first wave, we were not prepared for the ferocity of the DELTA variant. Scientific evidence had proven that many drugs once thought useful were in fact useless.

Our experience did not count now. Thankfully more of the staff were vaccinated as they were on priority. We promised their safety and we cannont let any one down. We knew even though vaccinated are prone for infection but probably resulted mild disease.

We only believed God has promised that nothing can separate from the Love of God neither death nor life, height nor depth…

THE PLAN

We made provision for a small Help Desk for the information as directed by the State Government.

We understand that we have to tackle the situation in 2 ways. One is to break the chain of transmission; the other is to manage the affected in all aspects, as we are the only shoulder to them.

Triage stated was started and COVID-19-19 symptoms were screened and vitals were checked. All the suspects were directed COVID-19-19 clinic where a doctor examine their general condition and decided to admit them or for home isolation to be prescribed. This strategy was to break the chain of transmission.

We managed a 6 bedded ICU with 2 mechanical ventilators and 14 bedded ward.

LIMITED OXYGEN

Though we were equipped with 40 D Type Oxygen Cylinders, they were running short of it as there was a demand-supply mismatch. We started calculating liters/minutes for the patients and for how long the cylinder would last. There were long queues and long waiting periods near the filling station.

We have faced discrimination based on our Community at the Station, but it was Dr. Augustine Raj, who made sure that not a single patient suffered a lack of oxygen. Day and night he used to make calls to the higher officials and God used to show us the way.

OT Technician Mr Prashanth, was sincere enough and the PRO team stayed by the side of the Manifold to change cylinders every hour.

By God's grace, now we have blessed with a donation from Dr. William Cutting for a 6KL Oxygen plant within our Hospital.

But the patient load was immense and we were falling short of Beds, especially ICU Beds. It was horrific to see patients waiting at our hospital door in ambulances waiting for vacant beds.

MOST OF THE PEOPLE WERE NOT WILLING TO GET TREATED ELSEWHERE. I RECALL A PATIENT SAYING " I AM BORN IN THIS HOSPITAL AND I RATHER DIE IN IT."

No one expected the high mortality, not only the elderly even the young ones. Breaking bad news was the new routine for us. There was a constant fear in our minds, what if it was us or our family.

We continued to keep building our faith, stronger and stronger and feared less.

I still remember the end of the shift, driving home, all alone as it was a complete lockdown saying to myself, “This, too, shall pass”

We were living in the world of uncertainty and we only had hope that we get a chance to live every other day. Every day was a task. We were not heroes, but we had to give our best.

I remember a staff holding patient’s hand tightly as she lay dying because right then, she was the only family the patient had.

We made sure to love and serve, like a mother, father, sibling, and child, ready to drop everything through our GOD.

Though a special thank Mr. Joel, who helped day and night serving nourishment to all the Health Care Workers, and made sure we were physically fit for the battle.

I recall chanting Mark Up when I see someone without it.

JULY 2021

The miracle, no staff of Campbell Hospital was affected by Covid-19-19 seriously. We all survived the wave. It was all because of prayers for sure.

I believe that the COVID-19 wave gave us a unique opportunity to demonstrate that the Gospel is not words, but the Love of Jesus which makes a difference in how we treat people and when we face hardships.

Jesus has forgiven our sins, and transformed our lives and he still does it, amidst this uncertainty, we have to strengthen our faith, offer our prayers, never lose hope, continue to love and serve and be at peace.

MIRACLES do happen.

Dr Dhiran Showri

Emergency & Critical Care Unit - CSI Campbell Hospital, Jammalamadugu, Andhra Pradesh

ANNOUNCEMENT

REACHING OUT TO THE PEOPLE LIVING IN MARGINS AMIDST THE PANDEMIC SITUATION

NATIONAL COUNCIL OF CHURCHES IN INDIA

In response to the COVID-19 Pandemic threat which may cause much causalities, The Government imposed National Lockdown, which was a much-needed necessity of the hour, but it left high and dry the most vulnerable part of our society, left with no means of sustenance and security, which left them in anguish, pain and sufferings.

The NCCI – WCRC took notice of this pandemic situation, understood the pan Indian States and the reality of the limited employment opportunity, with lack of education and skills, labourer from these states are a vulnerable lot.

THIS SUDDEN LOCKDOWN FORCED PEOPLE TO MIGRATE TO OTHER PARTS OF INDIA FOR SEARCH OF EMPLOYMENT, THEIR LIVES STARTED FALLING APART AND THEIR SURVIVAL WAS ON STAKE.

The labourer of Butibori area were already struggling with poverty and issues related to poverty (hunger, malnutrition, and violence at home and outside, lack of education and skills) with the lockdown they are left with no money and no opportunity for work, and still are expected to follow social distancing as a precaution for COVID-19-19 pandemic.

The response of WCRC-NCCI-CSA was much needed at this juncture to cater to the daily necessity in terms of food to these migrant labours and

other economically vulnerable persons living in those areas.

The distribution on 28th,29th and 30th 0f May 2020 of the dry grain kits was done by the WCRC - CSA support. In Butibori it was done by the CSA, URM and VCLC along with the Local action groups. The coordinating person was Rajesh Jadhav and Moses Gaur. Both are working with CSA as URM and VCLC Coordinators the official project wing of NCCI. Grain kit distribution work will be done under the leadership of Rajesh Jadhav, URM Nagpur he monitored and supervised the distribution in the presence of Ward Member Seema Choudhry of Shirur Gram Panchayat,Shri Mujib Pathan the General Secretary of Maharashtra Congress Committee, Nagesh Girhe the General Secretary of National Students of India ,Nagpur District and the SPL Executive Magistrate and Vice President of Journalists Association of Nagpur.

All the 3 Zones of Butibori area as Mentioned are Tembhri Village, Sathgaon and Slums of Butibori.

ALL OUR VOLUNTEERS WERE IN CLOSE CONTACT WITH THE GOVERNMENT ORGANIZATIONS & OFFICES ON A DAY-TO-DAY BASIS ON VARIOUS COVID-19 BASED ISSUES SO WE HAD NO PROBLEMS IN GETTING THE DRY GRAIN KITS, DISTRIBUTION ACTIVITIES DONE WITH THE PROPER CONSENT OF THE LOCAL GOVERNMENT AUTHORITIES.

Since our target group in Vidarbha and Chennai area was the peoples of the margins who are the daily bread winners of their families who are left with no money and no work. Through our initiative they were able to survive amidst COVID-19 Pandemic. Providing them the dry rations kits consisting of food grains and edible oil worked as their life line.

We distributed through our volunteers to 1000 in 6 districts of Vidarbha region and 750 in 2 major areas in Chennai region. Which may sustain a family of 4 persons for 10 days. In this time of struggle for food. Those people were the vulnerable communities, people from the margins, daily wage labourers and economically vulnerable persons including their families consisting of Male, Female and Children's of Vidarbha and Chennai.

SINCE THIS WAS AN EMERGENCY RESPONSE AND WE DID ACT FASTER BECAUSE IF WE DELAYED OUR ACT IN RESPONDING TO THE CRISIS THERE WERE CHANCES OF EMERGING HEALTH PROBLEMS.

Resulting in health issues because of no proper food for several days, because the present condition of those vulnerable people is pathetic with no food and basic meals there is a chance of severe health issues. So, to say the in-time relief from LDSC-NCCI-URM-CSA was a great support to those toiling people.

The distribution was done between 10th to 20th June-2020 of the dry grain kits was pragmatically done by the LDSC-URM-NCCI-CSA planning and support.

The Indian Society of latter-Day saints and National Council of Churches in India -Urban Rural Mission's Intervention in the lives of those flood effected villagers. 10th to 16th of November 2020.

During August 26th to 30th 2020 the Bhandara region of the Vidharbha, Maharashtra, had heavy rains and further resulting in the release of water from Sanjay Sarovar, Gosikhurd and Bawanthadi dams, the backwater of Wainganga river gushed into many localities and villages in Bhandara city, Paoni and Lakhandur tehsil, creating a flood-like situation. As per preliminary reports from our local contact Dilip Bisen, the Director of Gram Vikas Sansth, Bhandara that about 2,646 families of 58 villages have been affected.

Other than Releif work the NCCI-URM was involved in various activities such as Solidarity,Training and alliance Building.

COVID RESPONSE AT BELIEVERS CHURCH MEDICAL COLLEGE HOSPITAL

MS ROSY MARCEL

SETTING UP OF THE SCREENING DESK

Once we knew COVID had started spreading in Kerala, we set up 10 screening desks at the entrance of the hospital to take the travel and exposure history of each and every person visiting the hospital. If they had no exposure risk or travel history, they were provided with a single day pass for entry.

This desk was manned in rotation by various administrative departments including guest relations, billing, finance, information technology, administration, human resources teams etc. Even managers and Directors would fill in on occasion whenever patient load was high, to ensure patients were least inconvenience and at the same time, safety given top priority.

PROVISION OF QUARANTINE AND ISOLATION ARRANGEMENT

This was made available for staff and sometimes even family members, ensuring provision of food and medicines, free of cost. Staff, Student hostels and guest rooms in the campus were turned into quarantine facility.

Our pharmacy team ensured medicines reached on time and canteen staff (outsourced) were very cooperative to supply food to the doorstep of the quarantined staff. We even supplied a cake to a staff on her birthday, when she was quarantine, so that she could celebrate even in the gloomy

circumstances

PUBLIC TRANSPORTATION

In the absence of Public Transportation during the COVID lockdown, pick up and drop facilities for staff were arranged using available vehicles.

Almost 500 staff from 3 districts could continue to work due to the tireless efforts of our drivers, who did not shy away from working extra hours to meet the stretched requirements.

THE STAFF WERE SO GRATEFUL FOR THIS VENTURE THAT THEY OCCASIONALLY GIFTED DRIVERS WITH SNACKS OR OTHER SMALL ITEMS.

LEAD FROM THE BACK

When members within one department all fall sick together it leads to chaos, like in Purchase, where more than 50% of staff were either tested positive or quarantined, it was a huge strain, as the hospital was filled with COVID patients are we could not afford any delays in essential supplies.

During this time, as a senior management representative, chose to sit along with the purchase team in their department, so as to allay fears of the rest of the team and boost their morale.

BY THE GRACE OF GOD, THIS PERIOD WAS UNEVENTFUL IN THE AREA OF SUPPLY CHAIN MANAGEMENT.

QUICK TO RESPOND

Thanks to the speed and innovation of of our inhouse Information Technology team, we could quickly open up telemedicine facility for our wide spread patients primarily for follow-up consultations but also to provide guidance and education with regard to COVID.

OUR IT TEAM ALSO ENABLED US TO OPEN UP ONLINE BOOKING FOR COVID VACCINATION, ORGANIZE THE FIRST DRIVE THROUGH VACCINATION IN KERALA.

LEAVE DONATIONS

An innovative approach from HR Department was the introduction of Leave Donation, especially in situation where some staff had exhausted their leaves due to successive infections in their families or other circumstances which would have otherwise resulted in loss pay.

Many staff with surplus leave made use of this to help other staff who were in difficult circumstances.

INNOVATIONS WITH COMMUNITY AND VOLUNTEERS

Another initiative worth mentioning is the stitching of masks, during the peak of mask shortage, using easily available materials, as a result of which, we never ran out of masks and other PPE.

The support of our sister concern, the tailoring unit of Believers Church was instrumental in this aspect, as well as several community members who volunteered as tailors.

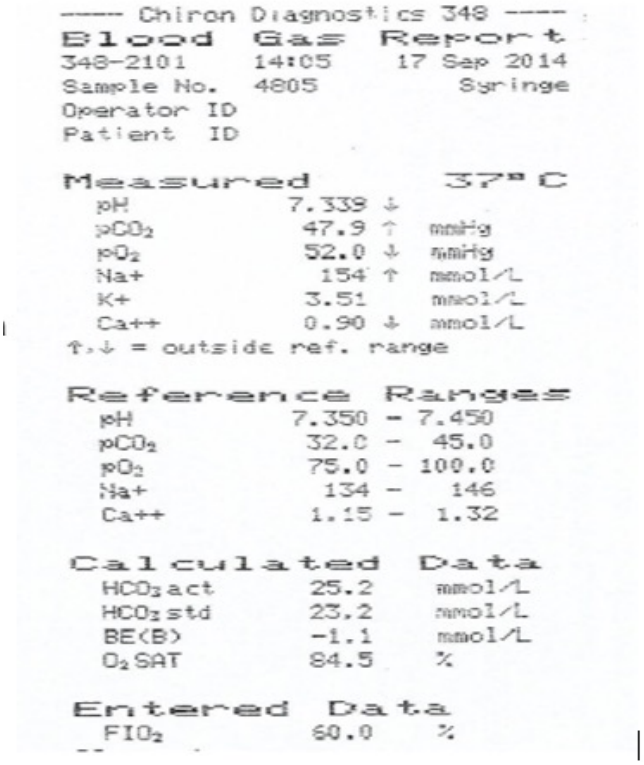
We thank God for our leadership, staff, team members for their continued support and encouragement. Today, we are able to share all the good experiences because we stood together. To may God be the glory.

Ms Rosy Marcel is the Regional Secretary of Kerala Region for CMAI.

QUIZ ON ARTERIAL BLOOD GAS

i) These ABGs are from real patients – not a set of manufactured numbers. ii) For pH, both decimal points are important iii) For PaO2 and PaCO2 round off to whole number for calculation iv) Use short equation for PA-a gradient

ABG 1: 25-year-old man with an acute exacerbation of asthma.



---- Chiron Diagnostics 348 ----
Blood Gas Report
348-2101 14:05 17 Sep 2014
Sample No. 4805 Syringe
Operator ID
Patient ID

Measured			37° C
pH	7.339	↓	
pCO_2	47.9	↑	mmHg
pO_2	52.0	↓	mmHg
Na+	154	↑	mmol/L
K+	3.51		mmol/L
Ca++	0.90	↓	mmol/L

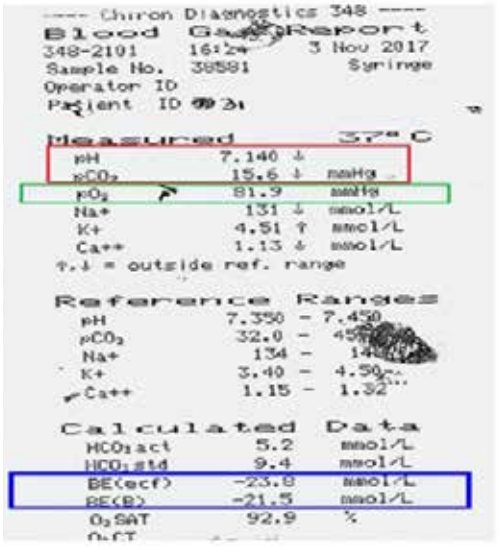
↑,↓ = outside ref. range

Reference Ranges			
pH	7.350	-	7.450
pCO_2	32.0	-	45.0
pO_2	75.0	-	100.0
Na+	134	-	146
Ca++	1.15	-	1.32

Calculated Data		
HCO_3 act	25.2	mmol/L
HCO_3 std	23.2	mmol/L
BE(B)	-1.1	mmol/L
O_2 SAT	84.5	%

Entered Data		
FIO_2	60.0	%

ABG 2: 50-year-old patient with fever and hypotension, on room air.



---- Chiron Diagnostics 348 ----
Blood Gas Report
348-2101 16:24 3 Nov 2017
Sample No. 38581 Syringe
Operator ID
Patient ID

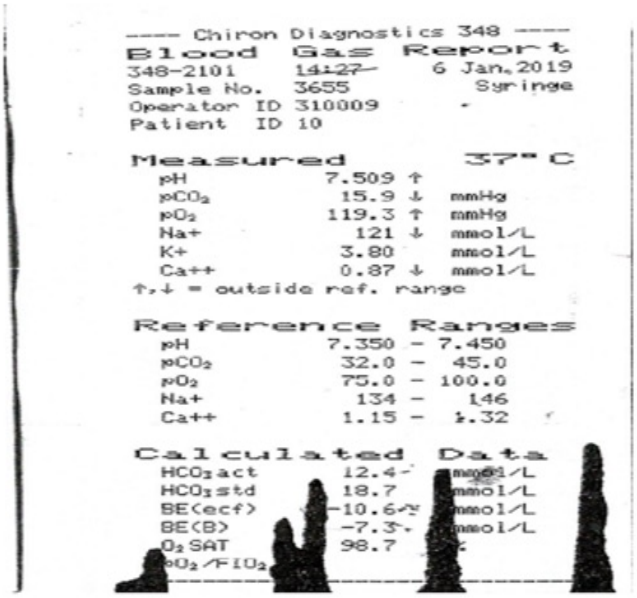
Measured			37° C
pH	7.140	↓	
pCO_2	15.6	↓	mmHg
pO_2	81.9		mmHg
Na+	131	↓	mmol/L
K+	4.51	↑	mmol/L
Ca++	1.13	↓	mmol/L

↑,↓ = outside ref. range

Reference Ranges			
pH	7.350	-	7.450
pCO_2	32.0	-	45.0
Na+	134	-	146
K+	3.40	-	4.50
Ca++	1.15	-	1.32

Calculated Data		
HCO_3 act	5.2	mmol/L
HCO_3 std	9.4	mmol/L
BE(ecf)	-23.8	mmol/L
BE(B)	-21.5	mmol/L
O_2 SAT	92.9	%

ABG 3: 25-year-old pregnant lady with tachypnoea and vomiting; FiO2 = 0.3 Chloride 95mmol/L | Lactate 3.5mmol/L



---- Chiron Diagnostics 348 ----
Blood Gas Report
348-2101 14:27 6 Jan 2019
Sample No. 3655 Syringe
Operator ID 310009
Patient ID 10

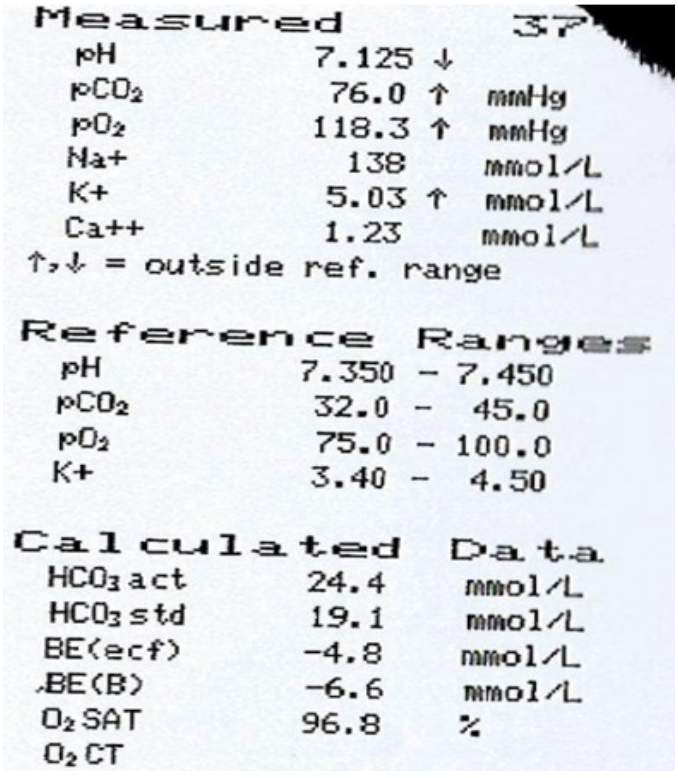
Measured			37° C
pH	7.509	↑	
pCO_2	15.9	↓	mmHg
pO_2	119.3	↑	mmHg
Na+	121	↓	mmol/L
K+	3.80		mmol/L
Ca++	0.87	↓	mmol/L

↑,↓ = outside ref. range

Reference Ranges			
pH	7.350	-	7.450
pCO_2	32.0	-	45.0
pO_2	75.0	-	100.0
Na+	134	-	146
Ca++	1.15	-	1.32

Calculated Data		
HCO_3 act	12.4	mmol/L
HCO_3 std	18.7	mmol/L
BE(ecf)	-10.6	mmol/L
BE(B)	-7.3	mmol/L
O_2 SAT	98.7	
pO_2/FIO_2		

ABG 4: Obese patient with fever, cough and productive sputum on oxygen by mask @ 6liters/minute



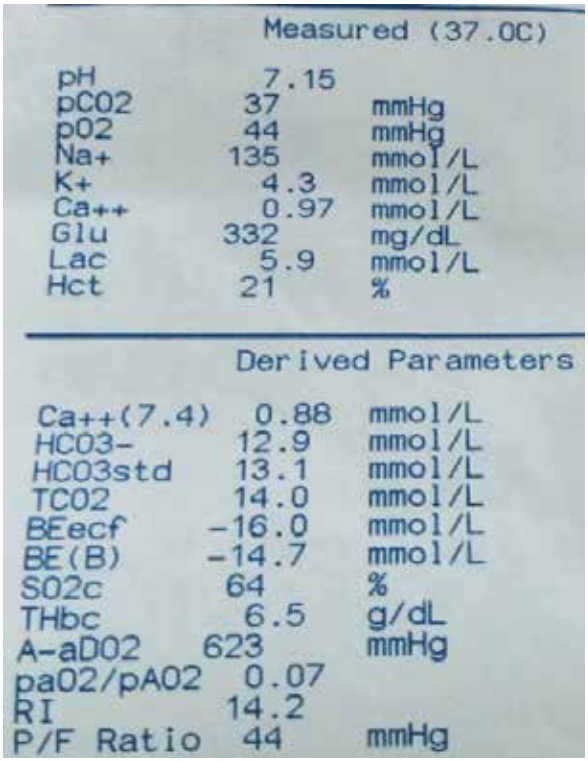
Measured			37
pH	7.125	↓	
pCO_2	76.0	↑	mmHg
pO_2	118.3	↑	mmHg
Na+	138		mmol/L
K+	5.03	↑	mmol/L
Ca++	1.23		mmol/L

↑,↓ = outside ref. range

Reference Ranges			
pH	7.350	-	7.450
pCO_2	32.0	-	45.0
pO_2	75.0	-	100.0
K+	3.40	-	4.50

Calculated Data		
HCO_3 act	24.4	mmol/L
HCO_3 std	19.1	mmol/L
BE(ecf)	-4.8	mmol/L
BE(B)	-6.6	mmol/L
O_2 SAT	96.8	%
O_2 CT		

ABG 5: 50-year-old man with abdominal sepsis in septic shock on FiO2 = 1.0



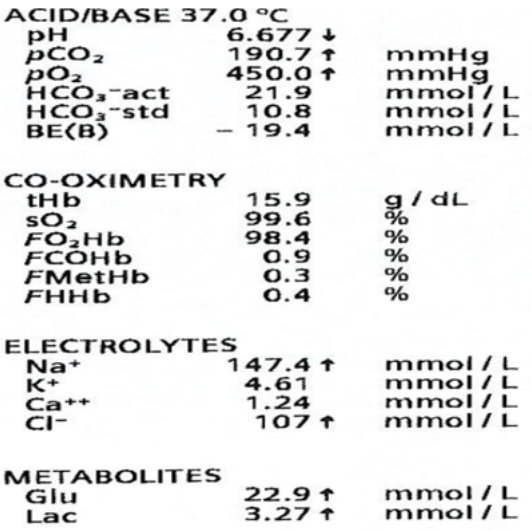
Measured (37.0C)

pH	7.15	
pCO2	37	mmHg
pO2	44	mmHg
Na+	135	mmol/L
K+	4.3	mmol/L
Ca++	0.97	mmol/L
Glu	332	mg/dL
Lac	5.9	mmol/L
Hct	21	%

Derived Parameters

Ca++(7.4)	0.88	mmol/L
HCO3-	12.9	mmol/L
HCO3std	13.1	mmol/L
TCO2	14.0	mmol/L
BEecf	-16.0	mmol/L
BE(B)	-14.7	mmol/L
SO2c	64	%
THbc	6.5	g/dL
A-aDO2	623	mmHg
paO2/pAO2	0.07	
RI	14.2	
P/F Ratio	44	mmHg

ABG 6: 45-year-old patient on chronic haemodialysis, missed his dialysis, came to AE in acute dyspnoea, had a cardio-respiratory arrest, resuscitated and sample taken for ABG. On FiO2 = 1.0



ACID/BASE 37.0 °C

pH	6.677 ↓	
pCO_2	190.7 ↑	mmHg
pO_2	450.0 ↑	mmHg
HCO_3^-act	21.9	mmol/L
HCO_3^-std	10.8	mmol/L
BE(B)	− 19.4	mmol/L

CO-OXIMETRY

tHb	15.9	g/dL
sO_2	99.6	%
FO_2Hb	98.4	%
FCOHb	0.9	%
FMetHb	0.3	%
FHHb	0.4	%

ELECTROLYTES

Na^+	147.4 ↑	mmol/L
K^+	4.61	mmol/L
Ca^{++}	1.24	mmol/L
Cl^-	107 ↑	mmol/L

METABOLITES

Glu	22.9 ↑	mmol/L
Lac	3.27 ↑	mmol/L

ABG 5: 50-year-old man with abdominal sepsis in septic shock on FiO2 = 1.0

VENOUS SAMPLE

RAPIDPoint® 500

ARTERIAL SAMPLE

RAPIDPoint® 500

ARTERIAL SAMPLE

ANSWERS

ABG 1:Scenario: Respiratory

OXYGENATION

PaO2 is low (<60mm Hg)

As PaCO2 is above reference range, best use PA-a gradient (not P/F ratio) to determine pulmonary parenchymal dysfunction

PA-a gradient (using short equation) = (700 x 0.6) – (48 + 52) = 420 – 100 = 320

This is increased so there is definite pulmonary parenchymal dysfunction.This may be due to asthma itself or an associated infection.

ACID BASE STATUS

Look at the pH: it is within reference range.

As the primary process is Respiratory, look at the PaCO2 next. PaCO2 is mildly elevated above Reference Range.

Then look at the Base Excess/Bicarbonate. They are within reference range – so no significant metabolic problem. Conclusions: Hypoxia due to pulmonary parenchymal dysfunction; Respiratory Acidosis.

NOTE: The elevated PaCO2 is a patient with acute asthma is a cause for concern as these patients usually hyperventilate (resulting in a low PaCO2) to maintain oxygenation. The disproportionate PaCO2 and low PaO2 implies that the patient is fatiguing and may need ventilatory support. In contrast, a similar rise in PaCO2 in a patient with Chronic Obstructive Pulmonary Disease (COPD) or Obstructive Sleep Apnea (OSA) may not have been a cause for concern if the sensorium was normal.

The ABG should always be interpreted in the context of the clinical scenario

Also note Na is on higher side (? fluid loss) and ionized calcium is low.

ABG 2: Scenario: Metabolic

OXYGENATION The absolute PaO2 is in safe range

P/F ratio is 82/0.21 = 390: ACCEPTABLE

PA-a gradient = (700 x 0.21) – (82+16) = 147 – 98 = 49 which is acceptable, so the pulmonary parenchyma is fine.

ACID BASE STATUS Look at the pH: it is ACIDOSIS. As the primary process is Metabolic, look at the Base Excess next.

Base Excess is negative beyond reference range: Conclusion: Metabolic Acidosis

Now look at the PaCO2. As per the “rule of thumb” PaCO2 should be 14 + 5. It should be 9 - 1 The actual value of PaCO2 is within this range so there is no secondary disorder.

Base Excess method, the fall in PaCO2 should be equal to the drop in Base Excess. Base Excess ECF is -24.the drop in Base Excess is from -2 to -24 (change of 22). So, the PaCO2 should drop 22 also, so the actual value of PaCO2 should be in the range (45-22) to (35-22) = 23-13 mm Hg. The measured value is 16 mm Hg. The actual PaCO2 is within range. Remember this is Biology not Physics, so there is range of expected values, not a single one).

Conclusions: No hypoxia, Metabolic Acidosis.

NOTE: The anion gap cannot be calculated as the serum Na and chloride are not given.

ABG 3:

Clinical scenario is not definitive OXYGENATION. The PaO2 is 120 – which is acceptable

She is on an FiO2 of 0.3 which gives a P/F ratio of 120/0.3 = 400 which is acceptable.The PA-a gradient is (700 x 0.3) – (120 + 16) = 210 – 136 = 74 which is acceptable.

ACID BASE STATUS: If Clinical scenario is taken as a metabolic problem. The pH is 7.509: high: Alkalosis The Base Excess is -11: Metabolic Acidosis.

However, in a person with metabolic acidosis, the PaCO2 expected should be lower than normal

- Cannot apply rule of thumb for pH, as pH is alkaline with a negative Base Excess
- As per Base Excess rule: 35 – 11 = 24

The actual PaCO2 is far below = 16mm Hg: which signifies that she is hyperventilating out of proportion to the drive: Respiratory Alkalosis

Conclusions: No hypoxia, Metabolic Acidosis + Respiratory Alkalosis If the Clinical scenario is taken as a respiratory problem: The pH is 7.509, high and PaCO2 is low: Respiratory Alkalosis The expected Base Excess in an acute Resp Alkalosis – no change; If chronic, positive Base Excess of 60% of change in PaCO2. The Base Excess is in fact a negative value of -11: Metabolic Acidosis.

Conclusions: No hypoxia, Respiratory Alkalosis + Metabolic Acidosis The conclusions are the same whichever way one start analyzing a clinically indefinite scenario

If you add on the Stewart Method you can come to the conclusion that there is also a Metabolic Alkalosis due to low chloride as the Strong Ion Difference (SID) is 121 – 95 = 26 which is far below the expected SID of 35 – 37. This also contributes to driving up the pH (respiratory alkalosis + SID related metabolic alkalosis). This insight would be missing in the Classical Approach. This is likely to be due to loss of chloride associated with vomiting.

POINTS TO NOTE There is obviously a HAGMA as the lactate is mildly elevated! This could be due to mild hypoperfusion of tissues due to volume depletion as a result of vomiting. The Anion Gap is 121 - (95+12) = 14 (mild elevation).

If the delta ratio is considered, (14 – 12) / (24 – 12) = 2/12 = which implies that the Metabolic acidosis is NAGMA. This brings out the basic principle that formulae in medical practice should not be applied blindly. The discordant calculated value in delta ratio is because the drop in bicarbonate is due to a double alkalotic process: respiratory alkalosis and metabolic alkalosis (Stewart approach given above). Mathematically this gives a low numerator divided by a high denominator giving a low value for the ratio. Respiratory alkalosis is common in pregnancy because progesterone drives the respiratory center to mild hyperventilation.

ABG 4:

Clinical scenario: Respiratory OXYGENATION

Patient is on oxygen @ 6liters per minute. To convert it to an FiO2, add FiO2 0.02 – 0.03 (2% - 3%) for every liter per minute of oxygen flow. This should be above baseline atmospheric oxygen FiO2 of 0.21. However, this is only an approximate calculation as it is an open system and the actual FiO2 inhaled will depend on patient's rate and depth of breathing. This patient 6LPM, FiO2 can be anywhere between 0.21 + (6 x .02) = 0.21 + 0.12 = 0.33 to 0.21 + (6 x .03) = 0.21 + 0.18 = 0.39 Mean = 0.36

Absolute PaO2 though safe in terms of oxygenation maybe too high for a chronic respiratory patient. P/F ratio cannot be used here as PaCO2 is high PA-a gradient (700 x 0.36) – (118+76) = 252 – 194 = 58 which is acceptable and indicates that the pulmonary parenchyma is okay.

ACID BASE STATUS As the scenario is Respiratory, start with the PaCO2 – it is high. pH is acidic – so patient has a Respiratory Acidosis. Next the Base Excess. The Base Excess is -5. The expected change in Base Excess in an acute CO2 retention should be NIL. In chronic CO2 retention (chronic respiratory failure), the Base Excess should increase by 40% of the rise in CO2. This ABG shows a Base Excess moving in the opposite direction. There is a concomitant metabolic acidosis.

Conclusions: No hypoxia but evaluate oxygen therapy as a cause for CO2 retention, Respiratory Acidosis + Metabolic Acidosis

POINTS TO NOTE In the above example no calculation is necessary (only logic is needed) to recognize the metabolic acidosis because in the above setting one would expect a positive Base Excess. The actual Base Excess is negative so there is a metabolic acidosis. The additional diagnosis can be made. by looking at the sign of the Base Excess and by using logic to arrive at what would be expected.

ABG 5:

Clinical scenario: Metabolic. OXYGENATION The absolute value of oxygen is low – this needs to be treated urgently. The P/F ratio is 44 (44/1.0) which is significantly low suggesting severe parenchymal dysfunction (ARDS).

The PA-a gradient is (700 x 1) – (44 + 37) = 700 – 81 = 619 – which gives the same information as a poor P/F ratio in this case: there is severe parenchymal pulmonary dysfunction (ARDS).

ACID BASE STATUS Clinical scenario is a metabolic starting point. The pH is low - acidosis

The Base Excess indicates a severe metabolic acidosis. Now looking at the expected PaCO2 in a patient with metabolic acidosis, As per Rule of thumb: Expected PaCO2 should be 15 + 5 = 10 – 20.

As per Base Excess rule, the expected PaCO2 should be low by the same amount as the Base Excess which is -16. The drop would be -2 to – 16 = 14. So expected PaCO2 = 35 – 14 = 21. The actual PaCO2 IS 37 which is high. No calculation is needed as the PaCO2 has gone in the opposite direction. So, there is a concomitant respiratory acidosis.

Conclusions: Hypoxia due to pulmonary parenchymal dysfunction; Metabolic Acidosis + Respiratory Acidosis

One should consider that this patient's inability to wash out CO2 (lack of an expected decrease) may be because of respiratory muscle fatigue and may need ventilatory support. Failure of an organ system is defined as its inability to meet the needs of the body and so this is categorized as respiratory failure.

POINTS TO NOTE The Anion Gap cannot be calculated as chloride is not given. In a patient with abdominal symptoms, the combination of Severe metabolic acidosis with pulmonary parenchymal dysfunction should suggest pancreatitis. Note the calcium and hemoglobin are low and lactate and glucose are high.

ABG 6:

Scenario: Post cardiac arrest the scenario involves both respiratory and metabolic components. OXYGENATION Oxygenation: Hyperoxic range The P/F ratio cannot be used in this situation as the PaCO2 is high.

The PA-a gradient is (700x 1) – (450+191) = 700 – 641 = 59 which is low and shows that the lung parenchyma is good.

ACID BASE STATUS

Starting with the metabolic component, the Base Excess is significantly negative. The PaCO2 is high. There is metabolic and respiratory acidosis. This is what is expected in a cardiac arrest.The same conclusion is reached id one starts with a respiratory scenario.

Conclusions: Hyperoxia, reduce FiO2, Metabolic Acidosis + Respiratory Acidosis (patient needs adequate ventilation).

The bicarbonate value is almost normal, illustrating the point that in a patient with a CO2 retention, there is an increase in HCO3, "filling up" the low HCO3 value due to the metabolic acidosis. Just looking at the actual bicarbonate would give an impression that the metabolic problem is minor. The other explanation is that the patient had a pre-existing high HCO3 level (see discussion below under Anion Gap). The Base Excess gives the true picture of the actual status in this situation.

The Anion Gap is 147 – (107 + 22) = 147 – 129 = 18. It is high.The Delta Gap: ΔAG is (18-12) = 6 and - ΔHCO3 is (24 – 22) = 2. The Delta Ratio = ΔAG/ΔHCO3 = (Measured Anion Gap – 12) / (24 – HCO3) = 6/2 = 3

Both the above indicate that the decrease in HCO3 is less than expected for the Anion Gap indicating that there was a pre-existing high HCO3 level.

POINTS TO NOTE: The glucose and lactate are both elevated.

ABG 7:

Scenario of dyspnea and low blood pressure can signify either a respiratory or metabolic scenario.The arterial as well as venous blood gases are available for analysis.

OXYGENATIONThe PO2 is in the hyperoxic range

The P/F ratio is 393/1.0 = 393The PA-a gradient is (700 x 1) – (393 +44) = 700 – 437 = 263. It is increased.The P/F ratio looks good but the increased PA-a gradient (even taking into consideration age and FiO2) can indicate a pulmonary parenchymal dysfunction.

ACID BASE STATUS: Analyze arterial sample valuesThe scenario could be metabolic or respiratory. The pH reveals Acidemia.The Base Excess is negative beyond reference range indicating a Metabolic Acidosis.Now looking at the PaCO2Using the rule of thumb, it is higher than it should be: It is 44 with a pH of 7.01.Using the Base Excess approach also indicates it is higher than it should be: Base Excess of about -20,

In this scenario, expect a CO2 drop of same: 15 (35-20) to 25 (45-20) mm Hg. The actual value is higher (44).The above conclusions should make one consider that the patient's inability to wash out CO2 (lack of an expected decrease) may be because of respiratory muscle fatigue and she may need ventilatory support. Failure of an organ system is defined as its inability to meet the needs of the body and so this is categorized as respiratory failure.

Conclusions: Hyperoxia (reduce FiO2), Metabolic Acidosis + Respiratory Acidosis

Anion Gap: 115 – (88+11) = 115 – 99 = 16. It is increased. The Delta Gap: ΔAG is (16-12) = 4 and - ΔHCO3 is (24 – 11) = 13. The bicarb has fallen more than expected so there is NAGMA + HAGMA. This is true because lactate is high and there is an additional loss of HCO3 beyond what is expected due to increased lactate.The Delta Ratio = ΔAG/ΔHCO3 = (Measured Anion Gap – 12) / (24 – HCO3) = 4/13 = 0.3 This, as per rule (<0.4 is NAGMA), reflects NAGMA BUT we know that NAGMA is not the only reason for this patient's metabolic acidosis because lactate is high. This brings out the basic principle that formulae in medical practice should not be applied blindly. Don't get lost in the calculations – look at the total picture. This is Biology (with its variations) and not Physics.

Treat the patient not just the numbers or images!! Using the Stewart approach, the SID is 30 (115-85) and hence there is a component of SID related acidosis (which corresponds to NAGMA in the Anion Gap approach). The lactate is high too and so is the glucose (check for ketones).

The metabolic acidosis is due to multiple causes.

POINTS TO NOTE The difference between venous and arterial CO2 is 11mm Hg (55-44) in the report indicating a low cardiac output (as it is more than the normal of 6mm Hg). This conclusion is valid only if taken from the central line. In addition, the Venous PO2 (PvO2) is 51 mm Hg with a Venous oxygen saturation (ScvO2) of 70% indicates borderline tissue perfusion as evidenced by the high lactate.

An arterial blood gas (ABG) report is an important investigation in the evaluation of any critically ill patient. Through this Exclusive Feature and Quiz we aim to help you gain more understanding.

In another article in the upcoming editions, we will focus on how to analyze it in practical terms and share a detailed article by the same author.

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