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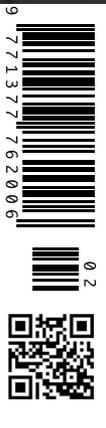
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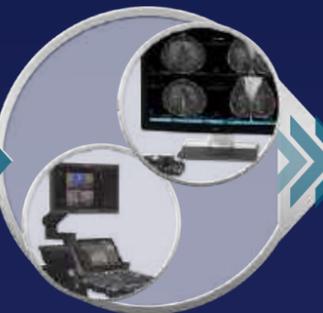
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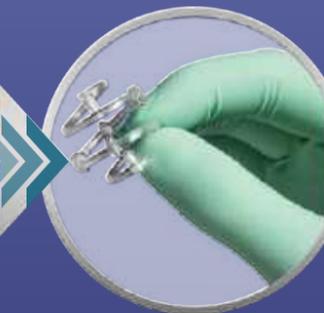
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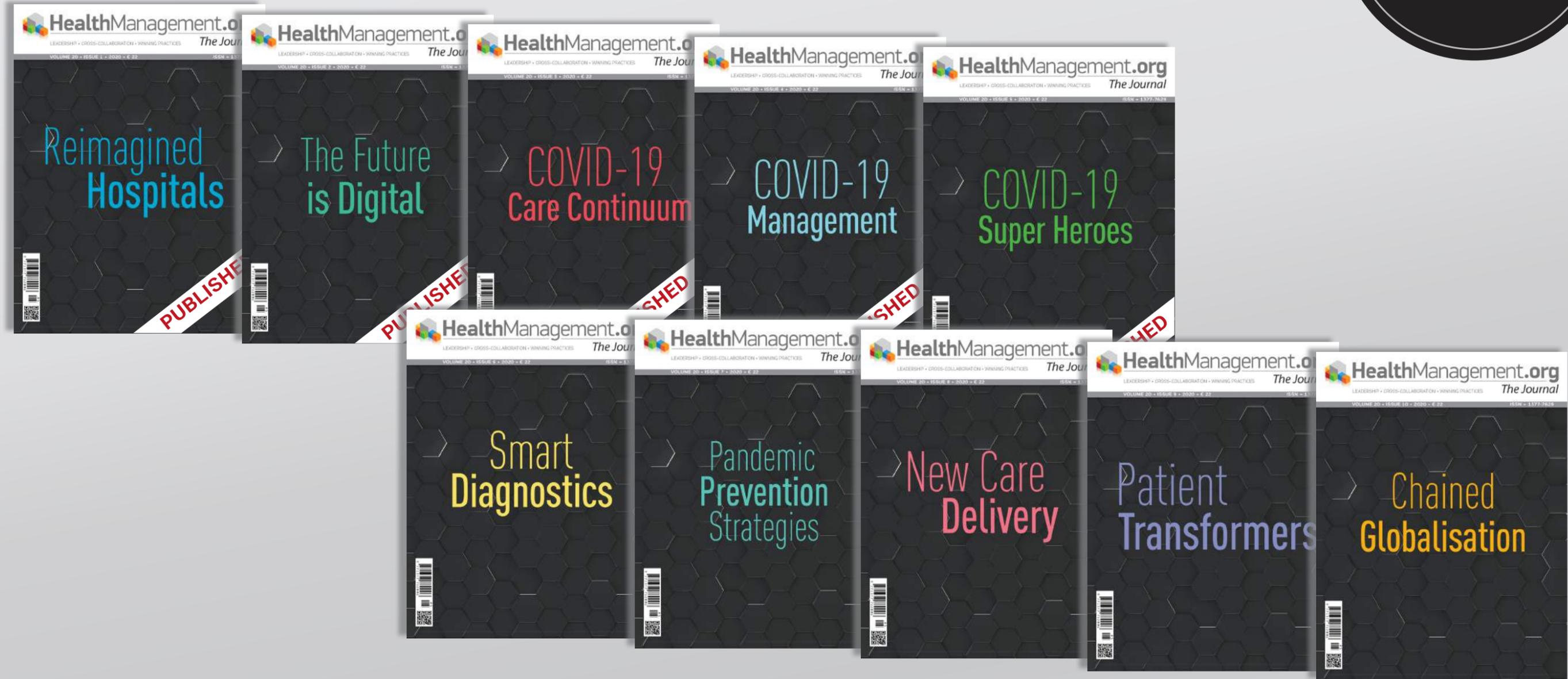
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Editorial



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COVID-19 Superheroes

COVID-19 has affected [15 million people](#) across the globe, and meanwhile, over 600,000 deaths are associated with it. Even my father, having some pre-conditions, passed away because of it.

The healthcare systems and economies of more than 200 countries have been severely affected, also impacting healthcare workers both physically and psychologically. Since they are at the frontline taking care of infected patients, they are also the most vulnerable to COVID-19 infection. Moreover, alarmingly high patient flows, stressful work conditions, lack of proper protective equipment (PPE), staff shortages, and limited resources have put extra pressure on them. One cannot thank them enough as they continue to cope and forge ahead, no matter what the challenges and the hurdles.

The heroism of healthcare workers during the COVID-19 pandemic begins with Li Wenliang, a Chinese ophthalmologist at Wuhan Central Hospital, who was the first one to alert Chinese authorities of COVID-19 and who died six weeks later of the same disease. Today, millions of healthcare workers are out there, providing care for patients with COVID-19 and risking their lives.

This issue is dedicated to all these Superheroes. Our goal is to honour each one of them and salute their courage, commitment and bravery. We present some amazing stories, which could be the stories of many others out there.

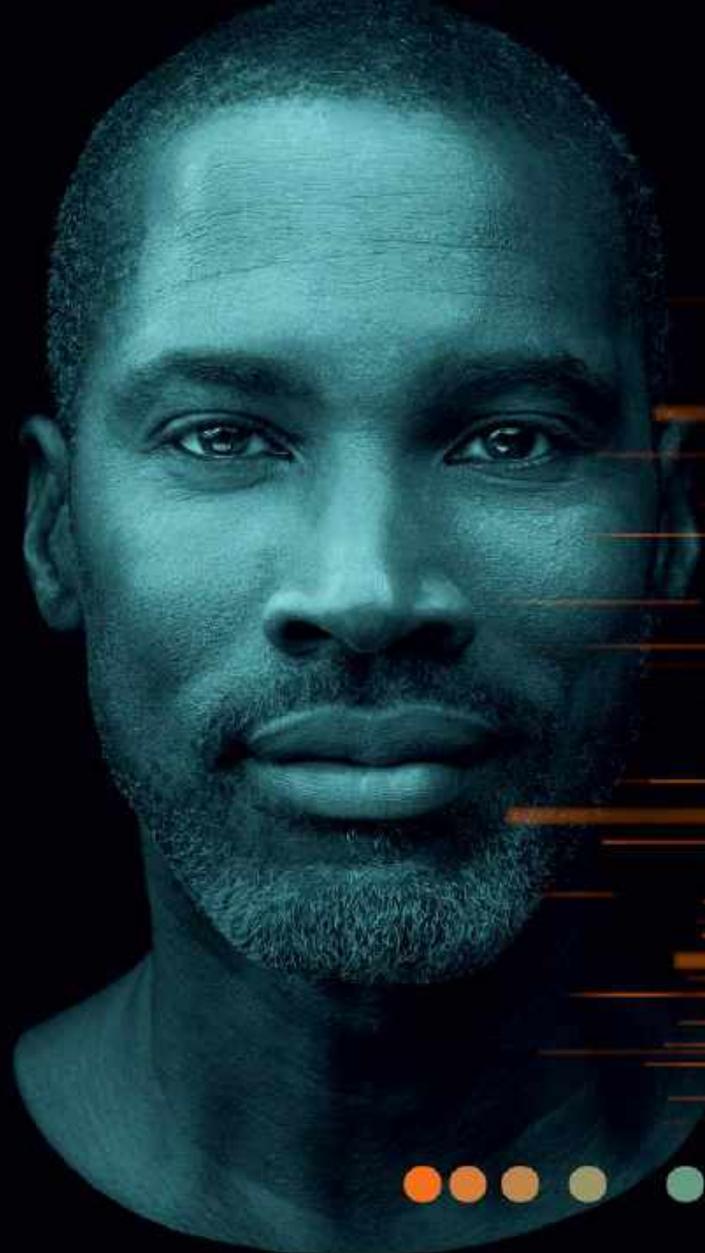
Adaora Okoli, an internal medicine resident physician shares her experience of dealing with the pandemic in the U.S. Sabine Torgler, a staff nurse who got infected with COVID-19 discusses her campaign for PPE delivery. Prof. Jonathan McNulty talks about the role of radiographers on the frontline. Valarie Martin, facility director of a care home shares the story of a 47-day lockdown of staff and residents.

Elikem Tamklo, Managing Director of Nyaho Medical Centre in Ghana talks about the hardships in his region. Lloyd Vincent, Co-founder of Africa Health Network shares the challenges they faced when managing the COVID-19 pandemic in East Africa. Svetlana Piliavsky conveys how COVID-19 is NOT regular flu and requests people to take this virus seriously. Prof. Theresa Rohr-Kirchgraber and Regina Lee highlight the many contributions of healthcare workers who are working behind the scenes.

Patient Safety Foundation Movement talks to a nurse in the U.S. who outlines major problems in nursing care exacerbated by the pandemic, and Amalia Hatziyianni discusses the meaning of virtue in the face of a crisis. Sunita Dube, Founder/Chairperson of MedScape India, discusses the 'We Doctors' campaign while Prof. Stefan Heinemann encourages all of us to become superheroes and do our part in this battle against COVID-19.

This issue is not about statistics, vaccines, clinical characteristics of COVID-19 or its treatment strategies. This issue is all about our healthcare heroes who are out there, putting their lives on the line and who continue to struggle with the challenges that COVID-19 presents every single day. We salute them. We honour them. We respect them.

Thankful Reading!



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390 COVID-19 Antibody Testing – Why it Matters and Factors to Consider



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390 COVID-19 Antibody Testing – Why it Matters and Factors to Consider



Sunita Dube, India
A radiologist, philanthropist and healthcare entrepreneur, Dr Dube has been leading the struggle for healthier India for the last 16 years. She launched many initiatives, eg Save the Girl Child, FitIndia, and now We Doctors for those on the frontlines and underprivileged.

417 Healthcare Warriors of India



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429 COVID-19 Challenges of IT Team



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368 Fighting Pandemic in Brazil: Experience of Largest Hospital Network



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384 Radiographers on the Frontline



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374 Tragedy of COVID-19



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402 So Not Your Regular Flu



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432 Digital Health After COVID-19



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415 Battle to Be Won by Virtue



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419 Fighting the Supervillain with Everyone's Superpowers



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406 Superheroes: Behind the Scenes of COVID-19



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427 Telemedicine in Time of COVID-19



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406 Superheroes: Behind the Scenes of COVID-19



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429 COVID-19 Challenges of IT Team



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423 Crossing the Rubicon to a Digitally Enabled Medical Care



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Lily Li is the Medical Safety Officer at Ortho Clinical Diagnostics. She also serves as a Director at Medical and Scientific Affairs providing evidence-based support to Ortho's current and future products. Lily is the author of more than 40 scientific articles.

390 COVID-19 Antibody Testing – Why it Matters and Factors to Consider



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Paul Lipton is the Global Product and Solution Manager for Agfa's Enterprise Imaging VNA and Medical Image Viewing solutions. He has launched award winning products for Agfa HealthCare including the Enterprise Imaging XERO Viewer, past recipient of the KLAS category leader award for Enterprise Viewers.

370 Agfa HealthCare Introduces XERO Universal Viewer & Microsoft Teams Integration During COVID-19 Pandemic



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412 We Salute Our Healthcare Heroes!



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380 The Role of Procalcitonin for Risk Assessment and Treatment of COVID-19 Patients



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After completing his medical studies in the UK, in 2015 Dr Tamaklo became the Managing Director of Nyaho Medical Centre in Accra. He actively promotes cooperation between the public and private healthcare and holds multiple awards as a young leader and entrepreneur.

392 Burning Platform for Change: COVID-19 Experience in Ghana



Sabine Torgler, Germany-UK
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376 Nurses Are Not Soldiers



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Lloyd Vincent is a Chief Medical Officer and Director and Co-Founder of Africa Healthcare Network. His major areas of interest are diabetic renal disease, disease management in chronic care and use of technology for remote medical monitoring.

396 Traversing the Unknown Frontlines - COVID-19 from a Resource Limited East African Setting



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364 Conception of COVID-19 Auxiliary Hospital from Nursing Management Perspective



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386 "Not in my care home"



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364 Conception of COVID-19 Auxiliary Hospital from Nursing Management Perspective



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425 Remote Work and Virtual Consultations: Emergency Setup



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400 Imaging solutions for a New Reality



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Have your say. Engage!

At least 100,000 healthcare workers have been infected, and more than 1000 have died because of COVID-19. In this issue, HealthManagement.org salutes these brave Superheroes - those who have already sacrificed their lives and those who continue to forge ahead.

To contribute, contact us on
Interested@HealthManagement.org

Conception of COVID-19 Auxiliary Hospital from Nursing Management Perspective

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The following experience report describes the development of a Personnel Concept in the field of patient medical care for the operation of the COVID-19 Auxiliary Hospital at the Hannover Exhibition Centre. The focus of the challenge was the creation of a Training Concept to provide adequate staff for patient care at the hospital. For this purpose, the chronological summary of the existing theoretical measures is provided.

Key Points

- As part of Germany's COVID-19 response, an Auxiliary Hospital (BKH) was set up in the Hannover Region to provide treatment to mild COVID-19 cases.
- The operation of the BKH implies some specific functions and features. Those were adopted from the recommendations of the Robert Koch Institute for Ebola virus disease.
- To fulfil the BKH's staffing needs, over 1,000 personnel were trained and deployed. This required designing and implementing of Personnel and Training Concepts.
- The BKH project team conceptualised the training programme and established an electronic data processing system for administration and coordination.
- The training was based on a modular programme with several thematic focuses, such as basic hygiene, patient support, vital signs control and others.
- To efficiently manage the training process, a software platform was introduced with elements such as participant registry, planning tools, registration portal, etc.

The pandemic of the SARS-CoV-2 virus has put the world civilisation in a state of emergency, unprecedented in the post-war period. The virus that has spread rapidly worldwide and led to serious illnesses in humans, is referred to as COVID-19 by the World Health Organization (WHO). Measures have been and are being taken globally to combat the pandemic and ensure medical care for the population.

Construction of BKH – Unique Challenge

The uncontrolled rise in the number of infections in Germany in the spring of 2020 required the establishment of measures to deal with the pandemic in the German healthcare system. In the Hannover Region (Germany), as part of the arrangements an Auxiliary Hospital (Behelfskrankenhaus, BKH) with approximately 500 beds was set up at the

Hannover Exhibition Centre from late March to mid-April, to provide additional medical care for less seriously ill COVID-19 patients.

The establishment of the BKH was a unique challenge for everyone involved in the project. Within six weeks, five large exhibition halls were converted into a functioning hospital with all the necessary additional supply units. In addition to the logistical tasks with

regard to structure and functions, the design of corresponding administration for the BKH management was significant. For the operation of a BKH, a Personnel Concept is required, which is specifically designed for the purpose of COVID-19 patient treatment. The special feature of this Personnel Concept was the parallel need of both medically trained personnel as well as support personnel/volunteers with no training in medical care. The unclear perspectives of the pandemic development in spring necessitated an urgent need for a comprehensive draft of a viable and operational Personnel Concept.

BKH Functions and Special Features

To understand the requirements of a Personnel Concept design, it is first useful to explain the function and specifics of this BKH. According to the plans of the Hannover Region, the BKH has to provide treatment and care for less severely ill COVID-19 patients who cannot be looked after at home, but do not need intensive care treatment. The BKH (with approximately 500 beds) should only be used when 70% of the existing hospital capacity has been filled. The aim is to relieve the hospitals in the Hannover Region of the mild COVID-19 cases, so that severely ill COVID-19 patients could be cared for and other necessary hospital activities/treatments could continue.

The BKH's structure and process organisation are characterised by special features, which deviate from the requirements to regular treatment facilities. The organisational structure of the BKH is designed to meet the needs of a treatment facility that specifically provides for the care of patients requiring isolation.

The design of the institutional structure and the regulation of the content, space and time sequence of work processes at the BKH follow the framework concept of the Robert Koch Institute (RKI) for coping with the Ebola outbreak. This concept

describes requirements for treatment facilities that provide special protective measures for the staff. These requirements are analogously applied to the current COVID-19 pandemic. Therefore, trained and properly briefed staff is a prerequisite for the COVID-19 patient care. During the care process, epidemiological measures must be implemented. Protection against infection of the personnel requires wearing special personal protective equipment (PPE) as well as measures for disinfection and decontamination (Robert Koch Institut 2019). For the BKH, the proposed PPE includes a full body protective suit with headgear, mouth and nose protection, a face shield and protective gloves. The work is carried out by wearing the PPE in extreme

conditions. Nursing care activities on the patient are more complex and only possible to a limited extent.

The organisational structure of the BKH, from the nursing management perspective, comprises the hierarchical structure for the division of work and coordination of the staff, which is intended for the nursing care of the COVID-19 patients. This includes nursing staff, nursing support staff, and coordination staff in administrative, training and management functions. In this context, the operational structure covers the work processes of the staff required for optimal nursing care of the patients. In the following section, two nursing management measures are presented for organising the BKH.

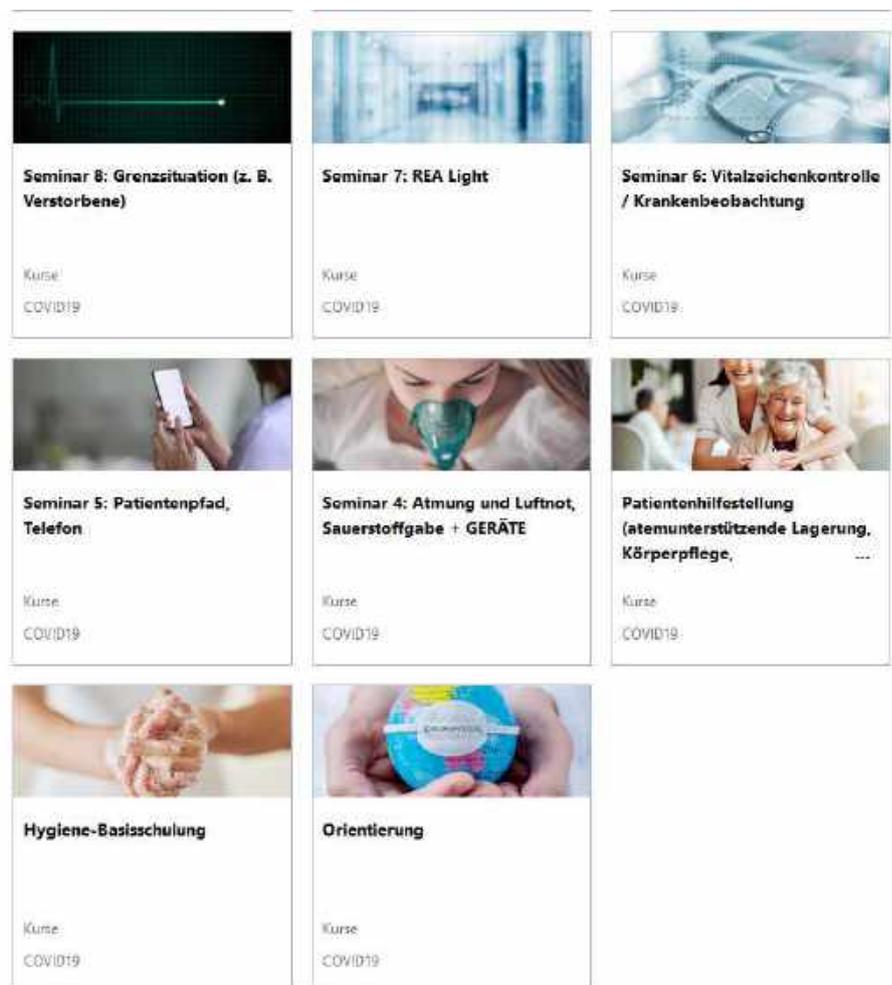


Figure 1. The Seminars of the Training Programme. Courtesy of Iris Meyenburg-Altward



Figure 2. Soldiers of the German Army During the Training. Source: Deutsche Messe AG

Nursing Management-Related Measures

Headed by Iris Meyenburg-Altwarz, experts from various departments were involved in the organisational planning for the nursing care of COVID-19 patients at the time of the BKH establishment. The project team's tasks included conceptualising the programme for the instruction and training of the BKH staff and establishing an electronic data processing system for the administration and coordination of training.

Goal Setting

The goal was, within a few days, to train more than 1,000 potential employees who possessed vastly different qualifications, and to school them for very different tasks, so that they would be able to adequately care for the patients, work together as a team, internalise the work processes and uphold hygiene standards – in

other words, to behave in such a way that there would be no external or personal risk.

Development of a Training Concept

To prepare the staff for the nursing assignment, the first step was to develop a comprehensive Training Concept as a cornerstone. A target group-oriented design of the training content was essential. Determining the training needs of the large number of nursing support staff who, as volunteers, did not have any medical or nursing qualifications proved to be particularly difficult. For this reason, important criteria had to be taken into account when developing the training content. The training should be thematically easy to understand and limited to essential information. For safety reasons, all risks in the area of activity at the BKH should be clarified. In addition to the theoretical audiovisual

communication of information, practical exercises should also be built into the training process. The training concept planning was developed by nursing education experts in collaboration with professional nursing staff from clinical practice. Considering the different criteria to be met, the decision was made in favour of a modular training concept with the following key themes (Figure 1):

- Basic hygiene (instruction and training of personnel in epidemic hygiene measures including putting on and taking off PPE)
- Patient support
- Breathing
- Patient paths
- Vital signs control
- Resuscitation course – light
- Borderline situations in patient care
- Drug administration
- Nursing documentation and handover.

The goal was, within a few days, to train more than 1,000 potential employees who possessed vastly different qualifications, and to school them for very different tasks

This modular system allows to flexibly combine individual training modules to form a module complex. A requirement profile was defined for the nursing support staff, which contained the entire spectrum of training modules offered. Regardless of any existing medical or nursing qualification, basic hygiene training is mandatory for all emergency services at the BKH and includes instruction and training on epidemic measures according to the RKI recommendations. From the care management point of view, the basic hygiene training makes an essential contribution to quality assurance of the Training Concept and to transparent risk communication in the sense of responsible risk management.

In a trial run, the first draft of the Training Concept was tested on soldiers of the German Army (Bundeswehr) who were involved in setting up the BKH (Figure 2). This was followed by a constructive evaluation of the training content and continuous concept optimisation. The interdisciplinary exchange of experiences from the test run provided additional impulses and insights for the BKH process organisation. For example, donning and doffing of PPE indicated the need for longer changing times, which is very important for schedule optimisation and a round-the-clock shift model. Combining several topics into one module proved to be useful in terms of improved time management during the training, which, in turn, allowed for optimal number of training modules and use of human resources.

Digital Management of the Training Concept

To master the challenges in terms of scope, content and time, we have partnered with a Norwegian company, which already had extensive experience of Competence Management in hospitals in the Nordic countries. Due to time constraints, the solution was translated into German within a few days and configured to the BKH's requirements by a small project group from the BKH and the company. This has been an evidence of what shared motivation, trust and professional competence can achieve even under pressure.

A large number of personnel is required to treat approximately 500 patients at the BKH. The high demand also means that the staff needs quantitative training. Furthermore, both existing and new restrictions and hygiene requirements have to be taken into account. For the purposes of a Training Concept, a tool for the overview and predictability of the training courses and participants is necessary. The tool requires extensive functionality to cope with various administrative processes. Some system requirements specific to nursing management were defined for use in the BKH. A system has to record all training participants with strategically relevant personal data, such as their existing individual qualification level. These recorded personal profiles should be managed centrally in a database. The administration includes the planning of the training needs, the organisation of the training dates, the documentation and certification of the training

courses carried out, and other support services, such as access to further training content or a communication platform for the interactive exchange of news and information. A tool with a suitable infrastructure can be a software solution. With digital management of the Training Concept, administrative processes in this area could be automated and the administrative effort reduced.

The potential of training management software can be broad. The range of functions could be automated and ideally work as a self-managing system. A registration portal would be pertinent, for example, where accredited training participants could register in order to subsequently plan individual training dates and receive current information on training modules (eg, event location, lecturer, etc). Documentation for training participants can be provided using a digital signature at the training location (eg, by scanning an accreditation card). The administration software then creates a corresponding training certificate as evidence and stores it in the participant's personal profile. For nursing management, automated reports can be used to carry out control evaluations of the participants' qualification progress.

Such automated digital tool represents a flexible and transparent support for personnel management and could be extended to other management processes. For example, once the operational readiness of the participants has been measured, a service planning tool could be integrated into the system. ■

Fighting the Pandemic in Brazil

Experience of Largest Hospital Network

Interviewee: [Paulo Moll](#) | CEO | Rede D'Or São Luiz | Rio de Janeiro | Brazil



Credit: RDSL

Comics Superheroes' Pay Homage to Health Professionals at a Hospital in ABC.

Founded in 1977 by cardiologist Jorge Moll, Rede D'Or São Luiz (RDSL) is today the largest private hospital operator in Brazil, with 37 hospitals, including high-level Star units, and 5,200 operational beds. In the face of the pandemic, RDSL has been supporting the public system and participated in the creation of over 1,100 new beds for public patients. HealthManagement.org spoke to Paulo Moll, RDSL CEO and the founder's son, about the hospital management in the COVID-19 era and leadership during a crisis.

What has RDSL done and is doing to be prepared for the COVID-19 crisis?

We set up a COVID-19 response committee in January. Since then, we have been working on two effort areas. Within the first one – administrative and epidemiological – we have created a mathematical model to predict the development of the disease, in addition

to reorganising administrative operations and purchases of supplies, from medicines to intensive care equipment. In the other area, care delivery, we have established guidelines for the COVID-19 patient care and separated the flows, equipment and areas of care for such patients. We have also activated a telemedicine service with monitoring and guidance capabilities,

and organised intensive training of our employees.

All of our units have a predetermined service guideline, as well as exclusive flows for patients with suspected COVID-19 infection. We expanded our emergency departments and separated the internal flow of COVID-19 patients. Overall, by now we have served more than 30,000 COVID-19 patients.

What practical steps has RDSL taken to ensure the safety of its staff and patients?

We train our employees intensively and use state-of-the-art personal protective equipment so that everyone is adequately protected. In addition, we have rolled out a psychological call centre system to support our team. Further on, all of our employees are covered to receive COVID-19 treatment, if needed, and that distinguishes us from other institutions.

RDSL is proud of its 'Smart Track' system of examining patients admitted for emergency care. Have you been able to use it with COVID-19 patients?

The flows of patients with suspected COVID-19 infection are exclusive and independent from the flows of other patients. With this separation of flow and the expansion of the emergency departments, not all of them remained with the architectural structure that supports our 'Smart Track' system. However, it is based on speeding up care and security with double-checking of patients by two different doctors, and this has been maintained for all patients.

RDSL has a practice of getting feedback from the staff and patients through surveys. Are there any plans to conduct such research for RDSL's COVID-19 care delivery?

The patient's perception of the care received is something we highly value, and we continue to promote this monitoring even during the pandemic. The result is very positive and rewarding, as we saw that our efforts were felt and recognised by our patients and their families. Remarkably, RDSL patient satisfaction increased to over 70 in Net Promoter Score (NPS) all over the company, and above 95 in our Star units – slightly higher than our historical scores.

There are several new facilities that RDSL is involved in setting up for COVID-19 care. What is the thinking behind undertaking such resource-demanding projects now?

In fact, RDSL has created, together with

partners from the private sector, more than 1,100 new beds for public patients. In Rio we have built and are managing 400 beds in field hospitals, 200 of which are for intensive care. But we have also activated many other permanent beds in various public and philanthropic hospitals. In addition, we have donated mechanical ventilators and personal protection equipment as well as financial resources to help the public system to fight the pandemic. In all states of Brazil where we have a footprint, we created action plans to support local governments. So far, more than R\$ 270 million (€45 million) have been invested, with a little more than R\$ 170 million from RDSL and another R\$ 100 million (€29 million) from other private sector partners.

We are market leaders, and we are doing what we believe is the right thing, helping our society to get out of this terrible situation.

It is important to note that the above were social investments, with no economic or financial return for RDSL. We have also invested approximately R\$ 300 million (€51 million) internally in the reorganisation and expansion of beds to serve our regular customers. Altogether it is a huge cash flow effort, but we are a robust and well-capitalised company that believes in our country and in our sector.

What are the 'must-have' qualities for a leading healthcare organisation to efficiently operate during a crisis of such scale?

Resilience and management speed. Without these two qualities, no company survives in today's world.

There has been much volatility in the public health leadership of the country recently. If you were in charge of Brazil's public health policies, what would you do to control the epidemic?

It is not my role, as we are a private company, but we can see that the tools that helped other countries with the best results were social isolation, the expansion of population testing, and the increase in the number of hospital beds

using field hospitals or activating beds in existing hospitals.

What has the 'leadership during a pandemic' been for you personally?

A time of great learning and of testing our resilience and speed in the management of our company. Beyond that, it has been an extraordinary opportunity to unite our 100,000 employees and third-party workers towards the same goal: to fight COVID-19. And I can already say they have done a wonderful job.

You were initially unwilling to join the family business in healthcare, but then got deeply involved. Has the pandemic made you reflect in some way on your career choice?

It has only reinforced the importance of having a member of the controlling family within the operation. The decision was right, and I hope to continue collaborating with the company for a long time.

What is the approach to hygiene, social distancing and other preventive measures in the Moll family?

The same protective measures that any person in society must take. Social isolation, wearing a mask when going out, washing your hands, reinforcing the hygiene of goods that come from outside, and paying more attention to the most vulnerable people, such as the elderly and people with comorbidities.

Currently, organisations systemically important to the country's public health, such as RDSL, are bearing a lot of responsibility. How do you personally feel about this?

Those who work in the healthcare sector already have a sense of social responsibility as the main driver of their work. We already knew that. Today more people know. It is important for the healthcare sector to get due attention. In every country in the world, including Brazil, there are and will be patients and healthcare providers. We will do our best for our company and our country, and remain firm in our mission of providing high-quality healthcare to our population. ■

Agfa HealthCare Introduces XERO Universal Viewer & Microsoft Teams Integration During COVID-19 Pandemic

Author: [Paul Lipton](#) | Manager of Product Management | Solution Manager, Enterprise Viewer, VNA, and Web | Agfa HealthCare

Agfa HealthCare and Microsoft Teams have partnered up to provide new communication and collaboration solutions to help healthcare providers and clinicians in their response to COVID-19.



Key Points

- Agfa HealthCare and Microsoft have joined forces to connect their XERO Universal Viewer and Microsoft Teams platforms.
- Paul Lipton, Manager of Product Development at Agfa, has developed a platform that would allow caregivers to coordinate on suspected COVID-19 cases.
- The Princess Alexandra Hospital NHS Trust (PAHT) in the UK, which serves a population of 350,000 across its three sites, was the first healthcare network to jump on this opportunity and deploy the software.
- The platform has already been nominated and short-listed for an IT technology award in the UK for its implementation at Princess Alexandra Hospital.

XERO Universal Viewer and Microsoft Teams Integration

Agfa HealthCare was an early adopter of Microsoft Teams, and the Agfa team has been working with the product for more than a year. During the COVID-19 pandemic, cases spiked and lockdowns were enforced in most regions of the world. The NHS was moving forward with an Office 365 implementation, and Paul Lipton and his team realised that this could be an opportunity to do something unique to facilitate clinicians with the COVID-19 situation. There was a need for intra-hospital and outer-hospital collaboration and image sharing. Hence, Agfa HealthCare and Microsoft joined forces to connect their XERO Universal Viewer and Microsoft Teams platforms.

However, this integration did not happen overnight. Lipton worked every night since the lockdown to create a platform that would allow caregivers to coordinate on suspected COVID-19 cases with radiologists, and also track and discuss suspected complications and share potential treatment

options on a dedicated channel for the ever-changing COVID-19 response. In many cases, the caregiver was able to avoid delays in critical care as a result of having a dedicated virtual team of responders for managing the crisis able to triage. When staff are overwhelmed, discussion and triage of newly suspected cases could be broadcast on the shared channel securely, and conversations could be initiated immediately by those that were available versus looking for someone in the hospital physically or calling a list until someone answered. It allowed hospital staff in the UK to save time and may have saved many lives with improved coordination of care.

Lipton put together an internal wiki page for the internal staff at Agfa to look at different use cases that they could help with during the crisis. A lot of time was spent assisting radiologists to report findings and working together. Elaborating on this idea, Agfa decided to use the Microsoft Teams platform to build a crisis centre around COVID. The Princess Alexandra Hospital NHS Trust (PAHT) in the UK, which serves a



population of 350,000 across its three sites, was the first healthcare network to jump on this opportunity as they were dealing with a significant spike in cases at the time and could benefit from a centralised platform where they could discuss and share images.

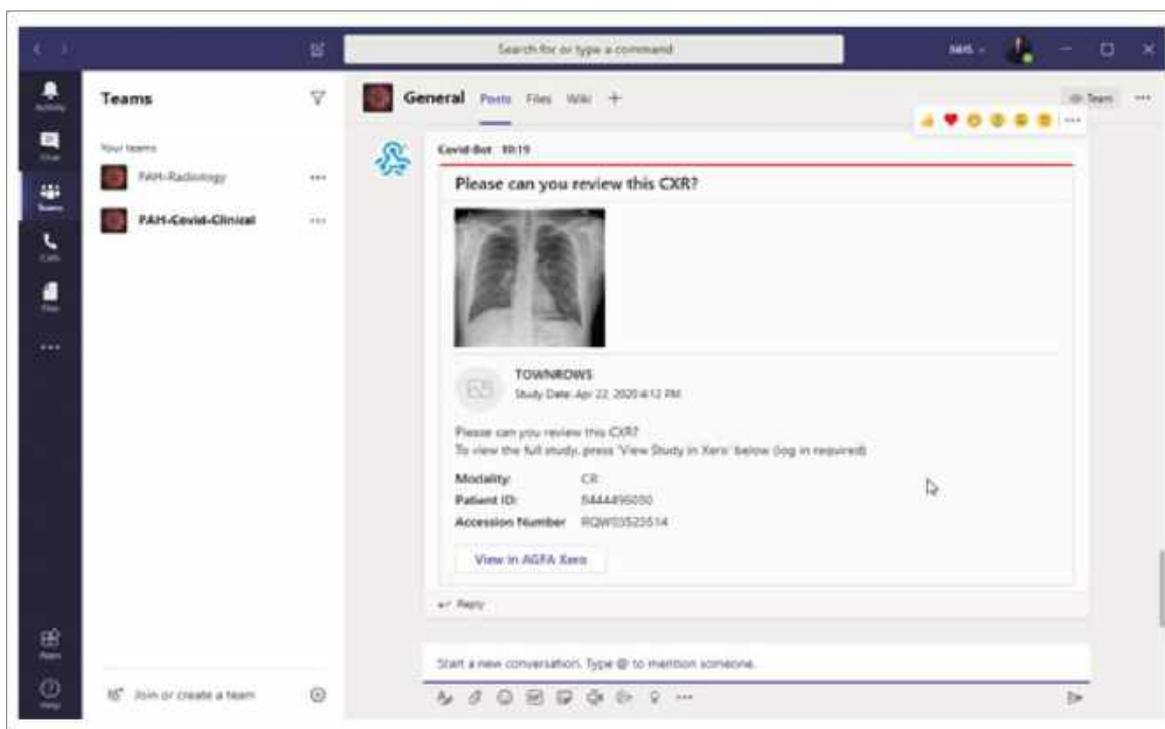
Stephen Townrow, Imaging Systems Manager, Princess Alexandra Hospital NHS Trust, says: "It's an innovative tool that assists the clinicians with sharing patient imaging around the Trust. The solution works seamlessly with Microsoft Teams, using our original XERO Universal Viewer client. The deployment was rapid, with no downtime."

Agfa is also partnering with other large health systems in the United States and is looking into expanding the use of this platform. In addition, multiple hospitals have shown interest in this application.

Since a lot of radiologists are working from home during the COVID-19 pandemic, creating this virtual room was an excellent initiative and offered radiologists and clinicians the

opportunity to share information over a safe and secure online image sharing platform. Lipton developed this image sharing solution while working remotely from his home office during lockdown. It allows healthcare professionals to send images across the channel and review and post comments on them. In this manner, conversations around the images and care coordination can be created efficiently, allowing clinicians to respond to the rapidly evolving pandemic. According to Lipton, this was an opportunity for him to sit down and apply all the knowledge that he's had in healthcare for many years to solve a unique problem.

Based on his design, the prototype for the Microsoft-Teams and XERO Universal Viewer integration was created. It was tested and keeping essential clinical requirements in mind, a new platform was developed that was designed to bring value to clinicians.



Benefits of the XERO Universal Viewer and Microsoft Teams Integration

Some of the key benefits of this new platform include:

- Instant collaboration versus hunting for somebody to access those images. Physicians can now share those images with the appropriate channel for managing this crisis and being able to determine the medical status of the patient and ensuring faster diagnosis and initiation of treatment.
- Access to a virtual group of physicians, radiologists, and specialists that are spread across multiple geographic locations. During the COVID-19 lockdown, many radiologists are not working from the hospital. Through this software, they can still participate as if they were in a room in the hospital. Hence, this is an excellent tool for bridging the gap between staff that are working from home and those working at the hospital.
- The platform saves time that would be spent looking for somebody to review patient images and address the ones that are of concern. With this image-sharing facility, a large group of clinicians can respond to patient images and multiple people can respond via the channel. This is much more time-efficient compared to a situation where you would have to call someone or request a specialist to review the images. Through this integrated software, Agfa has created an ad hoc, multidisciplinary team that can look at these images quickly without having to bring them into a room and without having to find the right individuals. They're all in the channel, which improves the effectiveness and efficiency of this collaboration.
- Even in a post-COVID-19 healthcare setting, this is a useful

software as it allows clinicians to conduct multidisciplinary team meetings no matter where they are in the world. Even if a specialist is on vacation, they can choose to check-in and offer their feedback and expertise in a particular situation. Hence, the platform provides a unique opportunity for clinicians to collaborate in ways they haven't before. The integration was initially designed for COVID-19, but the response from the healthcare community suggests that a virtual location to collaborate can be a useful tool for many different situations and scenarios.

Security of Patient Data

Microsoft Teams runs in a cloud-based environment. As part of this initiative, the security and privacy of patient data have been ensured. Only clinicians who are part of the network can access the software. Also, the software is audited, and the information is stored in an IT audit record repository. All images that are shared across the channels are secure and private, and physicians can access the information that's there. Everything that goes into that channel is sent into the audit record for Teams. This allows you to track access to the information, and then also track access to the viewer that provides access to the images.

The XERO Universal Viewer and Microsoft Teams Integration from Agfa has the potential to become much more than a channel for sharing information. The platform has already been nominated and shortlisted for an IT technology award in the UK for the implementation of this initiative at Princess Alexandra Hospital. The future offers significant opportunities for creating efficient virtual collaboration across different departments and hospital networks. ■



COVER STORIES

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Tragedy of COVID-19

◆ Author: [Adaora Okoli](#) Internal Medicine Resident Physician | Tulane University School of Medicine | New Orleans (LA) | USA

Adaora Okoli is a medical doctor working to strengthen health systems in low-income communities and achieve equitable access to health for all. In 2014, she contracted the Ebola Virus Disease while treating a patient in Nigeria and had to fight for her own life. Since then she has been an advocate for survivors, universal health coverage and global health, to the point that Bill Gates recognised her as one of his [‘Heroes in the Field.’](#) Dr Okoli has been caring for COVID-19 patients in the U.S., and she shares her experience of – once again – dealing with a deadly disease.

When I heard news in January about a new virus that was causing SARS-like illness in Wuhan, my first thought was, “Oh, not again. I hope this does not turn out to be something very serious.” But being caught up in my hectic job as a resident physician, I did not give it much thought, just something I kept my eyes on. As a resident physician, I rotate at three health facilities in New Orleans, Louisiana. We carried on business as usual, and even when the cases were rising in Wuhan, we were not really having conversations about it, until the U.S. had its first case. This is the pattern with most outbreaks. People usually go about their activities until it hits close to home.

When we got our first case of COVID-19 in March at the hospital where I work, I was terrified. One case is enough to wake you up. We did not have a COVID-19 team in the early phase of the outbreak. The patients came in really sick, and I was rotating at the medical intensive care unit at the time, before I began working on the general medicine ward looking after patients. It got to a point where we had to create COVID-19 teams, so that others could deal with non-COVID-19 cases. But this arrangement did not last for long, because about 80% of patients with the non-COVID-19 teams had COVID-19 due to how much it was spreading in the community. My team was on call every four days admitting patients with COVID-19. I would get to the hospital at 6:45am daily and start pre-rounding on the patients, donning and doffing personal protective equipment as I went into each room. I was hypervigilant and washing and sanitising my hands and every surface



I was in contact with very frequently. I saw and examined my patients at least twice a day. Many of them came in with mild disease, but a lot also ended up being stepped up to the medical intensive care unit after rapid clinical deterioration.

Times of Compassion and Grief

The emotional aspect of treating COVID-19 patients has to be my biggest challenge during this pandemic. I saw a lot more deaths in such a short time than I had seen in a year. These patients did not have family members with them when they died. It was a very lonely period. Physical distancing when all you want to do is hug and show compassion.

A COVID-19 patient who stuck in my memory was a middle-aged man who worked at my hospital as a technician. He was not very sick when he came to the emergency room, he was chatting on the phone that night. It took only two days for his health to deteriorate to the point of needing intubation. He died a few days later, and

to acknowledge my patients who had died to release my hurt and grief and to heal. I pray all the time. It keeps me sane. I speak with my family members often, and it helps to know that we are all together in this.

My 'Lessons Learned'

If there was anything I would do differently, it would be that I probably would not have gone out for Mardi Gras parades in mid-February. Many people might have been exposed during those parades, which are held annually as a well-attended festival with visitors from around the world. Although I did not get sick, I have a four-year-old at home to protect.

Other than that, I would not have done anything differently. I carried the consciousness of my experience with Ebola with me as I worked with my patients. It was mentally tasking going through the ritual of sanitising everything, but it was warranted given the circumstances.

As someone who survived a disease as deadly as Ebola, my advice to my colleagues on the frontline would be:

People usually go about their activities until it hits close to home

it broke me. I wept when I found out he had passed away. That's the tragedy of COVID-19. You are doing fine one minute and very sick the next.

The death of a co-worker I took care of was my worst moment. My very best moments were seeing my patients with COVID-19 who were intubated get extubated and actually leave the hospital. It was a victory like no other. Because we know all so well that it could have gone south.

I overcome the fear of being on the frontline through my faith in God and the fact that I have a four-year-old who depends on me for everything. It is scary being on the frontline which is filled with uncertainty and exhaustion. When you get exhausted that's when you are likely to get inadvertently exposed and infected. I could not afford to take the virus home to my daughter and babysitters, people who put their lives at risk to watch my child while I put my life at risk to care for COVID-19 patients.

All my life, I could confidently say that my mental health had been solid and in good shape. But it took a hit during this COVID-19 pandemic. I was lonely and depressed. As a healthcare worker, you sometimes feel you have to be strong and not show any sign of weakness, which is false and unhealthy. It took opening up to colleagues and mentors about the way I was feeling and allowing myself

give your best to your patients, but remember to be kind to yourself. Just like when you are in an airplane, which is about to make an emergency landing where you have to first wear your oxygen mask before placing it on another, you must ensure you are adequately protected before you can take care of others.

If there is a second wave later this year, we would have learned some lessons that would help us handle it better. One lesson is that if you suspect a patient has COVID-19 but they test negative a number of times, you have to still maintain the same level of caution because tests can be falsely negative. The second lesson would be to see this as a marathon and not a sprint in order to prevent burnout. Take time to rest as it might be months to years before COVID-19 goes away. The final lesson is to apply the experience of seeing so many different ways in which COVID-19 presents during the first wave to guide our approach to patients during the second wave. That is to not repeat things or treatments that did not work during the first wave.

We as a people have been through so much during this pandemic. We must stick together even as we physically distance ourselves. We hopefully now realise that the world is more connected than it appears and we must care about what happens to others too. ■

Nurses Are Not Soldiers

◆ Interviewee: [Sabine Torgler](#) | Staff Nurse | OnClinicall Nursing Agency & ProHealthCare Nursing Agency | Bristol | UK | Director | English for Nurses Ltd | Board member | European Nurse Directors Association

Sabine is a staff nurse who has had COVID-19 patients in her ward, got infected herself and started a [campaign](#) for personal protective equipment delivery. But she doesn't want to be called a 'hero.' In early June, she talked to HealthManagement.org about her COVID-19 experience and how the pandemic has made her question everything, even her calling.

Going Through Disease

I work in an acute hospital setting in Bristol, England, in a 'holding bay.' These 'holding wards' are for surgical and medical patients who have to either go to rehabilitation units or be relocated home. When COVID-19 came, nothing was really sorted within the management. So we were holding on to these patients while the whole system needed to be rearranged for COVID-19 needs.

Unfortunately, in the UK we started with the testing quite late. We were a ward with 19 patients and out of these 19, in the week of Easter we swabbed seven who had presented symptoms – cough, fever. We got the results on Good Friday, and out of seven patients we had five positive. And that was it. By that time we, as nurses, had already been exposed to those patients. In the UK we work 12 hours during the day and 13 hours in the night. This meant that in three days I had 36 hours of exposure, so my viral load was pretty high. I had difficulty breathing by then, and some nurses started off sick with others following over the Easter weekend. When I got back after the break, I was the only one left from my shift – this had never happened before. This also meant that there was a lot of work, so I spent another 24 hours in the ward, without proper PPE. By that time I had nearly 60 hours of exposure, and the next day I knew I was infected. Even without the symptoms beginning, it would've been a very big surprise if I hadn't caught it. Imagine going into a bushfire without the right equipment and then asking yourself – why am I burning?

When the incubation time is over and the symptoms start, you first feel lethargic, then the fever kicks in two days later with dry cough, which then develops into productive cough. Later you lose your sense of smell and taste, and have headaches so strong that you can't think.



I had all the 'classic' symptoms at the 'classic' time. To be swabbed, I had to go to an outreach team, which was based at a football stadium on the outskirts of the city. The timing of the test is very significant. Up to May, you could only swab between the second and the fifth day

after the symptoms show. On any other day the test result would be negative even if you are positive. This is also something COVID-19-specific as with other tests, eg for staphylococcus aureus, the timeframe does not matter. With COVID-19 there were only 72 hours during symptom presentation to get valid test results. I was swabbed on day 5, and the result was positive, as I knew it would be. My infection and the infections of other colleagues of our ward were so unnecessary in so many ways – if only we had had the right equipment!

It took me seven weeks to recover. The first three weeks were absolutely horrendous. Luckily, I could stay at home, but there were three critical days. If after those I hadn't gone on a plateau, I would've been hospitalised. Even though I had a 'mild version' of the disease, it was still a shocker. It's nothing like having the flu because that is over within 7-10 days. You never have the experience of three weeks. And here you not only have these but also another four weeks to get rid of the lethargy.

Afterwards I wrote a report stating that it was unacceptable as in England we have to fill in an incident form. I imagine readers in Germany, for example, may blame the management, but that's just part of the problem.

emotional, believe it or not. So when in mid-March the government declared a war on COVID-19, there was solidarity that gave me goosebumps. That was the reason why I decided to increase my hours. Normally I work 25% of the quota, but under such circumstances becoming a full-time nurse again was unquestionable.

The government called on everyone who could help. If you had not worked as a nurse for 10 years, that is normally a no-go in this country. But then they wanted everyone – please come back, we will fast-track your training, and so on. And I said – all right, let's do this!

It was absolutely incredible how I got sucked into this. Yes, we are one nation, yes, we want to save the National Health System (NHS) – and the NHS for British people is more important than the Queen, or maybe just as important – and that means a lot. No other European nation is so proud of their healthcare system than the British. No other European country celebrates its health system during the Olympic Games like the British society did in 2012 in London. So if the NHS is in a crisis, the whole nation is mourning.

I have never experienced anything like this in my home country. When I moved to the UK 17 years ago, I became

When you realise that you can actually die, it makes you question everything

For example, in other European countries in acute sector they were arguing whether we need to wear FFP3 masks when dealing with non-ventilated COVID-19 patients. The answer is, of course, you always have to wear an FFP3 mask, if you have COVID-19 patients – not just for aerosol-generating treatment. There must be international guidelines on COVID-19 that we all have to follow. Another point is that we got the patients' results back on Good Friday, which is obviously not the best day for any action. Healthcare systems should be aware that we are very inefficient on bank holidays and weekends.

I have been in the nursing profession for 26 years and never come across anything like this. When you realise that you can actually die, it makes you question everything. Why have I signed up for this? Shall I give up now? What happens if we get the second peak and the third peak? Will we have COVID-30 in ten years from now? All this is very frightening. It does something to you – whether you want it or not.

Incredible Solidarity

I am originally from Germany, and people in the UK are very different from those in my home country. They are very

a different nurse. Here, if you are in the nursing profession, you are in some ways a god. When people hear you're a nurse they can't thank you enough. So in some ways you feel very rewarded and appreciated by the British society. This is where the 'heroes' started, with all that weekly clapping and the church bells. Well, as a German, our history is not exactly good on the heroes' side, so I am not supporting the 'heroic' wording of this. A hero in my books is always about the army, but us nurses are not an army. We did not sign up with our lives, when we became nurses... where a soldier might go to war and be killed...

In this new normal, a thing as simple as a hug cannot be taken for granted anymore. Still, people look out for each other. I signed up to our community network to help those who are chronically ill or high-risk patients. In my house there are four parties, and since the lockdown Friday is our baking day – we bake for each other. And we are not the only ones, everybody does little things for each other. A young woman is playing harp in a park nearby – we are only 20 spectators, but she cannot give concerts so she's playing for us. Things like this are everywhere, and this is what the British are, after going through two world wars. Stiff upper lip and this attitude of 'we hold together, we



will make it.' And we *will* get through this, of course! But what would be the price?

Then there is Germany where the outbreak was less – not little but less – than in other European countries. My colleagues there, very good friends whom I have known for 30 years, had to listen to people saying, “Oh, it wasn’t *that* bad.” These colleagues are working in the endoscopy department. They are at higher risk so they wear FFP3 masks and are fully dressed in protective clothes. And trust me, nobody ever has to wear this whole ‘space suit’ to work 8-10-hour shifts under such pressure. Nobody has to have even a glimpse inside of what we had to go through. So it is absolutely impertinent to say something like this. In the UK nobody would ever dare to say to a nurse, “Oh, it wasn’t that hard, love, was it?” It would be unthinkable!

Fight for Basic Things

In this pandemic, the UK so far has had the worst outcome among European countries. We are still in a kind of a lockdown, still having 500-800 deaths per day with a population of 66 million. This is a true failure.

Now we are 10 weeks into the lockdown, and one would expect that by now, the country would be able to produce as much PPE as possible and not buy it from China or India. But this is not what the numbers show us! I am well aware that per day we have to use thousands of thousands of masks, gloves, etc. Nevertheless, it is unthinkable that in 2020 certain areas in the UK, especially those with the highest infection numbers, are not supplied with PPE. The number of COVID-19 patients are going down in the acute sector, but they are still very high in the community setting and care homes. For some reason, the government doesn’t see that these two areas are a priority now. There are thousands of companies in the UK, but the authorities have been unable to stimulate basic equipment manufacturing. And we are not talking about, say, ventilators, which are sophisticated machines (most of them here come from Germany). We are talking about masks, gloves and aprons. Basic things. In my view, this incapability to facilitate the production is a clear failure of the government.

When the outbreak started in Europe, in Italy, the BBC was showing all those intense pictures of what nurses, doctors and midwives had to go through without basic PPE. That really got into my head. Then the UK was hit, and I had my own first-hand COVID-19 experience. Later, pictures of our colleagues in New York started coming in. Putting these three examples – of Italy, New York and my own – into perspective, I thought, I can’t just sit here doing nothing. This was the start of my campaign (Box 1). There are, of course, millions of campaigns around. But as a nurse, or a midwife, or a healthcare professional, you act on behalf of all colleagues, and you feel the power of many behind you.

BOX 1. An Open Letter by Sabine Torgler [excerpt]

[...] We nurses don’t want to pay for the failures of governments with our lives. We are not cannon fodder! How dare you use us like this, leave us so alone! Where is your conscience?

What is the use of ‘COVID hazard protection funds’ for us? My life is worth more than this.

We demand the basic protection of equipment that we are entitled to, so that we can care for our COVID patients safely and professionally.

We demand honesty from you and your ministries!

Your so called ‘evidence-based’ policies regarding PPE appear to be adapted to the deficiency situation: disposable masks + gowns could now be worn repeatedly for several days or even weeks. For us and patients, this could mean a much higher risk of infection. That must not be obscured!

ACT FOR US!

If we don’t get support from our governments, care will collapse worldwide, we are already at the limit!

WE NEED YOUR CARE!

What I aim to achieve with my campaign is, obviously, starting the PPE production to cover the needs. This would also be a foundation for the future because with any pandemic there will be a second peak, or even a third one as was the case with influenza. According to reports, the second peak could be worse, but we are still in the first peak and have already been hit really hard. If we cannot control this, there would be hundreds of nurses and midwives and doctors dying because of the lack of PPE and testing and tracing. As I say in my campaign, we are not soldiers. As a healthcare professional, I don’t want to die because I did not have the right personal protection equipment. This is horrendous and unacceptable.

Another goal is that governments, not only in the UK but globally, realise they have failed. Of course, nurses working in Germany or Austria’s acute sector can probably say they have a government that looks after them. Nevertheless, nursing and medicine and midwifery is not just the acute sector. Even in these two countries, the home care and the community service have also been neglected in certain respect.

As such, no country in this world can say, “We are on top of our healthcare professionals, we have looked after them as much as we could.” There were countries that acted early on into the pandemic. But others, such as the UK or Sweden, started very late with the lockdown. I was wondering, why we have the World Health Organization, which is supposed to set standards for certain things. In turn, this makes you wonder what happens if we ever have this again. We don’t know yet if COVID-19 has mutated

into COVID-20 or COVID-21, and this is very worrying.

All these questions compromised my own belief of being a nurse. Nursing is not just a profession, it's my calling. We all have views about how we want to live. So if one day our beliefs and our systems are failing us, then I have a huge problem seeing what my colleagues have died for. Such thoughts could literally make me cry. We have signed up to save lives and to be there for human beings, but when we need help with basic equipment, the government says, "Well, actually 80% of PPE production is in China." And you think – well, that's not an answer. Why can we build hospitals in one day, but not produce enough of basic PPE? Why don't we support each other? And what about international solidarity? When I send

their benefit as well – farther and farther. My letter has gone out as far as South Korea, Japan, Germany, Austria, Switzerland, Italy, Spain, Croatia, Finland, Estonia, Ireland and the U.S. This does not mean, of course, that issues with PPE have been resolved, but it is still better than doing nothing. So many nurses in Italy, the UK, the U.S. have died, so we can't just sit and watch the world go by.

New Worrying Phenomenon

When you sign up to be a nurse and do your training, you know that one day you will be looking after a highly infectious patient, and you hope you'll have the proper support, be it equipment, a designated ward or anything else.

As a healthcare professional, I don't want to die because I did not have the right personal protection equipment. This is horrendous and unacceptable

my campaign letter to my colleagues, even the ones who think they are safe, I always call for international solidarity among healthcare professionals. I know that Germany, for example, helped Italy, but why didn't other European countries, who did not have large numbers, help our neighbours in Italy?

When people get my letter, many appreciate it but ask what they should do with it. My advice is always, just use it to bombard the Ministry of Health in your country, send it over and over again, help to spread the message. The important aspect here is that in many countries nursing is still a kind of obedient profession, nurses do as they are told to and would not think of taking any action. Also, not all nurses have had first-hand experience with COVID-19 patients, so they may not fully realise the scale of the problems. But my letter actually comes from somebody they know, and this ensures some trust in them. They realise that the disease is dangerous, that they have to take care, that it can hit anybody.

The best response so far has obviously been in the UK. The letter has gone to the Prime Minister, to the Minister of Health, to our local member of parliament, and obviously to our union, the Royal College of Nurses (RCN). I must say our union is very strong and they do tremendously good work. The RCN president actually took the time to respond to me – and we are 650,000 nurses and midwives here, and nearly 450,000 members in the union. She said it was a great letter and they were going to discuss it and see how they could act on it. I see this as a success. In general, it's satisfying that nurses, midwives and doctors took my campaign – which is for

But as a result of the pandemic, there is an emerging phenomenon of anxiety issues, the post-traumatic stress disorder (PTSD) among healthcare professionals working with highly infectious patients. The COVID-19 experience has hit us so hard that PTSD is appearing on an unprecedented scale. I believe this is one matter that the governments around the world should look into. 'Being a hero' and 'going to a war' is now part of a profession that has never had these kind of thoughts before. PTSD is pretty much anchored in our professional group.

Thankfully, mental health support services are being rolled out here and there. This problem has been openly discussed on BBC, with healthcare professionals coming up and saying, "I'm anxious to go to work" – even if they have the equipment. As I said, the NHS has a duty of care to the nation, so the mental health sector is looking into this. We already have programmes for PTSD booked for the army, and now we will try to apply them to the COVID-19 outbreak.

Personally, I do not feel anxious to return to work. I have been ill, of course, but not going back is out of the question. Moreover, I should go to a COVID-19 ward because for the time being I have certain immunity, even though I don't know yet whether I can be re-infected. After all, this is my profession. When I was very ill, I questioned everything. But then I would think – no, I am a nurse and I love nursing. I have my colleagues to support, my patients to care for. And as I said, my story is just one of many. It's a tiny drop in the ocean, but tiny drops make a big ocean and a big ocean makes big waves – that's how I see it, metaphorically. ■

The Role of Procalcitonin for Risk Assessment and Treatment of COVID-19 Patients

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Procalcitonin is widely used to assess the risk of bacterial infection and disease progression. Can it be an additional tool to identify COVID-19 patients at risk of severe disease?



Key Points

- Procalcitonin (PCT) is a widely used biomarker to assess the risk of bacterial infection and disease progression.
- Early evidence suggests that PCT may also be a valuable tool in identifying COVID-19 patients at high risk for clinical deterioration or patients at risk for bacterial co-infection.
- PCT helps to discriminate between milder cases and more severe cases. PCT also helps to distinguish between severe bacterial pneumonia and mild viral pneumonia.
- If a patient has bacterial co-infection, his prognosis and his mortality risk increases if early antibiotic treatment is not initiated.
- Recent clinical findings show that unnecessary antibiotic use can be safely reduced in patients with low likelihood of bacterial co-infection indicated by low PCT values.

COVID-19 and Procalcitonin

Procalcitonin (PCT) is a widely used biomarker to assess the risk of bacterial infection and disease progression. In patients with bacterial sepsis, suspected or confirmed lower respiratory tract infections, including community-acquired pneumonia, acute bronchitis and acute exacerbations of COPD, PCT can be a useful decision-making tool for antibiotic therapy (Schuetz et al. 2018). In addition, early evidence suggests that PCT may also be a valuable tool in identifying COVID-19 patients who may be at risk for bacterial co-infection.

COVID-19 is a respiratory and systemic disease that has infected millions of people worldwide. Most patients experience a mild form of the disease but there is a certain percentage of patients who progress to a very severe disease state that requires intensive care and invasive ventilation. In order to ensure better patient management and improved outcomes, early identification

of patients who may be at a higher risk of severe infection can play an important role.

COVID-19 is a relatively new disease, and there is still a lot we don't know about it. While we still need more reliable data, evolving evidence suggests that the use of PCT can help physicians better manage patients with COVID-19. We already know that in all the types of infections from the lung such as bacterial pneumonia or other types of viral pneumonia, PCT helps to discriminate between milder cases and more severe cases. PCT also helps to discriminate between severe bacterial pneumonia and mild viral pneumonia.

Most COVID-19 patients have very low PCT levels ($<0.25\mu\text{g/L}$ or even $<0.1\mu\text{g/L}$) at the time of admission, but elevated markers of inflammation such as white blood count (WBC) and C-reactive protein (CRP) indicate that they have inflammation in the lung. However, at a certain point, in the course of the disease, their PCT

levels start to increase. This could be due to two reasons. One of them would be that the patient has acquired bacterial co-infection. This is common in patients with a viral infection because once the lung tissue gets damaged by the virus, it's easier for normal bacterial flora to gain access and become invasive. This results in the development of secondary bacterial pneumonia in these patients, which is typically confirmed through blood cultures, sputum tests and radiological confirmation. If these tools show signs of bacterial pneumonia, it's very important to start antibiotic treatment in these patients. If a patient has bacterial co-infection, his prognosis and mortality risk increases if early antibiotic treatment is not initiated

The other reason could be that a patient starts to deteriorate, his general condition becomes much worse, he

can be a useful prognostic marker as information about PCT levels can give clinicians the confidence that the disease is not at a very severe stage. On the other hand, if PCT levels are high, this could be an indicator that the patient's condition has become severe either because of a co-infection or because of inflammation.

Determining Bacterial Co-Infection: PCT and Other Biomarkers

There are two possibilities when determining co-infection. One would be to look at the host, i.e. the patient, and the second would be to look at the pathogens. PCT is a host driven marker. If PCT goes up, it is a strong indicator that the host has a problem. PCT is a much more potent tool compared to other inflammatory markers such as CRP or white blood count because these are

Bacterial co-infection is common in patients with a viral infection because once the lung tissue gets damaged by the virus, it's easier for normal flora bacteria to gain access and become invasive

goes into shock and develops an inflammatory syndrome – a COVID associated pneumonitis, which has a complex pathophysiology with endothelial dysfunction. During this severe inflammation and septic illness, there is also translocation of bacteria through the gut membranes and a very strong induction of different cytokines. This increases PCT production by bacterial translocation through the intestines but also directly because of the huge inflammatory boost and toxic syndrome that is developing in these patients.

Overall, if a patient has milder COVID-19 infection, they generally are expected to have low PCT levels. This also confirms that it is not a bacterial infection but a viral infection. However, if, during the course of the disease, the patient gets worse, and his PCT levels increase, it must be taken seriously. This does not necessarily mean that there is bacterial co-infection. That could be a possibility, but it could also mean that the patient is going into severe inflammatory pneumonitis syndrome. In such cases, treatment strategies such as corticosteroids may be considered. However, PCT in these patients can function as a marker to monitor the patient and provide feedback on what's going on in the body of these patients. If a patient comes in with mild disease and low fever, PCT levels are expected to be low. In patients who self-quarantined at home and did not come to the hospital, and if their condition gets worse, PCT

inflammatory markers and are already increased in most of these patients due to inflammation.

PCT is a better marker because it's much more specific towards bacterial infection. However, high PCT levels alone do not prove there is co-infection. Once there is a patient with high PCT, there is still a need to look at pathogen derived markers such as PCR, sputum culture etc. This can help prove what type of infection it is because there could be different types of bacteria causing the problem.

The effectiveness of PCT as a prognostic tool for lung infection and for respiratory tract infections has already been proven in several studies. There is also strong indication of its benefits in COVID-19 patients, but since this is a new disease, the evidence is still evolving. While we may not have strong data at the moment, more studies show that PCT has significant prognostic implications (Gregoriano et al. 2020), and it can help detect co-infection. Based on the Wuhan cohort, and also some data from Italy and the U.S., the recommendation is to look at D-dimer levels to determine endothelial dysfunction and vascular problems. However, PCT is being used in addition to other prognostic tools, for the purpose of monitoring patients and as an infection marker.

PCT and Antibiotic Treatment

Evolving data show that more than 70% of COVID-19 patients

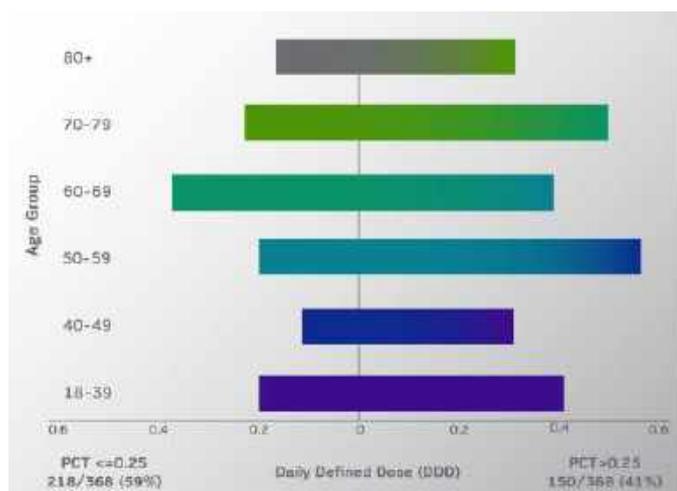


Figure 1: Antibiotic use (DDD) in COVID-19 patients treated in line with a PCT-based guideline recommending to limit antibiotic treatment to patients with PCT >0.25µg/L, if not indicated otherwise by clinical assessment. (Adapted from Williams et al. 2020)

get antibiotic treatment as it can be a challenge to identify COVID-19 patients without bacterial co-infection in whom antibiotics could be stopped safely. However, recent [clinical findings](#) show that procalcitonin can help in the assessment of these patients and reduce unnecessary antibiotic usage (Williams et al. 2020) (Fig.1).

Once a bacterial co-infection is established in a COVID-19 patient, PCT is very helpful to also monitor the patient and guide treatment duration. Typically, if there is a patient with high PCT levels and if co-infection is confirmed, it is important to bring PCT levels down by about 50% every other day. If the levels do not drop, it would suggest that the treatment is not working. Hence, PCT is a very useful marker. If PCT levels drop, it would indicate that the treatment is working and that the patient is on track. Once the levels have dropped substantially – around 80 to 90% of the peak level - it is safe to stop antibiotic treatment. This way, PCT is also a great tool to guide antibiotic treatment and can help reduce the unnecessary usage of antibiotics. PCT is an excellent marker that gives clinicians feedback on the course of the disease and how well treatment is working.

PCT is routinely used in our treatment setting, and we have evidence that PCT has strong prognostic implications. While Switzerland did not have thousands of patients as in other countries, but still in the patients that we treat, we use PCT, and we have clinical evidence that it is an effective tool for COVID-19 patients (Gregoriano et al. 2020).

COVID-19 is a healthcare challenge that has shaken most healthcare systems around the world. When it first started in China, other countries underestimated the severity of the disease and the implications of this infection. Now we know that this virus is causing very high severity of disease and significant morbidity and mortality. We also know a little bit

more about treatments and have a better idea as to how to diagnose patients and how to treat them. Prevention by social measures is now the main focus with different countries having different preventive measures in place. It is hoped that we will continue to see a drop in cases, and this pandemic will pass. Things remain uncertain as to how the next month will be with COVID-19 and whether we will continue to see cases in the coming months or whether we will be able to get the situation under control globally. Only time will tell, but for now, we can continue to do our best and diagnose, treat and manage COVID-19 patients to the best of our ability.

Obviously, the COVID-19 infection is far too heterogeneous and complex to be reduced to a single cut-off of any biomarker. Still, current evidence suggests that the likelihood for an adverse course with pneumonitis and/or bacterial co-infection increases with increasing serum levels of PCT. Knowledge of assay characteristics, particularly the functional assay sensitivity, and strengths, pitfalls and optimal cut off ranges in a predefined clinical settings are prerequisites for its optimal use in clinical routine. Importantly, PCT levels must always be evaluated in the context of a careful clinical and microbiological assessment. As the kinetics of PCT is of particular diagnostic and prognostic interest, repeated measurements should always be performed in the in-hospital setting. In addition, immuno-modulating drugs may suppress the upregulation of different biomarkers including CRP, and increase levels of WBC. PCT seems to be less affected by steroid use, but again more research is needed to better understand how different treatments for COVID-19 may influence PCT levels. ■

B·R·A·H·M·S PCT

B·R·A·H·M·S PCT provides information on the presence and severity of bacterial infection, helping clinicians in the intensive care unit, emergency department, and other hospital wards decide whether to initiate antibiotic therapy in patients with suspected or confirmed lower respiratory tract infections (LRTI) and when to safely discontinue antibiotics in patients with LRTI and sepsis. Clinicians in health systems worldwide rely on B·R·A·H·M·S PCT since 1996 to make patient care decisions with confidence. More than 5,500 publications have demonstrated the clinical utility of PCT, defined clinical cut-offs, and treatment algorithms based on the B·R·A·H·M·S PCT assay performance.

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Radiographers on the Frontline

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During the COVID-19 pandemic, radiographers continue to provide high quality diagnostic imaging services and deliver cancer treatments, while ensuring the safety of the patients.



Key Points

- Radiographers working in medical imaging, nuclear medicine, and radiotherapy have continued to provide essential services during the pandemic.
- COVID-19 has presented many challenges for radiographers who have responded well to overcome these.
- Education providers and student radiographers have also been impacted but have also responded rapidly to this crisis.
- Continued leadership is required within the profession for the months and years ahead.

The current global COVID-19 coronavirus pandemic has impacted all of us and will continue to do so for some time. Radiographers have continued to provide high quality diagnostic imaging services and to deliver cancer treatments throughout the pandemic. In doing this, they continue to ensure the safety of their patients with additional COVID-related considerations and precautions. Radiographers work across three recognised branches of the profession, namely, medical imaging, nuclear medicine, and radiotherapy, usually having completed a bachelor's degree which is often followed by further postgraduate education and training. The European Federation of Radiographer Societies (EFRS) represents over 100,000 radiographers and over 8,000 radiography students, across 36 countries, through 45 national societies along with 66 universities within our Educational Wing. This representation covers radiographers working in medical imaging, nuclear medicine, and radiotherapy.

Radiographers at the Frontline

Radiographers have faced significant challenges in 2020 but have, together with radiologists, radiation oncologists, nuclear medicine physicians, medical physicists, nursing, and many support staff, shown great leadership, professionalism, and resilience, while always having a caring and compassionate focus on their patients. I have heard stories from many countries across Europe, and beyond, of national radiographer societies, educational institutions, clinical departments, and individual radiographers showing

a strong, united, and supportive approach to dealing with these once in a lifetime circumstances. Radiographers are playing a hugely important role currently and are often going above and beyond in playing their part in this battle against the pandemic. While hard decisions were made to close workplaces and educational institutions; to cancel meetings, events, and conferences; even tougher decisions are being made by front-line healthcare professionals in the management of this crisis.

While the figures for cancelled/postponed examinations and treatments have been cited at over 80% in many centres and countries, essential activities have continued with new approaches to the management of workflow and teams rapidly implemented. As has been well documented at this stage, both chest radiography, conventional chest x-rays, and computed tomography (CT) have had a significant role to play in the management of patients with COVID-19. This has resulted in dramatic increases in the amount of mobile chest examinations being performed by radiographers, often under quite challenging circumstances, and with enhanced infection prevention and control measures. There has been much debate on the availability of appropriate personal protective equipment (PPE). Approaches taken in some environments have been unfortunate when really it should have been a non-debate. Radiographers are frontline healthcare personnel who perform chest radiography, CT, ultrasound, and other diagnostic examinations, together with delivering radiotherapy to all patients. Most of these procedures put radiographers in direct contact with

suspected or confirmed COVID-19 patients for a certain period of time. Thus, of course, radiographers must have access to PPE and they must have access to appropriate PPE so that no frontline staff need to consider putting themselves at unnecessary additional risk on the basis that PPE is not available to them.

The reduction in examinations across many areas, together with the dramatic increases in mobile chest examinations, has resulted in many radiographers being redeployed. For example, in some regions, radiographers working in breast screening services which have been temporarily suspended, have been deployed to support colleagues working in general radiography, in emergency departments, in intensive care units, in radiology departments, and in primary care settings. Such additional manpower has been essential to allow services to continue as many departments were hit by the impact of radiographers, and other personnel, having to self-isolate due to symptoms or confirmed COVID-19. The additional time and effort required for effective infection prevention and control measures including the donning and doffing of PPE and effective cleaning regimes following all examinations has also increased the workload.

Educational Challenges

Radiography education has not escaped COVID-19. Clinical skills training for students in diagnostic imaging, radiotherapy and nuclear medicine has been severely impacted over the past number of months, with the suspension of many clinical placement opportunities. This disruption is expected to continue due to the continuing impact COVID-19 is having on clinical departments together with social distancing and other measures. With this in mind, the EFRS recently partnered with the University of Liverpool, the UK Society of Radiographers, the Australian Society of Medical Imaging and Radiation Therapy, and the Canadian Association of Medical Radiation Technologists, on a global virtual conference focused on the potential role of simulation resources, techniques and placements as temporary solutions to this problem. Over 900 delegates joined this "Simulation-Based Education in Radiography/Medical Radiation Sciences: a response to COVID-19" conference and heard from over 35 global simulation experts and researchers who discussed how simulation could provide capacity for the duration of the pandemic restrictions. In general, educational institutions and radiography educators have responded well and played an important role during the current pandemic. They have: adapted rapidly to remote teaching and assessment, as have student radiographers, while all the time trying to maintain the quality of the learning experience; embedded new technologies in their teaching and assessment practice; facilitated on time, and sometimes early, completion of final year students who were urgently needed in the clinical workforce; made

themselves available to support frontline clinical services; led rapid research projects focused on COVID-19; and, have supported rapid training of frontline personnel.

One such initiative led by radiography educators was the vision of Professor Peter Hogg (University of Salford/UK) who, together with Ken Holmes (University of Cumbria, UK), partnered with the EFRS and the International Society of Radiographers and Radiological Technologists (ISRRT) on a project to develop e-learning resources on COVID-19 for medical imaging radiographers across the world that are caring for our patients as frontline staff. An international group of over 50 individuals from across the world collaborated to create the teaching and support materials. In less than three weeks, the resources went live and in the first week alone, over 4,000 radiographers from over 100 countries had engaged with these resources (Hogg et al. 2020). Separately, many of the national radiographer societies who are members of the EFRS, have produced their own guidance documents related to COVID-19 on PPE, self-care, practice guidelines on performing examinations (chest x-rays, CT scans, MRIs, ultrasounds) on suspected and confirmed COVID-19 cases.

There was also a special session at ECR 2020 on "COVID-19: the radiographers' perspective," which touched on the roles and work of radiographers during this pandemic (connect.myesr.org/course/covid-19-the-radiographers-perspective/).

Conclusion

For those of you in leadership positions, now is your time to lead our profession through these unprecedented challenges which, for many of us, will no doubt get worse before things get better. The EFRS thanks all radiographers, medical imaging, nuclear medicine, and radiotherapy, for your efforts, your service, and the pride you are showing in our profession at this time; you are all COVID-19 super heroes! Remember the motto of the EFRS: "Together everything is possible; be involved, make the difference!" ■

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“Not in My Care Home”

Interviewee: [Valérie Martin](#) | Director, Vilanova Care Home | Corbas | France

In early summer, a care home on the outskirts of Lyon in France made headlines in Europe. 4 June marked the end of the 47-day voluntary lockdown of its staff together with the 106 residents. This was done to protect the elderly from the coronavirus. The facility director Valérie Martin talked to HealthManagement.org about this experience, which was both terrifying and amazing.



When it became clear how remarkably fast the virus had travelled from China to Italy, I got very scared – for everyone, obviously, for the health of the population in general, but most of all, for the Vilanova residents.

I made the decision to lock down Vilanova on 15 April. Corbas where I live is 1km from the care home. I have been living there for 40 years and know it like the back of my hand. On that day I was staying at home when I suddenly realised how lucky I was to be able to move around – to my kitchen, my garden, my dining room... And I felt I couldn't take that liberty from our residents. They just could not be locked down in their rooms because of

the COVID-19 outbreak. So the solution was obvious to me: to preserve the freedom of the residents by temporarily giving up on mine.

Most of the staff already know me well. They know that as a director I think fast and act even faster. They were hardly surprised by my suggestion, and out of the 50 people I called, 29 said, “Ok, let's do it.”

During our quarantine, I had to sleep in my office while my colleagues slept on mattresses on the floor. But despite all the challenges, the days that followed were amazing, with the strong feeling of escaping a great danger.



Our residents did not fully realise the scale of the coronavirus disaster. They were not confined to their rooms and could move freely around the facility. We were always with them doing lots of activities, having discussions... we all truly bonded. The residents made new friends and talked to each other a lot. This atmosphere has been really nice, with lots of camaraderie and solidarity since there were only the staff and the residents.

For example, the residents got used to gathering in the living room and spending time together. It looked like they felt freer without any external interventions. Now, however, the family visits are allowed again, and visitors tend to take their loved ones to their rooms and chat with them there. To us, this a bit of a shame. We try to make the families understand that the beautiful relationships between residents have evolved during their absence, but it has been difficult so far.



Courtesy of the author

Worst Times

As it became clear that the virus was spreading in Europe, we were scared. But the worst period were the first two weeks in April, between the beginning of an enormous surge in cases in France and our decision to lock ourselves down in Vilanova. During those two weeks we kept entering the facility from the outside world and did not know if any – or all – of us was infected, so it was a bit of double or quits for us.

Each of those 15 days brought a lot of tension as we kept checking for the tiniest rise in temperature or signs of weakness. When finally the coming and going stopped and we established ourselves within the facility, it was a relief for all of us. Still, now I really feel like I need a holiday! So far I have only taken a couple of days off, but am looking forward to have more in late summer.

Feeling Rewarded

During our lockdown days my biggest reward was seeing how supportive and kind our residents were. They never pushed for anything, never demanded anything.

We'd come, we'd listen, we'd take care of them. But

they'd say, "No, no, it's fine, we know you have a lot of work! Don't worry, I'll wait." This was so moving.

And on 4 June, when our isolation was finally over, there were so many people in our car park. Firefighters, municipal police, paramedics, the Red Cross – they all came to greet us honking the horns of their vehicles and applauding.

I have now written a book about the days of our confinement and am waiting for it to be published.

Another Lockdown Is Possible

As I said, the families could visit again from 4 June onwards. They have to follow a protocol – wear a mask, have their temperature taken, etc. Surprisingly, we realised that there were visitors who did not respect the protocol. It made me think if I would have to close the home again – I don't want the virus coming into my care home and to see the residents spending the whole summer locked in their rooms! And yes, we would lock down again if necessary, although this would be really difficult.

The problem is that people have no 'barrier reflex.' We tend to forget that we might get infected from touching surfaces, such as door handles, or from shaking hands. In France, there is a culture of kissing to greet each other, of social touching – we are French and this comes from our Latin roots. Now, I personally try to remind myself every time that, "No, we should not touch!" But there are still plenty of those who do kissing or touching.

For the time being, we will see how things are going, but most probably we will have to lock ourselves down again sometime in October-November. We cannot do it earlier – we are mostly women, many have children who need to get prepared to school, we also need some holidays to recover. If we are isolated again during those months, we would have to have a break for Christmas. As a director, I cannot ask from my staff to be in isolation during Christmas. That is just not possible.

What Professionals Need

I think the first motivation to work with elderly people is to respect them. This is not among the professional skills you learn in vocational school, but for us here at Vilanova it is essential. If one respects an elderly person, they make a good professional!

To my colleagues around the world I would recommend to take the time to actually get to know your staff, the people who work with you. The bureaucratic burden on us is huge and very time-consuming, but you really have to find time to say hello, have small talk and be friendly. This is indisputable. Yes, we are managers, administrative staff, but we must not forget to be generous and selfless. ■

COVID-19 Antibody Testing – Why it Matters and Factors to Consider

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As we move into the next phase of the COVID-19 pandemic, there will be a need to test a broad strata of population, much more than what molecular tests can handle. The solution lies with serological tests.

As the world continues the fight against COVID-19, health-care executives are in an uncomfortable position – having to make critical decisions without answers they would typically obtain to guide their reasoning. There is a lot to be learned about SARS-CoV-2, its transmission rates and the immune response it generates, among other open questions, with a lot of attention in the diagnostic industry and the various solutions it provides.¹⁻²

Earlier this year the primary focus was diagnosing the disease, and molecular tests which directly detect viral nucleic material are ideal for this clinical use. But these tests have complex sample handling requirements, high cost and limited availability, all of which caused testing deficiencies even when deployed exclusively for targeted populations, ie symptomatic individuals and close contacts.³

As we move to the next phases of the pandemic, new questions arise which will require testing even broader strata of the population – much more than what molecular tests can handle. The solution lies with serological tests which detect the antibodies against the virus.¹

Public health and policy decisions need to be made based on the dynamics of the pandemic, such as extent of past and current transmission in specific geographical regions, strategies to target future vaccination programmes, and estimations of population-level immunity.

Targeted monitoring is also needed for populations with high infection risk or in whom infection has wider consequences, such as healthcare workers or households of case-patients. And finally, employers and private individuals may rely on antibody tests to assess how to best resume their normal activities.

Among all uncertainties in this pandemic, one thing is certain – antibody tests will be a key factor impacting our lives in the near future.

In this scenario, there are two critical questions we need to address:

Do antibodies to SARS-CoV-2 provide immunity against COVID-19?

Most likely yes, but not all detectable antibodies confer immunity. While data to fully establish immunity as scientifically documented evidence is not yet available, there are several reasons and indirect evidence pointing in this direction, such as the history of other viral diseases including closely related coronaviruses,⁴⁻⁸ the clinical improvement in patients who receive plasma from previously infected individuals,⁹⁻¹⁰ plus animal and in-vitro studies performed during vaccine and therapeutic antibody development.¹¹⁻¹⁵ These would indicate that individuals who are exposed to SARS-CoV-2 and develop antibodies with neutralising activity will enjoy at least some degree of protection.

Protection by neutralising antibodies is mainly mediated through blocking the interaction between virus and host cells, inhibiting viral entry and progression of disease. Therefore, most neutralising antibodies are against viral surface proteins.¹⁶ The spike protein (S), which protrudes from the viral surface, connects with receptors on the human cell. Antibodies expressing neutralising activity are predominantly against S protein.¹⁷⁻¹⁸

Several recent publications highlight the impact of different antibodies detected by serological assays. Many individuals exposed to SARS-CoV-2 did not develop neutralising antibodies, with some studies showing over 50% of asymptomatic individuals had no detectable neutralising antibodies.¹⁹⁻²¹ Simply knowing that you were exposed does not guarantee protection. Studies have also shown significant proportions of individuals testing positive for antibodies against nuclear protein (N) but not having detectable

anti-S antibodies potentially capable of neutralising viral activity.¹⁹ These individuals may have a false sense of security based on the positive test for anti-N antibodies. Even more concerning, a study by the New York Blood Center showed that 14% of convalescent plasma donors only had antibodies against N, raising questions if plasma from these individuals should be used to treat severely ill COVID-19 patients.²¹ Finally, a clinical study in hospitalised patients showed an association between lower disease severity and higher titers of anti-S antibodies, indicating potential benefit in improving clinical course. The same study showed the opposite pattern for N antibodies, which were present in higher titers in more severe, ICU patients.²²

To truly understand antibody-mediated protection to COVID-19, we need to measure the activities of neutralising antibodies. There are biological tests which directly measure neutralising activity by mimicking viral infection in cultured cells. They are time-consuming, labour-intensive, low throughput, and require viral particles and live cells. These operational complexities preclude them from scaled up routine testing in large populations.²³ All these challenges highlight the need for easier to use, surrogate markers of viral neutralisation, and studies have shown that levels of anti-S or anti-S1 antibodies have the best correlation to neutralising titers.²¹

Are serological tests available today reliable enough to help assess COVID-19 immunity?

Yes, but not all serological tests. A recent study by a group at New York Blood Center evaluated six different serological tests for their correlation with neutralisation. The tests evaluated represent a variety of technology platforms, both commercially available rapid tests and laboratory-based technologies, with different antibody targets. The study showed that laboratory assays had better correlation with neutralising titers than rapid tests, and assays targeting the S1 protein exhibited better correlation than assays targeting the N protein. The authors concluded that serological tests showing strong correlation with neutralising titers might serve to predict antiviral activity against SARS-CoV-2.²¹

In addition to correlation with neutralising titers, the performance of these tests, measured by their diagnostic sensitivity and specificity, is also important. All healthcare professionals who rely on serological tests for critical decisions need to be educated about the exact performance of

the assay they plan to use.²⁴⁻²⁵ If serological tests are used to help assess protection via correlation to neutralising activity, the biggest risk, for individuals and society alike, is the reporting of a false positive result which conveys a false sense of security. For this reason, while sensitivity is still very important, we need to pay special attention to specificity – the percentage of true negative results in individuals who do not have antibodies.

Unfortunately, this critical marker of test performance varies significantly among different assays, from specificity levels as low as 90%, to outstanding specificity levels with assays offering 100% specificity.²⁵ It is critical to note that even apparently small differences in specificity (ie 100% to 98%) actually represent a major difference in the clinical value of the test in real life, due to the low prevalence of SARS-CoV-2 exposure in the general population. Even in Spain, one of the nation's hardest hit by the pandemic, only about 5% of the population has been exposed to the virus.²⁶ It is therefore reasonable to expect that current global levels of exposure are significantly lower. If we assume a global population currently with 2% prevalence of exposure and we test 100 individuals with an assay having only 98% specificity (thus an assay which reports 2% false positives), we would end up with 2 out of 4 positive tests reported (50%) being a false positive. This rate of erroneous results can be catastrophic as individuals may consider themselves protected when they were not.

In conclusion, we are learning more every day about COVID-19 and many important open questions remain.²⁷ Still, healthcare executives must make decisions now, without all the answers they would usually seek for their reasoning. But a few important factors are already well-established and can guide these decisions in a time of uncertainty, including:

- Public health policy decisions will require antibody testing for seroepidemiological studies.
- Not all previously infected individuals develop detectable neutralising antibodies.
- Antibodies which provide neutralising activity are predominantly targeting the Spike protein.
- The performance of antibody tests in the market vary tremendously, and the selection of tests with the highest specificity (close to or at 100%) is critical for adequate management decisions to be made. ■

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Burning Platform for Change: COVID-19 Experience in Ghana

Interviewee: [Elikem C. Tamaklo](#) | Managing Director | Nyaho Medical Centre | Accra | Ghana

In mid-July, Ghana was among the African countries most affected by COVID-19. Infectious disease outbreaks are not uncommon here, and there has always been a critical need for the private and public sector to collaborate more. The situation is changing, however. HealthManagement.org talked to Dr Elikem Tamaklo, head of the oldest private group medical practice in Ghana, about his experience with COVID-19, the hardships his facility had to go through, and his struggle with the culture of stigma.

Our hospital was the first group medical practice in the private sector in Ghana. This year we celebrate 50 years, which is significant considering that independent Ghana is only 62. Back then, there weren't a lot of specialised personnel in the country, and being a Ghanaian-owned company, we started to bring together specialists trained abroad. Over time, Nyaho has grown in terms of its place in the community and has become the first place people would come to if they need specialist care – even though there are, of course, tertiary public healthcare institutions.

This means that every time there are pandemics, such as Ebola, people tend to come to us for care. As a result, we have developed strong relationship with the Ministry of Health and the public health department in our local district, as well as established a public health unit in our facility. It is uncommon for private health sector players in developing economies to invest in a public health department. Still, we have one, because we know that if an outbreak happens, patients would be coming in. So, when COVID-19 started around the world, we were prepared; for example, we launched the necessary initiatives, such as personnel training, as early as January 2020.

In terms of our business continuity plan, we had to rearrange the whole organisation so that there was one single entry point, and triage happening at that entry point. If a patient fit the case definition, we would separate and isolate them, do the test and send it to the reference lab. At that time, there were only two reference labs in Ghana, one in Accra and one in Kumasi, and we could fast-track the testing because of our strong relationships with the district health authorities.

Early Issues

In the beginning, the government was mainly focussing on the public sector. However, the main threat was that of imported cases, and in Ghana, many people who travel tend to prefer the services of private facilities. Most of them do not utilise public facilities. This was something I believe the authorities had not considered back then.

With our facility being only 15 minutes away from the international airport, a lot of those who travel come to us. One of the first reported cases of COVID-19 was diagnosed at our hospital, and this was because of the rigorous processes we had implemented. We followed all the public health protocols and were able to ensure the safety of the patient and our staff until the test results came in, after which the required processes were followed through on the public health side. Retrospectively, that meant we prevented the spread.

The general challenge for healthcare in our country lies with the coordination of the private sector as there is much operational diversity. The public sector functions under the Ghana Health Service, so it is more centralised and thus more coordinated. When it became clear that COVID-19 was spreading in the community, we quickly realised that the private sector's involvement in disease management is inevitable. We would 'pick up' positive cases just as any other facility would do – a frontline is a frontline regardless of whether it is public or private, this is just core health care. This is when we started engaging with the government to make sure that the private sector's involvement was a key priority.

As cases in Ghana progressed from only imported ones to community spread, the laboratory testing turnaround times increased from 24 hours at the early stages to three days, five



Courtesy of Nyaho Medical Centre

days, two weeks and then three weeks. This was, of course, unacceptable, and we started to explore testing capabilities internally. Through our partners that had access to supplies from China, we were able to bring in Polymerase Chain Reaction (PCR) equipment and test kits. To use them, however, we had to resolve numerous issues with the authorities regarding, for example, the patient data use in the private sector. Eventually, in early July, we became the first private hospital to be accredited to test for COVID-19 and provide care to patients who tested positive.

All this was possible through effective collaboration and engagement with all stakeholders and advocating for the development of a guideline on laboratory testing and reporting on respiratory infectious diseases in health facilities in Ghana. The document was released a couple of weeks ago, and now it is much easier for labs to set up their activities in a regulated manner and get registered. The same goes for hospitals in terms of which regulatory agency is required, how the data reporting is standardised and patients are managed.

Because of our reputation earned over the years and location, we were receiving many patients. However, there were challenges, such as shortage of personal protective equipment (PPE) and critical staff. Thanks to our growth plan, we had invested in an intensive care unit (ICU) with ventilators (we have 4 out of 60 in the entire country) and in an emergency team, our critical care nurses. It was clear that we were prepared to manage COVID-19 cases.

We reached out to partner with the district authorities and worked through a number of challenges to ensure the safety of

patients and clinical staff. Through our initiatives, it was easier for the Ministry of Health, the Ghana Health Service, to understand what was required from the private sector. This has paved the way for more opportunities and for other players to operate within the stipulated regulation.

Major Outcomes

There are three broad areas. First is the development in the public-private partnership. Going through this helped to emphasise the importance of the private sector in a pandemic. It has always been recognised, but never been formalised. COVID-19 has become that burning platform for change.

There is now a momentum to consolidate private sector players together into an association, to have a unified voice. Previously, we were a solitary voice with no representative body for the private sector. As such, for the public sector it is difficult to take us on, because individually, we represent hospitals, not private healthcare as a whole. Now we have a coalition of some private sector players.

Second, this also helps us at the organisational level. The capacity constraints are huge, and there's no way one sector, private or public, will be able to manage the pandemic alone, especially as the COVID-19 numbers keep increasing. We haven't reached our peak yet, and it is good that now other players are getting more involved too.

Finally, for us as a company, deepening the relationship with key stakeholders was important and will make us better prepared for any future outbreaks in Ghana. The COVID-19 experience has really taught us a few lessons about the

importance of stakeholder engagement. For example, we started the lab with official approval, and three weeks later, we were asked to suspend our services because we were doing too many tests more quickly than expected. This caused some friction, but it was a good lesson. Hopefully, we won't make the same mistakes again.

Overcoming Fear

In the beginning, there was fear among the staff, fear of the unknown. When we started doing the trial runs and taking patients in, a lot of clinical staff, who should know better, actually were the ones most afraid because of the PPE challenges. We had stocked up what we thought was enough PPE based on our normal operations. But we hadn't anticipated just how many and how quickly patients would be coming in. That meant we had to start rationing the PPE for our emergency teams. And the staff were scared for their own and their families' health.

as we have ventilators and an emergency service, the question always would be, have we done enough to ensure that each patient has the best chance at survival?

We owe a lot to the courage of our people because it was not easy in the early days. Now we have sorted out some of the PPE challenges, so there is some psychological safety. PPE was key to our operations team, and our public health team. The global supply chain was severely affected by the pandemic, and this affected us in Ghana. The cost of PPE and related consumables increased significantly, and access to equipment for testing and treatment was difficult due to the increased global demand. As a hospital, procuring on our own was a challenge as minimum order level from global suppliers were always too big for us. However, we were able to leverage our partnerships to get the needed supplies but at an additional cost.

In the early days, we found ourselves to be very constrained. Then the government launched some initiatives for local busi-

COVID-19 has become that burning platform for change. This is an unfortunate cause, but it has highlighted this need of both public and private sectors working together

Notably, while the government gave us some incentives, we weren't recognised as being part of the frontline – because we are the private sector. This raised a lot of questions from our public health teams. We engaged with government and gave them as much information about our actions as possible, being very transparent. This gave our staff the opportunity to question and challenge everything, and probably that had a therapeutic effect and enhanced the engagement. Yes, things were not perfect. But the staff were informed, hence engaged. Despite all the difficulties, they kept coming to work. This is testament of our people's integrity, not just the clinical staff, but the support teams as well whose work encouraged the frontliners to keep showing up for work.

As such, we didn't have a frontline worker saying, "I'm not coming to work." We had, however, situations when due to exposure, about 30 of our employees, all in the ER, had to be isolated. As a result, those left on the ground were short-staffed and concerned about what was going to happen to them. That was a very stressful time.

We started rotating the staff, looking into how we could support them. If we hadn't done that, a lot of our employees would be asking, "Why should we be doing this? Let's leave it to the government to do!" But our stance is, what if that is your family member? How would you want them to be treated? "We're doing this for ourselves," "we are the patient." As long

nesses to produce aqua gel, PPE, and so on. That helped, plus we were able to find some alternatives. Now our frontline staff have some guaranteed level of protection and feel more secure.

Fighting Against Stigma

My whole family got infected, but luckily it was relatively mild. Our children were asymptomatic, and my wife and I had the worst of the flu-like symptoms. There was about a week of fever and body aches; my wife lost her sense of smell and taste. Later on, I had fatigue hitting me at 11 am on most days, which is fine if you get to rest, but a challenge when you're working. In any case, we seem to be in the majority of people who have recovered.

In Ghana, the virus is in the community. This is how we were infected too, despite all the precautionary measures we have been taking in our house. Then again, at home, you let your guard down and, ironically, are more exposed than if you are in a hospital with strict protocols and your PPE on.

The disease here is often accompanied by stigma, which stems from that fear of the unknown. It's completely irrational. Unfortunately, people on the frontline are often met with reactions that are hurtful and separatist, even from those who you would expect to know better. But this is in our culture, so people follow.

Also, in the country, there was silence around COVID-19, among the people and politicians alike, so when I became positive, I shared my story openly to help reduce stigma suffered by those carrying the virus. Such are my values. I posted a video on LinkedIn, which then went viral. A lot of the news channels picked it up because I was the first in the country to publicly talk about it. That video was based on our communication plan to spread the information beyond our staff only, thus modelling the behaviour on a larger scale. Being authentic is what's required to build trust. I didn't want this to be misconstrued, because I was infected not in the hospital but the community. This is the reality, and if we don't talk about it, then we don't empower ourselves with knowledge.

Two weeks later, we did another video, which hopefully helped people to recognise the symptoms they had. The issue of stigma has had a significant impact on containing the spread of the virus. The fear of a positive result has prevented a number of people from getting tested. They would rather say, "I have malaria or something else." As a result of airing these videos and the engagement, the testing numbers have been increasing, and a lot more people have been taking it a bit more seriously, self-isolating. It has helped to reduce fear in our staff as well – there's no need to stigmatise, it's a normal disease, even if still unknown. Some people will be affected, but that's the minority. 19 out of 20 will recover.

There's a silver lining to my story. It was an opportunity to engage the staff more. We had multiple meetings afterwards, and from their feedback, I saw that they were empathetic. This gave me more context, not only at the hospital but on a country level. When we watch international news, we see a lot of negative stories and death reports, but none about people recovering. This sends the wrong message.

Story to Share

In the beginning, there were a number of false-negative cases, so by the time we had our first COVID-19 patient, the ER staff were really paying attention to the triaging. We had a doctor and a nurse at the entry point and security officers as the first point of contact. When this patient came in, they were generally fine, with mild symptoms. But the nurse doing the triaging strictly followed the protocol because of those previous false negatives that we had received. The patient was put into the isolation room, the test was done, and we called the district authorities. All our staff, including the security men, finally saw how that multidisciplinary approach should work, and that was just too good to be true. That first patient taught everyone that when we all play our part, we have the power. This was a long journey for all of us, full of mistakes, but we have learnt from them. That situation gave the right momentum to teamwork, and the patient was managed impeccably through all stages.

Another story is much sadder. A patient came in who was

unwell, and there weren't any beds available. Our ER staff were doing all they could for several hours, but the patient did not survive. The image of people trying their best and still failing to change the situation is heartbreaking. That was a very low moment for the organisation. As soon as I heard about it, I went to speak to everyone. But there are moments when it really hits you that a life is lost and there's nothing you can say to lift people's spirits.

That incident made me start questioning if we were doing enough. It also gave me a deeper level of motivation to keep pushing – for getting more ventilators, more PPE. At that time, I thought that it was someone's mother. It could be my mum. Would I have felt satisfied? Would I have said I'd done my best? Surely, everybody was having such thoughts. And to everybody, this loss gave some momentum to keep pushing with their work.

Things to Learn from Africa

In some respects, African countries' response was much more efficient than that of the West. We have to deal with infectious disease outbreaks often and are more aware of what needs to be done. At times, the decision-making in Western countries was confusing to us; many basic steps were ignored. For example, there was no testing or screening at airports, people were allowed to come in freely from anywhere. In Ghana, the authorities were really fast in implementing a travel ban. At all points of entry, incomers have their temperature checked, and have to fill out a form. These strategies, of course, do not give you 100% protection, but they are effective to a certain degree.

Another point is the agility of our thinking, especially when it comes to businesses. When you live in a low-resource environment, you have to come up with new ways of doing things. We saw companies, including ours, quickly rearrange to work remotely; restaurants close but offer delivery services; companies that used to make clothes produce scrubs for hospitals, and so on. This level of entrepreneurship is something I admire. We don't have the capabilities to make, say, sophisticated devices like ventilators or scale up our production. But seeing local people sewing masks, I think that lack of resources sometimes sparks amazing adaptability and creativity.

Mantra of Hope

Reflecting on what we have done so far, I think that if there is one mantra I have, it's about hope inspiring hope. There is a lot of mistrust in our health system, and this is being exacerbated by the crisis. There are fear and anger. Patients are being turned away because they might be infected. This is why we need more stories of people doing it right, and we need to encourage those doing it right. Without this, as a country, we will just demoralise everyone further. There are people who are choosing to come to their work at a hospital every day, but their efforts are still under-appreciated. So, the aim for us is to change this and focus on transparency and hope. ■

Traversing the Unknown Frontlines - COVID-19 from a Resource Limited East African Setting

◆ Author: [Lloyd Vincent](#) | Chief Medical Officer | Director and Co-Founder | Africa Healthcare Network

The purpose of this article is to provide frontline clinical and operational experiences in East Africa in the management of the COVID-19 storm – specifically within the dialysis setting – leading to best-in-class patient outcomes.

Key Points

- Introduction to COVID-19 globally and locally.
- Effective means of rapid response, organisational planning and preparing for the unknown.
- Leveraging the “infodemic” and the frontline experiences to map out a plan.
- Managing COVID-19 internally and externally – learning and innovating to achieve best outcomes.
- Prophylaxis in the absence of vaccines and anti-virals.
- Rinse repeat – plan, do, study, act (PDSA) – creating a culture of continuous improvement.

As the impact of the COVID-19 pandemic swept across the Middle East, Europe and the United States, Africa reported its first case on February 15, 2020 from Egypt. By April, Africa had 1,000 cases and 500 deaths but the media reports of the West had caused the predicted turmoil. The threat COVID-19 was thought to have exacerbated the impact in Africa and not any less in East Africa. Soon inward international flights stopped, and East Africa made quarantine mandatory for arrivals, both national and foreigners, with travelers needing quarantine. Large public gatherings, community meetings, rallies, sports, and entertainment were banned with the schools and universities being already shut.

Rapid Response, Organisational Planning and Preparing for the Unknown Unknown

The need of the hour for our organisation, Africa Healthcare Network (AHN), was a rapid response plan to be implemented within our haemodialysis centres across the region. Top priority was fast-tracking life-saving efforts, quick roll-out responses, and recovery strategies on the ground for our patients. Our team needed to prepare, expedite and facilitate urgent support of our haemodialysis patients both affected by COVID-19 and those at risk across East Africa. As fear, insecurity, and feelings of fragility due to the pandemic had filled our haemodialysis populations, all efforts and initiatives were aligned under the leadership team, most critically, with the priorities of the health of our

patients being kept in mind. The COVID-19 response was taken to the highest level of the organisation and coordinated into all the dialysis units. The entire coordination of operations, communications and implementation supervision was run from a common point within the organisation with all the staff standing together. The corporate and frontline's existing knowledge in infectious disease control, surveillance system and repurposing of facilities for screening, isolation and management of COVID-19 were capitalised in the rapid response preparedness.

The overall focus of this rapid response was three pronged:

- Strategies to prepare for and help prevent the spread of the virus within the units.
- Ongoing support to respond during the outbreak.
- Ensuring continued availability of resources to help patients recover from the disease and preventing morbidity and mortality among those haemodialysis patients affected.

were already capacitated to provide critical care with the existing nursing staff and physicians trained in advance. New patients being dialysed elsewhere were triaged for assessment and investigation before initiation into COVID-19 specific dialysis units or need for admission is decided. And our centres were the only ones to care for COVID-19 positive renal patients at the start of the disease prevalence. Detailed contact and communication systems were laid out with names of responsible individuals outlined. Independent, daily data collection and reporting systems of new or old, suspect or proven positive COVID-19 were set up.

All the frontline nursing staff were quickly trained in implementing the COVID-19 AHN guidelines, to make an effective frontline for the COVID-19 battle. Systems were put in place for patient education where needed and training of the nursing teams to screen and triage patients and staff, managing isolation dialysis and understanding management and treatment protocols. Proper and meaningful use of the scarce personal

Our centres were the only ones to care for COVID-19 positive renal patients at the start of the disease incidence

Leveraging the “Infodemic” and the Frontline Experiences to Map out a Plan

The first actions were to understand the unknown unknown of the pandemic with advice from experts across the globe. Our organisation circled the wagons, tapping into individual networks to gather experiences and guidelines from leading institutions such as the CDC, international dialysis chains, national guidelines, along with individual team inputs to prepare a common guideline document, with modifications for local reality.

The facilities of Dar es salaam, Tanzania were first identified high risk for potential early COVID-19 positive patients. Mwanza and Arusha were next prepared to isolate and treat suspects and positives. Much later the centres of Kigali, Gihundwe and Gisenyi at Rwanda. Isolation areas or complete units were identified specifically for dialysis of suspect and infected COVID-19 patient clusters. Specific dialysis nurses from the team within each unit were identified to form COVID-19 teams and trained to provide the critical services and readiness for needed responses. Besides triage at dialysis entry, hospital emergencies would triage patients coming into the dialysis units in the larger hospitals. The ICUs of these referral facilities

protective equipment resources and specially designed medical suits were stitched to treat suspect and positive COVID-19 patients. In the absence of personal protective equipment (PPE) in the marketplace, innovation was key. Additional capacity building was done in training nurses on the management of COVID-19 positive patient care on dialysis, improving infection prevention and transmission, utilising information from laboratory testing and other prevention measures. In addition, critically important in the situation among the staff, was providing the right messages with needed discussions to stay safe from infection, which were repeatedly reinforced. Physical distancing, mask use and hand sanitizer or soap and water use was enforced to force everyone to observe personal hygiene. Lastly, ensuring the frontline team stayed calm and united in patient centric care while also taking the necessary precautions to ensure our staff's safety.

Managing COVID-19 Externally and Internally – Learning and Innovating to Achieve Best Outcomes

All genuine public health, WHO and key government outputs online, radio programmes, online and



TV or news reports on the disease activity of spread, recovery and deaths were captured on a daily basis from across regions by the senior management on a common WhatsApp thread. This was used for dynamic planning and management, as new information emerged from all the government and international sources needing varied interventions depending on the situation. This information also needed to be vetted for accuracy. Additionally weekly reports were sent summarising our region's status report.

AHN's work of ongoing support to respond during the outbreak was drawn from its experience of its well-organised operations across the East African regions. However, public hysteria and mass hoarding created a situation where healthcare institutions were battling

since the influenza outbreak in 1918, no therapies have been proven to be effective to date. Despite the numerous ongoing clinical trials, none of the potential repurposed drugs used in the trials were available in East Africa. The use of steroids was dissuaded by the WHO. The question was: what's next? The only drug reported as being used in China and Italy, available in Dar es Salaam was the oral antibiotic azithromycin which was a relief as there seemed no drug shortages, at affordable costs. Literature reported this drug to have a beneficial anti-inflammatory and anticytokine effect in COVID-19, preventing inflammation to some degree, especially those which affected the activation of the coagulation pathways. But this alone was certainly not enough for the treatment of COVID-19.

Public hysteria and mass hoarding created a situation where healthcare institutions were battling COVID-19 on two fronts: care and procurement

COVID-19 on two fronts, care and procurement; local healthcare distributors drastically increased prices and repurposed sales towards shopping malls opting to capitalise on this hysteria increasing prices 25-100 fold. Nevertheless, our teams carried out the dialysis procurement, supply-chain services, and had existing inventory systems ensuring procurement of six months stock. Close oversight of logistics, supplier communications, potential regulatory bottleneck were overcome for urgent supplies of needed dialysis consumables and medical supplies, for adequate stocks. PPE of all sorts were procured for all the COVID-19 units as the threat loomed closer. Cloth masks were designed and stitched locally for all the patients when market did not have masks. Masks were later sourced from the market with guidelines when and how to reuse, as needed at the frontline. Goggles, face shields and boots were obtained from the market. Initially protective gowns were obtained from the market, but later due to shortages specially designed gowns with a hood for complete bodily protection were stitched to enable laundry and sterilisation daily, ensuring adequate stocks. Special remote oversight of the supply chain and inventory impacts was kept over core operations within the dialysis units remotely during the COVID-19 crisis. Numerous repurposed internal resources were also made available to the frontline as needed. But still a solution was needed for medication prophylaxis and therapies.

With the COVID-19 pandemic being the greatest global public health crisis of the current era, possibly

Creating a Cost Effective, Available, Accessible and Outcomes Driven Approach to COVID-19 Management in a Resource Constrained Environment

Finally, after extensive COVID-19 literature search, it was in late March 2020, with COVID-19 already in the cities and communities, a letter to the editor from Italy in the American Journal of Transplantation, reported the successful use of the drug colchicine in one of two transplant patients with COVID-19 on the ventilator that provided the break. Colchicine, a plant alkaloid, extensively used, freely available and affordable, was used to replace an expensive biological anti-cytokine drug tocilizumab due to the latter's non-availability. Since colchicine had the same spectrum of anti-inflammatory and anticytokine effects as in COVID-19, it was repurposed for use in the treatment of COVID-19. As an anti-inflammatory drug, it is extensively used in Europe as first line therapy for Familial Mediterranean Fever (FMF), a known illness in the region. The drug was also available in plenty in East Africa at affordable costs, with nobody needing it, which started our tryst with colchicine. Research into colchicine got us to the mechanism of action, safety profile, drug interactions, use and doses in patients with end stage kidney disease on dialysis and the potential advantages of its combination with another support drug azithromycin with a complimentary anti-inflammatory spectrum.

Coincidentally, COVID-19 had emerged within the AHN units at Dar es Salaam. Vigilant screening had begun to identify patients with symptoms and early COVID-19 who were positive on testing. The COVID-19 teams began their work of managing patients who were suspect and positive clusters with isolation dialysis. The numbers began to swell by late March and April 2020. Initial patients were admitted and started on colchicine and azithromycin therapy as planned in the treatment guidelines. But soon when early disease was identified and treated with colchicine and azithromycin, experience taught the team to treat them as outpatients, self-isolate at home and dialyse as an outpatient. Being the only centre treating COVID-19 in the initial stages of the pandemic within the city, referral for dialysis from the other hospitals began to pour in. But these were sicker patients with more of respiratory symptoms and lower levels of blood oxygen levels since they came into the hospital after being symptomatic for over 8 to 10 days. Most of these patients came from hospitals elsewhere with no ability to manage, needed admission and were sicker with more cardiac comorbidity in comparison.

Managing these two sets of patients hence provided an experience of the 1) early in-centre patients who rarely needed admission and 2) the late presenting sicker patients with more severe disease – a challenge to treat. Even at this stage, oxygen therapy remained the lifesaving mainstay as there were hardly any ventilators available. The learning was that early therapy of COVID-19 with colchicine, serving as a base, and azithromycin, a support drug, had outstanding outcomes, even if the system did get overwhelmed. We had accomplished a zero mortality rate of all our own dialysis COVID-19 positive patients and lost only four of the referred patients with severe underlying cardiac disease and late presentation to the hospital from amongst the dozens of referrals. A meeting of the nephrologists from across the city allowed us to share with all nephrologists our colchicine protocol use and outcomes – which led to implementation across the region. This cut down the referrals to our centre in the next couple of weeks. The AHN protocols and treatment guidelines were shared widely across countries amongst known nephrologists, and further colchicine was also used in elderly patients across the city with early disease. But the moral of the story was, colchicine, given early, had a quick response in preventing or reducing the inflammatory response of the body in COVID-19, preventing, or ameliorating the lung injury or activation of the clotting system; and, ultimately, collaboration is key.

Colchicine Prophylaxis in the Absence of Vaccines and Anti-Viral Therapy

With the outstanding response of colchicine in early disease, it was next extended as a prophylaxis for COVID-19, as evidence already pointed out good results with its prophylaxis in gouty arthritis and FMF. With the spread of COVID-19 out of Dar es Salaam and fearing another COVID-19 battle outside in the more remote areas, prophylactic colchicine was started in 74 patients at a large centre in Northern Tanzania. In the first few days, three patients came in with symptoms of early COVID-19 which could easily be managed but those were our last patients with COVID-19. Colchicine as a prophylaxis now has been extended to all our dialysis patients in Tanzania and Rwanda to prevent COVID-19 across all the centres. Not a single patient has presented with COVID-19 amongst our dialysis population since May 11, 2020. The same was now again shared with all our colleagues, partners and even competitors across the board and abroad; united against a common enemy. A unique experience, with a lot of potential to be used in the developing world, provided the opportunity to present an educational webinar for the International Society of Nephrology to share all the findings to the world at large.

Rinse Repeat – Plan, Do, Study, Act (PDSA) – Creating a Culture of Continuous Improvement

Although COVID-19 is no longer seen in any of our units today, we are nowhere near the end. With no vaccine coming in the near term, we as an organisation are embracing continuous improvement to innovate and adapt our response to COVID-19 both for prophylactic purposes for our at risk patient population and for those who present symptoms and/or are diagnosed as COVID-19 positive. This includes continuous monitoring of the COVID-19 manifestation in the region, engaging internal and external partners to ensure we have the most up-to-date information, working with supply chain to ensure we are well prepared to act, and then ultimately, act on the information we have to best equip our teams to ensure our patients receive the highest quality of care. This is only the beginning, collaboration and continuous improvement are key to winning the war against this COVID-19 storm. ■

Imaging Solutions for a New Reality

◆ Author: [Jack Hoogendoorn](#) | European Marketing Director | Canon Medical Systems Europe

During these challenging times, Canon Medical Systems has continued to provide high quality support to its customers and partners. Jack Hoogendoorn, European Director Marketing, provides an overview of the solutions offered by Canon during the COVID-19 crisis.

We are all experiencing challenging times due to the Coronavirus, which is still spreading around the world. Just like everybody else, we at Canon Medical Systems have had to adjust to the situation to ensure we can continue to provide high quality support to our customers and partners, so they can provide the best care possible to those who need it most: the patients. Jack Hoogendoorn, European Director Marketing at Canon Medical, tells a bit more about the solutions that the company has made available. Some of them were developed at an extremely rapid pace during the COVID-19 crisis.

Healthcare has clearly undergone a complete change in recent months. Old ways of working are obsolete, long waiting lists have arisen for regular care patients with the need for critical treatments, which only increases the workload for the hospital. In addition, investments are postponed or are under an enormous pressure. It is abundantly clear that it is now an absolute necessity to prepare for working in the new (imaging) reality. A reality where patients are optimally protected, risks are minimised and resources optimised.

Canon Medical is committed to helping medical specialists on their journey to a new reality by offering:

- Solutions to increase Workflow.
- Practical and flexible Rental and Mobile Solutions that are immediately ready for use.
- Customer Tailored Solutions; and
- Remote Service Solutions.

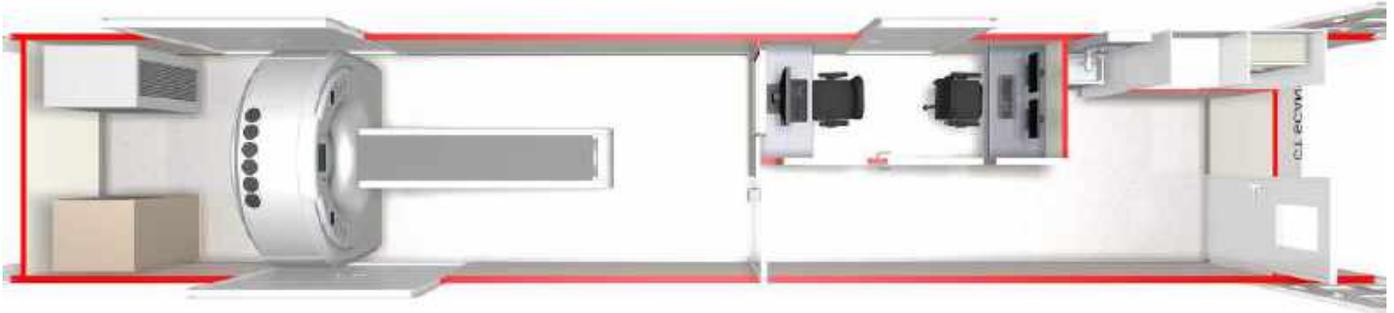
Workflow Solutions

An efficient workflow is necessary in every hospital and clinic, now even more than ever before. Workflows can be optimised with our image interpretation solutions with Artificial Intelligence (AI) algorithms. It improves workflow for physicians and technologists involved in diagnostic imaging and imaging examinations, and contributes to provision of efficient healthcare.

Rental and Mobile Solutions

To bridge the new equipment installations or temporary high workloads, Canon Medical provides static rental or mobile clinical solutions. The fleet of mobile imaging





Canon's new CT Scan Unit is a deployable imaging solution that enables uncompromising workflow, imaging performance and personal safety anywhere and anytime

trailers is equipped with state-of-the-art medical equipment. All that is required to take advantage of a mobile solution is sufficient parking and power facilities. Canon Medical Mobile Solutions are designed with patient comfort in mind. The wide bore provides a non-claustrophobic experience for the patient. The mobile scanners are equipped with a large changing room, ensuring patient privacy, whilst a secure locker is provided for patients' valuables. As I mentioned at the beginning, we rapidly developed a solution that can play a critical role in managing patients under emergency conditions with unusually high workloads or in infection control situations. With the new CT Scan Unit, we provide a deployable imaging solution that enables uncompromising workflow and imaging performance as well as personal safety anywhere and anytime.

Customer Tailored Solutions

Canon Medical is known as a flexible partner that supports professionals on the way to the new normal. Some of our country offices have created special offers that are individually tailored to clinical, operational and financial needs. This ensures clearly defined goals and completely transparent processes from the first day of our partnership. If requirements change over time, we will jointly adapt technology to our customer's needs.

Remote Service Solutions

Social distancing is one of the important givens in the new reality. With our InnerVisions remote diagnostics, we ensure that our highly trained engineers or application specialists, who can monitor our customers' systems remotely and assist our local engineers in preventing problems, resolve most of the calls remotely. All without

the need for an engineer to attend on site and all without interrupting the essential flow of patient care.

The above-mentioned solutions are just a small selection of the solutions available for healthcare professionals. All are developed with the Made for Life philosophy in mind: Made for patients. Made for partnerships. Made for you. And I invite you to have a look at our solutions and discover what our customers say by visiting Canon Medical's dedicated COVID-19 webpage: eu.medical.canon/covid-19/. ■

Canon Medical offers a full range of diagnostic medical imaging solutions including CT, X-Ray, Ultrasound and MRI, across the globe. As of December 2016, Canon Medical became a member of the Canon Group. In line with our continued Made For life philosophy, patients are at the heart of everything we do. Our mission is to provide medical professionals with solutions that support their efforts in contributing to the health and wellbeing of patients worldwide. Our goal is to deliver optimum health opportunities for patients through uncompromised performance, comfort and safety features. At Canon Medical we work hand in hand with our partners – our medical, academic and research community. We build relationships based on transparency, trust and respect. Together as one, we strive to create industry-leading solutions that deliver an enriched quality of life.

So Not Your Regular Flu

◆ Interviewee: [Svetlana Piliavsky](#) | Speech Language Pathologist/Rehabilitation Program Director | Boston (MA) | USA

The COVID-19 pandemic has hit nursing homes around the world particularly hard. With the infection spreading among both staff and residents, the consequences have been horrible. A director of one such facility in the U.S., who has survived the disease herself, talks to HealthManagement.org about this devastating experience and the need to change attitudes in those who still do not take COVID-19 seriously.

I am a speech pathologist and the director of a rehab/nursing home. In the facility, there are residents and 'short-term' patients that come for rehabilitation. When COVID-19 started, we stopped taking in new patients at some point. If we did take a new patient, they would be in quarantine for two weeks. Unfortunately, there was no proper PPE. I was screaming at the top of my lungs saying that if we didn't protect ourselves and they didn't start screening us for infection, we would be spreading it. Back then there were no directions from the Department of Public Health (DPH) on the use of PPE. We were actually told that was nonsense and PPE was only for our own comfort. We were told that we didn't need the equipment, that we didn't even have any COVID-19 and it was not transmitted the way everybody thought it did. It's just regular flu, don't worry about it – because the President said so. It was all very political.

At the end of March, I refused to allow any of my staff to see any patient without masks because I started to see symptoms. Despite being told that I was spreading panic and that nothing was wrong, eventually we were given regular surgical masks. In a couple of weeks I demanded we have gowns, and at that moment I was pointing out to the patients who I knew were sick. Unfortunately, the gowns were yet to materialise, and unfortunately, all those patients that I pointed out, died. It breaks my heart because I knew most of them and their families for years. They came to us because I worked there, and some were just short-term patients.

Going Through Disease

My husband was concerned about this new virus from day one. We had a small vacation planned for the end of February, to Puerto Rico. We were, of course, worried about having to be in an airplane where it would be

the most dangerous. We even took masks with us, but nobody around had any on, so... cruises were still in full swing, and we crossed the street whenever we saw that crowd. The situation continued to worsen, so from 4 March, when we returned, to 24 March, when the stay-at-home advisory was introduced, we went to the stores maybe twice, already being very careful.

On 8 April, I suddenly felt like something was squeezing my chest. I couldn't breathe, and the pain was excruciating. The temperature skyrocketed to 100.4°F (38°C), and I immediately had to notify the infection control nurse about my symptoms. She first suggested I pack my things and get out of there as quickly as possible, but then it was arranged for me to get tested. I went to a drive-through clinic and in four days got the results, which were positive.

At home, we were taking all possible precautions and self-isolating. My husband slept in the basement, we used different bathrooms, and so on – but six days later he got sick, too. That was a complete disaster. He had to take care of me because I couldn't move. We couldn't go shopping, couldn't go to the pharmacy. Our son, who is very brave, would bring us groceries without seeing us, leave them at the doorstep, and in about three hours we would disinfect those and then bring them in. That's how we survived.

I was very sick, with terrible pain, no sense of smell, high fever, fatigue, horrible cough and shortness of breath, with oxygen dropping down to about 84-86%. Other symptoms, that are very rare, were rash and hearing loss. Basically, I had everything in the book with this horrible disease.

There is nothing I can compare this to. The fever lasted for about three weeks, during which I would only go to the bathroom a couple of times a day. Brushing my teeth

would take about half an hour because of the shortness of breath, the fatigue, the pain, and so on.

My doctor suggested I go to the hospital, but I decided not to. Being in a hospital meant either being on a ventilator, or having oxygen support. The big question was also, how safe it was – there were not enough oxygen tanks, not enough medication. I would've probably been given one particular drug, heavily pushed by the government, but my doctor said it could be very dangerous for my heart. He was extremely supportive of my decision to stay home as long as I could handle it and do my breathing exercises (in which I specialise professionally). I also took vitamins and drank a lot of water with ginger and lemon – hot water as I couldn't do anything else, even room-temperature would give me chills.

The families of those patients who died were still calling me, at home, to make sure that I was alive. This was the saddest, the most incredible thing. It was giving us strength to survive. And still, there are some awful people who would say, "Ah, it's like regular flu, no problem." No, it's not a regular flu. It's something to which there is no comparison, and nobody knows what to do with it.

about 15, we are in very good shape now. I was even able to put my wedding dress on. It was still tight, but I could do it! And we have a new toast now – 'For life!' We're alive, and life is beautiful.

Politics, Policies and Deaths

Early on, the perception among my colleagues varied. Some were very worried. Others were dismissing all my concerns saying it was a flu and we had many other flus before – stop being paranoid. Here, it depends on what news outlets you were following, eg those where the President first said that people died from the regular flu and then – well, even if we get to the point where we lose 100,000, we're doing a great job. Well, he did a much better job because we ended up with many more thousands than a hundred.

Another very interesting point is that only in mid-May the government got the order to test everybody. Before, it would say there was no need. Since March, I tried to get the message through – start testing people, and if anybody was positive, send them home, so that we didn't spread it! The reply I got was, it was all nonsense, there were no orders, and even if people were tested, they

We were actually told that PPE was only for our own comfort

Now, three months later, I can only walk about half a kilometre, taking breaks and being short of breath. Two weeks ago I had to go back to work – my husband, unfortunately, lost his job over the quarantine period. My company allowed me to have a family leave of absence, so there was some job security. They also suggested I try to apply for the workman's compensation, which is about 60% of your salary. At that time it was all very new. Only several states, including Massachusetts, were offering this kind of financial protection to those in the medical field who got infected at work. I had to put a lot of effort into proving that last part, but in the end succeeded because a) since mid-March my husband worked from home and b) the only place that I would go was to work, in my car. As a precaution, we didn't do grocery shopping because we are both over 60 and I have other health issues. When I would come home from work, I would strip everything off, get washed, and only then get inside. Still, that didn't protect us.

The story is very sad. I have never been so sick in my life. The recovery is very painful. But every cloud has a silver lining. As I lost about 10 pounds and my husband

could get infected three days later anyway. In the middle of May they tested the first group. Out of 25 people, seven were positive. With no symptoms, none.

Now, by the order of the DPH, all the facilities are tested on a regular basis. Our facility has zero cases, and we take in patients again, who must be tested first in the hospital with negative results. We also test them upon arrival, and they are kept in a room for 14 days in a separate wing of the facility. After the quarantine they are tested again and, if negative, moved to another wing to a room for two people. In one very recent development, those who underwent the quarantine and are negative, are allowed to see their relatives. They meet outside for about 15-30 minutes keeping the six-foot distance and with masks on. No visitors are allowed inside. The staff arriving for work have their temperature taken, fill out a questionnaire, and don PPE. They are also regularly tested.

That's the story for now, which, I think, would've been wonderful if it happened three months ago – we could've protected ourselves and prevented all these deaths. My facility is 78 beds, 14 deaths. I know of facilities with 120 beds,



70 deaths; 450 beds, 155 deaths. It's disgusting. These elderly people who are most vulnerable – they are dying. But unfortunately, young people are dying too, and being very sick.

If Only...

Since the beginning, different facilities, companies, states had very different opinions about and ways of handling the outbreak. If everybody were on the same page, it would've been much easier. One wise move our company did was to stop people from going between buildings. It was necessary because nursing assistants, who are the least paid and often live in communities

six months, a year? Moreover, because my husband's and my immune systems are so compromised now, we don't know what else we can catch. That's why I still refrain from seeing my mother, who is almost 87 years old and lives in an apartment building. I don't go to that building. When I go to see her once a week, she comes downstairs, we keep six feet apart and have our masks on. She gets very upset about that because she believes I need to spend more time with her, which is heartbreaking.

These days I only go to work and am extra cautious there. On those very rare occasions that we go to a store, we wear double masks, K95 and a surgical mask

The families of those patients who died were still calling me, at home, to make sure that I was alive. This was the saddest, the most incredible thing

where social distancing is difficult, went from building to building. Some even had several jobs, and they were going around without being tested, spreading the disease. Once they were tested with positive results and dismissed from work, they wouldn't stay home because they needed money. The order was that if somebody didn't have symptoms for 48 or 72 hours, depending on the facility, they can return to work after 14 days of quarantine. The second test was not even required.

There are a lot of things that I do not agree with and do not understand, which can be done differently. First, test everybody on a regular basis. Also, provide monetary reimbursement, which actually some facilities did. At some point, the facility I work for was paying extra \$3, then extra \$10, then double to people who tested negative and continued to work, so that they would stop going from place to place. But that didn't last long.

And of course, the government could've started working on the vaccine and medication much earlier; closed the country; contained the spread; not been so greedy and stopped saying that we didn't have a problem.

What's Next?

I was afraid to go back to work. I did the antibodies test and, they tell me, there's 90% probability that now I am immune. The problem is that nobody knows for how long the immune system is going to work – three,

on top of it, and gloves and sanitise everything. Still, there's this horrible feeling of 'what's next?' Nobody knows that.

I just pray a vaccine is available soon, testing is more reliable, more people are tested, and the spread is somehow stopped. Unfortunately, the whole world is now infected, and with the borders opening we don't know how the infection control will be, the quarantine, the people's minds! There are still so many who say it's all nonsense. A relative has just told me – "I'm not afraid of dying." So what? I am!

I don't want anybody to suffer like we did. But to those who don't grasp what kind of suffering you go through, I just want to say, "Wanna try?" It's very painful to say that because I wouldn't wish this on anybody. But people – who don't believe, who don't care about themselves – need to have some responsibility to protect others. That's the biggest problem. Yes, there are many who will never get sick, even if they are infected. But they are spreading the infection and putting others at risk. Some go through this and survive, and some don't.

A family member of a patient who died said to me, "You have helped so many already, we need you back so you can help others." So I'm trying my best to help them to survive. I don't want to die. I want to live a little longer. Not 'a little,' much longer! And if my story helps anybody to realise what the world is going through, and that it has to be taken seriously, I would be more than happy. ■

Superheroes: Behind the Scenes of COVID-19

◆ Author: [Regina J. Lee](#) | Co-President, IUSM Chapter | American Medical Women's Association | USA

◆ Author: Professor [Theresa Rohr-Kirchgraber](#) | Executive Director | IU National Center of Excellence of Women's Health | The Barbara Kampen Chair in Women's Health | Professor of Clinical Medicine and Pediatrics | Indianapolis, USA

Are the real heroes only those in the hospital actively caring for COVID-19 patients or are those behind the scenes also playing an important role?

 Key Points

- During the pandemic, care is not only necessary for COVID-19 patients but also for those with other illnesses and diseases.
- Those in primary care have had to switch to providing virtual care and the transition is not easy.
- Those who do not have the clinical expertise to fight the pandemic still care for patients, provide comfort to colleagues and run their households.
- Many have played an important role in improving communication, providing online care, preparing online medical curriculum and finding alternative ways to deal with many other challenges during the pandemic.

When Dr. Cindy Brown, a pulmonary physician and researcher, studying cystic fibrosis, became aware of the impact COVID-19 was having on her colleagues in New York, she immediately thought of jumping on a plane and heading to New York City to help. After all, she is a pulmonary physician and though most of her work is now in research, she still has usable skills. She has two young kids, a strong research programme in Indiana, and a spouse. Not knowing what would happen in the upcoming weeks in Indiana, she discussed with her family and chose to stay put.

Many of us made similar decisions. We were not sure how our own cities and health systems would be impacted and we wanted to be ready. So we signed up on volunteer sites and waited. Meanwhile, hoping and praying we would not be needed, because if we did, that would mean our colleagues were sick, dying, and the enormity of the situation was dire.

Others, knowing they no longer had the type of physician expertise needed to fight this epidemic, continued with their work. They cared for patients, comforted colleagues, and ran the households.

As the stories kept coming and the accolades for our healthcare heroes piled up, those of us behind the scenes initially felt like imposters. The real "heroes" were those in

the hospital actively caring for COVID-19 patients, right?

As time went on, we realised that caring for our patients, whether they were COVID+ or not, was incredibly important. Illness continued, accidents happened, preventive care was needed and our role was to provide the care that was needed every day.

For Radiologist, Colleen Madden, it meant performing diagnostic mammograms and breast biopsies. Breast cancer does not take a break. While other centres were closed, she thought to herself, "If not me then who?" She put off her vacation and covered for the older physicians in the group who were more at risk. She diagnosed breast cancers and reassured others that they did not have cancer.

For many of us in primary care, we went from seeing our patients in the office to moving almost overnight to virtual/phone visits. Many of us had never done this before and the learning curve was a rapid upward projectile for both physicians and patients.

The change from having a patient in the room, and being able to physically examine them to seeing them on a video screen or just listening to them on the phone was strange. While we realised the necessity for this new type of medical visit, we worried about missing things. Missing that hard



mass in the abdomen or that skin lesion on the upper back. Missing the physical contact and the calmness that comes from the laying on of hands and the use of the stethoscope. We understood however, that many of our patients were scared to come into our office. The patients worried they would get infected from us and we from them.

Internist Dr. Jean Mensz notes “We not only have managed, we have succeeded. We have become familiar with the virtual visit and have helped patients feel more comfortable with this new technology. We have laughed at the kids, animals, and roommates that come into the visit at times. We have made our patients stand up and show us their skin lesions, how to move their joints or point out the parts of their bodies that hurt.”

Dermatologist Dr. Kate Oberlin noted “The first few weeks of the pandemic were frightening as our knowledge of the disease was still primitive. I knew I was at less risk being in an outpatient clinic but I still worried about bringing illness home to my family. I also didn’t want to leave my patients behind. I just felt guilty all the time and I’m glad we’re in a much better place now.”

For Dr. Susan Weigers, “Waiting for COVID was worse than actually dealing with it.” As the CEO, of the Temple Faculty Practice Plan, she experienced the anxiety of the unknown and watched the health care disaster unwind in NYC. “But” she says, “it gave us time to prepare. Everyone worked together and we turned three floors of patient office space into hospital rooms and made a large open ward in one of our lobbies in four days!” She noted that even the Chair of

Surgery, Assistant CMO and she herself, moved beds around to help the overwhelmed transport workers. Not surprisingly, the leaders who jumped into move beds...were all women.

In the early days of the pandemic, two things quickly became clear to Dr. Sylk Sotto. Communication was imperative and the information had to be concise, efficient, and transparent. Painstakingly done via numerous meetings, huddles, and emails, with 12-hr consecutive work-days during those initial months. As work changed to primarily working from home, often in isolation from others, wellness virtual check-ins became necessary. Virtual meetings could be as quick as asking “How are you doing? How are you feeling?” or required more in-depth support with psychologists stepping in for support.

For some, having clear missions and goals helped direct their efforts during COVID-19. Dr. Christen Dilly knew that an online gastrointestinal (GI) curriculum would be valuable for those educators and learners who had been removed from the healthcare or school setting during the pandemic and were now in need of teaching and learning from home. Mobilising a curriculum into an online module-based curriculum, one that could be used across the country was tackled with a purpose. Not even having a retinal detachment during the pandemic, which prevented her from doing any work for a few weeks, deterred her from her mission of creating this online curriculum.

While battling the pandemic in the frontlines was the reality for some, other medical professionals found alternative impactful ways to help those around them. For Dr. Diane Donegan, navigating the transition to telemedicine was difficult and required a constant supply of backups in case things failed. However, this paled in comparison to some of the challenges faced by those who had little interaction with technology, especially many of her patients. Determining what method worked best and, more importantly, was actually feasible for the patient to use required trial and error. Many virtual visits became phone calls. Some of her endocrine colleagues were in their 60s-70s and at risk for infection, so she volunteered to cover the inpatient service for them. She tried to help in other ways too - even something seemingly small such as volunteering to be a hospitalist backup, supporting local restaurants, or even paying her dog-sitter for services even when they were not using her.

We have a new normal with COVID 19. While our lives and the practice of medicine will never be the same, we appreciate even more, the important work done by so many.

A SUPERHERO can be many things. Most likely, YOU are one too. ■

The opinions of the authors are their own and do not represent IUSM.

Through Crisis to Better Healthcare

Interviewee: [Konstantinos Deligiannis](#) | General Manager at Eastern Europe | GE Healthcare | Athens | Greece

The COVID-19 ‘stress test’ has highlighted the shortcomings of healthcare systems worldwide. In Eastern Europe, the need is evident for the hospitals to upgrade on every level, from their infrastructures to their processes. HealthManagement.org spoke to Konstantinos Deligiannis, who leads the activities of GE Healthcare in the region, about comprehensive development of healthcare and the potential of public-private partnership.



Key Points

- In healthcare, the pandemic has exposed significant gaps in planning, public and private sectors interaction, primary healthcare, and manufacturing priorities and capacities, among others.
- Customer needs have changed, and so have the solutions offered by the industry. Containers to isolate equipment or localised technical assembly are some of the innovations brought to the market.
- Any crisis leads to revelations and many questions. To succeed, a leader must be rational, decisive and confident.
- As life returns to normal, 2021 will be a great moment for Eastern European countries to initiate changes in their healthcare sector.

In Eastern European countries, what were the weakest points in healthcare systems that the pandemic has exposed?

The most fundamental gap that the current crisis has exposed is the absence of planning. Although this is evident in other regions too, in Eastern Europe healthcare has been growing and maturing in a completely non-organised way. In the government-endorsed procurement systems, construction of new hospitals, or any other area, the plans have been patchy, with no strong common vision in mind. Different governments have their own priorities; different centres of influence have been promoting their interests, while on a national level, there is no strong and clear strategic plan. This is the only explanation to what we have seen in the ICU sector since the beginning of the pandemic. The infrastructure was simply not there. In fact, ensuring that the most critical part is in place should be first when developing or promoting a healthcare plan. This crisis has clearly demonstrated that we have to focus our thinking and devise a 360-degree strategy that will allow for the integrated development of healthcare.

Another very important point highlighted by COVID-19 is the lack of mechanisms to integrate public and private healthcare sectors. We have seen that in many countries, the critical ICU infrastructure in the public sector is insufficient.

At the same time, there is a strong private sector, which is not included in the response plans – or at least was not included in the beginning. COVID-19 has been a call to accept that the private sector is there. Historically, depending on the political priorities of different governments or parties, the private sector is either ignored or lauded, sometimes it is a burden and other times a necessity. Hopefully, this crisis has sent a clear message to the governments that private healthcare is a reality, is a necessity and can be a valuable pillar if integrated into the national planning of the healthcare system development.

Primary healthcare is another essential area to take into consideration. If we think about it, primary healthcare is simply not there because we push the care delivery to the hospitals. Hospitals are, by definition, very central structures that should be a last resort for serious or critical health issues, but instead, they are used on every occasion. Therefore, an extensive primary healthcare network is necessary for every country to ensure the best decision support in a very short time. Undoubtedly, the pandemic helped the governments realise this simple truth and its critical importance. It is clear that we have to take healthcare services as close to the patients as possible instead of concentrating and directing the delivery of care in the hospitals.

Finally, it is now clear that the availability and the quality of

a range of critical products defines the efficiency of a healthcare system. For several decades now globalisation has been increasing, with manufacturing being progressively moved out of Europe. There has been a clear gap to retain strong local manufacturing base in Europe, especially for healthcare equipment and devices. With this crisis, we have suddenly discovered how highly dependent on imports healthcare is in Europe.

As a result, this crisis will leave a permanent mark on the European economy, infrastructure and healthcare. Now, a strategic revision of the industry is required to identify the areas that must retain a local footprint. Whether this 'local' is going to be at a country level, or at the EU level, is a topic for further discussion. But one thing is clear – in Europe, we must ensure strong local manufacturing presence, especially when it comes to products that the healthcare sector depends upon.

What areas of work has the pandemic brought forward? Have there been any novel, COVID-19-specific solutions introduced on the market?

We had to adjust our work on many levels, for example by upgrading the company's digital infrastructure to ensure smooth transition to remote work and introducing new safety protocols once the offices have reopened. The biggest challenge, which was evident even before COVID-19 was declared a pandemic, was to ensure the continuity of services to our customers. We had to revise our priorities and asked our customers to do the same. As a result, the crisis has brought the customers and the industry closer and helped them work together. Now, everybody on both sides has a common goal, which is simple yet powerful: to keep each other going.

Naturally, our product portfolio has also had to be readjusted. The market has changed, and we, understanding our customers' needs, have adapted our solutions. For example, in Romania and Poland, we have installed a number of CT units, or in some cases x-ray units, in special containers, a solution branded as '[CT in the box](#).' This is an emerging trend in the healthcare industry. Hospitals have been expanding their space with isolated clusters to attend to COVID-19 positive or suspected cases. This new non-permanent facility allows for the increase in the number of examinations in a short time and the efficient and safe movement of patients around the facility.

As our teams needed to bring critical technologies to hospitals, but often couldn't enter the facilities to perform the necessary installation, another novel solution was introduced in Poland. The idea was to perform assembly and installation tests outside the hospital, inside a specially prepared bus, which we nicknamed the 'install bus.' The bus travelled from hospital to hospital, and our engineers provided their services on the spot. All the work was done in the vehicle, and equipment, such as ventilators, was delivered to the hospital ready for use. For medical facilities,



this ensured continuity of work and helped to keep people from non-controlled environment outside their premises. The acclaim for this service has been very high. Customers appreciate any extra support, innovation, or solution they can get from the industry right now – not only from GE but from any company that would go the extra mile to help.

Do you think this trend of increasingly mobile and local support service will stay after the pandemic peak is over?

The value of localising maintenance and repair services for medical systems is another big takeaway from the pandemic. Repair of healthcare equipment has to be always possible, whenever intervention is needed, irrespective of the situation at the borders. In Eastern Europe, GE Healthcare provides local service support in each country. Furthermore, we fit our equipment with one of the most advanced, digital, remote repair toolkits globally. On top of all these now, we have deployed local technical repair centres for small, mobile equipment in countries like Poland, so that even for major repairs these systems can remain within the country. In general, we keep looking for quality solutions, which can be developed and implemented fast, optimising our customers' productivity and uptime.

What has ‘leading during a pandemic’ been for you personally?

I have been with GE Healthcare for almost twenty years, and the pandemic was an opportunity to demonstrate and witness the impact of the work we do, in so many countries and societies. GE Healthcare has been able to provide almost 50% of all the COVID-19-related systems deployed in Eastern Europe. This is a major contribution. I have been deeply impressed with our team and their deep commitment to helping people, patients, healthcare providers – some of them even undertook considerable personal risk to provide and deploy the much-needed equipment. I am proud and honoured to work with them.

When you are facing a pandemic, the first question is how safe are the people you work with? In the GE team of Eastern Europe many people hold international jobs and constantly need to travel, so their safety is a major concern. Fortu-

nally, we have a very capable and experienced Environmental Health and Safety team that addresses all issues promptly and efficiently.

nately, we have a very capable and experienced Environmental Health and Safety team that addresses all issues promptly and efficiently. Another big agony in this crisis was how all of us could best contribute to the fight against COVID-19. Holding a position of senior responsibility, you have certain capabilities and can influence certain decisions, so how can you apply these degrees of freedom in a crisis? Choices must be made. We had a lot of distress calls and requests for support and equipment, from governments, hospitals, benevolent and donor foundations, too many indeed against a production that was, is and will always be finite. You see how right the request is, how dire their situation is, but sometimes you cannot help. It is an ugly feeling.

This pandemic is the second big crisis in the past ten years. The first was the financial crisis, the financial meltdown of 2009-2012, which took a heavy toll, especially on Greece. One can say it was a ‘rehearsal,’ so this time we were, at least psychologically, prepared. Judging from my experience, to successfully lead a company through a crisis, you have to put aside emotions and take decisions rationally. Take decisions fast, but not too fast; there is a very fine line. Your decisions should be based on the right information, but information keeps flowing in continually and you cannot delay; also a subtle line here.

Above all, you must have confidence. It radiates from the leader and cascades to the team. Confidence that the situation will improve: markets will recover, the customers will come back, and the revenues will flow in again. This confidence

Have there been any difficult decisions you had to take?

In the highly complex and difficult market environment of Eastern Europe, we are used to making difficult decisions. Still, one of the toughest challenges for us has been handling the requests for equipment in massive numbers that could not be available. For example, there has been a lot of pressure from every customer, every government, every country for ventilators. But no company had the capacity to satisfy this demand. We had to prioritise according to the severity of the situation and other considerations, which was not an easy task. This mismatch of demand and capacity shows that perhaps all of us, governments, healthcare facilities, industry, could have been

Thinking first about ensuring that the most critical part is in place should be first when developing or promoting a healthcare plan

better prepared. We all saw, early enough, what was happening in China, but no one could imagine Europe would follow. That was naive, and the story of this pandemic will be a good lesson for the future.

How do you think the situation will be post-COVID-19?

Nobody knows what the future holds, but I believe the hardest part is behind us, in the sense that the shock is not a shock anymore. Life will get back to normal soon, and from 2021 a major transformation of the healthcare sector will start, especially in Eastern Europe – this is a widely shared opinion. In the wake of this crisis, healthcare is becoming a priority area. A lot of investments are coming, and we will see previously unheard amounts of EU funding flowing into Eastern European countries with the aim of strengthening healthcare. This is the time of great opportunities and a major responsibility for all of us, for governments as decision-makers, for private healthcare operators who will absorb part of these investments, for companies such as GE Healthcare that are industry players and investing parties, even for all of us as citizens, to use this window of opportunity wisely.

There is the potential for fundamental shifts across the care continuum, including areas such as design and construction of facilities, training of healthcare workers, or sourcing and inventory management of critical care equipment and PPE materials, among others. But serious planning is required. We need to act with maturity and build a viable and powerful healthcare system for the next generations. ■

We Salute Our Healthcare Heroes!

 Author: [Olivia Lounsbury](#) | Clinical Research Coordinator, Patient Safety Movement Foundation | Irvine, CA | USA

The U.S. is one of the countries that has been hit hardest with the COVID-19 pandemic, and the stories about the frontline healthcare staff's plight are many. Lack of basic protective equipment, overburden, anxiety are just the tip of the iceberg of issues they have to face every day. The Patient Safety Movement Foundation (PSMF) talked to an unnamed frontline nurse about her work in a Texas hospital, and outlined the major problems in nursing care exacerbated by the pandemic.



Key Points

- Since the beginning of the pandemic, frontline healthcare workers have been working tirelessly, with their own needs often neglected.
- There are multiple issues with regard to PPE use and sterilisation while 'clustered care' introduced by some hospitals proved to have its limitations.
- Caring for the COVID-19 patients has also taken its toll on physical, mental and emotional health of frontline staff.
- Despite this, nurses continue to support each other in their work, of which they feel proud.

The near-universal toll and personal sacrifices due to the COVID-19 pandemic are well-established. Everywhere, people are suffering in one way or another. The physical and emotional burden experienced daily by healthcare workers on the frontlines is just as valid, and we cannot continue to expect mechanical-like operation from these individuals. They too have children they risk not seeing, have family members undergoing chemotherapy, experience job performance anxiety, which, coupled with a global pandemic, is amplified to the maximum. They too savour the few moments of camaraderie that are accidental externalities in performing the same task at the same time near a colleague. They too are people trying their best to help other people. It is important to recognise that the system's long-standing, gaping failures have been exposed, leaving individual healthcare workers

stranded without the proper resources in the time of greatest need. Assuming you recognise that healthcare workers are not spared from suffering when basic physical and emotional needs are left unmet, it is remarkable that they continue to carry on.

In the ongoing pandemic, the true superheroes have been those on the frontlines of the battle with the deadly coronavirus. Since its nascent stages, healthcare workers across the world have made personal sacrifices, compromised their own safety, worked overtime, subjected themselves to tremendous stress and anxiety, and have had to make difficult decisions personally and professionally.

These experiences are articulated to a personal degree in this interview with a nurse working on the frontlines in a Texas hospital. Although this nurse desires anonymity,

PSMF asked her about the near-universal challenges of nursing care during a pandemic, as well as the challenges specific to her region.

On 27 April 2020, Texas governor [Greg Abbott](#) was the first U.S. governor to issue orders for a phased reopening after over a month of COVID-19-related lockdowns. Subsequently, in mid-June (Champagne and Oxner 2020), the state reported a resurgence in cases greater than the initial surge. The decision, and the consequent outcome, fuelled public and professional contention and exacerbated the adverse impacts of the virus, with healthcare workers left to maintain operations as if nothing ever happened.

Personal Protective Equipment Challenges

By now, the world is very familiar with the challenges posed by COVID-19 in the healthcare setting, especially as related to personal protective equipment (PPE). Despite “rationing PPE very early on in the pandemic, *it’s hard to keep one gown clean all day,*” said the nurse. In addition to the gowns, the sterilisation process implemented for reuse of the masks leaves many nurses questioning its safety for themselves and their patients,

Hospitals have taken steps to implement ‘clustered care’ in an effort to mitigate PPE concerns and to limit the transmission that may be exacerbated by going into the room frequently. However, in this effort to protect staff, the process of clustered care may compromise the standard of care for patients, again, placing healthcare workers in a catch-22.

“For a ventilated patient, we go into the room every hour and provide basic care that can only be provided by physically interacting with the patient (eg, touching them, being next to them). We do clustered care every four hours. As a result, we’ve seen an increase in pressure ulcers, ventilator-associated pneumonias, and so on. Due to this decision, quality outcomes – things measured by Medicare, such as ventilator-associated pneumonias [and] catheter urinary tract infections, are no longer performed as they normally would be.”

The sole reason that so many healthcare providers went into the field is to help people who are in need. Knowing that clustered care and improper use of PPE may directly compromise patient outcomes, the anxiety and deliberation experienced by healthcare workers at each interaction is immense.

Every day, there’s a new policy, new research, new information from government agencies, interruption from managers – *the information overload wears on you*

as it “is not how they were meant to be used.” The manufacturer’s instructions specifically state that N95 masks are single-use and disposable. The chemicals used in the cleaning process are often unknown and are frequently changing. *Am I going to get cancer in ten years because of inhaling all of the chemicals needed to reuse masks?* The scepticism around the effectiveness of the cleaning process in maintaining sterilisation, coupled with the apprehension around the chemicals used, enhance the confusion and fear in bedside care.

Staff Safety Concerns

The simple act of donning PPE, a process intended to keep both the worker and the patient safe, is seen as potentially dangerous. “Putting on a mask means you’re touching your face. Even with good hygiene, there’s a greater risk of exposure.”

Before even encountering the patient, healthcare workers move with caution in deciphering the safest way to don and doff PPE that has been repeatedly chemically sanitised, to which the effectiveness is unknown.

Difficult Emotional Aspect

In addition to the new expectations of rapid-fire professional decision-making and adoption of new clinical protocols, healthcare workers are also experiencing the inherent emotional burden, both personally and with their patients and loved ones.

“I am a ‘feeler’ – an emotional person. It feels very callous to tell families, ‘I’m sorry, we are not allowing visitors at this time’ at the worst moment in a person’s life – robbing them of those experiences with their family,” the nurse told PSMF. *“It goes against everything I’ve learned as a nurse, goes against the grain of family-centred nursing.”*

“The lack of visitors has impacted the emotional and spiritual aspect of people’s lives. I feel overwhelmed with the constant need for human connection of our patients. The patients need to be able to FaceTime their families, and their families want to know how long this disease will last.”

Recognising the crucial need for person-centred care, nurses have been going the extra mile to help patients communicate with loved ones, and the nurse we talked



to was no exception. “One COVID-19 patient I cared for early on was an extreme case and their death seemed imminent. Our hospital did not yet have the capability to FaceTime families, so I let the patient borrow my personal phone to call their spouse. I thought, ‘If I were in the same situation, I would want someone to do the same for me.’” The patient ended up making a full recovery and leaving the hospital.

Nurse Stress and Anxiety

In an already demanding line of work, COVID-19 has increased expectations emotionally and clinically tremendously. Mental health issues, such as anxiety, depression and post-traumatic stress disorder, are notable in first responders and the military, and the same goes for healthcare providers. Nurse suicide rates and depression are underreported. “I have definitely felt more anxiety in the pandemic than I did before,” the nurse told us. “I was out for two weeks because I had respiratory symptoms similar to COVID-19 – yet I tested negative for the virus. The night before I returned to work, I was very anxious. I felt nauseous to the point of vomiting, and my heart was racing, anticipating the day’s chaos. Dreading my return to the hospital, I felt like I had drunk 10 cups of coffee. Upon returning, I told a fellow nurse, ‘I cannot tell you how anxious I am feeling right now,’ to which my colleague responded, ‘I feel the exact same way.’”

The anxiety provoked from the unpredictability of the pandemic has impacted patient care in significant ways. As the nurse told us, “Every day, there’s a new policy, new research, new information from government agencies, interruption from managers – *the information overload wears on you*. The chaos manifested in the clinic – medications were being given late, daily stresses were magnified tenfold.”

Sense of Camaraderie Does Wonders

“The biggest support for me is knowing that my co-workers are there for me,” the Texas nurse told us. “There is camaraderie and a sense that we are all in this together. We vent about silly stuff management is doing this week, which helps to offload the stress and anxiety and reminds me that *I’m not crazy – THIS is crazy!* Everything going on right now is nuts and we’re living that and our bodies are internalising that – nurses feeling physically ill, etc. My co-workers are the only ones who understand what I’m going through because they are also going through it – what it means to see a 40-year-old die on a ventilator or have doctors screaming at you over the hum of the Powered Air Purifying Respirator (PAPR).”

With little capacity to systemically support nurses during the pandemic, the brief moments of accidental run-ins with colleagues can immensely improve morale.

Nurses understand the policies other nurses are trying to comply with, the challenges of dealing with management while trying to balance patient care demands, and the significant adaptation and energy required each and every day.

“Nurses like to congregate and look out for each other. They are the biggest source of ‘you’ll never believe what happened today.’”

Nurses Continue to Persevere

Regarding the future of healthcare in the era of COVID-19, the nurse stated, “Texas has one of the lowest rates of testing nationally, yet the highest rates of COVID-19. We will keep seeing waves until there’s a vaccine. I don’t see any other way to curb the spread.”

As one might expect from a superhero, the nurse was very driven to persevere, despite all of the challenges. “Like many others, I live in fear of COVID-19 – but this is just another challenge that we’re being called to. *I take pride in my job*,” she explained. “Obviously, there are a lot of challenges – but if someone has to show up, I want to be that person. I want to be part of it.”

Listen to Nurses

While everyone in every corner of the world is feeling the impact of the COVID-19 pandemic, nurses and healthcare workers have the additional expectation of maintaining composure and the utmost work performance on an individual basis. Without the support of the entire organisation, this demand is unattainable and will likely lead to compromised physical and emotional wellbeing of staff.

Recognising the humanness in each individual makes a great nurse. It’s our turn to recognise the humanness in our nurses. ■

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Battle to Be Won by Virtue

◆ Author: [Amalia A. Hatziyianni](#) | Medical and Scientific Director | Famagusta General Hospital | Famagusta | Cyprus

Healthcare workers around the world are overburdened, exhausted and anxious. But some of them take the time to sit back and reflect on what is happening. One such person, a leading expert at the COVID-19 reference hospital in Cyprus, talks about the feelings during the pandemic and the meaning of virtue in the face of a crisis.



Watching the dramatic expansion of the epidemic in China, although in the beginning it was considered a local problem, far away from our country, was frightening. We were devastated to see so many people losing their lives from this deadly new virus there and later in Europe. When the World Health Organization (WHO) upgraded the infection threat level to a pandemic, it was clearly a matter of time for the invisible enemy to reach our island.

Initially there was fear for the health of our families, loved ones and compatriots, but we, as health professionals, knew that we had to take action to prevent the

spread of the infection and prepare our health system to deal with a possible high number of people falling ill. Fortunately, the Ministry of Health foresaw the risks to our citizens and started emergency preparations early on.

On Humility

As part of the strategic plan, the Famagusta General Hospital (FGH) was designated as the COVID-19 reference centre. When we learnt that we were put on the frontline of the battle against COVID-19, the unexpected pandemic, the invisible enemy, it goes without saying



that our concerns skyrocketed. That was an unprecedented crisis that required a rapid response by means of reorganising the hospital services, resources and staff. Understandably, at first the healthcare workers were scared, apprehensive and fearful for their own and their families' health.

We resorted to self-criticism and self-knowledge to identify, as realistically as possible, but with our human limitations in mind, our capabilities to fulfil this sacred mission. We chose humility. We overcame the panic of responsibility as well as the arrogance and selfishness of those who have been chosen to be on the frontline in the war against the coronavirus. On the path towards the unknown, which always raises anxiety, distress, the fear of infection, the fear for our loved ones, the feeling of insecurity, all our scientific and humanitarian potential

Our patients' desire to recover became the beacon for our actions. With it in mind, we upgraded our planning and organisational skills through unprecedented unity and teamwork of all the bodies of the FGH. There was great solidarity of the state, society and ordinary citizens. We offered our patients treatment but also filled them with optimism and provided them psychological and emotional support. For the patients, the medical and paramedical staff of our hospital substituted for the warmth of the family.

Fortunately, the majority of our patients recovered and were discharged from the hospital. For the healthcare workers caring for them, every discharge was a personal achievement and a cause for celebrations. Our staff showed impressive humility, compassion, devotion and extraordinary unity while caring for these patients.

Our patients' desire to recover became the beacon for our actions

had to be mobilised to support and live up to the expectations of our patients who saw us as their one and only lifeline.

On Fear

The main reason for the fear was the lack of knowledge of this newly-recognised infection. There were various aspects we had to learn about and get trained in very quickly. The first aspect was how to protect the healthcare workers, our patients and the society from this infection. But the most important was how to treat and care for patients with this disease. This required continuous training, studying of the latest medical literature, and communicating with colleagues from affected countries and learning from their experience. Equipped with the appropriate safety measures and knowledge, the fear of the infection was allayed. In no time, it was replaced by enthusiasm and willingness of the staff to get involved in the care of the people who unfortunately were stricken by the virus.

On Worst and Best

The loss of any patient under your care is always a very sad event, but in this particular case it was even worse because these patients could not have their loved ones around them in their final moments.

As they were in our care for quite some time, we developed a close bond with them, and the pain of their loss was similar to that of a family member.

On Being Prepared

We have reflected on the way we dealt with the first wave of the pandemic and drawn our conclusions. In the event of a second wave, our previous experience makes us better prepared to care for our patients. We already have all the required resources in place and the knowledge of treating these patients. Moreover, a significant amount of research is taking place all over the world, and we continue to keep ourselves up to date with the latest developments in the search of treatment and vaccination.

On Virtue

Equipped with the power of knowledge, training, protection, collaboration, appropriate resources, and compassion for the fellow human beings, we can save the lives of our patients.

We hope that the pandemic will be overcome. No matter what, the humanitarian ideals emerged victorious. Where there is dignity (or, more broadly, what in Greek we call *philotimo*) as well as determination, love, solidarity and humanity, battles against diseases are always won. This is the message sent by our reference hospital. Every recovery, every discharge filled us with happiness, joy and excitement. The pandemic caused so much suffering. Still, it has also highlighted the virtues of our nation. Our mutual support and solidarity is the culmination of virtue. Solidarity, love and humility not only heal but must also become the ultimate goal for our culture. ■

Healthcare Warriors of India

◆ Author: [Sunita Dube](#) | Founder/Chairperson | MedScapelIndia | Mumbai | India
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In India, the challenges of COVID-19 are exacerbated by the density of population, poverty, lack of education and hygiene culture. To help the public and support those on the frontline, over 7,000 healthcare professionals joined the nationwide ‘[We Doctors](#)’ healthcare campaign. Dr Sunita Dube, a radiologist by profession, spoke to HealthManagement.org about the initiatives of her organisation, MedScapelIndia, and her work during the pandemic.

I don’t know if there is such a term, but I think it was ‘doctor’s intuition’ that made me very concerned when I initially heard the news about China. I kept thinking of what could be done if the virus by any chance came into our country. As a result, in late January, I tweeted to the Honourable Prime Minister of India requesting him to stop issuing visas to people who wanted to visit India from China. My team and I spent many days researching and trying to figure out what that virus was and how it affected the human body, so that if it reached India, we would be prepared.

Everybody is Doing Their Best

I am immensely impressed by all my colleagues. Before the pandemic, we, as doctors, used to work very close to our patients. Hygiene norms have been followed, of course, but now maintaining distance from the patients while treating them is a very challenging task. As human touch is the core factor in medical practices, we have to constantly remind ourselves that distancing is the right thing to do under the new COVID-19 protocols.

If I had had a chance to go back in time, I would have definitely worked on improving my discipline and put more effort into educating people on the benefits of hygiene and building immunity with mindfulness in their lifestyles. I would have also come up with the ‘We Doctors’ campaign much earlier.

The general public is also doing their best. When the threat emerged, the situation was chaotic. No one was prepared for what was happening, or had any idea of what could be done. While people were following the government’s instructions and staying at home, there were some bravehearts who provided essentials like food and clothing to those who live below the poverty line. It is, of course, very important that everybody takes good care of themselves and their families, but at the same time it is the people who think beyond their own needs who make this world a better place.

The government of India and the health ministry have been very successful in framing policies for the benefit of

the society at large. It is often easy to give advice, but one cannot fully grasp the severity of the situation unless they put themselves into policy makers’ shoes. We, as ‘field workers,’ do have some practical insight, and the government has taken it into consideration when implementing its response plan.

The virus was completely new to the medical community. In COVID-19 patients, symptomatic treatment has been dominant, which is usually not the case in medical care. All doctors have been working out of their comfort zones, trying and learning countless combinations of treatments including antibiotics, antivirals, steroids and ventilator support. Doctors have been trying their best till the patient’s last breath. Some individual research in India has proven to be helpful. For example, we have recently discovered that radiodiagnostic practice can help people in critical stages with very low doses of radiotherapy; it is showing impact in critical patients.

Actions Make Impact

Our healthcare warriors have been doing a tremendous job. As doctors, we often forget to value ourselves while treating the patients, and when the situation is so fragile, we tend to get sceptical. I think, all the doctors should look out not only for their patients but also for themselves because they are the backbone of the healthcare system. Healthcare warriors need to have a lot more self-appreciation than they do now to be self-motivated.

For me personally, these times have been a great source of learning and realising my potential. I have come to understand that small steps too can lead to a better future. So now, I am more focussed on helping the society to create more awareness about COVID-19, which in turn leads towards a healthier India. We should all play our part, no matter how small or big, because more often than not our actions make significant impact. Also, family and friends should never be taken for granted because usually they are the people who support you unconditionally though hard times. ■

Helping to Get Spain's Largest COVID-19 Treatment Center Up And Running

The severity of COVID-19 grew chillingly real for Carlos Jimenez by the third week of March, when the disease claimed the life of his closest friend's father. He realized that he could no longer bear to watch the suffering that had enveloped seemingly every aspect of life. "I would move boxes or whatever else I needed to do," he says. "I wanted to go to the trenches and do my part."

Another close friend, José Pérez Blanco, wanted more from him than moving boxes. As director of a major hospital outside of Madrid, Blanco was responsible for setting up a makeshift COVID-19 medical center at IFEMA, the largest fairgrounds in Spain. As an executive account manager for GE Healthcare in Spain, Carlos had overseen various medical equipment installations for Blanco's hospital. Now Blanco wanted him to do something similar at IFEMA – but on a much tighter schedule.

Carlos quickly realized that he couldn't help Blanco while also doing his day job. So he requested to take off all his vacation time at GE Healthcare.

The marching orders for his new job were short and clear, Carlos says: "I was told: 'People will reach out to you with needs. Your duty is to meet those needs. If you are unable to do so, you must find someone who can.'"

The COVID-19 center was designed to handle a lot of patients, with one of the larger pavilions possessing 750 beds and enough equipment to treat up to 1,350 patients. The problem was that important life-saving equipment, such as ventilators, electrocardiographs and monitors, were scattered throughout the facility, making them difficult and time-consuming to locate.

Carlos saw that it was time to get 'lean' at IFEMA. Lean management is a system of continuous improvement used throughout GE's businesses. It focuses on boosting production efficiency by reducing waste and creating more value with fewer resources. For the staff at IFEMA, that meant having critical equipment on hand when they needed it most. Carlos and his team began taking inventory, scouring every inch of the medical facility to hunt down ventilators, ECG systems and other technology.

They moved the gear to storage areas placed in front of each nursing station, arranging each item on shelving or carts. "That way people could raise their heads and see what was available," says Carlos. Next, they standardized how to store each machine, such as always placing rarely used equipment on the bottom shelf below eye level. To keep track of their equipment, Carlos set up old-school chart boards for inventory all over the hospital, requiring



healthcare workers to check the equipment in and out.

Carlos and his team set up visual cues that walked people through storing equipment properly. They lined the floors with tape to demarcate where each machine belonged, posted simple pictures of the proper setup and slapped red inventory numbers on each piece of equipment to easily spot its whereabouts. Within a few days, the number of broken machines dropped by 98%, and caregivers were able to deploy critical equipment within minutes. "That was the most gratifying thing to see," says Carlos. "It was not just implementing order for the sake of order but eliminating any undue stress on clinicians."

On May 1, IFEMA discharged its last patient. The hospital had treated almost 4,000 people in 40 days, housing 1,300 at the outbreak's peak. Rather than pausing to acknowledge their hard work, the hospital staff and its volunteers spent the next week figuring out a strategy to quickly relaunch the facility if another outbreak arises.

Carlos returned to GE in early May with a deeper understanding of what is needed to operate efficiently in an emergency. However, what he talks about most is the inspiring people he met at IFEMA. "The entire time, I saw people coming here and working 24 hours, not willing to go back home and not asking to be paid." People like him. ■

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Fighting the Supervillain with Everyone's Superpowers

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Spokesman | Ethics Ellipse Smart Hospital of the University Medicine | Essen | Germany

The new superheroes of today – those on the frontlines of the COVID-19 fight – are widely acclaimed, but not always properly rewarded. While foundational changes of the system are necessary, there is a much simpler way to acknowledge their efforts, an ethics expert opines. This way, in fact, would turn anyone into a superhero themselves.

Key Points

- Superheroes are an indelible part of our culture, and COVID-19 – a supervillain – has created a new narrative for them.
- While the input of the 'new superheroes' is being acknowledged, this does not suffice without systemic changes.
- One such change may come from anybody, because anybody is capable of superpowers.
- Those who are selfish and careless lose, and – from a strategic perspective – solidarity wins.

"Heroes are made by the path they choose, not the powers they are graced with."

Iron Man

Grand Récit d'Pandémie

What would we be without heroes? As long as people hope, dream, worry and overcome challenges, we tell their stories. The spectrum ranges from art to pulp, from Homer's Gilgamesh, Iliad and Odyssey, the Attic tragedies, the medieval heroes, Judeo-Christian traditions, Nordic myths, Marvel; to Nietzsche's anti-Christian superhuman programme of revaluation of all values, and Wagner's ancient-Germanic heroes, amalgamated into an unsavory, ominous-eclectic mixture in National Socialism; to post-heroic (Münkler) and U.S. comic super(!)heroes of late modernism. In all these cases, the archetypes of the heroic, such as special physical and mental abilities, mostly occur together with basic ethical orientation. That is why we do not speak of good and bad (super)heroes, but only of superheroes and supervillains.

Superheroes are people distinguished by heroic deeds that have a particular impact, but also by moral importance. Their

drive is to bring the good into the world, to make a difference (Neiman 2012). Of course, sometimes even a hero fails, or is seduced and fails. However, this tension usually dissolves – in the good direction. And currently, there is a lot to do – with the COVID-19 crisis.

The corona crisis has created a new, global and somewhat anti-postmodernist narrative – Grand récit d'pandémie ('Grand story of a pandemic') – that calls new heroes to battle. This narrative did not arise in a cultureless space: "Publics bring their knowledge and past experiences with infectious diseases into their interpretation of media messages and they dwell in cultural contexts in which narratives on pandemics are in circulation" (Davis 2017, p. 7). The heroes are called to fight a new enemy, SARS-CoV-2, that seems cryptically harmless but is really a supervillain, with flexible incubation time; high infectivity in a-/pre-symptomatic COVID-19 sufferers; a tendency towards mysterious chronicity with surprising symptoms; and a final chance of immunisation nowhere in sight. Apparently, immersing in fictional superhero stories is emotionally relieving and motivating, but the ground truth can be found in clinics (and

apartments, retirement homes, etc) of this world. At the end of the day, everything depends on the triad of research, local containment and healthcare in concert with digital solutions like tracing apps (as long as immunity – natural or not – is just hope). Medical actors are assigned new, haunting roles. Virologists become, so to speak, priests of a new religion, superheroes that ‘man the frontlines;’ nurses and doctors are fully aware they are risking their own lives under sometimes unbelievable conditions (too little protective equipment, too little staff, etc) to – ideally, if possible – save the lives of others.

Superheroes & Us

The fact that those people who are so admirably committed certainly do not have any employment and/or job design alternatives in some cases does not detract from the effort and the result. Without a substantial, intrinsic piece of a noble spirit, this hard work is not sustainable. Unfortunately, there are various victims to complain about; a significantly higher, in comparison, rate of COVID-19 sufferers and fatalities among healthcare professionals is relevant (paying tribute does not reduce it; resources and systematic support do).

A hospital physician in northern Italian city of Cremona, Francesca Mangiatordi, has attracted media attention (eg, Jeffries 2020) as an example of fate, as she was forced to use triage medicine. Whether it is a [media-show](#) or not, in this case it is certainly useful to point out the factual situation with more drastic pictures.

The massive burdens, especially where triage is virtually unavoidable and healing action is no longer possible without the most serious ethical considerations, can only be dismaying. Even suicides among healthcare workers are to be lamented. Even if in many parts of the world – not in all – these professional groups are (finally) accorded ‘systemic relevance,’ failures (extreme as in the U.S., less drastic but also noticeable in Germany’s ‘nursing emergency’) will not be made up for in months, perhaps not even in years. Even if the reputation, if you can measure it by applause and frenetic acknowledgements, was immense at times, the salary structures of the healthcare industry are sad almost everywhere in the world. This is at least surprising for such a fundamentally important activity whether it is organised by the state or the private sector (although there seems to be a growing case for state-protected, adequate basic care combined with legitimate private business models that drive innovation – the patient must be the centre of attention, but the professionals must also be valued and fairly paid).

The now-familiar picture of Banksy’s ‘[Nurse-superhero](#)’ expresses what many people felt: admiration for the new superheroes of the corona crisis – an NHS nurse, one of today’s frontline healthcare Heroes and Heroines. The important question now is, what can – and should – we all do in the face of the pandemic (Heinemann and Richenhagen 2020)?

1. Hygiene rocks 2. Celebrate Face Masks



3. Distance means Closeness

Source: <http://dx.doi.org/10.1371/journal.p.0211304.g001>

Figure 1. The Big Three to Become a True Hero (Heinemann and Richenhagen 2020).

We can and should work for the superheroes, support them. Yes, we can become heroes ourselves if we use our superpowers for good. We can become heroes by making our own little ‘sacrifices’ that may restrict our way of life, but certainly not destroy, for example, democracy or ruin our lives.

Our Superpowers: Do What We Can

Attitude is crucial: confronting the situation even if it is difficult for all of us. Because it is about life or death, good life or suffering but also about livelihoods – yes, the economy and the society at large is being put to the test. Proactive action frees you up. It is better to wear masks (voluntarily), maintain hygiene and keep your distance (Fig. 1) than worry about toilet paper, and so on. It helps immensely to not generate any weighed-up scenarios forcing you to make decisions that clearly go beyond reason.

As far as it is medically and humanly reasonable and feasible, we can all make a substantial contribution and help the superheroes. Let us become a global ‘Sidekick Army’ fighting COVID-19 – and all the pandemics that are sure to come. We can set an example. Our children can and should be included, too (the UNICEF Project ‘[My Hero is You](#)’ – a new fictional book developed by and for children and aimed at helping families understand and cope with COVID-19 provides didactic support here). Our old people also deserve special attention; they often resist change the most, and this must be sized up safely.

Our superpowers are ordinary – or not. Only when we use them, do we grow beyond ourselves and our beloved everyday life because we protect ourselves and others, show

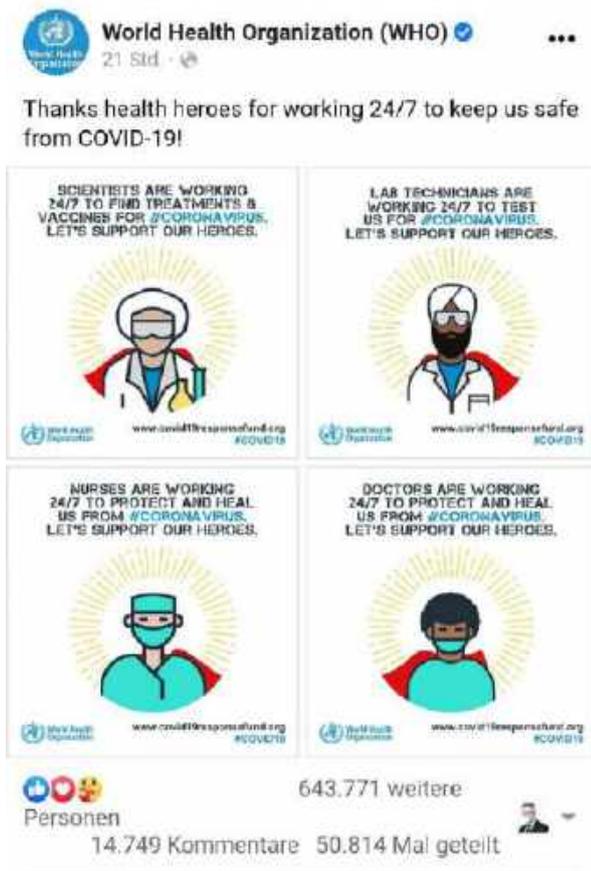


Figure 2. WHO Initiative to Thank Our Heroes Within the 'COVID-19 Solidarity Response Fund for WHO' (Source: WHO Facebook)

compassion, solidarity and discipline. Even if our mask may look less heroic, nobody knows our names and our actions go unpraised – they make a difference. It is our superpower to be strong against the pandemic together. Where, at first glance, systems, cultures and many more may divide, common understanding of basic values – to help people just because it is the right thing to do – also brings us together. It is not about doing the impossible, because duties imply ability. But what can be done, should be done. This is the path for Heroes.

Many organisations also support Superheroes, Heroes, etc in healthcare (Fig. 2) with campaigns. In addition, other professions are rightly recognised for their efforts, such as supermarket sales staff, those in delivery services, service staff at petrol stations, and so on. That in itself is a welcome development, but, as I have said, more than just statements must follow; real structural changes are needed. Why else would anything improve during the next pandemic, which is sure to come, if action is not taken today and healthcare is not developed into a place of the highest humanity, professional quality, inspiring innovation, high workplace attractiveness, and last but not least, optimal patient outcome? Digital

transformation is key to making such changes. This would also be a win-win situation for the system's usual losers – the people with neither purchasing power nor a voice. The best 'medicine for all' is not communism, it is justice. This by no means excludes legitimate business, even if, for example, the question of whether and how business can and should be possible with health data is controversial and requires deep ethical reflections (Heinemann 2019).

Many private initiatives have revealed a noble spirit in the communities. People help each other and thus also are superheroes. Some volunteers even actively participate in non-medical support for the COVID-19 treatment in clinics. There are many ways to help. The least anyone can do, as I said, is not to make the superheroes' work more difficult by their own careless behaviour. There may be no glory in prevention, but there is certainly no glory in carelessness. Our superpowers are not elitist, practically everyone has real anti-pandemic potential. Nor can we all change the grand narrative. But we can all together shape a future with such a strong society that there is no need to choose between factual survival and economic livelihoods.

This choice can only ever be made in favour of life. Even those who reject masks, for example, are probably well-advised to wear them in their own interest. Even those who still think COVID-19 is a sniffle and the real superheroes are not systemically relevant and admirable, can join in. The pandemic turns any purely selfish behaviour into a disadvantage for the egoist. Reciprocally altruistic or, even better, solidarity-driven brings better strategic results. Free riding at the expense of all those who restrict themselves to do the right thing, will not pay off. For the externalisation of the responsibility that everyone bears for everyone else in the pandemic is simply impossible (and ethically reprehensible).

These are complex relationships, but it seems clear that SARS-CoV-2 has no interest whatsoever in game theory (see Pejo and Biczok 2020 for a game theory study about the 'Corona Game') and simply wants to successfully complete its evolutionary programme. If everyone behaves intelligently, the probability of being infected decreases for those who are not able to apply tempered discipline – or even want to take advantage of others' discipline. That is correct, but for the free riders this probability does not drop to zero, and if free riders are not smart enough to keep their secret, they inspire others to follow and as a result weaken their own advantages. With each new infection, new exponential spread is easily possible as long as no final immunity has been achieved. Of course, it cannot be proven that my car has not been stolen because I usually lock it. But minimising risks in a pandemic works better in cooperation than purely with self-interest.

Admittedly, the above thoughts are extremely simplified at the level of individual decisions. However, modelling appropriate strategic situations makes sense because it enables deeper understanding of the factors that prevent, impede or promote broad agreement on the necessary and

valid measures in the context of individual responsibility for pandemic control. As long as we have the free choice to listen to wise recommendations, we should not wait until the state power sees no alternative to introducing tough sanctions and drastic measures. After all, they may well pose a risk to fundamental rights, at least in democratic states.

clean clothes.

5. Try to keep cool when you walk and warm when you ride and sleep.
6. Open the windows – always at home at night; at the office when practicable.
7. Food will win the war if you give it a chance – help by

There may be no glory in prevention, but there is certainly no glory in carelessness

Back to the Future

In 1919, *Science* published a paper on the major takeaways from the Spanish flu pandemic. Even then, prevention was described as an extremely difficult undertaking, and key factors were identified that made it so difficult to implement. “First, public indifference. People do not appreciate the risks they run. [...] The second factor which stands in the way of prevention is the personal character of the measures which must be employed” (Soper 1919, pp. 501-502).

How similar this looks to today’s picture. One could also say that the superpower that everyone has is in breaking through these factors (Bavel et al. 2020). The ‘superpowers’ recommended by a U.S. hygienist George A. Soper are as timely today as they were 100 years ago:

- “1. Avoid needless crowding – influenza is a crowd disease.
2. Smother your coughs and sneezes – others do not want the germs which you would throw away.
3. Your nose, not your mouth was made to breathe through – get the habit.
4. Remember the three C’s– a clean mouth, clean skin, and

choosing and chewing your food well.

8. Your fate may be in your own hands – wash your hands before eating.
9. Don’t let the waste products of digestion accumulate – drink a glass or two of water on getting up.
10. Don’t use a napkin, towel, spoon, fork, glass or cup which has been used by another person and not washed.
11. Avoid tight clothes, tight shoes, tight gloves – seek to make nature your ally not your prisoner.
12. When the air is pure breathe all of it you can – breathe deeply” (Soper 1919, pp. 505-506).

Unless the context requires otherwise, words in singular always include plural and vice versa; words implying gender always include all genders.

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Crossing the Rubicon to a Digitally Enabled Medical Care

Interviewee: Dr [Alessandro Roncacci](#) | Chief Medical Officer Interim | Affidea Group

The COVID-19 pandemic has become a catalyst for healthcare to embrace digital care. Affidea Group is already on this path and has outlined four priority areas to ensure the best possible care delivery for patients, doctors and providers.



Key Points

- Due to the need of minimal physical contact, the pandemic accelerated the healthcare's transition to digital care delivery.
- Safety is more important than ever, with reimagined workflows in place that can ensure efficiency, precise diagnostics and better patients' experience.
- Affidea has launched home care services and video consultations in several countries to provide patients with a fast and secure way to see their doctor from the comfort of their home.
- Teleradiology will have an increasingly important role and Affidea is already pioneering it benefitting from its platform of interconnected centers.

There are turning points in history when nothing afterwards would ever be the same again. This has been happening from ancient times when a decision determined who would lead the world forward to particular inventions that turned our world upside down. When Julius Caesar crossed the Rubicon River with his army in 49 BCE, he precipitated the Roman Civil War, which ultimately led to the rise of the Imperial Era of Rome. That day was a turning point in history, and everyone knew they would either emerge victorious or vanquished.

We are living a decisive moment in the healthcare industry. Even before the pandemic, we were witnessing a new trend in healthcare delivery – the shift from hospitals towards more outpatient settings, while the digital transformation was a point in everyone's agenda as a long-term objective. COVID-19 has accelerated this trend and has become the bridge for all of us to cross 'the digital Rubicon' in medicine.

The driving principle is to minimise exposure to physical contact wherever possible along the patients and doctors' pathway: from appointment and registering to reporting and receiving the exams, everything needs to happen online as much as possible. Patients will enter the medical centre only for the examination.

How can patients, healthcare providers and doctors adapt to this new normal? By embracing a new model of digital care delivery, with a sharper focus on patients and doctors' safety and with reimagined workflows that can

ensure efficiency, precise diagnostics and better patient experience.

At Affidea, we have aligned to the new market conditions, prioritising four things: maintaining the highest safety standards in our centres to protect our staff and patients; reshaping our operating model and the workflow in the centres; developing solutions to support the national health systems; and responding to the needs of patients and private companies with new customised services.

Safety becomes more important than ever

When restrictions have been gradually lifted across all countries, as a leading European healthcare provider with strong safety standards in place, Affidea has created a 'Care for Health' programme to support businesses to return to work safely. In countries like Greece, Italy, Hungary, Portugal, we have become the preferred healthcare partner of many private companies from different industries. We are offering them consultancy in safety measures and swab and antibody testing in compliance with national healthcare regulations and labour policies.

Our lab capabilities were crucial while navigating the COVID-19 pandemic, and it showed us that it can be more and more integrated with our portfolio of diagnostic imaging services and medical consultations in order to step into the predictive medicine field as a leading healthcare provider.

With a click away, patients can bring the doctor to their home today

One massive change brought by COVID-19 is remote care. When physical distancing is so crucial to slow the spread of the virus, the remote appointment options allow patients to continue managing their health and see their doctor safely from the comfort of their own home. This made healthcare providers to think out of the medical centre 'box,' adopting telemedicine or home care services.

At Affidea we have launched both home care services (blood collection, nursing, rehabilitation or diagnostic

patients recovering from COVID-19 is needed.

Together with our Thoracic Imaging Subspecialty Experts, Affidea has developed a follow-up programme with a multidisciplinary approach for patients recovering from COVID-19. At three months from discharge, all COVID-19 patients need to undergo a physical examination benefitting from the expertise of an interdisciplinary team, functional evaluation of the lungs and conventional chest radiography, with the possibility of adding a high-resolution CT if any abnormalities are found.

To increase patients' safety, our sub-speciality experts have developed low-dose CT protocols that allow accu-

How can patients, healthcare providers and doctors adapt to the new normal? By embracing a new model of digital care delivery

services at home) and video consultations in several countries to provide patients with a fast and secure way to see their doctor from the comfort of their home. They can connect with their Affidea Doctor in a matter of minutes. From anywhere they can go online. It's fast, affordable and convenient.

As one of the early pioneers in digital transformation, we see a similar shift in remote reading. Teleradiology will have an increasingly important role, and at Affidea, we have already moved into this direction, taking advantage of our platform of interconnected centres and impressive network of radiologists across 16 countries. An interesting study published in the American Journal of Radiology (Quraishi et al. 2020) has shown that more than 56% of radiologists would prefer to continue reporting offline, even post-COVID-19. The ability to access images in real-time, safely and securely, safeguarding patients' privacy, can improve efficiency, productivity and doctors' experience. 65% of radiologists from the same study reported decreased stress levels and 96% found improved or no change in turnaround times. This is the start of the telemedicine era.

As we continue to navigate the COVID-19 pandemic, an important focus will be the clinical follow-up for patients that tested positive for COVID-19

Although the lung is the most severely affected organ in patients that contract the virus, COVID-19 may increase the risk for other diseases like cardiovascular, neurological and renal diseases. Therefore, a careful follow-up of

rate identification and characterisation of interstitial lung abnormalities. Moreover, our Dose Excellence programme will enable us to optimise the radiation dose patients receive during a CT while ensuring a high-quality image. In this way, we make sure that patients recovering from COVID-19 have the best possible care along their medical journey.

In all 16 countries where Affidea is present, we have the know-how and experience, reliable and recognised safety procedures in place, a dedicated team of professionals and state-of-the-art equipment to be the preferred partner for doctors, patients and payors, be they public or private, standing by them when times are tough. ■

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Remote Work and Virtual Consultations: Emergency Setup

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◆ Author: [Luis Carretero](#) | CEO | Hospital de Dénia – Marina Salud | Alicante | Spain

For a hospital in Spain, the national state of emergency meant two major practical challenges – to provide tools for the staff to work remotely, and to roll out a virtual consultation system. Two hospital leaders talk about the challenges they had to overcome on this way and explain the technicalities of the implemented changes.



Key Points

- Declaration of the emergency state in Spain had several major consequences, particularly with regard to the continuity of patient care and uninterrupted workflows for the staff.
- As a result, the IT team has implemented a number of projects related to the scheduling of appointments, home follow-up of patients, patient comfort and remote work.
- Time constraints and the necessity for the new work order resulted in a number of challenges, such as maintaining the operational activities and ensuring the delivery of care, but also to some great rewards, eg, realising the enormous importance of the information systems in the hospital's work.
- While any change requires a lot of effort, in general the new approaches are met positively. On this way it is essential to keep your innovations simple.

On 13 March, 2020, with the government's emergency decree and COVID-19 declared a pandemic, one of the measures taken by the health authorities was to cancel face-to-face consultations in primary care centres and hospital outpatient clinics, and the isolation of patients admitted to hospitals. This decision to impose social isolation had several consequences:

- All planned activity was paralysed. This could be a serious problem since certain pathologies may lead to complications if a patient is not attended to within a defined time interval.
- Additionally, suspected COVID-19 patients with mild pathology had to

be isolated in their homes and followed up by health professionals to assess whether the symptoms worsened and decide on the need of treatment in a health centre.

c) Patients admitted to a hospital were largely isolated from their families. This contradicts the culture common in Spain that no patient is alone during their hospital stay. This isolation generated anxiety not only in patients but also in the family environment.

d) The hospital and the primary care centres became places of risk of contagion so teleworking had to be enabled for professionals who did not have to be in direct contact with patients.

Strategic Changes

Given the above situation, the following strategies and projects were defined.

Scheduling of appointments. According to a new process, practitioners reviewed all scheduled appointments and made the following decisions in each case.

- The case is not a priority and can be delayed, but a face-to-face appointment is necessary. A relevant remark is made so that it can be scheduled after the no-care phase in the centres is over.
- The case is a priority. It is scheduled as a priority with high security levels.
- The case can be resolved. The



doctor calls the patient and carries out a virtual consultation, most of the time by phone and in some pilot cases through a videoconference.

The technical setup involved the integration of the Zoom videoconference system with the electronic medical record (EMR). This integration uses the Zoom API and an SMS message API so that, in the medical record review flow, a doctor can start a videoconference with a patient by simply clicking a button. This process, however, includes several steps:

- Clicking on the videoconference button opens a Zoom virtual room in a browser on the doctor's computer. This room is unique and different for each patient.
- A link to the room is sent by SMS to the patient's mobile phone. Clicking on this link automatically opens the room.

Prior to this process it is necessary to contact the patients through the Call

in different areas to enable patients to hold videoconferences with their families during hospitalisation. These conferences were held using the Zoom platform, which had a very low learning curve.

Remote work. External access from home was a reality in the organisation from the beginning, but only for a limited number of users. As of 13 March, one of the priorities was to move the maximum amount of workers to their homes and make remote work possible. This whole process coincided with the change in the network infrastructure. The new firewalls were not yet ready to take on new VPN connections, so the use of existing ones was extended – a great effort since it was necessary to remotely install software on the staff's computers that had the most diverse configurations.

Due to complications in access configuration, not all systems could

implemented.

In terms of infrastructure, we needed resources such as tablets, smartphones, web cameras and headsets. On the software part, it was the licensing of Zoom and SMS-sending software, and the development of API integration. The use of Zoom as a videoconferencing solution required staff training, but the rest of the components were standard.

On the other hand, seeing that the information systems were the key to the success of our crisis management strategy has been the biggest reward. We have discovered that the systems not only are the foundation that sustains the operations but they must also be the accelerators of organisational and cultural change.

To see that patients and the epidemiological situation in general were under control at all times also was very rewarding.

The processes/projects that under normal circumstances would have taken months to realise were implemented in two-three weeks

Centre to confirm that they are willing to have a virtual consultation with a doctor, and have a smartphone. They also need the Zoom application installed. If it is not, they are guided through the installation and a test run is performed.

Home follow-up of patients with suspected COVID-19 infection. This required a new development on EMR as a set of forms was defined that were modified over time, since clinical information on COVID-19 evolved every week. In addition, this system included a census of patients as well as a planned daily follow-up process. Follow-up consultations were carried out by phone – integration of videoconferencing was impossible because the EMR in primary care was different from that of the hospital, with lesser room for development.

Patient comfort. A set of smartphones and tablets were made available

allow remote access, so adjustments and updates were necessary to make it possible.

Overall, the processes/projects that under normal circumstances would have taken months to realise were implemented in two-three weeks. Additionally, we have accelerated the adoption of virtual consultations and telework as a valid mechanism and not as a one-off or exceptional solution.

Biggest Challenges and Rewards

There have been a number of challenges on the way. For example, to get the professionals out of the care centres and enable telework. To implement systems in a very short period of time while keeping the rest of the projects going and the systems up and running. To not leave any patient behind neither lose control of the organisation due to the radical changes that were being

Change Leadership

There is a reason for change. Social distancing is the best prevention strategy we can do with COVID-19, and organisational changes along with technological ones are welcome. Obviously, any change in our organisations is a complex process, but the attitude towards change has been very positive.

One characteristic experience during the pandemic has been 'leadership in solidarity,' ie, there has not been a single leader but rather natural leaders have emerged in the face of adversity.

If you are dealing with challenges similar to ours, you have to imagine the best solution, make it easy to use, and not put up barriers that have not existed before. Think of solutions from other sectors that can be applied to certain processes even if they do not fit into the established culture. ■

Telemedicine in Time of COVID-19

◆ Author: [Alberto E. Porciani](#) | CEO and Founder | Top Doctors | Spain

The COVID-19 pandemic has boosted the demand for telemedicine services. Not all health systems, however, were ready to switch to this new format, so some corporate providers decided to offer their telehealth platforms for free. The CEO of one such company talks about the thinking behind the step and shares his vision of telemedicine's role in the future.



✓ Key Points

- The COVID-19 pandemic has presented a real threat of healthcare systems being overwhelmed. To avoid this, telemedicine has become an essential element.
- The surge in demand for telehealth services made it clear that such systems should be available to all of society, which led some companies to give healthcare professionals free access to their platforms.
- Thanks to this, it was possible for doctors to attend to patients with suspected or confirmed COVID-19 infection while maintaining social distancing and basic hygiene rules.
- Telemedicine will eventually become part of conventional medical care, and this requires certain adaptation from various agencies including governmental regulatory bodies.

COVID-19 has forced us to change, or perhaps it is better said that we have had to adapt. Before the coronavirus pandemic, in 'normal' times, medical practices and hospitals in Spain were already very busy. In Spain, there was an average of 7.26 visits to the doctor per inhabitant, which is well above the

European average of 6.80, according to figures released by Eurostat in 2017. Fast forward to the present, and the novel coronavirus has brought this system to the brink of collapse. The duty and obligation of those who are a part of the health sector has been to help as much as possible, making

everything that is needed available to avoid reaching that point. Digitalisation has been key to this.

When observing the trend that telemedicine was acquiring in China, it was found that in the first few weeks of lockdown, healthcare professionals attended via telemedicine to

176,368 people suffering from any of the symptoms of COVID-19. From this observation, we knew that the escalation of COVID-19 measures was going to become a worldwide trend and that companies that had this technology would need to make it available to all of society. As a company dedicated to providing technological solutions to doctors, we decided to help the healthcare system by making available to all medical professionals in the countries in which we have a presence, both from our network of specialists and to anyone who needed it, our telemedicine services at no cost. These costs were assumed by the company. We made this decision to alleviate the difficult situation experienced by both the health sector and patients, who in order not to congest hospitals and medical centres, were postponing their health check-ups and doctors' appointments.

ever. As a result of this decision, we activated other tools such as an electronic medical prescription service, a platform for exchanging medical documents and an immediate medical consultation chat service. Together, these technological solutions allow doctors to overcome the obstacles presented by lockdown in continuing to deliver care to their patients. All of these services were, once again, at no cost to doctors during the COVID-19 crisis. Thanks to these tools, doctors can:

- Prescribe medication in a regulated way through an electronic prescription, and the patient can exchange it directly at the pharmacy for their treatment.
- Exchange tests, reports or results safely with patients.
- Resolve any medical question instantly online.

COVID-19 has rewritten healthcare

practices are establishing a strict appointment policy, with the most urgent of patients seeing the doctor in practice, whilst the rest continue to consult the doctor via video calls. This allows patients to resume their health care as soon as possible, but to do so without increasing their risk of COVID-19 infection.

From my point of view, there is still another step to be taken in the use of these technologies, which we will see with the arrival of the new normal. We will observe a phase, in which the concept of telemedicine will be fully integrated into conventional medical care, as well as into the offers given by health insurers, who will undoubtedly include this service in their coverage to support their policyholders. For this to happen, social, health, business, educational and above all governmental areas must be adapted. At present, Spain does not have a

Now that medical consultations are starting to resume as lockdown measures gradually de-escalate, the vast majority continue to do so through telemedicine

Telemedicine has helped health professionals during this pandemic in several ways. Firstly, it has allowed practitioners to attend to possible cases of COVID-19 before referring those in person to hospitals, thus helping to decongest them. It has also helped doctors to continue caring for patients who could not attend face-to-face appointments. Lastly, and above all, it has allowed health care to be given to patients, without compromising social distancing and hygiene measures.

On top of this we wanted to go further and offer complete solutions to doctors and patients. Therefore, we decided to accelerate our pending technological developments so that we could offer them during a time when they would be needed more than

as we know it. Almost overnight we have found ourselves in the future of technological healthcare, which many thought would not become a reality for some time. In fact, technological players have gone from having to spend hours trying to demonstrate how the digital transformation of the health sector helps everyone, to seeing demand for these types of solutions, both by the private and public sectors, multiply by 30 in just two months. Now the current challenge is getting these tools to perform fluidly with this sudden increase in demand.

Now that medical consultations are starting to resume as lockdown measures gradually de-escalate, the vast majority continue to do so through telemedicine. Many

specific regulation on this matter, but one must be established. It should be noted that the use of this technology has always been totally secure, to encrypt the data that are handled and the conversations held, and maintain the anonymity of the patient. For this, a number of national and European laws are applied, including the GDPR.

To summarise, we are learning from these very difficult times, seeing what the needs are and solving deficiencies in record time. This is all thanks to digitalisation, which has helped the healthcare system to electronically close the circle in the doctor-patient dynamic. Above all, this has transformed this relationship into one that does not require the patient to leave home if it is not absolutely necessary. ■

COVID-19 Challenges of IT Team

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◆ Author: Valentín Elizondo | E-Health Programme Manager, Clínica Universidad de Navarra Pamplona | Spain

After a state of emergency was declared in Spain in mid-March, an IT team in a leading hospital had to develop a number of systems, upgrade the infrastructure and provide training, to ensure that the delivery of care continues smoothly. Two experts who led this massive effort share their experience and outline the new areas for work, which the pandemic has brought to the forefront.



✓ Key Points

- Despite the state of emergency in Spain, Clínica Universidad de Navarra had to continue providing care to its patients. Its IT team was tasked with finding alternative ways of care delivery.
- A virtual consultation system was set up with expanded functionality, and relevant training was provided to the staff and the patients.
- Use of many online platforms simultaneously proved to be counterproductive, and the IT team had to optimise the communication flows between various parties with a distinct set of tools.
- Training the staff and the patients has been one of the biggest challenges on the way. The IT team encountered some reluctance from the staff to use the new telemedicine tools, but the general perception has been favourable.
- Now telemedicine is one of the priorities for further development. Some potential for improvement also lies with video conference systems, data collection, and security.

Clinica Universidad de Navarra (CUN) in Pamplona and Madrid, Spain, is a private academic and research hospital system listed among the top 50 hospitals in the world according to Newsweek magazine. At CUN, we take care of thousands of patients from more than 50 countries per year. CUN's distinctive feature is that it has its own hospital information system (HIS), electronic medical record (EMR) system and ancillary systems being developed by a strong IT team for over 30 years. During the pandemic, this has proven to be our main strength.

Tasks and Challenges

Due to the COVID-19 outbreak, the Spanish government declared a state of emergency on 13 March, 2020. The

the physicians to better understand the strengths and weakness of virtual consultations, and we are going to work on a strategic plan in order to make virtual consultations part of the services we offer. Also, it is now clear that we should reconsider what a virtual consultation is. At the beginning, we thought that it was only to provide a video call between a patient and a physician, but we discovered it was much more than that. The process starts with the patient getting an appointment and, maybe, needing to send medical information to the physician in a secure way. Or the other way around, the physician needs the patient to fill in some forms. A virtual consultation also does not end when the video call is over as some drugs may need to be prescribed or

- One tool to send/receive files and medical records from/to patients.
- One tool to call/contact patients and colleagues.
- Encourage the use of our mobile app and patient portal to get in touch with patients.

Biggest Reward

We can be proud of ourselves. As an IT department, we were more prepared than we thought. Almost no technical issue had to be resolved. Now, two months later, we think that this has been a big step towards the adoption of new methods, and we have found support among the physician leadership to encourage the use of our telemedicine systems. Now our challenge is to maintain this momentum and improve the virtual consultation ser-

So far, our biggest work has been in change management, focussed on physician training. We had to make a big effort here

measure allowed the authorities to limit the movement of citizens and ration the use of services in a bid to slow the spread of the coronavirus.

We at CUN, however, had to keep providing medical services to each of our patients, regardless of where they were, with all the available tools. So we put all our IT team to work to achieve this objective as fast as we could.

So far, our biggest work has been in change management, focussed on physician training. We had to make a big effort here. Other tasks have been easier as we had done part of the job before the pandemic and have been more prepared.

We are right now evaluating the outcomes. The main objective was to provide an alternative way to deliver patient consultations. We have just completed a survey among

nursing department may need to be informed of the patient follow-up.

We have discovered that, in order to achieve the excellence we want, there are many tasks to be done.

Change management and effective internal communication to align physicians, nurses, assistants and patients in a short period of time using the right tools was a real challenge. We were overwhelmed with so many communication tools for internal and external communication. We were trying really hard not to collapse using at the same time tools such as Skype, WhatsApp, phone, Teams, Zoom or email, among others. In those new stressful conditions, having too many options was counterproductive. Therefore, we had to choose one, and only one, tool for each task.

vice, so that it becomes something physicians use every day. It should help us to reach and retain patients who live far from our facilities.

User Attitudes

We can observe two attitudes to the adoption of computer tools. There are some physicians who see the new tools as 'a waste of time,' but there are more of those who think these tools help to improve their work and that we, as hospital, must encourage their use. We can say that our physicians either love video consultations, or hate them. It seems that there is no middle path.

The biggest challenge so far has been with training patients and physicians. In the first two weeks of the state of emergency, the IT department's work was mainly about organising training for physicians

and nurses, with courses all day long for each tool. We also had to reinforce patient training and explain how they can access our patient portal to send files, medical records and second opinion surveys, make appointments, or make video calls to our employees.

Infrastructure Adjustments

There was a huge need for web cameras and video infrastructure setup. Also, many laptops had to be

staff are also fine with telework.

The major outcome of these projects would be that, when the pandemic ends, we will still be providing video consultations. Now our physicians demand more online tools from us to serve patients as efficiently as we do during traditional face-to-face meetings.

Increased adoption and new departmental projects would be some of the KPIs we must be looking at.

One of the long-term outcomes is

that patients can provide by themselves before getting to the hospital. It will improve our face-to-face consultations, but especially our remote consultations.

Additionally, cybersecurity and secure development issues are now much more important than before as our systems are more exposed. Over the years, all security issues we had to deal with were related to infrastructure and network access. This has changed now, and this year our

Our physicians either love video consultations, or hate them. It seems that there is no middle path

provided to the staff.

More than 400 CUN employees received training, and we acquired and started using new software, as we needed a documentation transfer tool for the second opinion consultations and medical review follow-ups, and patients were sending files by email or through other non-GDPR-compliant platforms. We were not ready in March because patients were used to providing all this information on paper and by hand to a physician. There are still some concerns about privacy and how to send medical information online. This is why we have decided to use the new software, which is 100% integrated with our HIS and EMR, so patients can trust our system and actively use it.

Major Outcomes

For the IT department, the work has not changed much because of the pandemic. The only difference is working remotely. Among the IT staff the satisfaction with remote work is very high, and they claim they will keep working this way once the pandemic has ended. Our clinical

work on new and improved processes based on the lessons learned in stressful conditions, to be better prepared to face the new challenges.

New Research Areas

This pandemic has surely opened some new directions for us.

One line of action would be the increase in mobile and cloud-based tools and their integration with our on-site systems, so that the physicians are able to use all their tools regardless of where they physically are.

Also, new collaboration tools for physicians are needed. Video conference systems used by patients and doctors to meet should improve with added functionality, eg, a multi-party call with another doctor or the patient's relatives on the go. The physical space and environment, in which physicians use the video system, had to be reevaluated as noise or light conditions are important, but almost no one takes care of these.

Another discovery has been the need to upgrade the data collection during the registration process. We should expand the amount of data

development team will have to make a big effort to improve the situation.

Success Factors

We think that our relative success has been due to the adoption of agile teams for the development. This enabled us to react fast enough when a response was needed. Many processes had to be revised because of COVID-19, and our system enables us to implement the changes quickly.

Regarding the general management, a strong crisis committee has been created. This has helped to communicate information between departments and areas, to clarify and unify the criteria.

Our advice to colleagues would be – you should not be afraid. Taking risks to push new initiatives, using technology, and transforming an organization are the new roles CIOs have. And here in Spain, not just at CUN, every CIO we have talked to discovered that we were more prepared than we thought. ■

Digital Health After COVID-19

#medicosfrentealcovid Experience

Author: [Julio Lorca Gómez](#) | Director, Digital Health Development | DKV | Barcelona | Spain

Supporting the efforts to ‘flatten the curve’ of COVID-19 infections, a company in Spain has encouraged health professionals to volunteer and offer teleconsultations to the population using its telemedicine platform free of charge. An expert who led the project explains why this was necessary from a business perspective and how telehealth is here to stay and grow.



Key Points

- Today, eHealth is a powerful ecosystem that can reconfigure and disrupt healthcare.
- The COVID-19 pandemic has made many people realise how useful digital tools can be.
- With many new technologies available, eHealth will continue to develop and thrive.

I am a doctor, but over the years I have developed my career in innovation and specifically in digital health. A few days ago, I remembered an article from 1997, in which I talked about what would be the future of electronic prescription that we were conceiving at that time. I ended up saying that:

“...[it] will be part of a truly comprehensive care process, articulated around powerful information technologies shaped as large telematic networks that will allow to maintain a personal and unique medical history as a reflection of the health biography of any citizen and that will be accessible from any point and time it is required” (Lorca 1997).

This is exactly what we have achieved today, “an ecosystem that creates powerful

forces that can reconfigure and disrupt industries.” In healthcare, it has the potential to deliver a personalised and integrated experience for consumers, improve providers’ productivity, engage formal and informal caregivers, and improve outcomes and affordability.

In Spain, during this long period of lockdown due to COVID-19, we have seen a surprising growth in citizens’ initiatives to help the community, ranging from local networks to support the elderly with grocery shopping to performances on many balconies. On the business side, there has been a great effort to adapt daily activities to the virtual environment. And, of course, we have had the best health professionals who have been struggling under these extreme conditions and to whom we are grateful.

A symbol of this would be a case of a retired doctor, Dr Josep Maria Sala, who, like so many others, volunteered to support COVID-19 patients following an offer from the SEMI and SEMFYC scientific societies. As Dr Sala says, “I came to provide about 40-50 consultations a day. I got up in the morning, turned on the application and did not stop. I worked with the application ‘Quiero Cuidarme Más’ 12 hours a day, people were very grateful, and I felt useful. Also, I had never had such grateful patients, and the lockdown flew by because I was working all day long.”

Indeed, the COVID-19 pandemic has certainly been a turning point for eHealth. During this time the need for health care

and advice has increased exponentially, but traditional accessibility was compromised because of the risk of contagion and because physical health clinics and hospitals were overwhelmed by demand.

Until now, both patients and professionals were unsure of the efficiency or potential of eHealth services. Spain has a primarily public health system, and for many people this digital type of medical care has never been the first choice. But in the last three months of running our free-for-all project #medicosfrentealcovid (‘Doctors in front of COVID’), it has generated 30,000 consultations, and I firmly believe that this has opened the eyes of many people.

This encourages us to continue on the path of predicting the future... by defining it. And that is what we are going to do from now on in our new Laboratory of Innovation in digital health at Barcelona Health Hub headquarters, Old Hospital de Sant Pau. With the #smartpositivehealth movement we aim for a model of innovation driven by utility that allows to transform the available knowledge into sustainable value, thanks to the enabling power of the new technologies of virtualisation, ubiquity and artificial intelligence. ■

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Upcoming Issue

Cover Story: Smart Diagnostics

Recent advances in technology have led to a major shift in prevention, diagnosis and treatment. A one-size-fits-all approach is rapidly moving towards a personalised patient pathway, so that the patient can remain at the centre of healthcare. Genomics, preventive lab tests and personalised pharmaceuticals have created new dynamics. And with major players like Amazon, Apple and Google moving into health-care, how fast will we see progress? What fresh ideas and solutions are changing the game?

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