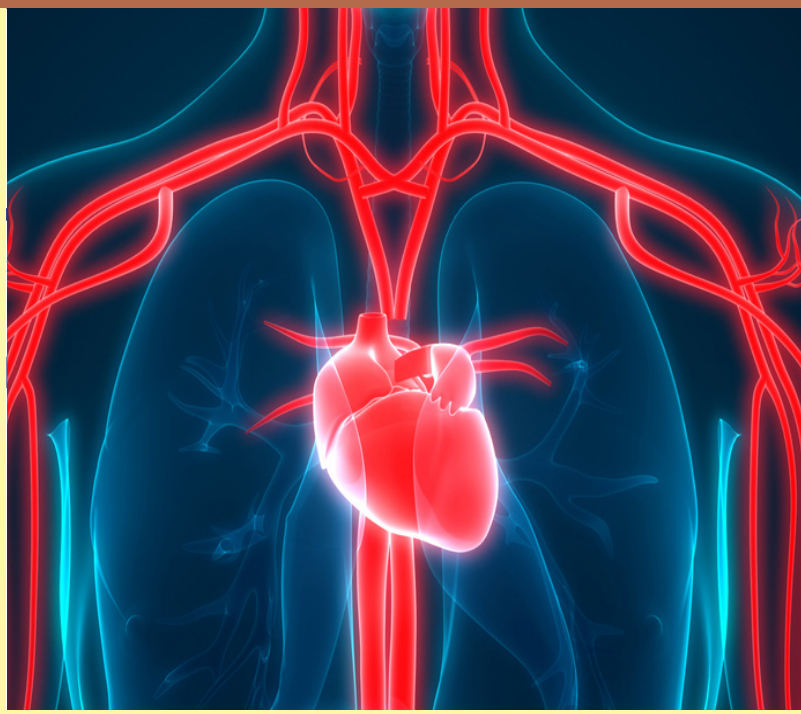
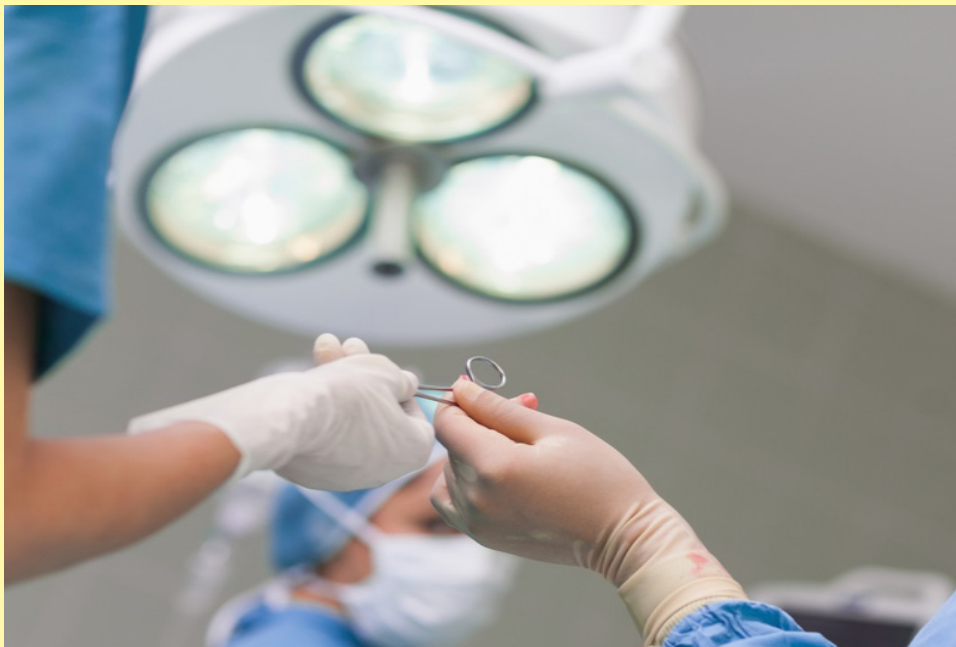
Swāsthya Health

JOURNAL FOR HEALTHCARE PROFESSIONALS स्वास्थ्य

Promoting Research & Innovation

Spring 2021





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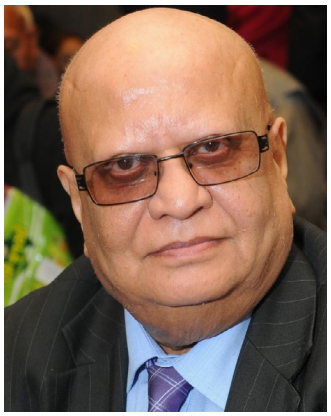
Designed and Published by
Gujarat Publications Ltd
Bedfordshire, United Kingdom
Managing partner: Capacity Management Ltd



Last year, when Swasthya was undergoing planning considerations, there were anxious times regarding the enormity of the challenge. Often during the development stages, encouragement from many colleagues added to the strength of perseverance to face the challenge. It is indeed a sense of satisfaction to realise the successful completion of the target of the year by publishing all the quarterly issues.

The COVID pandemic has dominated almost all aspects of our lives with paralysing effect and unleashing a significant level of disruption. Thus, the issues related to the COVID pandemic has featured in many of the articles in some form or other. I would like to register our sadness at the loss of many of our colleagues who have sacrificed their lives while bravely contributing to alleviate sufferings and save many lives. Our condolences to the family of Dr KK Aggarwal, a remarkable medical professional of high repute among the giants of the medical fraternity who passed away after battling with COVID in India on 17th May 2021.

I am grateful to Dr Iqbal Singh for highlighting some key issues and recommendations arising out of the recently published Race Disparities Commission report with the insistence that it is vital to ensure that health action plans are led by BAME medics. Dr S Basra, GP, has resurrected the famous saying by a Greek Physician and Father of Modern Medicine," All disease begins in the gut." His opinion article discusses the role of inflammatory processes in the well-being of the many patients seen by the GP surgeries for various ailments.

Swasthya has now three specialist sections; Surgery, Cardiology and Mental Health, with the editorial, focused on articles and information that promotes 'innovation & research' for improving patient care and safety.

There is an article and information on Clozapine and Pharmacogenetic Testing, which is regarded as a "Eureka" moment in modern psychiatry. Mental Health section Editor Dr Santosh Mudholkar has described it as a new dawn in the treatment for the Schizophrenia. Dr Mahendra C Patel has kindly pointed us towards a new research initiative on Asthma drug budesonide that shortens recovery time in non-hospitalised patients with COVID-19.

The readership of Swasthya is expanding and the expert contributions are being noticed by many institutions in the medical fraternity. I welcome Dr Sharad Agrawal, a Cardiologist who has kindly agreed to lead the Cardiology Section of Swasthya. Dr Santosh Mudholkar, a Consultant Psychiatrist is leading the Mental Health Section and assisted by Prof Nandini Chakraborty, a Consultant Psychiatrist as Associate Editor and Dr Fabida Aria, also a Consultant Psychiatrist. Mr C R Chandrasekar has taken the lead for the Surgery Section and he is joined by Mr Amit Sinha as Associate Editor, both Orthopaedic Surgeons.

The collective efforts are reflected in the quality of contributions of articles, and I am indebted to their guidance and support. I am looking forward to adding sections for other specialities as there will be new additions of experts joining the Swasthya editorial team in due course.

I am grateful to Dr Satwinder S Basra, Dr Anand Deshpande, Dr Kailash Chand and Prof Gautam Bodiwala for their encouragement and support for the Swasthya. I would also add my sincere thanks to Satish Parmar for his support and assistance.

As a team, we hope that you will find this issue, both informative and helpful.

Buddhdev Pandya MBE
Managing Editor
Swasthya

The changing shape and role of pharmacy

-consolidation of expertise and resources

Mr Buddhdev Pandya MBE
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Organisational Psychological Medicine

Prof. Mahendra C Patel
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Mr Buddhdev Pandya MBE Prof. Mahendra C Patel

Throughout the history of healthcare, from what one known as compounders to the modern-day pharmacists, all represented a valuable link between the doctors and the patients. There was a common phrase 'Ask the pharmacists', used then and it has returned back into the community.

There are huge technological advances facilitating improvement in quality of care. The NHS with its significant transformation would inevitably bring many new challenges for the primary care, requiring additions specialised support in the GP surgeries.

The NHS England's House of Care model includes many solutions involving changes in many working practices and developing multidisciplinary team approaches. In this context the modern pharmacists would need to be placed in a position for their proactive engagement to be more effective interfaces between specialist providers and the wider primary and community care teams.

A glance at the past development

The origin of access to many drugs goes back to many years when the European countries, including Briton developed apothecaries derived from Peppers, and other Spices. The traders of spices brought crude drugs and prepared medicines and sold to Grocers or Apothecaries. It evolved into a distinct occupational group in the thirteenth century. These practices were allowed under the law of Guild of Grocers until 1617 when the Society of Apothecaries was formed[1].

These apothecaries were both physicians and pharmacists, diagnosing and dispensing the medicines. Later by 1815 a new group had emerged and expanding to act as chemists and druggists to become manufacturers and packaging for the wholesale market. The Apothecaries Act of 1815 confirmed apothecaries as general practitioners and leaving others to retail selling and supply of medicines[1].

The modern pharmacy has its roots began with the foundation of the Pharmaceutical Society of Great Britain in 1841. Its membership jumped from 800 in 1841 to 2000 in 1842. By 1868, when it was made illegal for anyone to sell or dispensing or compounding medicines, or to use the title chemist and druggist or pharmacist, or dispensing chemist, unless formally registered to do so. Today in 2020, there are estimated 42,990 registered pharmacists and 19,311 registered pharmacy technicians in England.[2]

The word 'compounder' was well known in the colonial Britain. They were processing drug by mixing or altering ingredients to create a medication tailored to the needs of an individual patient. In other words, they were basically pharmacist but not allows to prescribe medication. This was done by the doctors. This relationship between the doctor, pharmacist and the patient were strengthened by 1880 when the House of Lords ruled that companies could not only use restricted titles but could sell poisons provided it were sold by a qualified person, confirming the pivotal role of pharmacist in the process.

In a landmark court decision in October 1920 the Court imposed restrictions that the Society did not have powers to regulate wage, hours of business, and the prices at which goods were sold, or to provide insurance or legal services.
By 1946, 24 million workers were covered by National Insurance. In July 1948 the National Health Service made the service available to everyone, raising the prescription numbers from 70 million in 1947 to 250 million in 1949. The counter sales started to had decline rapidly and more dispensing assistants were recruited. During 1950s and 60s, the numbers new drugs came into the market with the increase of tablets and capsules, the extemporaneous dispensing decreased. Prescriptions alone generated almost half of the income of the pharmacist.

In the early 1980s a new role for hospital and industrial pharmacists emerged. The community pharmacies reinvented itself with initiatives such as the National Pharmaceutical Association's 'Ask Your Pharmacist' Campaign.

The Nuffield Report in 2014 pointed towards the change for community pharmacy to shift away from dispensing and supply, and towards pharmacists as care-provers. It noted, "We believe that the pharmacy profession has a distinctive and indispensable contribution to make to health care that is capable of still further development'.

Pressures on the GP surgeries

There are demographic changes and more complex health needs, placing more demands in the primary care sector. It is also worrying that the number of GPs relative to the size of the population has been notably fallen since the 1960s.[3]

The North West London and the East of England would have lowest total number of GPs per 100,000 people. Also, lesser numbers of previously trained are likely to join the NHS.

The inconsistency in the immigration policy has nurtured a shortfall in recruiting enough from abroad. In recent years, more GPs have also sought early retirement, adding more pressure on the NHS.

The Royal Pharmaceutical Society (RPS) believes that primary care patients should have the benefit of a pharmacist's clinical expertise in the GP surgeries, like that is experienced by patients in hospital.
The Nuffield report (2015) suggested that 3.6 per cent of patients, most of them older and frail, took up more than a third of the bed capacity in England's hospitals in 2014. Most having competed their treatment could be discharged back into the community. However, due to shortages in arrangements in providing homes care or a placement in any care homes, many have no choice but to be remain in the hospital. The policy of unblocking beds occupancy, understandably, has become a necessity to prioritise urgent cases and to facilitate emergency admissions.

It falls upon the GPs to pickup the treads of care for those discharged from the hospital care, leaving the surgeries overwhelmed, originating from patient requests and prescribing and other follow up recommendations from other health professionals. It is important to bear the factors that and inappropriate polypharmacy in frail elderly people can be problematic. The face-to-face consultation time constraints and the demands on the GPs means that quality of care can be compromised.

It would be prudent to have practice pharmacist as a part of the team in the GP surgeries as part of processing the patient's clinical record with the appropriate medication.

This can also help reducing communication gaps and easy access to expert advice for patients making the system more user friendly. This can support patients by helping them in relation to any self-limiting minor ailment consultations and provide guidance to get the most from their medicines.

There have been previous calls by the Royal Pharmaceutical Society (RPS) and General Medical Council to have greater involvement of a pharmacist in medical practices.[4] However, in March 2015, both of these institutions accepted 'radical proposals' which were aimed at encouraging the pharmacists working in GP practices all over the country.

Prescribing pharmacists and access to medical record

The NHS Summary Care Record (SCR) is an electronic summary of key clinical information. Now this is being integrated to create central patient record systems for use by all healthcare professionals, but the focus is now on ensuring inter-operability between individual health record systems and across boundaries.

This is one of the significant changes in the primary care is the access to medical records of patients in the pharmacists in the community pharmacy setups. This would also be a game changer for the primary care where the community pharmacist resource was rather seen as stand-alone entity, but now using the NHS reference number, access to the medical record enables the 'prescribing pharmacist' to review medication or offer advice.

Savings on prescriptions:

Medicines are recognised as the single biggest intervention for the prevention and treatment of ill health. It costs the NHS approximately £14.4 billion (2013–2014). The World Health Organization estimated, the adherence among patients with chronic diseases averages only 50%. The cost of non-adherence has been reported to be over £300 million with a potential to save £500million in the UK.[2] One of the key roles for the clinical pharmacist independent prescriber would add value for medication reviews, moving the management of patients with multiple long-term conditions away from the doctors. There are other areas such as the blood tests, adjustment of therapies and issues relating to pain controls for acute sufferers, to ensure no one falls through the cracks in the service that should be a patient centric process.

Quality control

The Pharmacists can deliver safe, high quality, effective and efficient care to patients. Most physicians are familiar with consequences of errors in prescribing medicine. The PRACtICe study[5] has indicated the overall prevalence of prescribing and monitoring errors in general practice at 5%, coupled with the large numbers of unscheduled admissions caused by medicines, about 7%. The PINCER study evidenced the cost effectiveness and the value of the pharmacist.

An added benefit would be that the practice pharmacist could help in managing good practice guidance issued from the National Institute for Health and Care Excellence, and the Medicines and Healthcare Products Regulatory Agency.

The pharmacist independent prescriber role would also provide scope for medication review clinics, moving the management of patients with multiple long-term conditions away from the doctors, while providing effective support for patients.

As the technology is advances, the future pharmacists with specific training would provide expertise in the optimal use of medicines in multi-morbidity. The Centre for Workforce Development has predicted likelihood of having surplus of over 19,000 pharmacists in the UK. By 2040. Thus, deploying the skilled pooled of professional would a part of the solution. They could ideally complement the role of GPs and practice nurses and adding value to the range of knowledge available in GP surgeries to manage increasingly complex care. At least, their presence would help improve care across the interfaces between specialist providers and the wider primary and community care teams.

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5. The need for good prescribing practice is well documented by the PRACtICe study.

RACE DISPARITIES COMMISSION REPORT

Vital that health action plans are led by BAME medics

Professor Iqbal Singh OBE FRCP
Chair – Centre of Excellence in Safety for Older People (CESOP)
Member - Honours Committee Health

The CRED Report has three specific recommendations aimed at health and it is important that these specific recommendations are implemented and resourced properly to be able to make a meaningful contribution to addressing health inequalities.

Covid-19 has highlighted the huge disproportionate impact on BAME healthcare and social care staff, communities and accentuated many of the structural and health inequalities. Over 20% of NHS staff are of BAME origin. Over 44% of the doctors working in the National Health Service are of BAME origin. This may be viewed in many ways as a shining example of diversity within the NHS, but further analysis points out the lack of this group in the powerful decision-making groups and strategic advisory groups. It is therefore a poor example of inclusion.

The appointments commission had taken positive steps to increase the representation of BAME doctors and communities in the NHS boards but over the last ten years the percentage of NHS board chairs from BAME backgrounds has remained between 6-9%. This lack of visibility and involvement in decision making is reflected in individual trusts at the higher levels in the NHS, DHSC and other regulatory and health organisations. Such absence or exclusion appears to be caused by bias and discrimination in career development, progression, recognition and appointment process.

In terms of the three specific recommendations:

Recommendation 2: Review the Care Quality Commission's (CQC) Inspection Process.

The CQC as a regulator has the potential to influence and help deliver change by holding the individual trusts accountable. Sir Simon Stevens launched the Workforce Race Equality Standards (WRES) that all trusts have to publish and are assessed on their WRES data. There are nine indicators which form a part of WRES data and these include BAME board membership, percentage of BAME staff experiencing harassment, bullying or abuse from patients, relatives or the public in the last twelve months. The percentage of BAME staff believing the trust provides equal opportunities for career progression or promotion and the percentage of BAME staff personally experiencing discrimination at work and the relative likelihood of white applicants being appointed from shortlisting across all posts compared to BAME applicants. For some years now the WRES data is taken account of in CQC inspections and forms part of the well-led domain assessment. This reflects the capability of the leadership of the individual trusts.

In 2020 and recently in several medical journals including the Health Service Journal (HSJ) The trusts that have performed well on the WRES data and those that are at the bottom of the WRES data have been published. Organisations where the WRES data is poor should not be graded as Good or Outstanding but a maximum of requires Improvement.

Recommendation 10: Pay Gap Review

The second recommendation in relation to health is recommendation 10 and it talks about the need for a strategic review of the differences in the pay gap in terms of ethnicity in the medical profession. It will be important that this review is led by a senior BAME doctor, just as the Gender pay gap review in medicine was led by a senior female leader and addresses issues around workplace culture, structural barriers, filters and barriers to progression, involvement in decision making and promoting diversity in leadership. It also looks at the opportunities and recognition with clinical excellence financial awards.

Recommendation 11:

Setting Up a Health Disparities Unit

The third recommendation is recommendation is 11, to establish a new office of health disparities in the UK. The high levels of CVD, diabetes in the Asian community, hypertension and mental illness in the black population and certain haemoglobinopathies is evidenced based and known for many years. To address these disparities and improve outcomes the unit will need a system of targeted interventions and effective and meaningful public health messaging which has the confidence of the local communities, it aims to reach.

For these recommendations to be successful it is important that the implementation is led by senior BAME doctors and leaders.

The success will only be achieved with support and working with stakeholders, BAME professional organisations and doctors. It is therefore critical that those leading on implementing these recommendations have the confidence and the trust of the BAME professionals and communities.

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SURGERY

Swasthya Health Journal for Professionals Spring 2021

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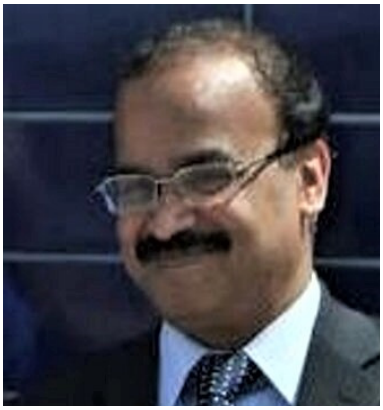

The Spring issue of Swasthya is a Cardiology focus issue. There are five articles relevant to various surgical specialities. For many around the world, surgery can be the only hope for a normal life and the Spring issue of Swasthya touches some facets of this exciting and challenging speciality.

One of these facets is paediatric cardiac surgery, which is known to be one of the most challenging surgical specialities. In his article, Dr Thareen takes a closer look at the challenges facing this niche speciality and the progress it has made in improving lives. Around 1.3 million children are born with Congenital Heart Disease (CHD) worldwide and sadly many do not have the option of diagnosis or corrective surgery. Nevertheless, corrective surgery - when available - can be a lifesaving event for the children affected and life altering for their families.

Dr Gupta discusses a topic that has similarly life altering consequences for children in his article on the 'miracle' of microvascular surgery, which focuses on the case study of an abandoned baby boy. Dr Gupta's article follows the child from his initial life and limb threatening injuries through the long road to recovery with multiple plastic surgical procedures to when he finally reaches a happy adulthood.

Surgeons are innovators and inventors by nature. In the Socratic dialogue 'Republic', Plato states that "our need will be the real creator" which has been transfigured over time into the English proverb 'Necessity is the mother of invention.' Thus, working in settings with limited resources does not restrict surgeons, as they can still improve through innovation. Dr. Gnanaraj's article in this issue on the frugal innovations a rural surgery in India has made provides a fascinating illustration of this proverb and demonstrates how such innovations can be cost saving without compromising safety.

Frugal scientific innovations can make science, accessible worldwide at an affordable cost. The profile of Prof. Manu Prakash and few of his key innovations are featured in the innovator profile.

However, even when the most careful precautions are taken to ensure safety, surgery can be a risky speciality and surgeons need to be realistic in delivering their surgical expertise. Whilst a technically perfect surgical operation does not guarantee a perfect clinical outcome, it is also important not to be too pessimistic in discussing risks vs benefits of any surgical intervention. Dr Govil Bhaskar explores this tension in her article and advocates a realistic balanced optimism, which is important for surgeons to maintain in the face of the unexpected.

Any surgical intervention requires a balanced optimism, with room for frugal and imaginative innovations.

Mr CR Chandrasekar M.Ch.Orth FRCS FRCS T&O
Orthopaedic Surgeon
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Swasthya Surgery Section

Swāsthya Health स्वास्थ्य

Paediatric Cardiac Surgery:

Progress and Challenges-Are We Getting There?

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Head & Consultant Pediatric Cardiac Surgeon
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Ministry of Health and Prevention. Sharjah. U.A.E.

Globally, defects in the heart are amongst the most common congenital diseases occurring at birth. Incidence of congenital heart defect (CHD) is about 8-9 per thousand live births and rate of disease is fairly stable across countries and populations. Considering the total projected live births of around 140 million in 2020, there could be close to 1.3 million children born with CHD this year alone! [(1)] CHD is presenting as a significant health problem amongst children in developed, developing and under-developed nations, and there is a clear felt need for specialized centres with comprehensive programmes for treating these children. CHD's are the fourth leading cause of neonatal deaths. [(2)]

Up to a third of babies born with CHD require some form of an intervention early in life. Even though number of percutaneous interventions done in cardiac catheterization lab have been steadily increasing over the last 2 decades, the vast majority of interventions are still cardiac surgeries. So, paediatric cardiac surgery is an indispensable component in curative and palliative services for CHD and a team of competent and highly trained professionals that include paediatric cardiac surgeons, paediatric cardiologists, intensivists, anaesthesiologists, nurses, and perfusion technologists form the essential human resource for any CHD programme. It would be inappropriate if any personnel with no or limited specialized training, deliver paediatric heart care, as happens in some centres where surgeons primarily doing adult cardiac surgeries perform surgeries in children with CHD also. Developing local expertise for treating children with heart disease has ripple effects on other health services in the organization too. Paediatric cardiac surgery interfaces with many other sub-specialties, so investments in paediatric cardiac surgery can, therefore, lead to parallel improvements in many departments of a hospital. [(3)]

History of cardiac surgery dates back close to 8 decades and in the earliest era, operations on children and young adults with CHD accounted for lion's share of heart surgeries. Closure of patent ductus by Gross in Boston, MA (1938), repair of coarctation of the aorta by Craford in Stockholm, Sweden (1944), and the "blue baby" shunt procedure by Blalock et al in Baltimore (1944) were landmark achievements that signalled the birth of medical and surgical subspecialties of paediatric cardiology and congenital heart surgery. From these modest, albeit monumental beginnings, paediatric cardiac surgery has indeed come a long way with remarkable paradigm shift towards better results. These include innovation of cardio-pulmonary bypass (CPB) machines, miniaturization of CPB circuits, filtration techniques and better myocardial protection strategies. Surgical techniques are more refined now and are continuously evolving. Anaesthetic techniques have effectively kept up with these advances with increasing focus towards enhanced recovery after paediatric cardiac surgery (ERAS). Fast tracking and ultra-fast tracking in a few instances of even neonates/ infants with complex CHD's, where they are extubated in operation room (OR) itself or in the first few hours on ICU, was identified as one of the important international quality improvement initiatives, as well as a means for better use of resources. [(4)] In fact, it has been the author's observation and practice over the last few years that with proper planning and a motivated team it is possible to extubate majority of patients in the OR. We have followed this management plan even in neonates undergoing Norwood operation, which is considered to be the one of the most complex cardiac surgeries. This is probably the only such reported practice in the world. [(5)]. Introduction of medications like Prostaglandin (PGE1) have made a sea change in salvaging new-borns with duct-dependant circulations to facilitate safe transition to cardiac surgery within the first few days to weeks of life.

One unmistakable realization regarding paediatric cardiac surgery is that it is quite a demanding specialty. One needs elements of technical skill, judgment, diagnostic acumen, physical stamina, and emotional intelligence to be effective and successful. It is not only hard to get to do, but it is indeed hard to do so, also. [(6)] When the great Dr. William Norwood remarked that congenital heart surgery may be the most difficult specialty in medicine, the author is more disposed to agree with him in all humility, even at the risk of sounding pompous. Over the last few decades, we have been operating on much younger and smaller patients and addressing more complex pathologies. At the same time, confidence of paediatric cardiologists when they refer cases and expectations of parents when their children get operated, of a successful outcome are not only increasing, but sometime border on irrational despite extensive counselling. All these make the task of a paediatric heart surgeon and the team not only more challenging and but also extremely stressful. Nevertheless, the field is one of the most gratifying specialties and presents lot of exciting work to do.

In the current era, across-the-board operative mortality for all patients in large international, multi-institutional congenital heart surgery registry databases is about 4%, or slightly less. However, there could still be a significant post-hospital morbidity burden after discharge in these patients despite 96% of them going home after treatment. Short-term and long-term outcomes, with respect to survival, have improved substantially and continue to get better for the most challenging forms of congenital heart disease. The break-through being early diagnosis in the intra-uterine period itself by foetal echocardiography and planning intervention within the first few days of life in a dedicated paediatric cardiac centre. A step-ahead, although in early phases, would be therapeutic interventions on the heart in the mother's womb itself! Anomalies such as transposition of the great arteries for which "anatomic repair", as early as first 3-5 days of life is indicated, offers a particularly good chance of restoring normal or near-normal cardiovascular physiology. [(7)] Initial reparative surgery for Tetralogy of Fallot is gaining popularity since it has an extremely high expectation of survival even though interventions might be

needed subsequently to preserve the function of the right ventricle. This has been made possible due to intense long-term follow-up and development of clear guidelines for interventions. [8] Finally, anomalies like interrupted aortic arch with ventricular septal defect, left ventricular outflow obstruction, and anomalies with univentricular physiology which form the spectrum of complex CHD's, reasonable palliation can be achieved without heart replacement even though they entail staged surgical interventions. Surgical results are dramatically better than those achieved a few decades ago but one has to acknowledge the distressing realities concerning durability of the surgical treatment and less than optimal quality of life. [9]

To conclude, the focus of modern-day paediatric cardiac surgery should be on having a rational, evidence-based and a multi-disciplinary team approach to improve survival while optimizing functional status and quality of life. It is but an undeniable reality that, except for few simpler anomalies, majority of CHD are still chronic diseases with lifelong implications for a child's health and well-being, while adding burden on the healthcare systems. [10] A lot of work still needs to be done to safe-guard the life of these children and to add quality to their lives rather than just adding quantity.

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Picture source: UAE HEALTH and Image Credit: COURTESY: Al Jalila children

Front Row(L to R): Dr. Richie Jain, Dr. Rajnish Garg, Dr. Jameel Thareen Khan, Saeed (father of the baby) Dr. Roberto Di Donato, Dr. Anil Ramaiah, Dr. Munira Al Maazmi Second row(L to R): Dr. Fares Chedid, Monsy Sam, Dr. Christoph Fink, Abdul Ahad Khan

Innovation in surgery:
In a life saving complex and rare heart surgery a two-day old baby girl with a congenital heart defect that would have required a heart transplant, underwent a complicated procedure in Al Jalila Children's hospital. The team of surgeons were able to save her heart and also take her off the ventilator right after the surgery and establish her independent breathing. The surgery allowed the patient to have a much better chance of recovering from her serious condition, this is the first step of many to come on her way to full recovery.

RURAL SURGERY IN INDIA -*FRUGAL INNOVATIONS*

Dr. Gnanaraj Jesudian MS, MCh (Urology), FICS, FIAGES, FARSI
Consultant Surgeon
Secretary of the International Federation of Rural Surgeons
Past President of Association of Rural Surgeons of India.

KEY POINTS

The Primary concerns of Rural Surgeons are Safety and Cost Reduction. Without the frugal innovations it would be difficult to provide affordable surgical Care. Low – Cost Innovations like Mosquito Net Mesh for Hernia Repair, locally made Endo – Loop have dramatically reduced the cost of Disposables.
Jugaad Innovations like Generator from automobile engines, vehicle head lamps as OR lights, etc., are seen in most of the rural Operating Rooms. The Gas Insufflation Less Laparoscopic surgeries and the Laptop Cystoscope have taken the Specialist surgeries to rural and remote areas. Innovations like the "Easy Position Easy Fix" stirrups offer superior advantages over the commercial alternatives. Low – Cost suture aid helps in improving the quality and there are several techniques that are relevant to rural surgery. Some of them have been endorsed by the World Health Organization and all of them by the International Federation of Rural Surgeons.

INTRODUCTION

The rural areas of India have about 70,000 In – Patient beds in mission hospitals and these hospitals are the primary Surgical Care providers in rural and remote areas other than the Government facilities. Several Frugal Innovations have helped these hospitals provide high quality surgical care at affordable cost and the same spirit of innovation helped them to survive the current Pandemic [1]. The Association of Rural Surgeons of India [https://www.arsi-india.org/] and the International Federation of Rural Surgeons [https://ifrs.site/] are involved in evaluating and endorsing several Frugal innovations that helped the Rural Surgeons.

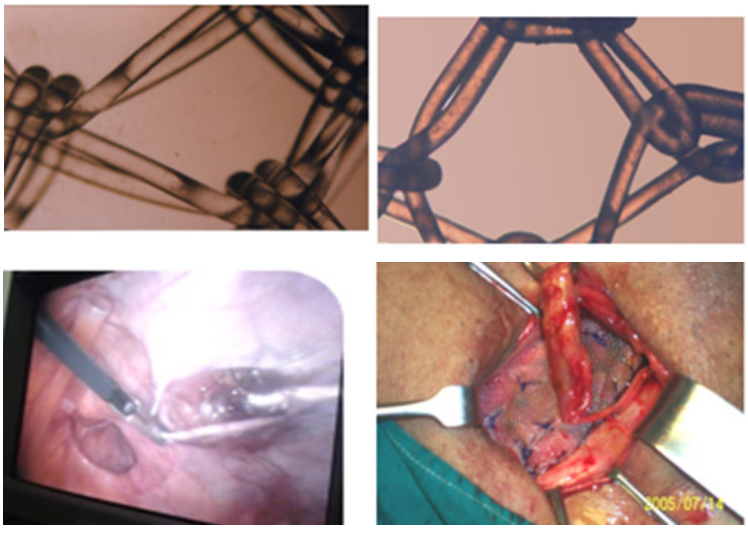
The primary concern of the Rural Surgeon is the safety of the Patient. Unlike the large Hospitals in urban areas any news about complications spread very quickly in rural areas and would adversely affect the surgeons. Lowering the costs to make surgeries affordable for the poor and the marginalized is the second major concern of the rural surgeons.

We will have a look at what drives these innovations among rural surgeons in India.

THE LOW-COST INNOVATIONS

We will start with a famous one. The use of Mosquito net for tension free hernia repair is listed as one of the 6 famous, effective, and low – cost innovations in Surgery by the WHO [2].

Figure 1: Mosquito net used as Mesh in Open & Laparoscopic Hernia repairs



The percussor to this was the use of Fish Net Nylon sutures instead of the commercial Monofilament Nylon sutures. The Prolene mesh and Mosquito net have Polypropylene and mosquito net has varying amounts of Polyethylene while Prolene mesh has Polydioxanone. Although several other such low-cost innovations are available this was one that is of such dramatic reduction in cost (3000-fold reduction) and has several publications including meta - analysis and Randomized Control trials.

It is important for rural surgeons to keep looking out for less expensive alternatives. For example, commercial Endo -Loops are useful in Laparoscopic Surgeries. They are also quite easy to make in the Operating Room with the locally available materials [3].

THE JUGAAD INNOVATIONS

India is a land of Jugaad Innovations. The rural Operating Rooms are filled with such Jugaad innovations as shown in Figure 2. The standby power generator is often made from second – hand vehicle engines. The OR light is from head lamps of old cars. The Industrial Oxygen is standard in rural areas as they are less expensive and have larger capacity.

Figure 2: The Jugaad Innovations in the Operating Room

INNOVATIONS FOR SAFETY & COST REDUCTION

The recent Pandemic has taught us that it is safer to offer surgeries at the local level than having them centralized in the name of improving the quality. One such innovation that makes surgeries possible in rural areas and at the same time makes it safer is the Gas Insufflation Less Laparoscopic Surgeries [GILLS] [4]. This innovation also finds a place in the WHO compendium of Medical Devices for Resource poor setting. Figure 3 shows the first-generation device.

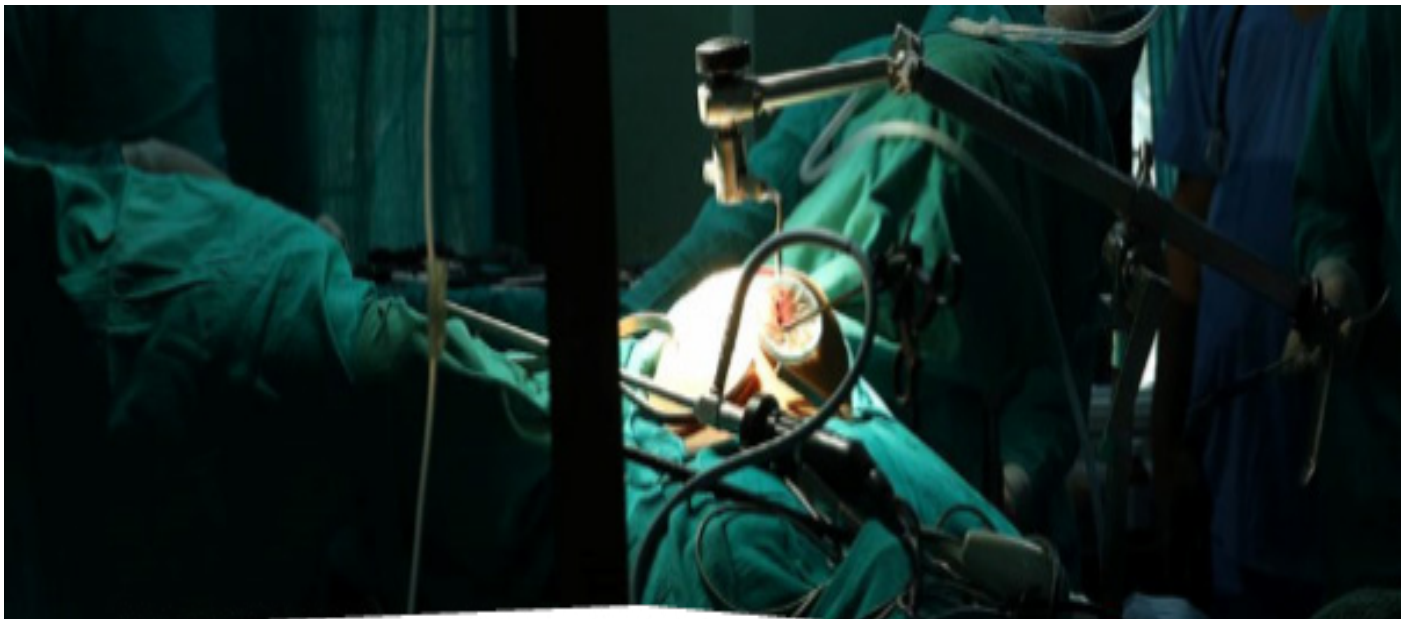
With the device Laparoscopic Surgeries are possible under less expensive and easily available Spinal Anaesthesia. The Complications of port insertions and gas insufflation and the physiological changes due to the gas and the complication related to anaesthesia are not there too.

Reverse Engineering and altering the requirements to reduce the cost was used for creating a low – cost vacuum therapy unit for the non – healing wounds and adding other features required for India [5].

RURAL SURGERY SPECIFIC INNOVATIONS

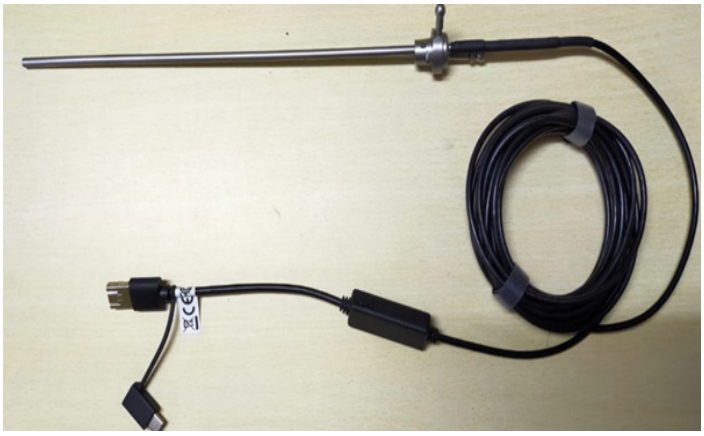
Some innovations are specific for rural areas as they might not have much relevance in Urban areas. The Newon Ventilator can run on electric power, compressed air or can be operated mechanically (http://mdcurrent.in/practice-management/how-to-reduce-cost-in-rural-hospitals-presented-at-the-ifrs-meeting-by-dr-r-r-tongaonkar/) in addition to costing less than 20% the cost of standard ventilators.

Figure 3: Gas Insufflation Less Laparoscopic Surgery Device



The Laptop Cystoscope (https://www.youtube.com/watch?v=7AbhIn2ZAwI) is another innovation that is specific for rural areas. It helps in diagnosing and treating about 50% of the Urology patients that a rural surgeon might see (Figure 4). The investment for the equipment is less than 10% of the set up that is required for the currently available equipment.

Figure 4: The Laptop Cystoscope



THE SUPERIOR INNOVATIONS

Some of the innovations are superior to the conventional equipment like the GILLS equipment, which is better for learning, for doing Single Incision Surgeries and better during the Pandemic because it is isobaric rather than high pressure system. Another innovation that provided superior quality in terms of positioning possibilities is the "Easy Position Easy Fix Stirrups that won the Prestigious Lockheed Martin award given by the Department of Science and Technology of the Indian Government [http://mdcurrent.in/press-releases/lockheed-martin-award-innovative-easy-positioneasy-fix-stirrups/] .

IMPROVING QUALITY

Some innovations from Rural Surgeons help improve the quality of surgical care like the use of hypodermic needle as a suture guide during vasovasostomy [6] and the further development of a useful suture guide by Dr. Sukumar Maiti (https://www.youtube.com/watch?v=9RAkH2_yvec).

EMERGENCY INNOVATIONS

Getting Gas and Power supply sorted out is difficult in rural areas. For example, during Laparoscopic surgeries in a rural hospital we ran out of carbon di oxide gas because of a leak that was not detected earlier. We used the Nitrous Oxide gas from the Anaesthesia Machine instead of carbon di oxide. With little experimenting we were able to work out letting in the gas at the desired pressure (http://mdcurrent.in/surgery/no-gas-laparoscopic-surgery-rural-areas/).

Sometimes when there is no power supply both the regular and spare Generators fail. During such a time we found that use of torch light is sufficient to complete small Urology procedures like DJ stent removals. We had to go back to the old ways of directly looking into the Cystoscope instead of having the help of Camera and monitor.

However, prior to this when the power failed, we were halfway through Laparoscopic Appendicectomy and we completed it using the torch light for connecting to the light cord and using the Cell phone camera for doing the surgery.

INNOVATIVE TECHNIQUES

Over the years the rural surgeons have also developed innovative surgical techniques that use the available equipment instead of the expensive ones like the following;

1. Renal Stone removal through the normal urinary passage [http://mdcurrent.in/primary-care/innovative-cost-effective-treatment-renal-stones-remote-areas-surgical-services-initiative/]
2. Core through Urethrotomy [http://mdcurrent.in/urology/core-blind-endoscopic-internal-urethrotomy-regular-self-calibration-cost-effective-option-rural-areas/]
3. Hernia repair [http://mdcurrent.in/primary-care/small-incisional-hernia-repair-low-cost-minimally-invasive-technique-for-rural-areas/]

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Dr. Gnanaraj Jesudian MS, MCh (Urology), FICS, FIAGES, FARSI

Dr. Gnanaraj became interested in Rural Surgery after visiting the Kukna Tribals in Dangs District of Gujarat during his undergraduate days in CMC Vellore. During the last 3 decades he helped 63 hospitals in rural areas start Minimally Invasive Surgeries. He has over 350 publications in National and International Journals about rural surgery and has few innovation awards including the Lockheed Martin award of the Department of Science and Technology of the Indian Government. He is currently the Secretary of the International Federation of Rural Surgeons and Past President of Association of Rural Surgeons of India.

A Dose of Realistic Optimism for Surgeons

Dr. Aparna Govil Bhasker; ***MBBS, MS***
Bariatric and Laparoscopic surgeon-India

Taking a decision to get a surgery done is not an easy one. Patients and their families derive a lot of clues from the surgeon's demeanour and body language which helps them to take these decisions. Even the smallest of surgical procedures can lead to grave complications and rarely can even lead to mortality. As the complexity of the operation increases, so does the chance of having complications. Most patients and their families suffer from "optimism bias" and despite being informed about complications during a consultation, they tend to filter the information related to bad news. Hence the onus is on the surgeon to drive the point home. In an increasingly litigious environment, surgeons have to tread carefully on the fine line between being optimistic and being brutally honest.

Well, the solution to this conundrum may probably be found in realistic optimism. I have always believed that surgery is a very humbling branch. While surgeons may be vested with the power to cure many diseases, all of us are well aware that however skilled and experienced we may be, we can never get to a zero percent complication rate. We all know that failure can strike us at any time. Sometimes it could be because of an unintentional mistake and at other times we just lose to the forces of nature. Law of averages eventually catches up with all of us some day. Despite this awareness, most of us choose to go on. "Action, heroism, certainty and optimism", are some of the key tenets of surgical culture all across the world.

We take all risks into account and perform new operations every day. Should we attribute this to heroism? I guess our non-surgical colleagues may agree to that. However, being a surgeon myself, I know that what drives us is not heroism, but optimism. Not just optimism, I would say that it is actually realistic optimism that drives most surgeons.

So, what is "realistic optimism" and how do we apply it to the surgical practice? How is it even more relevant in today's times?

Optimism is a necessity. However, unrealistic optimism can sometimes be misconstrued as having a non challant and uncaring attitude. In worst case scenarios, unrealistic optimists may be treading on waters of denial. When it comes to surgery or taking surgical decisions this would translate into ignoring possible risks and complications and focusing only on the positives. In a scenario where things may not go our way, it comes as a shock to the patient and their family. Despite the good intent of the doctor/surgeon, this forms for a perfect setting for a litigation. During the Covid-19 pandemic not taking the added risk into account would border onto sheer foolhardiness.

On the other end of the spectrum is unrealistic pessimism. Unrealistic pessimists would go on to highlight the negatives much more than the positives. They would downplay the possible benefits of a particular procedure and focus a lot more on the side effects and complications. While it is important to keep our patients informed, it is also necessary to have some perspective. Treatments and surgical operations only come into common practice when their benefits are significantly more than the risks. No doctor deliberately wants to harm their patients but sometimes in trying to be honest we may tip over the scales to being too pessimistic. An over defensive doctor may unknowingly take away hope and push the patient into denying treatment.

This finally brings me to the middle ground and we all have to ultimately choose between being realistically pessimistic and realistically optimistic. Being realistically pessimistic is considered as a safe zone for certain professions and surgery is one of them. It is said to prepare patients and their families better for any eventuality. It also takes the onus of liability away from the doctor/surgeon. As surgeons we are an integral part of the tragedies of our patients and their families. Being realistically pessimistic helps us to maintain a certain degree of detachment which is necessary for our own survival. It prevents over involvement and protects surgeons as they venture into the unfamiliar territory of taking high stake decisions.

All said and done, doctors are human too. What ails the world today, ails us too. However, we also have to move forward and rise to the occasion to do right by our patients. We have to take the risks into account but ultimately, we have to move towards resilience. As we do this, we have to take our patients and their families along with us on the road to realistic optimism. While personal impact of negative outcomes can never be compared to statistics of complications, as doctors/surgeons we cannot take away hope from millions of patients. Just as patients must be made aware of all possible negative outcomes, they must also be made aware of the tangible benefits of the treatment being offered. Risk taking is a part of the journey towards a better life. As surgeons we become a part of this journey along with our patients. We have to help them to be able to objectively weigh the pros and cons and reach to a decision taken mutually for their betterment. Being realistically optimistic helps to ease the tension for a patient and their family and clear a partially cloudy disposition. At times carefully chosen words of optimism may be just the ice-breaker that was needed in order to reach to a life-saving decision.

As surgeons we need to develop resilience and realistic optimism. We have no option but to become comfortable with ambiguity. None of us will be a hundred percent right or wrong in our decisions but ultimately whatever happens, in our hearts we must know that whatever we are doing is in the best interest of the people that we are serving.

Unrealistic Pessimism ⇨ Realistic Pessimistic ⇨ Realistic optimism ⇨ Unrealistic Optimism

A PROVIDENTIAL RARE ESCAPE
"LIFE BACK FROM THE WILDERNESS"

Challenges of reconstructive plastic surgery – A case study

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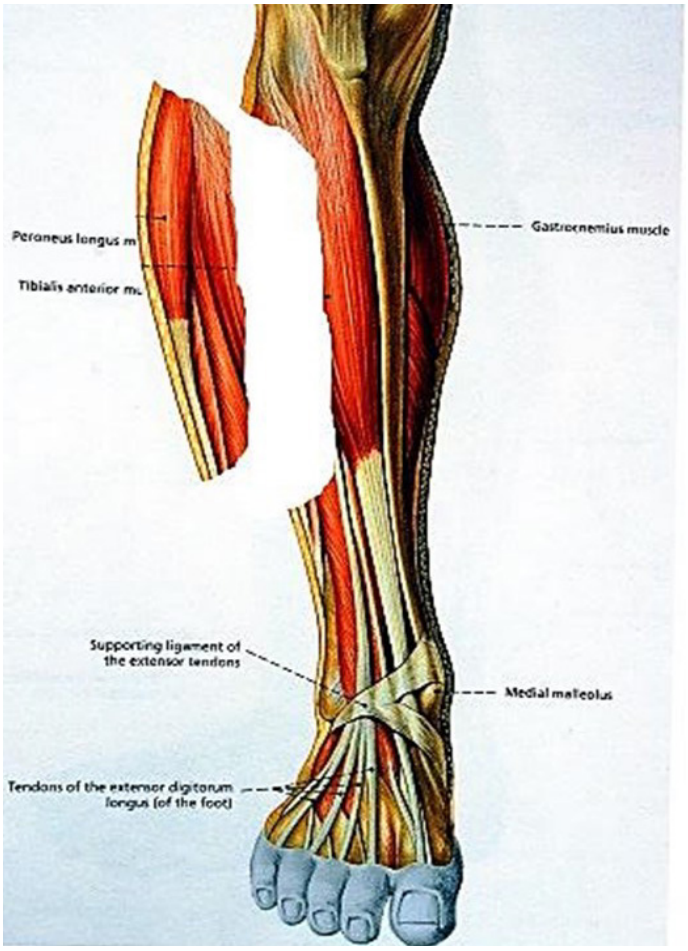
This is a vivid account of how this blessed three hours old baby was snatched away from the jaws of a monster, by the field workers at the village near Varanasi in a grave life-threatening condition, on July 31, 2003 and his eventual journey to the normality. He was further assaulted and being mauled by wild beasts. The entire thigh and the calf muscle of his right leg being chewed off and left bleeding profusely at the mercy of "the Hand of God". The newborn was initially treated at the Institute of Medical Sciences, Varanasi for primary intensive surgical care. Thereafter, he was referred to Mumbai for definitive Reconstructive Micro-neural and vascular surgery aimed at the functional reconstitution.

On arrival, the evaluation delineated extensive damage to the blood vessels, muscles, common peroneal nerve and skin in the thigh and the calf region. Compounding the extensive nature of the soft tissue injuries were the risks associated with prolonged anesthesia in this age group. Definitive surgery involved a complete freeing of all the scarred tissue, replacement of the lost muscle and skin bulk along with restoration of continuity of the damaged segment of the nerve/vessel using microsurgical procedures ("Eighteen hour"). He stayed in the hospital for almost 16 months including celebration of his 1st birthday in the hospital. Subsequently at the age of around 11 years, he was reassessed for the growth discrepancies and realizing the need to reinforce the strength and the volume of the calf muscles, a sophisticated and specialized free functioning muscle transfer (FFMT) procedure was undertaken in supra major surgery involving orthopedic surgeons, micro surgeons and the complete ICU back for post-operative care (28 hour long procedure).

To summarize initial conditions to begin with and surgical steps:

On arrival at the Hospital at Mumbai:

a. Poor general condition of the patient
b. Extensive Post Traumatic scar in the popliteal region and the anterior-lateral-posterior part of the calf/leg region.
c. Marks of the multiple animal bites on the outer side of the thigh and leg
d. Loss of distal pulsations of the Anterior Tibial/Dorsalis Pedis Vessels
e. Loss of Lateral Popliteal Nerve function
f. Loss of the head / proximal shaft of the Fibula
g. Talipes equino varus (TEV)/or due to loss of function/ muscle bulk of the muscles of the lateral compartment/ un-opposed action of the muscles of medial compartment.
h. Limb Length discrepancy



1st Stage: 25th July 2004

- Excision of the adherent scar and release of
- fibrous tissue
- Microscopic exploration of the popliteal vessels
- and identification of the blockade / loss of
- continuity of the popliteal artery
- Microscopic exploration of lateral popliteal nerve
- and identification of the proximal / distal cut ends
- of the lateral popliteal nerve.
- Excision + release of the contracture on the leg
- and the calf region.
- Fascio-cutaneous rotation advancement flap
- from the Leg + Skin graft.

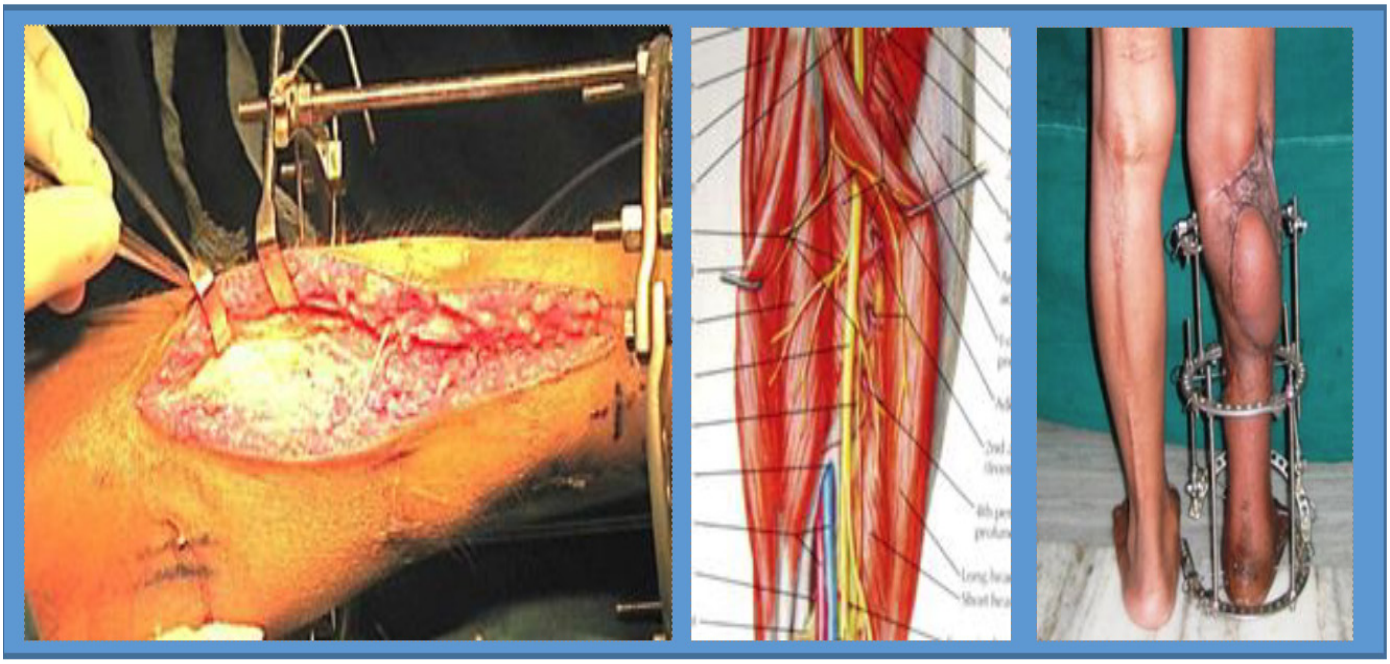
Immediate post-operative recovery was good. The distal circulation improved and the flap survived. All the wounds healed by primary intensions.
Thereafter, the patient was reviewed at the SOS Village residence at Varanasi in his own natural surroundings in Sept. 2010;

2nd Stage: 4th October 2014

• Healthy and elongated (with the age) fasciocutaneous flap + matured SSG
• Post Traumatic hypoplasia of the muscle + soft tissue in the popliteal region and the anteriorlateral-posterior part of the calf / leg region.
• Good quality distal pulsations of the Anterior Tibial / Dorsalis Pedis Vessels (reconfirmed by the MR Angiogram)
• TA shortening + loss of function / muscle bulk of the muscles of the posterior / lateral compartment / unopposed action of by the muscles of the medial compartment + Limb Length discrepancy

Due to severe hypoplasia of the residual muscle of the region, tight / short TA tendon as well severe soft tissue shortage, it was decided to undertake microsurgical release of the previously repaired popliteal vessels / nerves as well Free Functioning Muscle Transfer as well soft tissue replacement i.e. Lat. Dorsi myo-cutaneous flap. The timing of the procedure was planned so as to take the advantage of the growth spurt in the following years.

- Exploration of the popliteal region and Identification of the lateral popliteal nerve and the sural nerve grafts used earlier
- Identification of the popliteal artery and the vein graft used earlier
- Release of adherent soft tissue and previously placed fascio-cutaneous flap
- Release of the scars around of the hypoplastic muscle + soft tissue in the popliteal region and the anterior-lateral-posterior part of the calf / leg region.
- Re-adjustment of the External fixator to achieve full corrections of the ankle and the foot position to neutral position.
- Harvest of the large Lat. Dorsi myo-cutaneous flap
- Micro anastomosis between the recipient vessels + Flap pedicle.
- Nerve Cooptation between the nerve to Lat. Dorsi + Lat. Popl. Nerve
- Loose fixation of the muscle flap recipient area + Skin graft on the flap Post operatively, he was recovering well. 100% pache of the skin grafts as well satisfactory



healing of all the wounds.

3rd Stage: 24th February 2015

Reviewed for adjustment of the External Fixator and the flap and Additional Neurotization (supercharging) + adjustment of the muscle tension

- Exploration of the popliteal region and identification of the lateral popliteal nerve and the sural nerve grafts used earlier Identification of the artery and the vein anastomosis done earlier
- Release of the adherent soft tissue and previously placed Latissimus Dorsi flap
- Identification and harvest of the sparable branches of the sciatic nerve for supercharging innervation to the transferred Latissimus Dorsi muscle
- Re-adjustment of the External fixator to achieve full corrections of the ankle and the foot position to neutral position.

4TH Stage: 5thJanuary 2016

Reviewed for removal of the External Fixator+ adjustment of muscle tension

- Exploration of the popliteal region and identification of the lateral popliteal nerve and the sural nerve grafts used earlier
- Release of the adherent soft tissue and previously placed LD flap
- Identification and harvest of the sparable semitendinous group of muscles for supercharging the strength to the transferred LD muscle
- Cineplasty (surgical fitting of a lever to a muscle) reinforcement using the TFL strips and tenorrhaphy
- Advancement of the Flap and adjustment of the scar / fibrosis

I am very happy that this boy is now 18 years old and is living a satisfied life like a normal child, he is very thankful to the micro-surgical process as well as to the NGO looking after him so nicely. He has grown as an intelligent and hardworking boy today, making best of the opportunities at the SOS CHILDREN'S VILLLAGE at Varanasi.

This is a gift of micro-surgery to a child which otherwise, despite being unwanted, being thrown at the tender age of three hours and despite being attacked by the wild animal, has survived. Eighteen years after a newborn boy was abandoned in the sugarcane fields and was mauled by a wild animal, with a path-breaking surgery to reconstruct his tattered leg.

The boy who was left deserted in a sugarcane field to die was in actuality born with a "HAND OF GOD" that brought him to the right place at the right time. It's a miracle to save a limb, to save a child which could be achieved only through the reconstructive surgery. He grew up with extensive damage to the blood vessels, muscles, nerve and skin in the affected leg.

He is 17 years old, a cherubic boy, recovering happily at the SOS CHILDREN'S VILLLAGE at Varanasi.
"Life is a journey of either Fate or Destiny and each of us has a specific journey from God that redefine our lives or diagrams being shared, and equip us for the very purpose we were designed"

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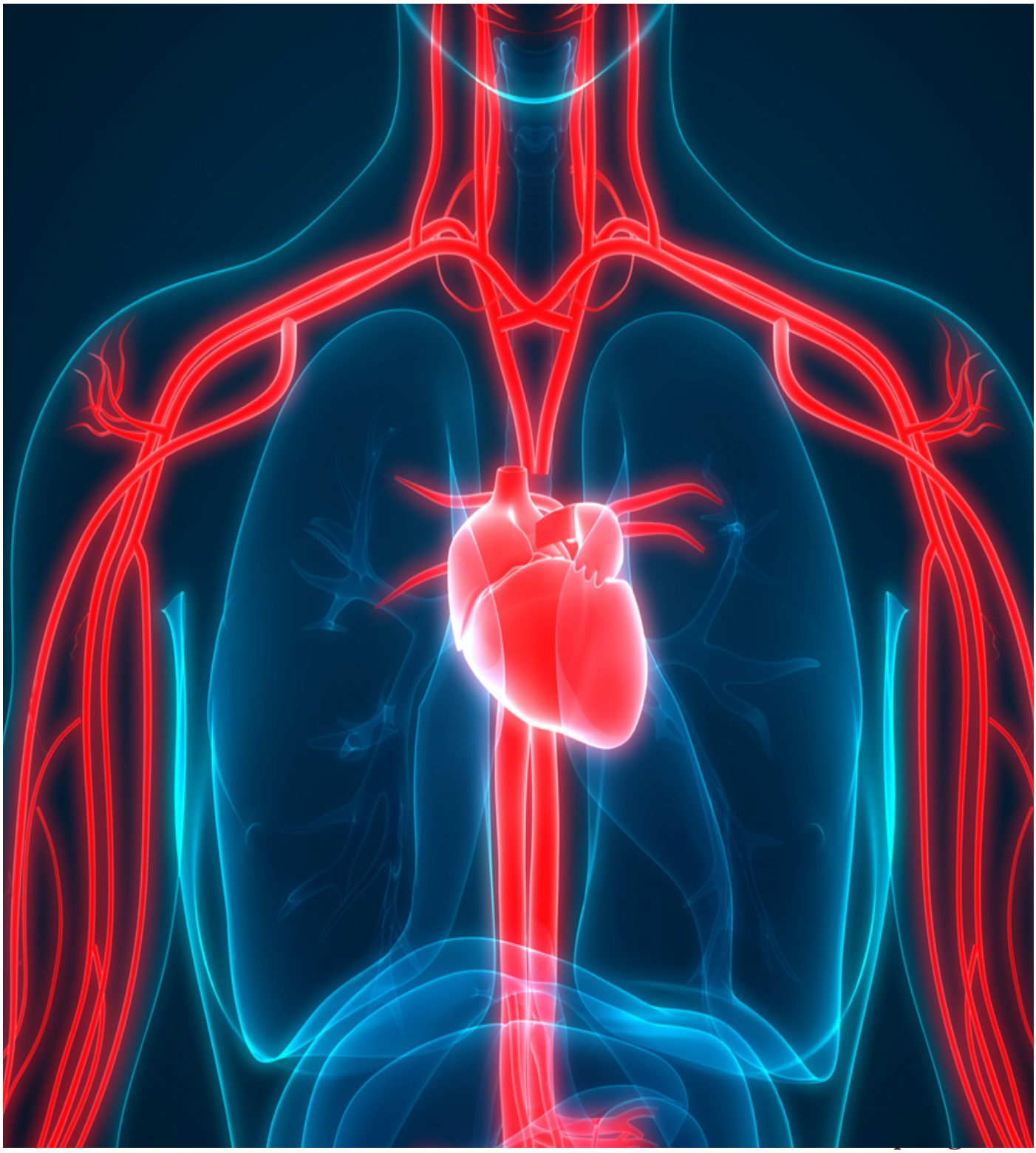
Swasthya Health स्वास्थ्य

CARDIOLOGY

Swasthya Health Journal for Professionals Spring Issue 2021



The 'Swasthya' a UK based quarterly Healthcare Journal is gradually gaining wider publicity and momentum. While its initial three issues, over the last year, were mainly devoted to the medical specialties of mental health and surgery, a new section for Cardiology is being started from this Spring edition in 2021. There are five guest articles on Cardiology in this issue mostly on Covid theme, which has been in the forefront of everyone's mind over the past one year.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), also known as Covid-19, was first reported to the World Health Organization (WHO) as a pneumonia of unknown cause in Wuhan, China, on 31 December 2019. In this day and age of international travel, SARS-CoV-2 quickly spread internationally and within three months the number of cases outside of China surpassed those within China. The cases were rising so fast across the globe that the WHO declared COVID-19 a pandemic on 11 March 2020. By now in April 2021 (i.e., just over 13 months' period), WHO dashboard has shown a total of 142,238,073 confirmed cases all over the world with 3,032,124 confirmed deaths from Covid-19 [1]. In the UK we have a cumulative total of 4,393,307 confirmed cases with 127,307 deaths within 28 days of confirmed Covid-19 infection. These are very grim and sobering statistics for the medical science as well as our human race.

SARS-CoV-2 or Covid-19 belongs to a large family of single stranded RNA viruses called Corona Viruses, which also include SARS-CoV and MERS-CoV known to have affected humans in the past. Although Covid-19 is primarily a respiratory virus but it can cause serious damage to heart and other organs of the body. In this issue of Swasthya, I have written an article devoted to the Cardiac Manifestations of Covid-19.

When the pandemic started in March 2020, we were hardly prepared to deal with rapidly worsening medical crisis. Only little was known about this new virus. There was a lot of confusion among healthcare experts across the globe. While a few countries adopted a policy to actively promote the use of masks or face coverings (like South Korea, Singapore, New Zealand, Australia), many world leaders opposed its widespread use, in the name of protecting liberal values. Gradually, as the scientific data emerged, use of masks / face coverings became mandatory in the public places throughout the world. Initially the medical fraternity also did not know for sure, which treatment will work against this virus and started using several different medications in a hypothetical manner. There was a collaborative effort by the scientists across the world to organise clinical trials to collect scientific data to support use of medications/ therapeutic strategies which were shown to be effective. Similarly global efforts were made to develop vaccines in a record time frame. Vaccination programme has shown very good progress in the UK but vaccine hesitancy has also been seen in a relatively small percentage of individuals throughout the world mainly due to fear of side-effects. In this issue there is an article by Dr Aggarwal from India to make physicians aware of different side effects of covid vaccines and their management.

Since 23rd March 2020 when the first total lock-down was imposed across the UK, even after one year, there have been intermittent and variable levels of on-going restrictions [2]. During the acute surge of hospital admissions with Covid-patients, a large numbers of hospital beds and the healthcare staff had to be diverted to provide emergency care for these patients, and as a consequence the management of patients with some chronic non-covid conditions was automatically pushed to back seat. In this issue there is an article on admission rates of patients with heart failure during Covid lock-down period by Dr Sankaranarayanan.

It was not just medical care of the non-covid patients but teaching and training activities of medical students and junior doctors were also significantly affected adversely by the Covid. This has been described in his article by Dr Katira in this issue. There is another very informative article by Dr Ghosh on Cardio-oncology, which is developing as new sub-specialty within Cardiology.

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Cardiac Manifestations of Covid-19

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1.1 Introduction:

As the name indicates, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), popularly called covid-19, is primarily a respiratory illness but the growing clinical experience has shown that it can cause serious damage to heart and other organs of the body. World Health Organization (WHO) declared Covid-19, a pandemic more than a year ago on 11th March 2020 and despite the worldwide efforts to control it, the virus is still managing to ravage the human lives [(1)].

A significant amount of published medical literature is now available on Covid-19, reflecting gigantic ef-forts made by the scientific community across the globe. A quick PubMed search for the topic 'Covid-19 and Heart' returned a substantial list of 5460 articles, out of a total of 118,397 articles on 'Covid-19'. Unfor-tunately, however most case series involve a limited number of patients often less than 100. Moreover, there is no consistency on the findings reported in the available literature with regards to cardio-vascular involvement in Covid-19, possibly due to significant variation in patient selection, diagnostic criteria as well as severity of underlying Covid infection.

2.1 Pathophysiology of Covid-19:

SARS-CoV2 (or Covid-19) starts as an acute respiratory illness and droplet transmission is the primary mode of transmission. The virus uses its S-spike to bind to Angiotensin Converting Enzyme 2 (ACE-2) re-ceptors, which act as an entry point to the cell. These ACE-2 receptors are expressed in lungs as well as other tissues like Heart and Kidneys [(2)].

This relationship between viral entry and ACE2 receptors was the basis for the controversy surrounding the use of renin-angiotensin-aldosterone system antagonists (RAS blockers or ACE inhibitors), which in-crease ACE2 expression in animal studies and therefore can theoretically increase susceptibility to infec-tion. However, this inference was disputed in the position statements of all major cardiovascular societies in the UK, Europe and North America.

2.1.1 Acute disease progression in Covid-19 usually shows 3 distinct clinical phases, although with variable duration and some overlap [(3)]:

1. An early infection phase of viral response
2. A pulmonary phase – Abnormal chest imaging
3. A severe hyperinflammation phase (or Host's immune over-reaction)

A large majority (up to 81%) of patients with Covid-19 remain asymptomatic or develop only mild consti-tutional symptoms (like fever, cough, malaise). This 'early phase' is due to innate immunity mediated through monocytes and macrophages. Some patients progress to a 'Pulmonary phase' due to continuing inflammatory response and further pulmonary damage, hypoxemia, and cardiovascular stress. Only a mi-nority of patients develop a 'severe hyper-inflammation phase' as the host's inflammatory response con-tinues to amplify, despite a diminishing viral load [(3)]. This phase of hyper-inflammation can be seen as our own deranged hyper-active defence mechanism to fight the virus and is characterised by a profound cyto-kine storm leading to multiple organ failure and a possible fatal outcome [(4)].

Within the context of acute disease progression in Covid-19, lymphocytopenia is a prominent feature and a high proportion of critically ill patients show progressive lymphocytopenia. Patients with severe disease eventually develop high total white cells and neutrophil counts, while maintaining a low lymphocyte count [(5)]. Exaggerated systemic inflammation and cytokine storm may correlate with lymphocytopenia and is a hallmark of severe disease [(4)].

2.1.2 The mechanisms of cardiac injury by Covid-19 are not well established. Cardiac involvement or myocardial injury may happen by 3 possible mechanisms:

(i) Secondary to respiratory failure and hypoxemia
(ii) Secondary to wider systemic hyperinflammatory response
(iii) Direct Myocardial invasion by the virus

In most critically ill patients, a combination all three above are responsible to a variable extent. Milder forms of cardiac injury in the form of elevation of cardiac biomarkers is a prominent feature in Covid-19 and may still indicate worse prognosis as compared to those with normal biomarkers [(5)]. In autopsy stud-ies patients with myocarditis showed no evidence of direct viral infiltration suggesting systemic hyper-inflammation to be responsible [(6)].

3.1 Cardiac Involvement in Covid-19:

It is difficult to know the exact frequency of cardiac involvement in patients of Covid-19 because majority (up to 81%) remain asymptomatic or get mild illness, and therefore they simply self-isolate at home and do not undergo any medical examination or pathology tests. Data is largely available from hospitalised patients, who are likely to have been severely affected, and show that cardiac involvement is not uncom-mon. There has been a significant variation seen in the rates reported for cardiac involvement due to dif-ferences in the diagnostic criteria, types of investigations undertaken, severity of covid-19 infection and relatively small size of studies. Any pre-existing yet unknown cardio-vascular disease in these patients will add to difficulties in precise estimation of Covid-19 induced cardiac problems.

Cardiac involvement in Covid-19 patients may be in the form of:

1. Effect on heart rate, rhythm and blood pressure: Covid-19 patients are at an increased risk of arrhythmias and blood pressure abnormalities due to underlying co-morbidities, hypoxemia, metabolic derangements, systemic inflammation, or myocarditis. In one study of 138 hospitalised patients, palpitation was reported as a symptom in 7.3% of patients although significantly higher proportion of critically ill patients showed arrhythmias in the form of tachycardia, bradycardia or even asystole [(5)]. Specific arrhythmias like atrial flutter or fibrillation were reported in 7%, Ven-tricular tachycardia or fibrillation in 5.9% [(5,6)].

A high proportion of critically ill patients (25-31%)

showed hypertension [5,8]. It was difficult to know from retrospective data if this hypertension was due to the pre-existing illness, or a reaction to the critical illness, or a phenomenon related to potential derangements in ACE2 expression. As expected, some critically ill Covid-19 patients also showed significant hypotension requiring vas-opressor support [8].

2. Effect on Cardiac Biomarkers: Significant elevation in specific Cardiac biomarkers (like NT pro BNP, Troponin, CK, CK-MB) may represent cardiac stress or myocardial injury [6,9]. Studies that reported the frequency of elevated cardiac biomarkers, NT pro BNP was elevated in 28% (106/380), Troponin 17% (278/1659), CK18% (84/466) and CKMB 12% (133/1148) [5,6,7,8,9].

   Significant elevation in Troponin does not automatically mean a classical type 1 myocardial in-farction (MI) due to coronary occlusion but more likely reflect non-coronary causes or type-2 MI in a critically unwell Covid-19 patient [9]. Elevated cardiac biomarkers have shown significant prognostic value in hospitalised patients with Covid-19. In a study by Guo et al, Troponin T was found elevated in 27.8% of hospitalised patients. Those with elevated Troponin showed a mortali-ty of 59.6% vs 8.9% in those with normal level [6].

3. Myocarditis, Heart Failure and Cardiogenic Shock: Among the causes of death with Covid-19 in Wuhan cohort, myocarditis leading to myocardial damage and heart failure contributed to 40% of deaths, either exclusively or in conjunction with respiratory failure [6,7]. Moreover, those with confirmed diagnosis of heart failure showed a mortality rate of 64% [6,9]. The mortality risk asso-ciated with heart failure was more significant than age, diabetes mellitus, chronic pulmonary dis-ease, or prior history of cardiovascular disease [6]. In a case series 3 out of 4 critically ill patients with heart failure degenerated into cardiogenic shock.

   Mechanism of myocardial injury / myocarditis has been discussed in detail in section 2.1.2 above and likely to be related to cytokine storm and hyper-inflammatory state, rather than direct myo-cardial invasion by the virus. True prevalence of myocardial dysfunction in hospitalised patients with Covid-19 may never be fully apparent, given the difficulty in performing echocardiography in these patients requiring strict isolation.

   In a recent interesting Frankfurt Registry of 100 patients who had recovered from COVID-19, car-diac magnetic resonance (CMR) imaging performed at median 71 days from diagnosis of Covid-19; revealed cardiac involvement in 78 patients (78%) and ongoing myocardial inflammation in 60 patients (60%), which was independent of pre-existing cardiac conditions, severity and overall course of the acute Covid-19 illness and recovery [10].

4. Acute Coronary Syndrome (ACS) and acute Myocardial infarction (AMI): can occur in pa-tients with COVID-19, but the incidence of such events is unclear.

   The mechanism of increased risk of ACS in Covid-19 patients may be due to heightened pro-thrombotic activity, as evidenced by significantly elevated D-dimer levels. Additionally, severe systemic inflammatory response (even in other illnesses like Influenza) is known to increase the risk of plaque rupture resulting in either a ST-elevation MI or non-ST-elevation MI due to endothe-lial and smooth muscle cell activation, macrophage activation, and tissue factor expression [11]. The inflammatory response can be so intense that even spontaneous coronary artery dissection (SACD) can occur [12].

   Although the above is possible, most cases of myocardial infarctions in critically ill patients with Covid-19 actually represent type-2 MI due to hemodynamic effects of hypoxia, sepsis and meta-bolic derangements rather than true coronary obstruction (type-1 MI).

   A rise and/or fall of Troponin is not sufficient to secure the diagnosis of acute MI, and this should be based on clinical judgement, symptom/signs, ECG changes, and imaging studies.

Conclusion:

Covid-19, despite being primarily a respiratory virus, has shown to cause serious damage to heart as well as other organs. Wide ranging abnormalities of heart rate, rhythm as well as blood pressure control are common. Elevation of specific cardiac biomarkers suggesting myocardial injury, myocarditis or cardiac stress is common. High proportion of critically ill patients develop heart failure and cardiogenic shock. Acute coronary syndromes have been reported but are not so common.

True estimates of the above forms of cardiac involvement by Covid-19 even in hospitalised patients may be difficult to obtain, due to problems in organising common investigations (like echocardiogram, cardiac MRI, Cardiac catheterisations etc) on a routine basis under strict isolation, to protect medical staff and di-agnostic facilities. One recent Cardiac MRI study on patients recovered from Covid-19 showed evidence of cardiac involvement in 78% of patients even after a median of 71 days after the initial diagnosis.

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What is the effect of lockdown upon hospitalisation due to COVID-19 amongst patients from a heart failure registry?

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Introduction

Coronavirus disease 2019 (COVID-19) is associated with a mortality risk in heart failure (HF) patients [2]. In order to curb the spread of the virus, the UK government announced a national lockdown in March 2020. Whilst there is data [4, 5] [6] regarding the prognosis of HF patients hospitalised with COVID-19, the impact of lockdown upon in incidence of hospitalisation, is unknown.

Methods

Our single centre, retrospective observational study was undertaken in a British university hospital to analyse the effect of lockdown upon COVID-19 hospitalisations amongst HF patients and the predictors of risk. We collated data regarding co-morbidities (Charlson Co-morbidity Index-CCI), [7], the Rockwood clinical frailty score (CFS), clinical features, blood results, HF treatments and 30 day mortality.

Results

We identified 1097 HF patients from our existing HF registry with HF hospitalisation in 2018 and 2019. 50/801 (6.2%) surviving HF patients required hospitalisation due to COVID-19 from March-November 2020 ("COVID group"); 24 patients (3.1%) during the first lockdown (March-June 2020) and 26 (3.5%) in the post-lockdown period (July- November 2020); p=0.7. In comparison to patients not hospitalised with COVID-19 ("no-COVID group), the COVID group had a significantly higher prevalence of co-morbidities (Table 1) - hypertension (p<0.001), diabetes (p=0.005), ischaemic heart disease (p=0.01) and increased body mass index (p=0.04). This data is in line with other studies [2,6,12,13]. CCI was also significantly higher in the COVID group (6.5±1.5 versus no-COVID group 5.7±1; p<0.001). The COVID group was frailer (Rockwood CFS in COVID group 6.5±1.5 vs. 6.1±1.1 in No-COVID group; p=0.02). HF patients hospitalised with COVID had a longer hospital stay than for HF (median 14.5 days vs. 8 days; p<0.001) and 30 day mortality was 52%.

Table 2 illustrates mortality predictors. Whilst the incidence of diabetes, hypertension and frailty was significantly higher amongst the group that died within 30 days, multivariate regression analysis demonstrated that only diabetes (OR 3.82;95% CI 1.13 to 12.95; p=0.03) and Rockwood Frailty Score ≥6 (OR 6.530695 % CI:1.8958 to 22.4961; p=0.003), were independent predictors of mortality.

Conclusions

Our study showed a similar incidence of COVID-19 hospitalisation pre- and post-lockdown amongst HF patients. The incidence of COVID-19 hospitalisation in our HF cohort (3.1%), was similar to the overall incidence during the first wave in England (3.5%) [10]. It can only be surmised that HF patients have been taking adequate shielding precautions in view of media reports of higher risk of complications amongst patients with cardiovascular co-morbidities. It is also possible that the anxiety felt by HF patients and their reluctance to attend hospital may also have resulted in reduced hospitalisations due to COVID-19 [11]. 30-day mortality due to COVID-19 hospitalisation was high (54%) in our HF cohort, comparable to other studies [6, 12],[13]

Study limitations include the single centre, retrospective observational design and relatively small number of COVID-19 hospitalisations in this cohort.

In conclusion, our data suggests that lockdown did not seemingly affect incidence of hospitalisation due to COVID amongst patients from our HF registry. Co-morbidity and frailty scores should be incorporated during initial clinical assessment to aid risk-prediction for 30 day mortality.

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Table 1: Comparison of HF patient characteristics (COVID versus no COVID)

Baseline Characteristics	COVID (n=50)	NO COVID (n=751)	p
Age	75.3 ± 10	73 ±14.1	NS
Female	40%	46%	0.4
DM	27/50 74%	225/751 30%	<0.001
HTN	41/50 82%	466/751 40%	0.005
IHD	29/50 58%	301/751 40%	0.01
COPD	11/50 22%	233/751 31%	0.18
CKD	27/50 54%	370/751 (49%)	0.52
AF	25/50 50%	413/701	0.2
Charlson Age adjusted Comorbidity Index	6.5±1.5	6.1±1.1	0.01
Rockwood Frailty Index	5.8±1.9	5.1±1.7	0.005
Beta blocker	78%	653/751	0.15
Mineralocorticoid antagonist	28%	262/751	0.43
ACE/ARB/ARNI	65%	81%	0.05
Device therapy	7%	60/751	0.95
Average length of stay	15.6 (± 14.8) Median 14.5 (3-57)	8.6 8 (1-43)	<0.01
HFpEF	36%	32%	0.92
BMI	33.67 (±9.1)	31.1±8.1	0.04
NTpro-BNP	6242 (415-24000)	3564 (515-7000)	0.07
Hb	118.5± 19.2	119±20.5	0.83
Urea	6.9± 3.9	8±4	0.2
Creatinine	154±71	128±69	0.05
Sodium	136±5.3	139+4.5	<0.001
GWTG	43±7.1	38.8±6.4	<0.001

Table 1. Demographic data and background of patients admitted with COVID vs Non-COVID. p<0.05 is taken to mean statistical significance.

Table 2: Comparison of HF patient characteristics (DEAD versus ALIVE)

Baseline Characteristics	DEAD (n=27)	ALIVE (23)	p
Age	77.8±8.9	73.9 ±10.1	0.2
Female			
DM	21/6	11/12	0.03 (OR 3.82;95% CI 1.13 to 12.95)
HTN	21/27	12/23	0.06 OR 3.2 (95% CI 0.9456 to 10.8858)
IHD	15/12	10/13	0.4 (OR 1.63 CI 0.5 TO 5)
COPD	7/27	4/23	0.5 (OR 0.9 CI 0.3 TO 2.96
CKD	15/27	12/23	0.81 (OR 1.15 CI 0.38 to 3.5)
AF	14/27	11/23	0.37
Charlson Age adjusted Comorbidity Index	6.5 ± 1.6	5.9 ±1.3	0.15
Rockwood Frailty Index	6.2±1	5.4±1	0.006 (≥6; OR 6.530695 % CI:1.8958 to 22.4961; p=0.003)
Beta blocker	71%	80%	0.22
Mineralocorticoid antagonist	31%	24%	0.45
ACE inhibitor	61%	71%	0.18
HFrEF			0.9
BMI	33.6±8	31.8±7.5	0.4
NTpro-BNP	6807(1810- 24305)	5700 (1653-17000)	0.91
Hb	121± 20	115± 18	0.33
Lymphocyte count	1±0.4	1.1±0.5	0.5
BUN	6.9±4	6.7±3.5	0.9
Creatinine	153± 98	150± 65	0.9
Sodium	134.3± 5.9	136.7± 4.3	0.42
BP	134±29	146±32	0.17
HR	88±20	78±19	0.2

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One of 15 cardiologists in the UK, selected by the British Cardiac Society for the inaugural Emerging Leadership Program and appointed to the British Cardiac Society Digital and Communications Committee.
Active research role as NIHR Research Scholar and Honorary Senior Clinical Lecturer at Liverpool Centre for Cardiovascular Science (University of Liverpool).
PI for several multi-centre national and international clinical trials in heart failure
Research Interests: Cardio-Renal Syndrome, novel biomarkers, Digital Technologies in Heart Failure, Frailty in Heart Failure, Clinical Risk Scores

Dr KK Aggarawal
5th September,1958 -17th May 2021

OBITUARY

Dr KK Aggarwal, Padma Shri awardee and former national president of the Indian Medical Association (IMA), passed away on 17th May 2021 after a long battle with Covid-19 at New Delhi's AIIMS. His life was dictated to the welfare of the public and raising health awareness. During the COVID pandemic he made constant efforts to collate and determinate information relevant to the medical profession. He was an outspoken personality and a voice for the medical professionals who was never restrained from raising concerns on many controversial issues. Sr. Physician Cardiologist and President of Confederation of Medical Associations in Asia and Oceania & HCFI has left a legacy of contribution to public healthcare and support for the causes medical fraternity that would be dearly remembered. He was a friend of Swasthya and we pray for the peace his soul and for the strength to family to bear the loss. RIP Dr Aggrawal ji.

On behalf of Swasthya: Buddhdev Pandya MBE, Dr Sharad Agrawal, Mr CR Chandrasekar, Dr Santosh Mudholkar, Mr Amit Sinha, Dr Nandini Chakraborty

"Forewarned is forearmed":

Anecdotal examples of some post-COVID-19 vaccine adverse effects

Dr KK Aggarwal MD (Medicine)
President Confederation of Medical Associations of Asia and Oceania (CMAA) & Heart Care Foundation of India (HCFI), Past National President, Indian Medical Association (IMA)

It has been more than one year since Covid-19 was first identified. The disease has become more manageable now than when it burst upon a world, which was unprepared for it and so spread like wildfire. Since it is a new disease caused by a new virus, there is also no immunity against the virus. Allowing herd immunity to develop naturally was not a viable option as it would add to the considerable high morbidity and mortality. Hence it was imperative to have a vaccine ready for use, at the earliest. Many vaccines - Pfizer-BioNTech, AstraZeneca-Oxford, Moderna, Johnson & Johnson, Sputnik V, Sinopharm – have been granted emergency use authorisation in various countries in view of the public health emergency.

India too rolled out its Covid-19 vaccination drive on 16th January this year, with two vaccines, Covishield and the indigenously developed Covaxin. Till date, more than 14 crore vaccine doses have been administered across the country. India has also approved its third Covid-19 vaccine, Sputnik V, developed by Russia.

A Covid-19 vaccine has been one of the most or perhaps the most awaited event in recent times. However, reports of post-vaccine adverse effects have generated a fair amount of vaccine hesitancy.

Adverse events with vaccines are inevitable. And, like any other vaccine, Covid-19 vaccines too can cause side effects. Most are mild or moderate and may resolve spontaneously.

The benefits of vaccines far outweigh the risks; hence, as physicians, we should encourage people to take the vaccine. Vaccines are beneficial; they reduce the risk of infection and also protect from developing serious disease.

But, it is also important to be aware of the possible adverse effects because most post-vaccine complications are manageable and preventable (Table 1). Evaluate the risks in every individual. In the high risk individuals, give the vaccine by doing appropriate risk reduction and under observation with proper informed consent. This way, adverse events can be anticipated and prevented.

Table 1: Type adverse reactions with Covid-19 vaccines

Allergy reactions			
Type 1 Immediate	IgE mediated	First 30 minutes	Anaphylaxis, treatment is adrenaline
Type 1 delayed	Non IgE mediated, complement mediated	After 6 hours	Urticaria, rash, treatment involves montelukast and H1 blocker
Type IV delayed cell mediated hypersensitivity reaction	Type IV delayed cell mediated hypersensitivity reaction	Type IV delayed cell mediated hypersensitivity reaction	Type IV delayed cell mediated hypersensitivity reaction
Non allergy reactions			
Exaggerated Th1 response	Day 2-4	Immuno-inflammation anywhere in the body, skin, eyes, heart, blood, liver	Treatment is mefenamic acid, colchicine or short course of steroids
Exaggerated Th17 response	Day 4-14	Thrombo-inflammation, venous thrombosis, splanchnic or cavernous sinus thrombosis or pulmonary. Features are high d-dimer and low platelet count.	Treatment is aspirin or non-heparin oral anticoagulants or artemisinin
		Or temporary activation of underlying Th 17 diseases, like psoriasis, Crohn's disease, ulcerative colitis, eczema, auto-immune thyroiditis	Treatment is supportive and symptomatic Autonomic Overlay Short lived

Autonomic Overlay Short Lived		
Bradycardia	Vagal stimulation	Symptomatic
Postural hypotension	Autonomic dysfunction	Symptomatic
Post meal hypotension	Autonomic dysfunction	Symptomatic
Inappropriate tachycardia	Autonomic dysfunction	Symptomatic
Accelerated hypertension	Sympathetic overactivity	First 48 hours after vaccine
Vasovagal	Autonomic dysfunction	First 30 minutes

Table 2: Efficacy of various Covid-19 vaccines

Covaxin	Oxford-AstraZeneca (Covishield)	Pfizer-BioNTech	Moderna	J&J/Janssen	Sputnik V
2nd interim analysis of Phase 3 trial Overall, 78% efficacy 100% efficacy against severe Covid-19 70% efficacy against asymptomatic infection	66.7% efficacy against symptomatic disease 100% effective in preventing hospitalisations. Efficacy is 54.9% when time between doses was ≤6 weeks apart *but* 82.4% when given ≥12 weeks apart. *(India is administering the 2nd dose between 4 to 6 weeks after the 1st dose)*	95% effective in preventing symptomatic disease. 100% effective in preventing hospitalisations. Equally protective across age groups	94.1% effective in preventing symptomatic Covid-19 after 2nd dose. 89% effective in preventing hospitalisations. Efficacy slightly low in ≥65 years	Phase 3 trial conducted in USA, Latin America, and South Africa Overall, 66% effective in protecting against moderate to severe Covid-19: • USA (72%) • Latin America (66%) • South Africa (57%) 85% effective in preventing severe disease. 100% effective in preventing Covid-19-related hospitalization and death, 28 days after vaccination	Interim analysis the phase 3 data 91.6% efficacy against symptomatic infection 100% protection against moderate/severe COVID-19 Efficacy seen across all age groups, including older adults (≥6 years)

Since the pandemic began, I have been holding daily virtual meetings and counselling sessions with diverse groups of people – those who have Covid-19; patients in home isolation; the general public; Resident Welfare Associations (RWAs), NGOs, teachers, principals and students of schools and colleges including doctors, to educate them about the disease and then the Covid-19 vaccine, and remove their fear and dispel prevailing myths.

Herein, we look at some anecdotal and visual accounts of adverse events experienced by vaccine recipients. These have been reported to me in my meetings with them.

The sole purpose of sharing them here is to sensitize doctors, including the general public, about the possible adverse effects and not to dissuade anyone from taking the vaccine. This way they can be anticipated and timely and the right steps can be taken to prevent them as "Forewarned is forearmed".

Vaccines can cause immediate type I hypersensitivity reactions, which occur within few minutes of exposure. These allergic reactions are due to the vaccine excipients such as polyethylene glycol (PEG) or polysorbate 80. Anaphylaxis occurs with 15-30 minutes of the vaccine; hence, the mandatory 30 minute waiting period at the vaccination center after taking the vaccine. Serious allergic reactions occur one in a million vaccine recipients.

Delayed type reactions (Non IgE, complement-mediated) reactions may occur after 6 hours of taking the vaccine: angioneurotic edema, rash on the neck, urticaria. They are mild and not fatal.

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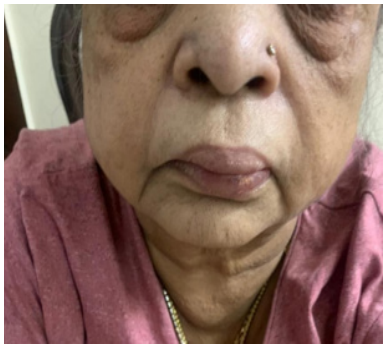


Angioneurotic edema after 6 hours

Rash on the neck on the second

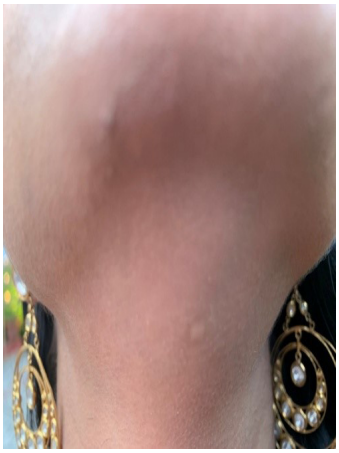
Urticaria on the second day after the vaccine

Rash seen on 5th day in a patient with history of allergy

Type IV hypersensitivity reactions at the local injection site (similar to lepromin or tuberculin test) are very common and can be confused with local cellulitis. They appear as indurated raised inflammatory skin lesion usually between 2nd and 4th day at the injection site or even remotely from the injection site on the same hand.

5 days after the vaccine

Rash away from the site of injection on 14th day



Painful lymphadenitis

Chickenpox rash 10 days after the vaccine

The vaccine can precipitate underlying inflammation or autoimmune disease via Th1 and Th 17 responses: rheumatoid arthritis, adult chickenpox, herpes zoster, painful lymphadenitis, episcleritis, left eye conjunctivitis, psoriasis. Patients have also reported flaring up of their Crohn's disease and irritable bowel syndrome with diarrhea (IBS-D).

Patient with history of psoriasis since 15yrs suffered a relapse on the second day after the 1st dose.

The vaccine may also cause neuroinflammation triggering seizures (focal or generalized), transient ischemic attack (TIA). Patients have reported increased tinnitus, blurred vision and neurological pain.

Vaccine can cause thromboinflammation. Patients have developed vaccine-induced thrombocytopenia with superficial clots. This reaction is quite similar to heparin-induced thrombocytopenia (HIT). Such patients need rivaroxaban and not heparin. Check platelets after the 4th day. If platelets start decreasing after day 4, immediately start rivaroxaban.

Vaccine may cause thrombosis

Vaccine-induced thrombocytopenia with venous thrombosis: Superficial venous clots in lower limbs 14 days after the vaccine; platelets dropped from 3 lakhs to 1.5 lakhs.

Blood clot in the arm 3 weeks after the vaccine

Vaccine may cause sympathetic overactivity, which can manifest as accelerated hypertension and transient atrial fibrillation (AF). A 76-year-old female developed accelerated hypertension (190/120) and transient AF, which reverted. Another elderly patient reported atrial fibrillation.

Vaccine can act as trigger to Covid-19. Few patients have reported testing positive for Covid-19 after the first dose of vaccine, from second day to up to 15th day. This can cause severe inflammation presenting as high fever and rising C-reactive protein (CRP) levels.

As doctors, we can evaluate the risk in every person before they take the vaccine. Assess your patient and ask yourself the following questions:

- Will he/she develop & tolerate vasovagal reaction? If the patient has a history of syncope, ask them to take the vaccine while lying down and stay hydrated.
- Will he/she develop and tolerate immediate (IgE) and or delayed (Non IgE) allergy? If likely (non IgE mediated): pre-load with Montelukast + H1 + H2 blocker. If known IgE allergy: Get eosinophilic count and IgE levels, do a scratch test/ intra dermal challenge.
- Will he/she get exacerbation of thrombo-inflammation? If baseline CRP >1 mg/L, it will cause rise in CRP, IL-6, IL-1β). In such cases, preload the patient with ACS (aspirin, colchicine and statin). CRP may rise by 30% on day 2. If rise is more or CRP is >10 mg/L, then add mefenamic acid or any other immunomodulator.
- Will he/she get overactive sympathetic response? (abnormal HR variability, 6 MWD/T less than 700 feet or over sympathetic response to walking) pre-load such patients with a β-blocker.
- Advise patients to continue all their medications unless contraindicated on the day of vaccination.

Impact of Covid-19 on medical education

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The impact of Covid-19 on medical education has been catastrophic. Health Education England (HEE) has worked with key partners to expedite the registration of 2213 final year medical students to be become new junior doctors and the join the NHS frontline early. Doctors who have retired in the last 3 years are being asked to consider returning back to work. Similar adjustments were done across the pond and in Europe. The GMC National training survey highlights the disruption caused by Covid-19 and it's adverse effect on morale of our trainees[1,2].

Historical perspective

It is well recognised that at times of major conflicts, the quality of training suffers tremendously. We understand that during the Blitz, students and newly qualified in-turns were drafted to areas of need. Additionally during World War II, certain American medical schools abbreviated their post graduate degree programme from 4 years to 3 years to address doctor shortages. Despite this bleak outlook, radical reforms in medical education occurred after the [2] World Wars leading to significant improvements in the curriculum and in-take along with significant increase in women admissions to medical school.

Clinical teaching

Almost all medical schools swiftly moved on to remote learning and majority of university staff worked from home. All across the world, final year medical students were drafted into the medical workforce as 'early graduates' and have certainly assisted in the pandemic response. There is evidence to suggest that they were well supported – they were deployed on 'non-Covid' areas and had named mentors. Junior doctor morale was already low during the pre Covid era due to loss of firm structure, frequent changes in specialities and exceedingly busy shifts. This has now been worsened with Covid 19 causing rota disruptions, working in unfamiliar surroundings and concern over personal protective equipment. Nearly half of juniors have reported anxiety, depression and burnout. In addition to changes in the clinical landscape, there have been disruptions in specialist examinations and speciality recruitment processes. Despite swift response from all Royal Colleges, GMC, HEE, BMA and other allied organisations; juniors have reported stress and frustration due to uncertainty[3]. Staff absences due to illness or self-isolation can be as high as 20%; the negative aspects of quarantine should not be underestimated[4]. Healthcare professionals had a high incidence of stress and anxiety disorders; with females and nurses having the highest incidence[5].

Although the current pandemic has thrown up major challenges to the National Health Service such as significant reduction in routine work and elective surgery along with all out-patient clinics being switched to tele-clinics trainers have demonstrated a willingness to adapt and designed innovative learning opportunities in place of traditional teaching methods to mitigate these unprecedented turn of events.

The swift response towards digital technology has successfully converted all out-patient clinics into telephone clinics – innovative use of speaker telephones and other innovative gadgets such as split ear phone pieces have managed to provide worthwhile training to medical students and junior doctors.

E-learning is not a normal concept and there have been multiple platforms providing different learning materials for healthcare professionals. These include www.e-lfh.org.uk and e-brain.net[6,7]. However Covid-19 has exploded a rise of innovative trainers including peer to peer trainers who have created new learning materials and are holding video conferences for learning worldwide utilising software such as zoom. It has been demonstrated that video conferences are non-inferior to face to face education. There are additional advantages such as increased breadth of teaching resources available along with a reduction in the time and cost of travelling for teaching.

A lot of junior doctors were drafted towards managing acutely unwell patients with Covid-19 and this was taking them outside their comfort zone. However, basic management of an acutely unwell patient will always be helpful whatever your speciality. There has been an explosion of medical literature surrounding Covid-19. All doctors whatever their speciality have closely followed this evidence and have sifted through to assess the strengths and weaknesses of various studies available. This has provided us with helpful tools to discern the quality of evidence "which in the long run will inform our judgement to effectively management patients in our own sub-speciality too".

The development of peer support networks may lead to reduced doctor burnout and improved patient care[8]. Additionally the key learning has been in softer skills such as leadership, innovation to adapt and team building. As clinicians have had to change their pattern of working on a daily basis there has been a great opportunity to observe excellent leadership skills at close quarters.

Leadership focussed on resilience, lucid communication

to provide timely information and empowerment; and providing a supportive culture to enhance a continuum of staff sustenance will be required in the days' ahead[9].

There has been concern regarding craft specialities where online resources cannot replace "hands-on skills". However, several simulation labs have sprung up in various regions to assist with this deficiency. Remote learning should promote sharing of resources beyond the usual confines and programs should invest in virtual platforms available to all trainees[10].

Additionally Royal Colleges and Health Education England have issued guidelines to state that progress of junior doctors would not be affected just because of Covid-19. Although there is some uncertainty whether training will need to be extended a lot of background work is ongoing to mitigate these challenges. Schwartz ward rounds have been invaluable in improving team working and building resilience. In our own hospital, we resorted to 'reverse Schwartz rounds' where a junior would lead the round as a Consultant and roles were reversed to build morale.

Key Messages-

- Globally, major disruptions have been reported in medical education due to Covid 19 pandemic
- In response reorganisation of healthcare services has taken place
- Adverse psychological impact on trainees has been catastrophic
- Surgical and craft specialities have been particularly affected
- E learning platforms and Simulation centres have come to rescue
- Silver lining of the pandemic has been a renewed 'sense of camaraderie' amongst healthcare teams.
- Future directions-
- How will long Covid 19 affect a proportion of trainees?
- Will the key learnings from Covid 19 ultimately produce a more resilient healthcare workforce?
- Whether Covid 19 has been a springboard to transform medical education delivery?

Conclusion

The Covid 19 pandemic has caused major disruption in the field of medical education. Although the negative impact is likely to last for a long time; there has been a swift response to mitigate some of the challenges. There needs to be a new balance between training needs and service provision to prevent uncertainty and frustration amongst trainees. It remains to be seen whether this pandemic will ultimately lead to transformational change in medical education. One of the silver lining has been the 'sense of camaraderie' and 'flattening of hierarchy' as all seniors, juniors and allied healthcare professionals have joined forces to continue to care for our patients. We should be looking to create competent doctors who are resilient to meet the demands of future similar disruptions.

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SOURCE: Medical Economic Times

Cardio-Oncology

– *establishing itself as a new subspecialty in cardiology*

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Cardio-Oncology is the care of cancer patients with cardiovascular disease[1]. While it has been established a speciality for a few years in the USA and in some parts of Europe, it is now rapidly developing in the UK. This review aims to give the reader of an overview of the exciting new specialty of Cardio-Oncology.

What is Cardio-Oncology?

Cardio-Oncology is the prevention and management of heart disease in cancer patients[2]. While the bulk of work is related to cardiovascular toxicity of cancer therapies it is important to remember that there are other interactions between cancer and heart disease with many common risk factors and disease pathways at cell and molecular level[3].

The mortality rate among patients with cancer has decreased dramatically over the last 20 to 30 years. However, the toxicity of conventional cancer treatment (both chemotherapy and radiotherapy) is greater than previously appreciated and is a leading cause of morbidity and mortality in survivors. New "targeted therapies" are being developed at a rapid pace many of which have recognised or unrecognised cardiovascular toxicities. The cardiac toxicities of cancer treatment include heart failure, cardiac ischaemia, arrhythmias, pericarditis, valve disease and fibrosis of the pericardium and myocardium4 (Figure 1).

Chemotherapeutic agents can broadly be divided into cytotoxic agents (anthracyclines e.g. Doxorubicin, taxanes e.g. Paclitaxel and others like [5] Fluorouracil, Cyclophosphamide and Cisplatin) and molecular targeted therapy [Monoclonal antibodies e.g. Trastuzumab (Herceptin), tyrosine kinase inhibitors e.g. Sunitinib and Vascular endothelial growth factor antibodies (VEGFs) e.g. Bevacizumab] (Table 1). The cardiovascular side-effects of these agents are varied (Figure 2). Newer immunotherapies like Chimeric Antigen Receptor T Cell (CART) therapy have their associated cardiotoxicities5.

Radiotherapy can cause cardiac damage through macrovascular and microvascular injury (Figure 3). The risk of radiation-induced heart disease is increased with anterior or left chest irradiation, lack of shielding, higher doses and with concomitant anthracycline chemotherapy6. Patients who received radiotherapy historically are at increased risk compared to current radiotherapy regimes due to the development of better shielding protection.

Presentation

Cardio-Oncology patients can present in a number of ways. Depending on the cardiac diagnosis (e.g. heart failure versus ischaemia) different investigations and management plans are formulated.

The key role of Imaging

Cardiac imaging is the primary investigative modality. With the known effect of chemotherapy on cardiac function, cardiac imaging has been used to monitor this. Traditionally in the USA nuclear medicine (MUGA – multi-gated acquisition)

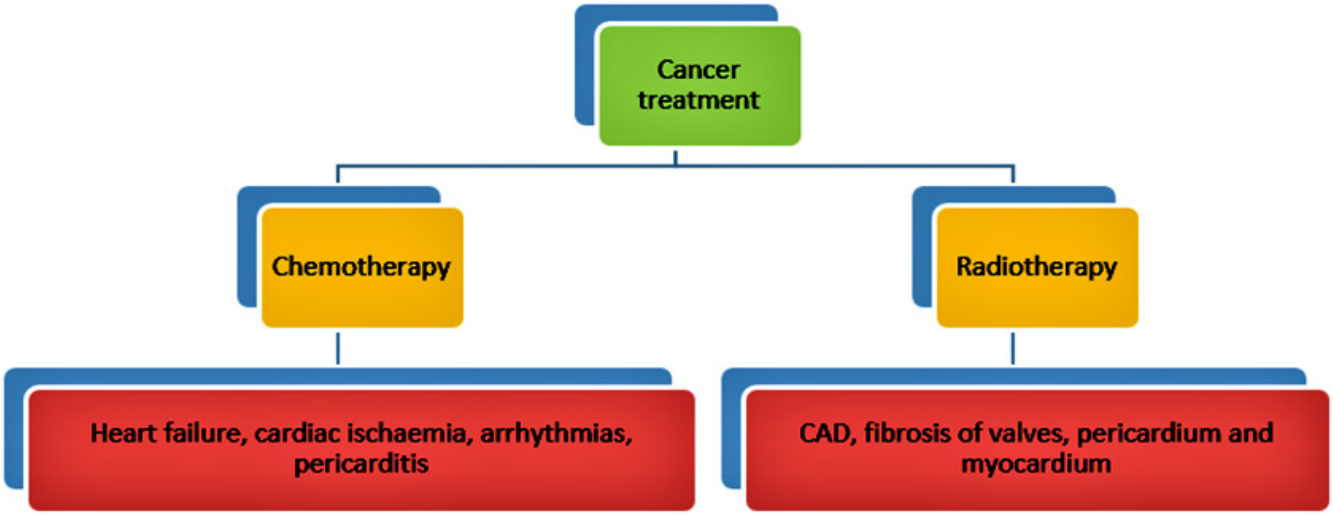


Figure 1. Cardiovascular side effect of cancer treatment

scans have been used to monitor ejection fraction (EF) in cancer patients. The predominance of this imaging technique in the USA is due to widespread availability and good reproducibility. However, such an approach has considerable drawbacks – namely repeated exposure to radiation with repeated surveillance scans and an inability to offer a more nuanced assessment of cardiac function other than EF.

In most other countries, echocardiography is the key initial imaging investigation. It widely available, inexpensive and does not expose the patient to radiation. In the UK the first national guidelines in cardio-oncology were released in March 2021 focusing on the role of echocardiography in monitoring cancer patients[7].

Other imaging modalities have their role also. Cardiac magnetic resonance (CMR) imaging can complement echocardiography by demonstrating the location of focal myocardial fibrosis and inflammation. CMR is however limited by availability, cost and patient acceptance, making it unlikely to wholly supplant echocardiography[8].

Computed Tomography of the Coronary Arteries (CTCA) is also a useful investigation especially when assessing the effects of radiotherapy-induced fibrosis and coronary atherosclerosis[9].

Management and Prevention

Patients with chemotherapy or radiotherapy induced heart failure, valve disease or coronary ischaemia should be treated as per standard European and national guidelines, but some registries suggest that cancer survivors may be undertreated for conventional CV risk factors. The treatment of coronary disease with stents (and the associated antiplatelet agents) may be difficult if cancer surgery or treatment with chemotherapy that may seriously diminish platelet numbers, is imminent.

There is limited data on the cardio-protective effect

Table 1

Class	Mechanism of action	Typical use
1. Cytotoxic agents		
a. Anthracyclines – Doxorubicin, Daunorubicin, Epirubicin	Intercalate into nuclear DNA, impair topoisomerase II, cell transcription and division, producing Reactive-Oxygen-Species	Leukaemia and soft tissue tumours
b. Taxanes – Paclitaxel, Docetaxel	Polymerise tubulin leading to dysfunctional microtubules disturbing cell division	Breast and ovarian cancer
c. Other agents – 5 Fluorouracil, Capecitabine, Cyclophosphamide, Cisplatin	Bind to DNA causing crosslinking and ultimately apoptosis	Testicular, bladder, ovarian cancer
2. Molecular-targeted therapy		
a. Human epidermal growth factor 2 receptor (HER2) antibody - Trastuzumab	Humanized Immunoglobulin G1 monoclonal Ab directed against the HER2 protein	Breast cancer
b. Tyrosine kinase inhibitors – Lapatinib, Sunitinib, Imatinib	Stop protein activation by blocking signal transduction cascades	Breast, gastrointestinal stromal, renal cancer, leukaemia, non-Hodgkin's Lymphoma
c. Vascular endothelial growth factor (VEGF) inhibitors – Bevacizumab, Sorafenib, Axitinib	Inhibit tumour-associated angiogenesis mediated by VEGF and VEGF receptors.	Brain, kidney, lung, colon cancer
d. Other biologic agents – Rituximab	Monoclonal antibody acting against CD20 protein	Leukaemia, lymphoma

Table 1. Mechanisms of action and uses of common cardio-toxic chemotherapeutic agents. HER2 - Human epidermal growth factor 2 receptor, VEGF - Vascular endothelial growth factor.

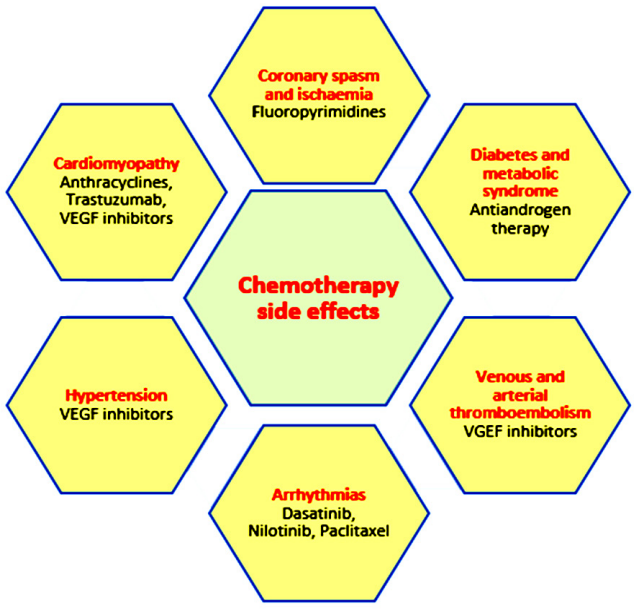


Figure 2. Cardiovascular side effects of chemotherapeutic agents. VEGF – Vascular endothelial growth factor

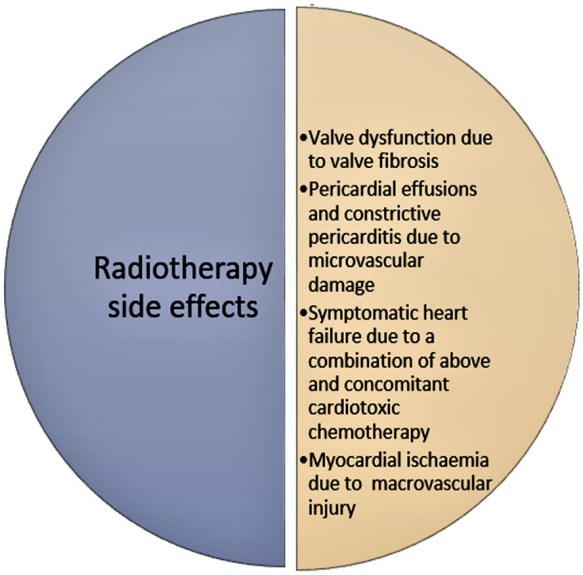
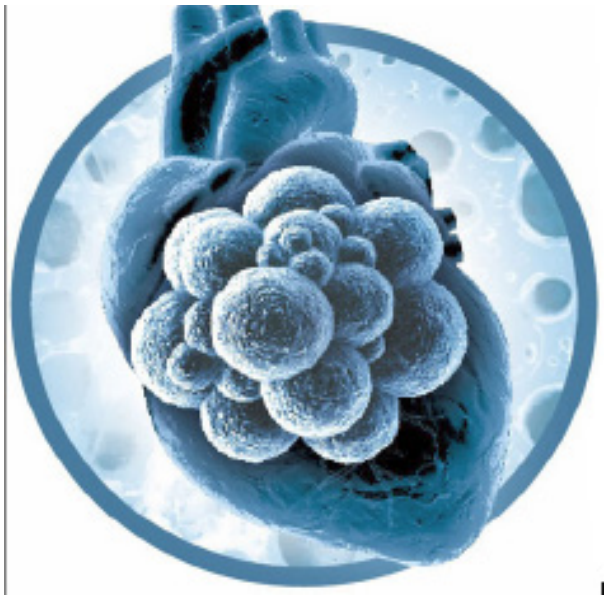


Figure 3. Cardiovascular side effects of cancer



PICTURE SOURCE: Healio.com

of Angiotensin Converting Enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs) and beta blockers in patients undergoing chemotherapy. Their use in this context (e.g. when the EF or strain values drop significantly with chemotherapy but still remain in the "normal" range) is unlicensed. Desraxozane (an iron chelator) has been shown to reduce doxorubicin-induced cardio-toxicity. It may be initiated at the first dose of anthracycline or after a cumulative doxorubicin dosage of ≥ 300 mg/m^2. However its use is licensed in the treatment of only a few cancers and its use is not widespread and although a previously a worsening in cancer outcomes was suggested, subsequent studies have not confirmed this potential.

The current UK perspective – services and training

There is an increased recognition that optimal cardiovascular care for cancer patients can be best delivered through dedicated Cardio-Oncology services. Cardio-Oncology services are now being developed at a number of hospitals in the UK[2]. Given the increased success of oncological treatments the number of cancer patients with cardiovascular problems will increase with time resulting in a greater need for Cardio-Oncology services. This realization led to the appointment of the first consultant cardiologist in the UK with a special interest in cardio-oncology (the author).

Training programmes in Cardio-Oncology are well established in the USA with trainees from both Cardiology and Oncology undertaking these fellowships with the ultimate aim of developing Cardio-Oncology services with Cardiologists and Oncologists working together as a team[10]. Currently only a few hospitals in the UK offer Cardio-Oncology Fellowships. The aim of societies like the British Cardio-Oncology Society (http://bc-os.org/), International Cardio-Oncology Society (https://ic-os.org/) and American College of Cardiology (https://www.acc.org/Membership/Sections-and-Councils/Cardio-Oncology) is to expand training in Cardio-Oncology and ultimately develop formal training programmes.

Key points

- Cardio-Oncology is a new and exciting specialty involved with the prevention and management of heart disease in cancer patients
- Chemotherapy, radiotherapy and cancer itself have cardiovascular effects
- Cardiovascular complications include heart failure, valve disease, pericarditis, pericardial effusions, ischaemic heart disease and arrhythmias
- Imaging investigations are key for detection of abnormalities and monitoring of patients with echocardiography the principal imaging modality
- Limited evidence showing the cardio-protective effect of ACE inhibitors, ARBs and beta blockers – new trials ongoing
- Current expansion in Cardio-Oncology services and training opportunities in the UK

Conflicts of interest:
The author is Education lead for the British Cardio-Oncology Society and on the Education Committee of the International Cardio-Oncology Society. He is also on the Cardio-Oncology Leadership Council of the American College of Cardiology.

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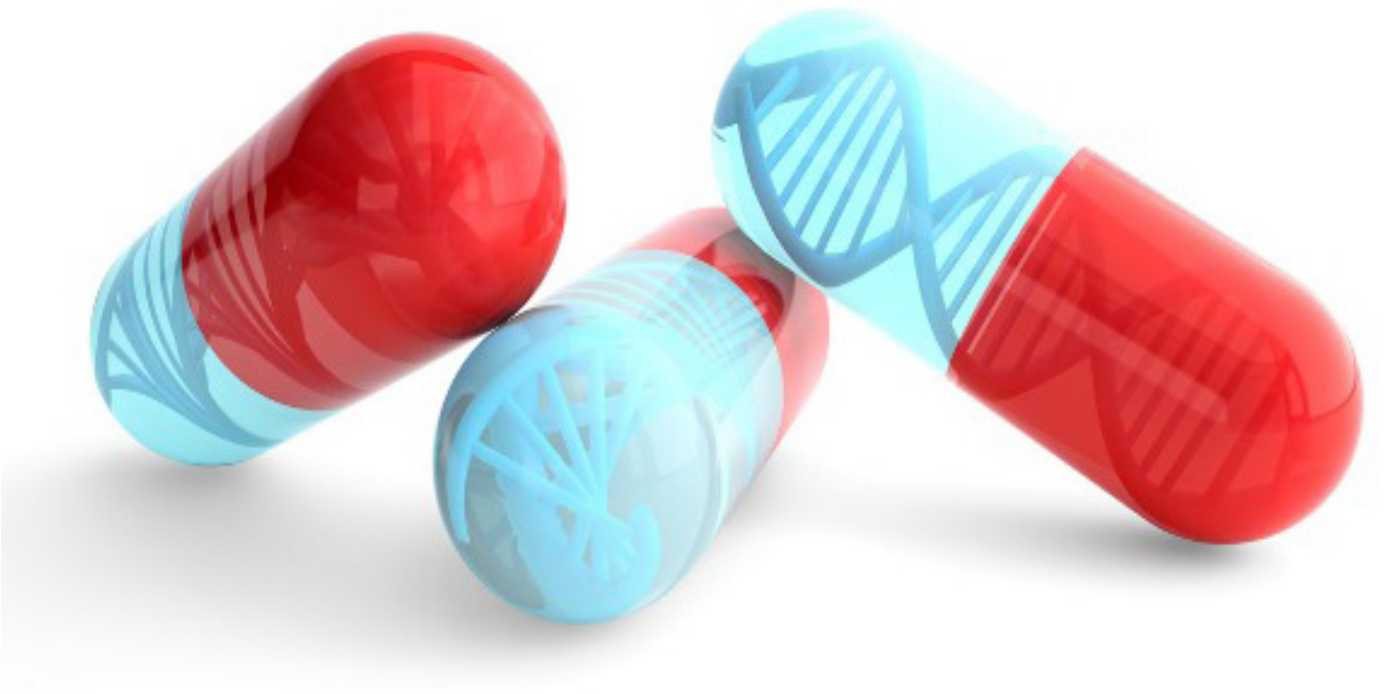
Swasthya Health स्वास्थ्य
Volume:1 Issue: 4 2021

MENTAL HEALTH

Swasthya: Journal for Healthcare Professionals



Contents .....

I welcome readers to the first-year anniversary issue of Mental health section of Swasthya. When I was contemplating writing the editorial for inaugural Swasthya issue last year in May 2020, little did I imagine that we will still be in a lockdown in a years' time. The last year has seen insurmountable amount of suffering and loss of lives due to covid-19 pandemic. While we are about to see lockdown measures lifted in U.K. the pandemic is causing massive surge in cases in second wave in India. On behalf of Swasthya mental health section editorial team I empathise with readers who have suffered due to covid. The arrival of spring with spells of sunshine and cherry blossoms blooming all over the country it appears that there are some green shoots of recovery and sense of optimism.

Firstly, I would like to welcome two of my esteemed colleagues on the Editorial Board of mental Health section. Prof. Nandini Chakraborthy, Professor of Psychiatry, University of Leicester and Dr Fabida Aria, Associate Medical Director, Leicestershire Partnership NHS Trust. Both, Prof Chakraborthy and Dr Aria bring their academic and clinical experience and will be working alongside me as Associate Editors. Their appointment is part of the strategy to strengthen the editorial board governance and attract high quality articles focussing on innovations, beacons in clinical practice in the field of mental health. We consider ourselves fortunate they can spare their valuable time and contribute to the editorial board.

The mental health section harnesses this positivity and I am delighted to present you with intellectually stimulating articles ranging from Pharmacogenetics, art and mental health and holistic approach to caring for patients with severe and enduring mental illness. We have waited in anticipation for the last few years regarding developments in pharmacogenetics and personalised medicine. Now for the first time in psychiatry we have a discovery which is likely to revolutionise the decision making in prescribing Clozapine for patients suffering from treatment resistant schizophrenia (TRS). Prof. David Taylor, Professor of Psychopharmacology and Pathology at King's College, London requires no introduction. Prof Taylor is well known as the editor of Maudsley prescribing guidelines which is now a gold standard for prescribing in mental health in U.K. It is indeed an honour to introduce Pharmacogenetic test (PGT) and Prof Taylor's e-interview to Swasthya readers.

The social isolation brought about by lockdown, although can exacerbate psychological difficulties, it also provides an opportunity to indulge in art in supporting mental health recovery. Dr Hanna Booth's article elucidates the role art can play in mental health recovery and how it is a powerful tool for empowering patients in their recovery.

Dr Aria's article on holistic care for patients with severe mental illness is a timely reminder of the physical health co-morbidity in this with severe mental illness and the need for parity of esteem in this regard. The article is grounded in clinical setting and will be of interest to jobbing clinicians as well as colleagues in primary care.

We are also interested in providing our readers key appointments in mental health and share success of colleagues who are working hard in these extraordinary circumstances. We are pleased to hear about the appointment of Dr Basudeb Das as Director of Central Institute of Psychiatry (CIP), Ranchi, Jarkhand, India. CIP is one of the oldest psychiatric establishment and training centre in India. We are grateful to Prof Chakraborthy to facilitate this interview.

I hope you will find this section interesting and looking forward to your feedback.

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Chief Editor
Swasthya Mental Health Section

CLOZAPINE AND PHARMACOGENETIC TESTING : A NEW DAWN

Dr Santosh Mudholkar ***MBBS MD MSc FRCPsych***
Consultant Psychiatrist

Introduction:

It is not often that there is such an excitement in psychiatry research as seen following breakthrough advances as the announcement of "Pharmacogenetic test (PGT)" for Schizophrenia by Prof David Taylor, Myogenes on 31 March 2021. Is this the "Eureka" moment in modern psychiatry?

Background:

Schizophrenia is one of the severe enduring mental illness with peak age of onset in early adulthood in both, men and women with a course of relapse and remission. The term "Schizophrenia" was originally termed by Eugene Bleuler (1911/1950)[1]. Bleuler's primary symptom was "cognitive", a form of thought disorder, loosening of associations. Globally, the prevalence (number of cases present in a population at a given time or over a defined period) of Schizophrenia is around 1.4 to 4.6 per 1000 population at risk. The incidence of Schizophrenia is around 1.5 per 10,000 in general population each year[(5)]. Antipsychotic medications remain the cornerstone of treatment.

Schizophrenia is characterised by delusions, hallucinations (Positive symptoms), affective flattening, poverty of speech, lack of volition, anhedonia (negative symptoms)[3] and disorganised thought process (reality distortion syndrome). Schizophrenia is associated with psychiatric co-morbidities and increased risk of suicide. The aetiology of Schizophrenia is multi-factorial with a combination of genetic, biological, psychological and social factors being implicated. However, no single causative factor is yet identified and there is no cure for this severe mental disorder. However, advances in pharmacotherapy with development of Chlorpromazine in 1950s, subsequent introduction of Haloperidol in mid 70s and series of second generation antipsychotic medications in the 1990s and the millennium have greatly improved control of symptoms, course and prognosis.

The course of Schizophrenia shows a high degree of inter-individual variability, with about 20% of individuals with first psychotic episode remaining symptom free for 10 years. WHO[6] studies have shown a slightly better prognosis in less developed countries compared to the developed ones. In nearly 50% of cases the illness takes are course of relapse and remission. It is estimated that around 25% of cases with Schizophrenia are resistant to currently available treatment, often termed as Treatment Resistant Schizophrenia (TRS). In these cases the disorder usually has an entrenched, long-term, chronic course with persistent psychotic symptoms, gradual cognitive decline, psychosocial impairment affecting the individual sufferer's quality of life.

Clozapine: benefits and side-effects

Clozapine, a dibenzodiazepine, a novel antipsychotic drug was synthesized in 1956 and commercially sold in 1972. Although it is not known to cause any extra-pyramidal side-effects and tardive dyskinesia it was (and remains) associated with increased incidence of agranulocytosis in 1970s resulting in restrictions in use. Interest in Clozapine was re-ignited after the landmark study by Kane et al (1988)[4] found that Clozapine was superior to Chlorpromazine in over 30% of patients with TRS who had not responded to two or more antipsychotic medications in the past. Clozapine is undisputedly, the "gold standard" for Treatment Resistant Schizophrenia (TRS). There is clinical evidence that Clozapine reduces suicide risk in sufferers and improves quality of life.

As Clozapine is associated with various haematological side-effects including neutropenia (3%) and agranulocytosis (0.8%) of cases treated with Clozapine. Hence, regular monitoring of full blood count is mandatory for patients who are prescribed Clozapine. Up until now it was not possible to predict who is likely to benefit from Clozapine and who is likely to develop serious side-effects. If a patient develops haematological side-effects they can lead to a medical emergency and temporarily or permanent withdrawal of Clozapine therapy. Agranulocytosis if not adequately treated can lead to fatality. This has severe ramifications not only for clinical management but also patient's psychosocial life. Rebound psychosis following Clozapine withdrawal is well recognised and can be severe requiring psychiatric re-hospitalisation.

Will pharmacogenetic test add value?

So before commencing a patient on Clozapine it will be valuable to know if the patient is likely to respond to its what dose is likely to benefit, risks for developing haematological side-effects such as neutropenia or agranulocytosis.

We are sharing with you the ground-breaking innovation in pharmacogenetics. The "Clozapine test" which is likely to have a huge impact and help clinician's decision making whether Clozapine is the appropriate next step for Treatment Resistant Schizophrenia (TRS) patients who have shown limited improvement with two or more other antipsychotic medications. Prof David Taylor, Professor of Pharmacy, South London & Maudsley Mental Health NHS Trust gives us insight into the advantages of this pharmacogenetic test. The Clozapine test is now available in U.K. and is marketed by Myogenes ltd.

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The world's first pharmacogenetic test
for patients with treatment-resistant schizophrenia

The world's first genetic test for patients with treatment-resistant schizophrenia is launched by 25th March 2021.

At the webinar organised by Psychiatric Genetic Testing Ltd, the PGT Clozapine Test was launched in presence of nearly 380 senior psychiatrists of the United Kingdom in London.

The United Kingdom psychiatrists would be the first in having access to a test that identifies key elements of a patient's genetic profile which will allow truly individualised treatment for people with the most difficult to treat schizophrenia.

The webinar focued on the only effective treatment for people with treatment-resistant schizophrenia – the atypical antipsychotic clozapine.

Research over the past quarter century has shown that in these patients, clozapine treatment improves symptoms, reduces hospital admissions, and prevents premature death. Clozapine should be used after a patient has failed treatment with two different antipsychotic medicines.

In a minority of patients, clozapine can cause serious side-effects and, despite its benefits, there is often a reluctance to prescribe it because, until now, it could not be predicted who would respond and who might have a toxic reaction.

This has resulted in many patients facing long delays – sometimes years – before they are offered treatment with clozapine. This prolongs suffering for patients who may instead receive treatment with cocktails of antipsychotic medicines which are not effective for them but can be potentially harmful. It also adds to healthcare costs.

David Taylor, Professor of Psychopharmacology at King's College, London, creator of the test, explained aspects of a patient's genetic profile have been shown to be important in clozapine therapy. For the first time, the PGT Clozapine Test removes much of the uncertainty about the use of clozapine by providing information on the risk of a toxic reaction and the likelihood that a patient will respond. He said, "Doctors can now have access to detailed information that will enable them to be much more precise when making treatment decisions. In the UK alone, the PGT Clozapine Test has the potential to transform the lives of tens of thousands of vulnerable patients with schizophrenia."

Professor Sir Robin Murray FRS, one of the world's leading psychiatrists, chaired the webinar and hailed the test as a crucially important step towards the goal of personalised treatment for people with psychiatric disorders.

Source: www.psychgenetic.com

About the PGT Clozapine Test

The test uses a saliva sample. It analyses ten genes with sensitivity and specificity above 99% for single-nucleotide variants and small insertions/deletions (≤20 bp) to provide information on key aspects of clozapine treatment:

- The likelihood of response
- The risk of agranulocytosis
- The patient's status in respect of benign ethnic neutropenia
- The rate of clozapine metabolism
- The recommended starting dose and
- The recommended treatment dose

The PGT Clozapine Test was created by Professor David Taylor, who is Professor of Psychopharmacology at King's College, London and Director of Pharmacy and Pathology at the Maudsley Hospital.

Treatment-resistant schizophrenia and the role of clozapine in its treatment

Schizophrenia has been described as "the worst disease affecting mankind, even AIDS not excepted."[1] It is a disintegrative psychosis where the person affected experiences a distorted reality. Key symptoms include delusions, hallucinations and paranoia. In addition, disordered thoughts and emotions are very common and a deficit syndrome involving poverty of thought and speech, self-neglect and difficulties with relationships affects more than half of patients. Lifetime prevalence is about 1 in 83, and a person with schizophrenia is about 3 times more likely to die prematurely than the population average.[2]

Antipsychotic medicines are the mainstay of treatment for schizophrenia but about one-third of patients do not respond well. NICE has defined treatment-resistant schizophrenia as follows: people with schizophrenia whose illness has not responded adequately to treatment despite the sequential use of adequate doses of at least 2 different antipsychotic drugs of which at least one should be a non-clozapine second-generation antipsychotic. Patients who meet these criteria should be offered clozapine.[3]

Clozapine is the only effective treatment for people with treatment-resistant schizophrenia.[4] Its use significantly reduces both hospital admissions and long-term mortality.[5]

Although the value of clozapine is widely acknowledged there is still a reluctance to prescribe; as a result, usage rates vary widely and there may be long delays before eligible patients are offered clozapine. This results in poor outcomes, exposure to potentially hazardous antipsychotic polypharmacy, unnecessary distress for patients, and avoidable healthcare costs.

The reluctance to use clozapine is due to a number of factors. Because clozapine can cause neutropenia in about 3% of patients, and potentially life-threatening agranulocytosis in about 0.4% of patients, haematological monitoring is

The PGT Clozapine Test was created by Professor David Taylor, Professor of Psychopharmacology at King's College, London, and Director of Pharmacy and Pathology at the Maudsley Hospital. Professor Taylor is the author of over 350 peer-reviewed publications in journals such as the Lancet, BMJ, British Journal of Psychiatry and Journal of Clinical Psychiatry, which have been cited over 15,000 times. In 2014, David was ranked in the top 100 clinical leaders in the NHS by the Health Service Journal. He is the Editor-in-Chief of the journal Therapeutic Advances in Psychopharmacology.

mandatory and is a major barrier to treatment.[6] A further complication is the presence of benign ethnic neutropenia in patients of African ancestry which can be misconstrued and so prevent patients from being offered treatment.[7] Individuals vary in their metabolism of clozapine, creating uncertainty about an appropriate starting dose and the optimal treatment dose. In addition, surveys of clinicians have repeatedly found negative perceptions and inadequate knowledge of how to manage clozapine's adverse effects as key factors limiting prescribing.**8** A recent study by a group at the Maudsley Hospital in London found that clozapine is prescribed for less than a third of eligible patients in the UK.9

Who will benefit from the PGT Clozapine Test?

Patients with treatment-resistant schizophrenia are among the most vulnerable of those in the care of mental health services. Four groups are likely to benefit:

- Any patient who meets criteria for treatment-resistant schizophrenia but has not yet been offered clozapine
- In addition, in patients already receiving clozapine:
  - o Patients with only a partial treatment response
  - o Patients where neutrophil counts necessitate interruption of treatment
  - o Patients with possible benign ethnic neutropenia but their status is uncertain

It has been estimated that there are currently nearly 90,000 patients in the UK who would meet criteria for treatment-resistant schizophrenia but who are not currently in treatment with clozapine.

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Special feature

e-interview
Prof David Taylor

FFRPS FRPharmS

Inventor of the "Clozapine Test"

By Dr Santosh Mudholkar FRCPsych
Consultant Psychiatrist
Chief Editor of Swasthya

Prof David Taylor

1. **How did you develop an interest in Psychopharmacology?**

   I had depression when I was 18 years old and was given dothiepin. No one can take that drug and not think treatment could be a lot better.

2. **What is your typical "work day"?**

   I don't really have one. I suppose I would sum it up as 'trying to do something useful while being bombarded with emails'. I supervise quite a bit of research, get involved in clinical cases, manage a department and (2 years out of every 3) write the Maudsley Guidelines. And reply to emails..

3. **Can you tell us about your professional journey from psychopharmacology to pharmacogenetics?**

   Pharmacogenetics has always been there - we have known about poor and fast metabolisers for more than 50 years; it is only recently that we have been able to identify the genes responsible. Gradually we learn more and more about genetic determinants of response and toxicity.

4. **Why is there a need to develop pharmacogenetic testing before commencing Clozapine?**

   Because currently the use of clozapine is based on a lot of guesswork. For any individual you do not know their chances of responding, their chances of getting agranulocytosis, or whether or not they have benign ethnic neutropenia. You have only a rough idea of the dose likely to be needed. The test takes away some of this uncertainty.

5. **How accurate is the test in its prediction?**

   The test is in four parts. For response the accuracy is shown by the confidence intervals we give around the estimated chance of response. There are 27 possible genetic combinations, each of which has an estimated chance of response. Some CIs are wide (e.g. 8-51%) some much narrower. For risk of agranulocytosis, the estimated risk is pretty accurate because we are looking for variants that have a high risk of dyscrasia. The risk (usually between 0.3% and 20%) is a very good estimate although we cannot currently identify people with no risk. For BEN, the SNP we look for (rs2814778) is probably the cause of BEN, so we feel this test is more accurate than a haematology assessment. For dose prediction we use a mathematical model to take account for 5 metabolic enzymes. The test for dose is at least as good as current algorithms based on smoking status and gender, and we hope to gather data to show that it is more accurate still.

6. **When will "Clozapine test" be available for patients in NHS in U.K.? Do you have any plans of marketing this test Internationally?**

   It is available now. It's up to the NHS, or at least individual trusts to decide if they use it. The cost is not prohibitive, and it is a once in a lifetime test - it doesn't need to be repeated. It is probably cost-effective because it will help more people get on to clozapine (who will then spend less time in hospital) and referrals to haematologists will be greatly reduced. Yes we have plans to launch overseas.

7. **How should clinicians request this test through their local NHS Trusts?**

   It is freely available from PGT. Clinicians should probably get the all-clear from their budget holder before ordering a test.

Prof David Taylor:
Professor of Psychopharmacology
King's College, London
Founder of the "Clozapine Test"

Psychiatric Genetic Testing

Credit for coordinating the interview to: Karen Bayliss at Psychiatric Genetic Testing Ltd?

The Art of Inspiring Creativity in a Psychosis Service

Dr Hanna Booth MBChB
Specialty Doctor
PIER team Leicester
Leicestership Partnership and NHS Foundation Trust

The National institute for Clinical Care and Excellence, or NICE, which guides UK health care, gives art therapy as one of the recommended treatments for patients with psychosis and schizophrenia. In our trust we have an Art Café, which outside of lockdown runs at our local mental health unit.

For some people, the urge to paint or draw continues in spite of their mental health difficulties. We have received as a team some beautiful gifts of artwork presented to members of staff or to use to raise funds. (see below image 1)

However, this is not the story for everyone. One of the challenges of working with patients with a first episode of psychosis is this. How can you inspire people who either because of trauma, anxiety or negative symptoms have lost their creative mojo? How can you encourage people who may have come to define themselves as a patient and forgotten that they are many other things? And when you find such people on your caseload, how can you transcend the barriers presented by transportation challenges, anxiety about leaving home or meeting with others to connect with people outside of a purely clinical setting to help kick-start a love of all things creative?

Some time back, I looked after a lady who was an accomplished artist, but due to her response to some difficult circumstances did very little past the basics of survival. With her especially in mind, my occupational therapist colleague and I cooked up a plan. We decided to set up a pilot group where we would provide some art materials and give people time and space to come and be creative together. Nobody would have to talk about their symptoms but just come and be artists of whatever level, together. We discovered that the

Image 1

main challenge was getting people to our health centre. When they came, they seemed to really enjoy it, but without the aid of care co-ordinators bringing them and encouraging attendance, they would forget or not manage to come.

We decided after the pilot that a different approach was needed. Social anxiety, poor motivation secondary to depression, or worries about transport seemed to have stopped people coming consistently. We felt that we could start a hub, where people could post in their art and have an option to meet up in a group if they liked, perhaps just every month instead of two-weekly as we originally planned, but that this attendance would be optional. This way, people who needed a gentle bit of inspiration could continue at home if needed. Our plans were thwarted by the onset of the UK COVID-19 lockdown but we decided that at least people could still post their work to us and one day, when we are back to having a full waiting area, their work could be displayed there for others to enjoy.

In the mean-time another colleague had a brainwave. Why don't we run a remote art group instead? Our art hub took on a new form. It is now called 'Creative Connections' and is run successfully on a fortnightly basis over Microsoft teams. The attendees have built some lovely connections with each-other and have a new topic to inspire them each time that they meet.

As Picasso said, 'Art washes away from the soul the dust of everyday life'. Some of our examples of soul washing activities are shown in the pictures above.

"Art washes away from the soul the dust of everyday life." - Pablo Picasso

Dr Hanna Booth, MBChB Leicester Medical School, is a Speciality Doctor in an Early Intervention in Psychosis service, the PIER Team, in Leicester UK. She has a passion for arts and creativity which she expresses through painting and writing outside of working hours. In her role as a doctor she helps to run an online art group with PIER.

Holistic health care for patients with severe mental illness

– collective responsibility for all professionals

by Dr Fabida Aria
Consultant Psychiatrist
Associate Medical Director
Leicestershire Partnership NHS Trust

Psychiatry has come a long way over the decades. Public mental asylums were established in Britain after the passing of the 1808 County Asylums Act. It was only in 1845 that the Lunacy Act changed the status of the mentally ill to have the status of patients who require treatment. In the 1900's the asylums had thousands of patients, and the institutionalization was not far from custodial institutions. From the 1960's deinstitutionalization started, community services started developing and asylums were gradually closed over the next few decades. This was a huge acknowledgement that mental disorders were health problems; patients who had mental disorders should be treated as members of society and not be placed for years in institutions.

Currently in England, we have psychiatry units often away from general hospitals, and this has led to a different type of segregation, both of mental health patients and mental health professionals. The recent developments in England to develop core 24 and enhanced liaison service 26[(1)] is a welcome move where we now have more mental health professionals based at general hospitals and the need for looking after the mental health of a person who presents with physical health problems or at accident and emergency with mental health problems. In addition the extra funding for perinatal psychiatry[(2)] has led to close working of perinatal mental health professionals with primary care and obstetric departments.

The NHS Mental health implementation [(2)] has assured an extra £2.3 billion investment fund which is ringfenced and be available year on year to help provide mental health care to an additional 2 million people, and also has specific targets for patients with severe mental illness, to ensure they have integrated care and increased number of people (390,000) to receive health checks by 2023/24.

In terms of physical health care of patients with mental health problems there have been great initiatives over the years including national and local commissioning for quality and innovations (CQUINs), Quality outcome framework targets , to name a few. The importance of intervening and not just screening was repeatedly emphasised. All these initiatives were brought about to help reduce the inequalities faced by patients with severe mental illness, where the mortality is around 15 to 20 years earliar than the general population[(3)] .

In a research and analysis briefing paper published by Public Health England titled " Severe mental illness and physical health inequalities" in September 2018[(3)] ; the major causes of death for patients with chronic mental illness included cardiovascular disease, respiratory disease, diabetes and hypertension. The main findings were as follows-

- Confirmation that compared to all patients, SMI patients have a higher prevalence of obesity, asthma, diabetes, chronic obstructive pulmonary disease (COPD), coronary heart disease (CHD), stroke and heart failure and similar prevalence for hypertension, cancer and atrial fibrillation.
- demonstrate that the differences are more pronounced for younger age groups with the highest health inequality in ages 15 to 34 for asthma, diabetes, hypertension and obesity
- demonstrate that SMI patients are more likely (1.3 for female and 1.2 for male) to have one or more of the physical health conditions examined in the analysis than all patients
- demonstrate the health inequality between the SMI and all patients is almost double for multi-morbid (2 or more) of the physical health conditions
- demonstrate that SMI patients aged 15 to 34 are 5 times more likely to have 3 or more physical health conditions and this health inequality reduces with age
- demonstrate that patients living in more deprived areas have a higher prevalence of SMI
- confirm that SMI patients living in more deprived areas have a higher prevalence of physical health conditions

- demonstrate that SMI patients experience inequalities in physical health for obesity, asthma, diabetes, COPD, CHD and stroke after standardising for deprivation as well as age and sex
- The need for all health professionals to acknowledge the need and their role

Whilst all the strategies to look at ways to address these are commendable, it is also important for the health and care community to acknowledge and understand the extent of the inequality these patients face; and also consider the commitment and faith we have in ourselves and each other to help these patients to make a real difference. For all chronic illnesses, the benefit of small changes are often seen over time, and in the fast paced environment of our working lives, the time we need to take to invest in this area can be a challenge. We often hear of individuals and teams who are passionate and committed to make the change.

There has also been a gradual change of moving people on from secondary care to primary care therefore reducing the length of time a patient is with services; and loss of key relationships and prompts from a familiar person can affect the attendance for health checks and subsequent interventions as required. The transitioning between services needs responsibility shared on both sides. We have to find ways to bridge these gaps and also ensure the integrated care models will surely work for patients and carers in the best way.

Understanding patients and carers

Having more than one health condition is a challenge. For a patient with severe mental illness, the journey with health can be very varied, with some patients having outpatient and other having inpatient contact. Some may have been detained under the mental health act. All these experiences along with the illness as well can be quite an emotional and intense experience for them and their loved ones. When they then hear they have an additional physical health diagnosis this can again cause further emotional reactions. Patients may be searching for explanations within themselves and others. It is not uncommon for mental health prescriber to be blamed for the additional diagnosis of diabetes, obesity, high triglyceride levels. It is true there are significant side effects related to psychotropic medications and it is necessary to explain about the need for looking after the physical health from the start of any treatment. Patients if diagnosed with additional conditions may be recommended further medication to manage the comorbid condition and their status as a patient becomes more pronounced. They often have to go for additional tests, appointments and see more health professionals, often who talk to them on the condition the professional is qualified in.

Engagement and building trust

Patients with severe mental illness can often have experiences that are very unique to that individual. For a health care professional to be able to truly make an impact, the element of trust is key. One requires a huge amount of perseverance and patience it can take months to years even to engage some patients. Many mental health professional have mastered this art over a long period of time. Specialist teams including early intervention in psychosis teams that provide a bespoke service to patients and carers from their time of diagnosis; and assertive outreach teams that help engage patients who have chronic, severe and enduring mental illness, are difficult to engage, often requiring lengthy admissions and may have comorbid substance misuse were created in 1999 to help provide an intensive service in the community[4]. These teams worked alongside community mental health teams. Several areas have now reorganised and these teams are not universally present at all areas. It is vital to preserve the expertise of these professionals and continue their role in all services and remember the need for the time and effort to help these patients to trust and engage with the care for all their conditions.

Other ways of engaging patients to work on health and wellbeing

Accompanying patients for appointments- if a patient with severe mental illness is supported to attend their appointments for health clinics such as diabetes, cardiac and respiratory clinics etc the health professional seeing them can have a more comprehensive understanding of their mental health and social situation. In addition the patient can feel valued and cared for and is likely to take the advice more seriously due to the combined effort of two or more professionals. This includes services such as smoking cessation, lifestyle changes. This does mean more time from the professionals however the impact of benefits on individuals cumulatively and to society far outweighs the risks.

Doing blood tests and ECG's from the mental health teams and having a good transition plan if this changes- Many teams have the ability to provide blood tests and ECG's in places familiar to patients , there are teams who have also trained mental health staff who can do phlebotomy and ECG's at home. This has improved the uptake of blood tests, and also been especially beneficial during covid times.

Consideration of cultural, religious and spiritual actors

It is so important to understand the cultural factors of each individual, and not make any assumptions. Culture can play a significant role in how a person responds to a diagnosis of mental illness and their subsequent engagement.

Many patients go to religious and spiritual leaders and working alongside them so that they can also reinforce the need to take treatment for their mental health can provide patients and carers multiple avenues of support and further build collaborations.

Medication and interethnic differences and genetic differences

Medication is only one aspect of treatment of severe mental illness and we must be used in conjunction with other psychological, social and cultural interventions as needed for the patient. Medications for mental health are perceived differently in different cultures and also within sub cultures.

It is important to consider genetic and environmental factors and how these may affect a patient. In a study[5] it was noted that there were differences in the plasma proteins that transport medications among ethnic groups. The plasma concentration of α1-acid glycoproteins, which provide binding sites for psychotropic drugs in the blood, was found to be significantly lower among Asians than among whites and African Americans . In addition the activities of conjugating enzymes (transferases) that are involved in the metabolism of most psychotropic medications are now known to be genetically determined. Furthermore the CYP system has been found to demonstrate genetic polymorphism and to exist in a bimodal distribution; individuals may be classified as extensive, poor, or slow metabolizers. The genetic polymorphism and subsequent functional expression of CYP enzymes, particularly CYP2D6 and CYP2C19, may

contribute to differences in rates of psychotropic medication metabolism. In addition to these genetic differences between ethnic groups, interethnic differences in enzyme activity may exist, partly resulting from a variety of environmental factors, such as diet, use of herbal medicines, and other lifestyle factors.[5]

Socioeconomic factors, housing, support for employment

One should not underestimate the socioeconomic factors for patients who have severe mental illness, as this can affect education and employment. Supporting patients in these areas when they are stable will hugely help improve their quality of life and give society a valuable contribution. Examples include individual placement support and recovery colleges. Many patients have taken on roles of peer support workers and this has been a huge success. Whilst we talk to patients about their health it is so important to consider their social and environmental aspects. Supporting a person to do the form to get their benefits, apply for housing, having access to a bus pass, having a package of support from social care makes a huge difference. These cannot be underestimated at all and the only way to achieve this is for health, social care, housing and other agencies to work collaboratively. The impact of severe mental illness for many people also means interrupted education due to episodes of illness, varying IT skills and vulnerability to be taken advantage of by others such as providing them with illicit drugs in return for money or prostitution as examples. Having substance misuse services working in collaboration and similar approach from other agencies such as police to help protect patients from exploitation are other examples.

Ask the patient what they think

It is important for clinicians to be able to ask the patients views, there are patients who believe they have an illness, but prefer not to take medication. On the other hand some patients may not believe they have a mental illness however they take prescribed medication to help sleep, or feel relaxed. When clinicians ask patients' their views genuinely and are able to convey the reason for the question to be to help the patient, they may hear the most important aspects that are relevant to the patient clinician relationship, and to work on the treatment plans together for the long term.

Seeing patients with chronic mental illness in physical health care clinics

As a clinician who is not an expert on mental illness, one may consider how best to approach a patient with regards to their health condition. Some patients may have residual or treatment resistant conditions such as hallucinatory experiences or delusional beliefs. It is best to talk to the patient just as you would to any other patient, and ask them if they have a clinician who they see for their mental health who they would consent for you to liaise with. For patients on medication such as clozapine, even a simple symptom such as tachycardia should be taken seriously as over several years it can cause significant cardiac problems. Similarly for a patient with COPD, all professionals should consider ways to advice on smoking cessation. This should be specific to the patient at the stage they are at. An expert advising a patient and showing they really care can have a genuine impact on the patient.

Joint clinics with psychiatrists and experts in physical health conditions

Having a one stop clinic with multiple professionals will be a great way to ensure all chronic conditions are given equal importance, and to show the patient that all professionals are keen to improve their overall health and wellbeing, and in doing so can gain several years of their life. This also helps professionals learning from one another on their area of expertise.

Corresponding with other clinicians seeing the patient and with patients' consent ask for copies of letters and sharing of information between various systems is key to know the opinions of experts in these areas and how strategies that work for the individual can be used by others.

Recovery

Recovery is defined as "A deeply personal, unique process of changing one's attitudes, values, feelings, goals, skills and/or roles. It is a way of living a satisfying, hopeful, and contributing life even with limitations caused by the illness. Recovery involves the development of new meaning and purpose in one's life as one grows beyond the catastrophic effects of mental illness. Recovery from mental illness involves much more than recovery from the illness itself."[6]

A recovery framework that has been developed from a systematic review and narrative synthesis of the literature[8], has found that the areas most relevant to clinical research and practice are connectedness, hope and optimism, identity , meaning in life and empowerment (also called CHIME framework)[7]. In patients from ethnic minority groups there was a greater emphasis on spirituality and stigma, culture specific factors and collectivist notions of recovery.

Conclusion

This article has tried to look at how we can collectively reduce health inequalities for patients with severe mental illness. It explains the importance of acknowledging our own ability to help; and really understanding the patients. Taking time to build trust can give a huge benefits over time. Every opportunity a professional has must be used in the best way, and collaborating with other specialists and general practitioner who is also seeing the patient can make a positive difference for the patient, help share medical information directly without using the patient as the messenger and make the patient feel valued. The use of preventative techniques should always be considered , and lifestyle advice should be given regularly .The impact of a small change in parameters such as pulse, BP, small increments in weight and HbA1C to name a few must be taken seriously for this group of patients. Understanding the patient, taking time to engage them, taking into account their cultural aspects and individual views will help to foster a good patient clinician relationship. Doing joint clinics with psychiatrists and other disciplines for example cardiology, diabetes and endocrinology, respiratory can be a way forward for the future to help treat all conditions the patient has collaboratively, increase expertise across the conditions and reduce the health inequalities that patients with severe mental illness face. Patients who are on long term psychotropic medication need to have the optimal care not only for their mental health, but also their physical health. Recovery is more about quality of life and not absence of symptoms, and the need for patients to be able to connect, have hope, identity and meaning in life and empowerment are key factors that support and help a person to achieve recovery.

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Obituary: **Prof Julian Leff** (1938-2021)

Prof Julian Leff was Professor of Social Psychiatry at Institute of Psychiatry (IoP), London. He was regarded as an original thinker who developed and translated research ideas to lives of people who suffer from Schizophrenia. His work led to improvement in understanding the impact of social factors in patients suffering from Schizophrenia. I did not have an opportunity to meet him personally but read his work with interest as a young trainee psychiatrist in India in the early 1990s and later in U.K. A few years back at Royal College of Psychiatrists International Congress in Birmingham in 2018 I had the opportunity to watch a documentary regarding his life and work and also meet his son, Adriel.

One of Prof Leff's key research work demonstrated that family interventions aimed at reducing high expressed emotions (high EE) resulted in reducing relapse of Schizophrenia from 50%to less than 10%. In another study, Prof Leff showed that that higher incidence of Schizophrenia in Black Caribbean population in U.K. was likely to be due to social factors. He was involved in International studies of incidence of Schizophrenia co-ordinated by the World health Organisation (WHO). During one such visit to India he was impressed by how a supportive family environment is beneficial to individuals suffering from Schizophrenia.

Prof Leff also invented "Avatar therapy" in 2008. It is an innovative therapy in which people who hear voices have a dialogue with a digital representation (avatar)of their presumed persecutor voiced by the therapist, so that the avatar responds by becoming less hostile and concedes power over the course of therapy.


Credit: Matthew Lewin HAM HIGH

Prof Leff received several national and International awards during his distinguished psychiatric career including the Burgholzli award from University of Zurich in 1999, The Royal College of Psychiatrists, London conferred on him it's highest award, "Honorary Fellowship" in 2015. Prof Leff was awarded Yves Pelicier Lifetime Achievement Award by World Association of Social Psychiatry in 2017.

On behalf of Swasthya Editorial team I convey sincere condolences to Prof Leff's family.

Dr Santosh Mudholkar
Chief Editor, Mental Health section, Swasthya

Frugal Science

- innovations from an innovator

Prof Manu Prakash

Inventor and Innovations
Profile by Mr CR Chandrasekar

There are over seven billion human beings in the world. However, the number of other living mobile organisms far exceeds and can be measured in trillions. Some of these organisms are visible to the naked eye but most remain invisible due to their size, including parasites and bacteria which are constant source of human strife. Conventional microscopes with their power of magnification enable 'invisible' organisms and parasites to be seen and microscopy is hence a crucial medical technique. However, the cost of a microscope can be prohibitive.

Another problem is posed by centrifuges, which are important in laboratory medicine to separate biological fluids but can also be costly for most rural/field settings. The current Covid19 pandemic has highlighted the need for rapid diagnostics.

Five of Manu Prakash' inventions taken from available open-source references are listed below (1-4)

1. Foldscope (1)– a field microscope useful in fight against malaria -One million in use

'An ultra-low-cost origami-based approach for large-scale manufacturing of microscopes, specifically demonstrating brightfield, darkfield, and fluorescence microscopes. Merging principles of optical design with origami enables high-volume fabrication of microscopes from 2D media. Flexure mechanisms created via folding enable a flat compact design. Structural loops in folded paper provide kinematic constraints as a means for passive self-alignment. This light, rugged instrument can survive harsh field conditions while providing a diversity of imaging capabilities, thus serving wide-ranging applications for cost-effective, portable microscopes in science and education.'

Manu Prakash is a 39-year-old Indian born scientist and he is a Professor of Bioengineering at Stanford University, USA. He is a well-known innovator and has produced inventive ways of addressing the above problems –low-cost field microscope, low-cost centrifuge, open-source high throughput imaging platform etc.

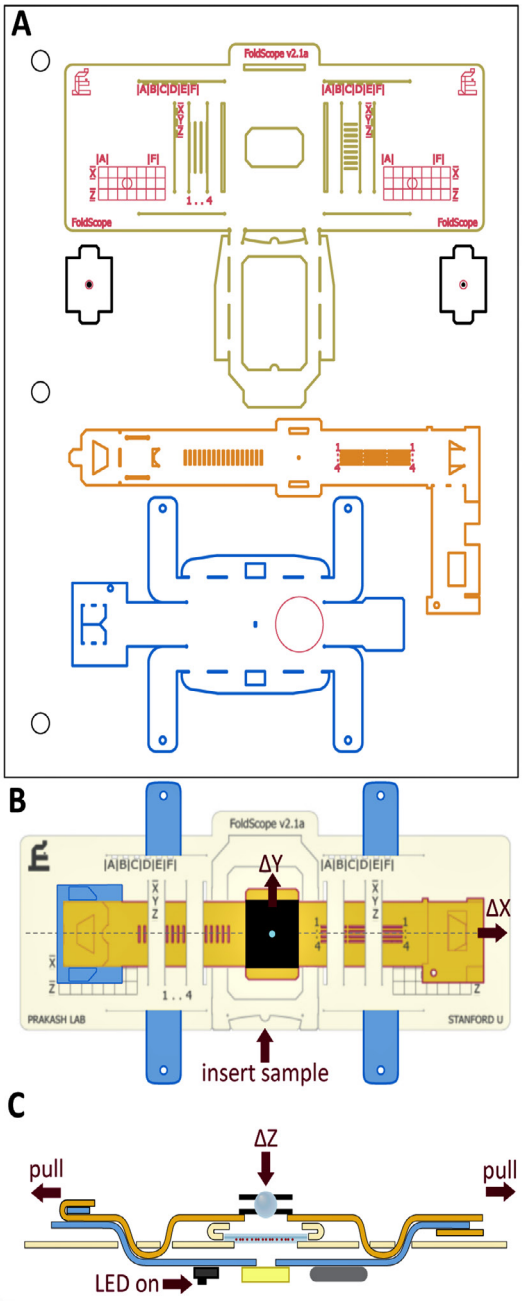


Figure -Foldscope design, components, and usage. (1)
(A) CAD layout of Foldscope paper components on an A4 sheet. (B) Schematic of an assembled Foldscope illustrating panning, and (C) cross-sectional view illustrating flexure-based focusing. (D) Foldscope components and tools used in the assembly, including Foldscope paper components, ball lens, button-cell battery, surface-mounted LED, switch, copper tape and polymeric filters. (E) Different modalities

assembled from coloured paper stock. (F) Novice users demonstrating the technique for using the Foldscope. (G) Demonstration of the field-rugged design, such as stomping under foot.

2. Paperfuge -Hand-powered ultralow-cost paper centrifuge [2]

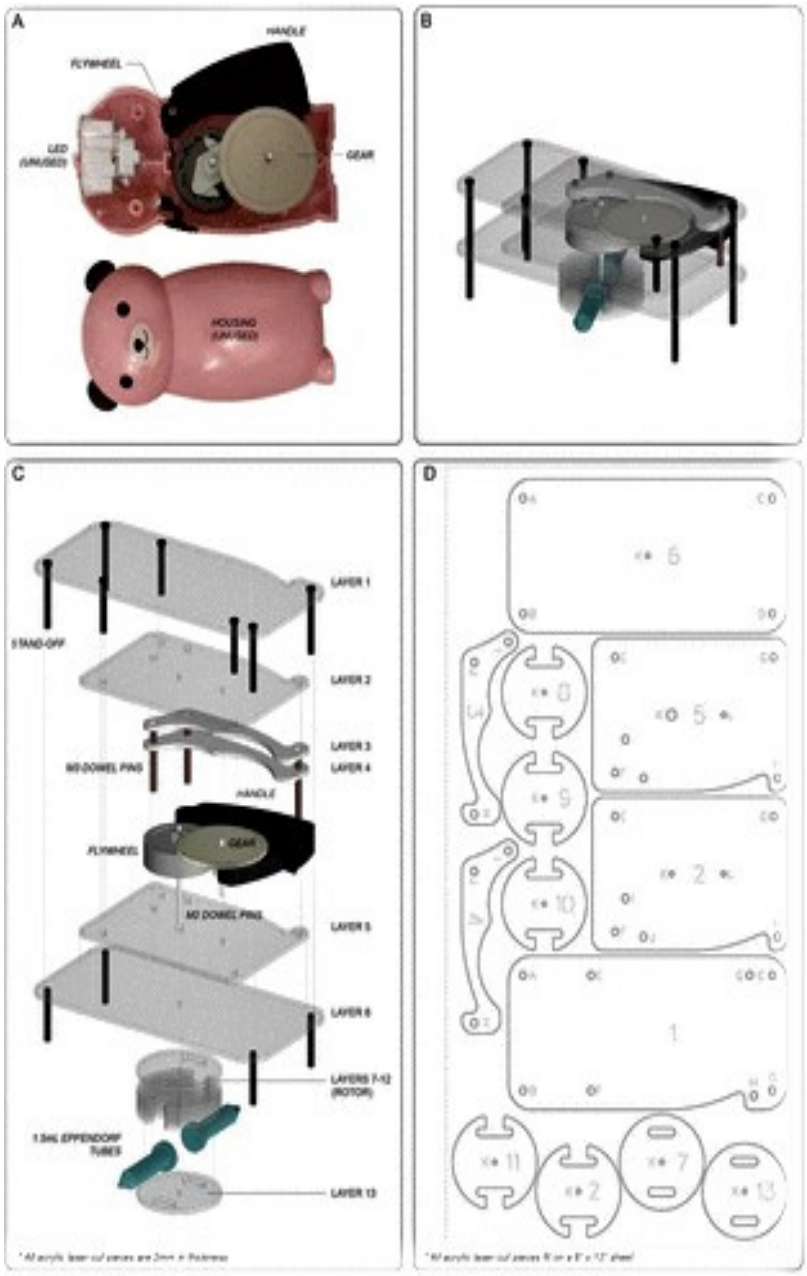
'a lightweight, ultralow-cost centrifuge based on an ancient toy. The "paperfuge" can separate blood components in less than 2 minutes. The hand-powered device highlights how creative design can be used to make diagnostic tools for use in global settings with limited resources'[2]

The team designed a whirligig, which they call a "paperfuge," made with a paper disk and braided fishing line for the string. They analyzed the mechanics of the device, which consists of successive winding and unwinding phases. Based on their modelling, they optimized the components, including the disk radius and width, and the string radius and length. Using a high-speed camera, they showed that the paperfuge could reach speeds of 125,000 revolutions per minute (rpm) using only human power.

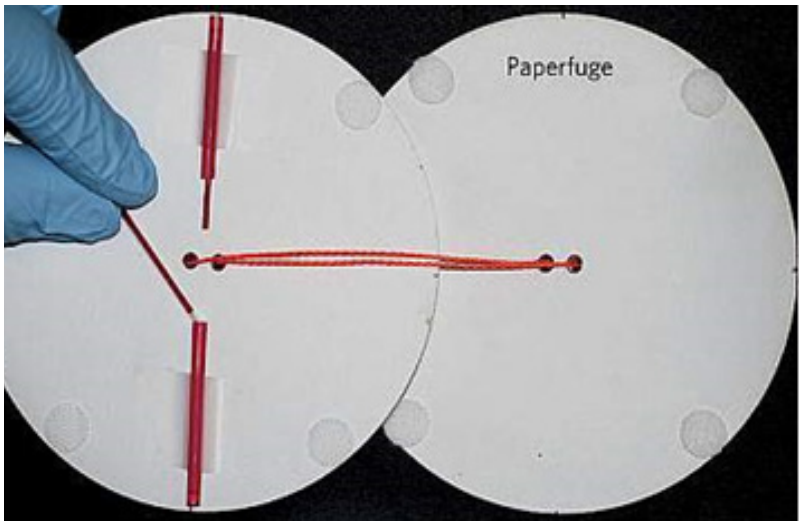
The researchers used drinking straws to hold tubes containing blood samples and found that the paperfuge could separate pure plasma from whole blood in less than 1.5 minutes of spinning. This separation provides a reading of hematocrit, which is used to diagnose anemia. With 15 minutes of spinning, they could separate out a layer known as the buffy coat. This layer is used for diagnosing conditions where a parasite is in the blood—such as malaria and African trypanosomiasis (sleeping sickness). The device weighed 2 grams and could be made for 20 cents.

3. Handyfuge-LAMP: low-cost and electricity-free centrifugation for isothermal SARS -CoV-2 detection in saliva [3]

'An open hardware solution- Handyfuge - that can be assembled with readily available components for the cost of <5 dollars a unit and could be used together with the LAMP assay for point of care detection of COVID-19 RNA from saliva'[3]



'Components of Handyfuge. (A) Dismantled hand-crank flashlight similar to a Dyno-torch flash light providing a one-way ratchet mechanism for converting hand-crank input into uni-directional rotation of the associated gears. (B) Three-dimensional Schematic of a Handyfuge. (C) Assembly and blow-out of of Handyfuge components including borrowed fly-wheel from flash-light and associated acrylic cut pieces. (D) Two-dimensional laser-cut pattern for fabricating a handyfuge.' [3]



4. Octopi-Open configurable high-throughput imaging platform for infectious disease diagnosis in the field [4]

'a low-cost ($250-$500) automated imaging platform that can quantify malaria parasitemia by scanning 1.5 million red blood cells per minute'.

Figure -Reconfigurable high-throughput imaging platform.

'(A) Construction of the modular imaging platform. The left column shows three different imaging modules (top row), a motorized scanning module, and three different illumination modules (bottom row). In the low mag imaging module (top left), a captive linear actuator is used for focus actuation. In the high mag imaging module (top middle and top right), piezoelectric stacks combined with micrometers are used for focus actuation, where the micrometer can be replaced with a captive linear actuator to motorize coarse adjustment. Inset shows the construction of the low-mag imaging module sub-assembly, which consists of a pi-camera, a long pass interference filter and another cellphone lens. For different applications, sub-assemblies with different configurations should be switched as a whole, in contrast to the high mag imaging module, where objectives, filters, tube lens and cameras can be individually switched. The right column shows some examples of currently available portable computing devices that can be used as the computation module. (B) A photograph showing three Octopi prototypes with different imaging modules optimized for different applications.' [4]

5. SQUID -Simplifying Quantitative Imaging Platform Development and Deployment [5]

'With rapid developments in microscopy methods, highly versatile, robust and affordable implementations are needed to enable rapid and wide adoption by the biological sciences community. Here we report Squid, a quantitative imaging platform with a full suite of hardware and software components and configurations for deploying facility-grade widefield microscopes with advanced features like flat field fluorescence excitation, patterned illumination and tracking microscopy, at a fraction of the cost of commercial solutions. The open and modular nature (both in hardware and in software) lowers the barrier for deployment, and importantly, simplifies development, making the system highly configurable and experiments that can run on the system easily programmable. Developed with the goal of helping translate the rapid advances in the field of microscopy and microscopy-enabled methods, including those powered by deep learning, we envision Squid will simplify roll-out of microscopy-based applications - including at point of care and in low resource settings, make adoption of new or otherwise advanced techniques easier, and significantly increase the available microscope-hours to labs.'[5]

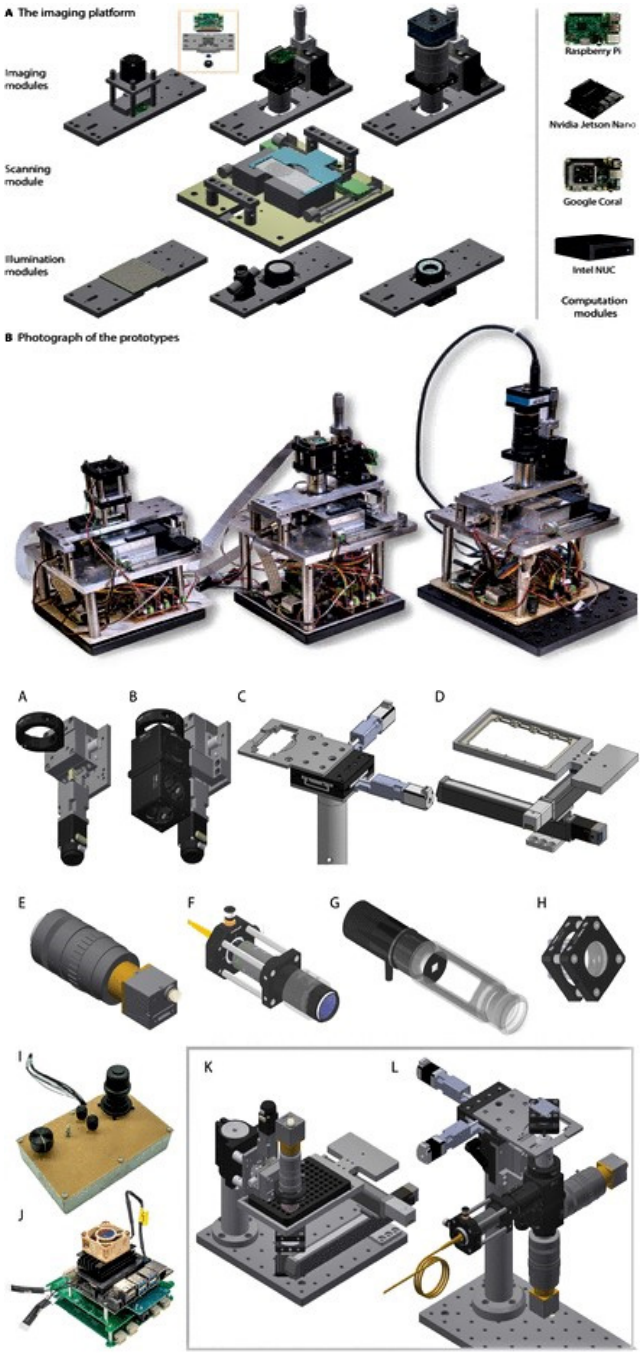


Figure -Squid hardware. (A) Motorized focus block (B) Motorized focus block with two cage cubes mounted (C) 28 mm × 28 mm motorized XY stage (D) 140 mm × 80 mm travel motorized XY stage with a well plate adapter (E) A typical image formation assembly with an industrial camera and a machine vision imaging lens (F) Flat field laser epi-illumination module (G) Flat field LED epi-illumination module (H) LED matrix trans-illuminator (I) Control panel with an analog joystick, a focusing knob, a toggle switch and two rotary potentiometers. Currently the toggle switch is used for enable tracking (when implementing tracking microscopy) and one of the potentiometers is used to adjust the XY stage max speed. (J) Driver stack (shown also a Jetson Nano for running the microscopes in place of a laptop or desktop computer) (K) One example configuration: upright microscope for reading a 96-well plate (termed Nautilus from here on-wards](L) Second example configuration: multi-color flat field epifluorescence microscope with simultaneous transmitted light channel (e.g. for tracking microscopy). [5]

More information about the innovator Manu Prakash is available from his latest Medscape interview [6] and Wikipedia [7].
His scientific publications can be accessed through his Orcid id https://orcid.org/0000-0002-8046-8388

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Health Swāsthya स्वास्थ्य

Inflammatory process play a major role in many chronic diseases.

What is the Major Driving Force of Systemic Inflammation?

Dr Satwinder S Basra
General Practitioner

Modern lifestyle encourages people to keep eating frequently. Gut can become 'battlefield'. As Napoleon Bonaparte says the winner would be the one controlling that chaos, both his and his enemies'.

Probiotics and prebiotics are major topics in nutrition, though they sound similar, but have different roles in maintaining health. Probiotics are beneficial bacteria, and prebiotics are food for these bacteria. Recent advances in medical technology are proving that Prebiotics help to grow good gut bacteria.

Hippocrates (460-370 BC), a Greek Physician and Father of Modern Medicine," once famously said: "All disease begins in the gut."

Until 1977, there was a general acceptance that the multiple organ failure was thought to be due in infections. This was influenced by a new thinking in the profession that it could be due to uncontrolled inflammation where the gut may be the site of Multiple Organ Failure. 'The process could start in the gut and Microbiome. Where man meets microbe', the concepts are not new, and found its references even in the Bible, Koran and in Hindu vedas.

Recent technological advancements have provided collection of data describing the structure and functional capacity of the microbiome in a variety of conditions available to the research community. There is consensus that the disruption of the gut Microbia (termed "gut dysbiosis") is influenced by host genetics, diet, antibiotics, and inflammation, and it is intricately linked to the pathogenesis of inflammatory diseases, such as obesity and inflammatory bowel disease (IBD).

Existence of the Inflammatory state is well known in Type II diabetes, Rheumatoid arthritis, cancer, Asthma, Allergies, Inflammatory Bowel Disease (IBD), Autoimmune diseases, pancreatitis, Liver diseases like Cirrhosis and Nash, and many more. In recent years, Inflammatory diseases such as Crohn's, Multiple Sclerosis, Asthma, Type I Diabetes are on the increase. Many types of injuries produce a similar inflammation. He says that inflammation has many diseases.

Do we need this: "infectious diseases (e.g. Mumps, measles, Rubella, TB, coming down due to immunisation?"

Gut microbia, an integral part of the human body, comprise bacteria, fungi, archaea, and protozoa. Macrophages are the key players in the maintenance of tissue homeostasis by eliminating invading pathogens and exhibit extreme plasticity of their phenotypes, such as M1 or M2, which have been demonstrated to exert pro- and anti-inflammatory functions.

Microbia-derived metabolites, short-chain fatty acids (SCFAs) and Gram-negative bacterial lipopolysaccharides (LPS), exert anti-inflammatory or pro-inflammatory effects by acting on macrophages. There is still scope for further understanding the role of macrophages in gut Microbia-inflammation interactions to seek a novel method for preventing and treating inflammatory diseases.

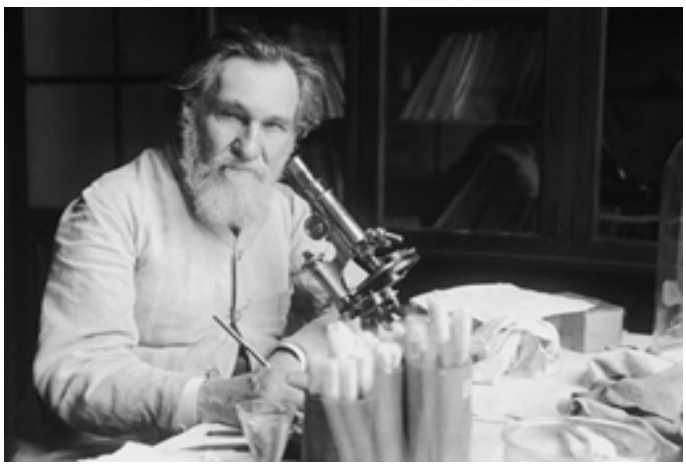
Initially it was difficult to isolate bacteria even though colon has got many hundred species of bacteria till modern techniques to culture were developed. Change in microbiome disease related and inflammation is disease related and in both changes were found to be parallel to each other.

Ilya Ilyich Mechnikov, a Russian Imperial zoologist known for his pioneering research in immunology tried to find why people in some cultures live longer than others. In his published paper in 1907, he studied 5 different segments around the world to observe that there was only one thing in common in these groups of people was that they all consumed fermented foods. He found in Bulgaria people take fermented milk (He named the bacteria, Lactobacillus Bulgaricus). Now there are about a thousand species of bacteria. Elie Metchnikoff, the father of immunology, (1845-1916) investigated intestinal microbes as causative agents in aging, a process he called "autointoxication." He believed that lactic acid-producing bacteria (such as those found in yogurt) would suppress the growth of more proteolytic, autointoxication bacteria.

Nobel Prize Winner, Dr Lederberg, describes the collective genome of our indigenous microbes (microflora), that a comprehensive genetic view of homo sapiens as life form should include the genes of our microbiome (Microbiota). It includes bacteria, viruses, fungi and archaea.

In the fields of molecular biology and genetics, a genome is all genetic material of an organism and consists of DNA. The genome includes both the genes and the noncoding DNA, as well as mitochondrial DNA and chloroplast DNA. At birth 99% of genome is absent.

Even a 7-day course of anti-biotics wipes out gut bacteria and takes a year to replenish. Sub-therapeutic use of Anti-biotics in farm animals causes changes in the human microbiome when consuming. This is impacted by the modern lifestyle changes Immunisation, decrease in parasitic infection and includes dietary changes in fats, prot-



Nobel Prize winner, Ilya Ilyich Mechnikov, who discovered phagocytes.

-teins, artificial colours, sweeteners, emulsifiers, insecticides, increased use of antibiotics, all cause of the collateral damages.

- *Ciprofloxacin is the worst:* One dose of broad-spectrum antibiotic, reduces 1000 species to 250 species of microbiota. Stress of previous antibiotic therapy on outcome of Gram-negative severe sepsis. 30% mortality if a patient had any type of antibiotic 6 months prior of operation.
- *PPI- Omeprazole/ H2RA, Vasopressors*: Cause change in pH, decreased pO2 including pCO2
- *Opioids:* Decreases motility and bacterial clearance mechanism. It also alters bacterial pathogenicity. Pseudomonas becomes aggressive. It attaches to the mucosa. Normally they live happily in GUT.
- The intestinal environment of surgical injury transforms Pseudomonas Aeruginosa into discrete hypervirulent morphotype capable of causing lethal peritonitis.
- Artificial sweeteners and emulsifiers have dramatic influence on host microbiome.
- *Microbiome:* Metabolises drugs, produce Vitamins, SCFA (Saturated Fatty Acids), Amino Acids, Modulation of Hormone secretions, modulates immune function, maintains mucosal barrier function.

Has our Fear of 'bacteria, made us more susceptible to diseases?

GUT MICROBIOME is affected by DIET, Drugs, Stress, Infant feeding. Birthing process, Life cycle changes, Geography.

Relationship of microbiome and some common illnesses.

- *Overeating:* In general, it is safe to say that the obesity is blamed on the lifestyle choice and often counts for lack of will power, and that may be considered as a Psychological issue! It is simply a problem of overeating and not a single disorder. Probably there are several dozen phenotypes or more clinically meaningful types where the inflammation is strongly associated with obesity.
- *Transferable obesity:* Interestingly, there is low grade inflammatory process in Adipose tissue in Obese patients. And, the obesity is considered as transportable from an obese person to thin person by transferring the Microbiome of obese person to lean person.6
- *Impact of the western diet:* Decreases diversity, increases firmicutes, Decrease Bacteroidetes, increases body fat, amount of increase in at roughly linear with changes in microbiome. Gut microbiota decreases insulin resistance.
- *Functions of Microbiome:* Microbiome Metabolises drugs, produce and metabolise nutrients like Vitamins, Saturated Fatty Acids, Amino Acids, Modulation of hormone secretions, modulates immune functions, maintains mucosal barrier function. Microbiome should be treated like an organ.

Bacteria metabolise 5FU and makes it more active to kill cancer cells.

Factors impacting on Gut microbiome: Stress (Exercise, metabolic, psychological), Geography (6 hours of flight to a different area changes) infant feeding, birthing place (home or hospital). Medical practices like vaccinations, Antibiotics and Hygiene and Host genetics. This leads to Dysbiosis.

What happens in Dysbiosis: Dysbiosis leads to altered intestinal permeability and changes in microbiome. Broad spectrum antibiotics cause changes within a few hours. Microbiome species are reduced from over 1200 to mere few hundred. PPI, vasopressors cause change in pH, decrease pO2 and increase pCO2. Opioids decrease gut motility and gut clearance mechanism, alters bacterial pathogenicity. These also decrease luminal nutrient delivery. Even working in the hospital alters gut bacteria in healthy individuals. Pseudomonas when exposed to opioids they become aggressive. Bacteria gets attached to mucosa. It is important to maintain healthy microbiome during illness.

How does Probiotics help us?

Multiple mechanisms described to support concept of microbe involved in systemic inflammatory regulation.

1. Competitive inhibition of pathogens.
2. Enhance Heat Shock Protein in gut.
3. Tight junction protein synthesis-holds the intestinal cells together preventing absorption of toxins from lumen of gut.
4. Enhance mucosal blood flow. Right bacteria increase blood from 30-50%.
5. Stimulate gut immunity.
6. Increase return of GI motility.
7. Helps maintains microbiome diversity in colon.
8. Butyrate (Fermentative product) enhances neutrophil killing chemotaxis, resolution of inflammation, anti-neoplastic. Microbiome transports Butyrate it to blood.

Leaky Gut Syndrome.

It means Increased Intestinal permeability-here intestinal wall exhibits permeability. It is controversial syndrome. Diseases associated with Leaky Gut are IBD, IBS, Coeliac, Type I Diabetes Mellitus, AIDS, Multiple sclerosis, Autism, Migraine, Food sensitivities. Little objective data supports Fibromyalgia, Depression, Allergies, and skin disorders. No objective data supports Weight gain or Chronic Fatigue Syndrome.

Microbiome and Brain functions:7 Gut communicates with brain via Vagus nerve. 90% of Vagus fibre from gut go to brain and not vice versa. Hence health of the Gut can affect the brain.
Clinical use of probiotics: The pool of beneficial microbes can be resupply by Dietary prebiotics. Other way is Refaunation (FMT)-Faecal transplantation!
Role of Probiotics in pregnancy and maternal outcomes:8
Gestational Diabetes: Pre-eclampsia: reduced by 50% in high-risk pregnancies. Inflammatory markers: Reduced
ENTEROCOLITIS IN NEONATES: There is some reduction in mortality 9.8 vs 6.8%. A four-Probiotics regimen reduces postoperative complications after colorectal surgery in a double-blind Placebo controlled study.9
SEPSIS: about 40% reduction in Sepsis in healthy neonates. Cost one dollar a week. C Diff diarrhoea: 60% decrease with probiotics.

There is a greater challenge for the practitioners in the primary care to exercise their capacity towards somewhat a 'holistic approach' in managing patients with relative risks. Intestine constantly battles between Barrier function and selective absorption. Variety of bacteria living in the gut affects our health.

Judicious use of antibiotics when required and encouraging use of probiotics may be helpful in General Practice.

Asthma drug budesonide shortens recovery time in non-hospitalised patients with COVID-19

PRINCIPLE is the world's largest Phase 3 platform randomised controlled trial to find clear evidence of an effective COVID-19 treatment for use in the community that can significantly shorten recovery time.

Prof Mahendra G Patel said, 'Early treatment with inhaled budesonide shortens recovery time by a median of three days in patients with COVID-19 who are at higher risk of more severe illness and are treated in the community'.

Inhaled budesonide is a safe, relatively inexpensive and readily available corticosteroid commonly used around the world in inhalers to treat asthma and chronic obstructive pulmonary disease. It was added to the PRINCIPLE trial on 28th November 2020.

Recruitment for the inhaled budesonide arm of the trial stopped on 31st March 2021 since, in the view of the Trial Steering Committee, enough patients had been enrolled to establish whether or not the drug had any meaningful benefit on time to recovery. Obtaining further data on hospital admissions or death was unlikely due to the reducing number of cases in the UK.

For the interim report, a total of 961 patients were randomly assigned to receive inhaled budesonide at home and were compared with 1819 patients randomly assigned to the usual standard of NHS care alone. Of these, 751 people in the budesonide group and 1028 in the usual care group were SARS-CoV-2 positive and included in the primary interim analysis.

Based on the interim analysis using the latest data from 25th March 2021, the results showed the estimated median time to self-reported recovery for inhaled budesonide was 3.011 days shorter compared to usual care (95% Bayesian credible interval 1.134 to 5.410 days), with a high probability (0.999) of being superior to the usual standard of care. 32% of those taking inhaled budesonide, compared to 22% in the usual care group, recovered within the first 14 days since being randomised into the trial and subsequently have remained well until 28 days (relative risk 1.46, 95% CI 1.23 - 1.74). Participants in the budesonide group also reported greater wellbeing after two weeks (mean difference in WHO-5 Wellbeing score + 3.37 ,95% CI 0.97 – 5.76, p = 0.006).

Among patients who had completed all 28 days of study follow up by 25th March 2021, 8.5% (59/692) in the budesonide group were hospitalised with COVID-19 compared with 10.3% (100/968) in the usual care group (estimated percentage benefit, 2.1% [95% BCI -0.7% – 4.8%], probability of superiority 0.928). Since fewer than expected people were admitted to hospital in the trial, and with COVID-19 cases and hospitalisations continuing to drop in the UK, it is not clear from this interim analysis whether budesonide reduces hospitalisations.

Patients with COVID-19 symptoms that started within 14 days and who are at higher risk of a poor outcome from the illness could join the trial and those with a positive SARS-CoV-2 result were included in the main analysis. Patients treated with inhaled budesonide were asked to inhale 800 micrograms twice a day for 14 days and were followed-up for 28 days. All patients were aged over 50 with an underlying health condition that put them at more risk of serious COVID-19 illness, or aged over 65.

Joint Chief Investigator, Professor Chris Butler, a South Wales GP and Professor of Primary Care from the University of Oxford's Nuffield Department of Primary Care Health Sciences, said: 'PRINCIPLE, the world's largest platform trial of community-based treatments for COVID-19, has found evidence that a relatively cheap, widely available drug with very few side effects helps people at higher risk of worse outcomes from COVID-19 recover quicker, stay better once they feel recovered, and improves their wellbeing. We therefore anticipate that medical practitioners around the world caring for people with COVID-19 in the community may wish to consider this evidence when making treatment decisions, as it should help people with COVID-19 recover quicker.

'This exciting finding about the beneficial effects of inhaled budesonide would not have been possible without the contribution of those patients who volunteered to participate: your gift of taking part will help doctors and nurses provide better evidence-based care for people with COVID-19 worldwide. It also stands as a monument to the far-sighted funders of PRINCIPLE, the UK-wide clinical research networks who have been absolutely key to the successful implementation of the trial, all the general practices and clinicians who support PRINCIPLE, NHS Digital, HDRUK, the Therapeutics Task Force and the hard work and dedication of our study team and oversight committees in the Primary Care Clinical Trials Unit.'

Joint Chief Investigator, Professor Richard Hobbs, Head of Oxford University's Nuffield Department of Primary Care Health Sciences, said: 'For the first time we have high-quality evidence of an effective treatment that can be rolled out across the community for people who are at most risk of developing more severe illness from COVID-19. Unlike other proven treatments, budesonide is effective as a treatment at home and during the early stages of the illness. This is a significant milestone for this pandemic and a major achievement for community-based research.'

Professor Mona Bafadhel, from Oxford University's Nuffield Department of Medicine, and a Consultant Respiratory Physician, led the earlier STOIC Phase 2 efficacy study of inhaled budesonide for early COVID-19 and led the development of the budesonide study arm for PRINCIPLE. She said: 'The news that the findings of the earlier-phase STOIC trial, which reported at the beginning of the year, have been replicated at scale here in the PRINCIPLE trial is outstanding. We are now sure that we have a treatment that will benefit patients with early COVID-19 worldwide Inhaled budesonide is readily available worldwide and commonly used to treat asthma and chronic obstructive pulmonary disease.'

Professor Fiona Watt, Executive Chair of the Medical Research Council, which co-funded the study, said: 'Researchers involved in the PRINCIPLE trial have overcome considerable logistical hurdles to set up a world-leading rigorous drug trial in people's homes. We are now rewarded with the first inexpensive and widely available drug that can shorten recovery times for COVID-19 patients in the community. People around the world will be helped to recover faster thanks to these exciting new results.'

As soon as all remaining patients in the trial have completed their follow-up and a full analysis has been completed, detailed results on time to recovery and hospitalisations will be published. For this preliminary report, 92.8% of people randomised to the budesonide arm had the opportunity to complete 28 days of follow-up.

PRINCIPLE launched in April 2020 with the intention that drugs shown by the trial to have a clinical benefit could be rapidly introduced into routine NHS primary care. The trial is evaluating a range of potential community treatments for COVID-19 to reduce recovery time and prevent hospital admissions and deaths. It is recruiting participants who are most at risk of serious COVID-19 illness, either due to their age, symptoms, or an underlying health condition.

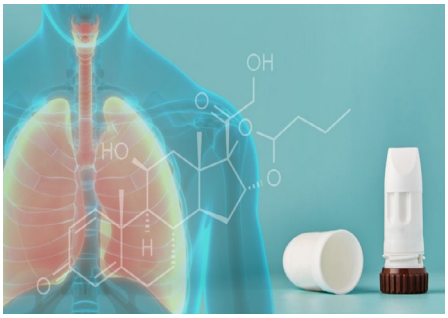
PRINCIPLE has pioneered an innovative methodology for community-based research that allows for many treatments to be efficiently and rapidly assessed in a single trial, resulting in this world-first finding of an effective community-based treatment during the course of a pandemic. Typically for trials of this size in the community, patient recruitment would take place opportunistically via general practices. Yet in PRINCIPLE,

while general practice remains critical to delivery of the trial, everyone across the UK, regardless of where they are registered to receive their health care, can sign-up if they are eligible. To date, more than 4,700 patients have volunteered to join PRINCIPLE, making it the world's largest platform trial of COVID-19 treatments to take place in community settings.

In January 2021, PRINCIPLE demonstrated that the antibiotics azithromycin and doxycycline are not effective treatments for COVID-19 in the early stages of the illness, changing clinical practice in the UK and internationally. PRINCIPLE continues to investigate the effects of treatment in the community with colchicine, a commonly used anti-inflammatory, and favipiravir, an antiviral used in Japan to treat influenza.

PRINCIPLE is led from the Primary Care Clinical Trials Unit at the University of Oxford's Nuffield Department of Primary Care Health Sciences. PRINCIPLE is supported by a large network of care homes, pharmacies, NHS 111 Hubs, hospitals, and 1,401 GP practices across England, Wales, Scotland and Northern Ireland. The trial is integrated with the Oxford RCGP Research and Surveillance Centre and works closely with the NIHR Clinical Research Network, NHS DigiTrials, Public Health England, Health and Care Research Wales, NHS Research Scotland and the Health and Social Care Board in Northern Ireland. PRINCIPLE is funded by a grant to the University of Oxford from UK Research and Innovation and the Department of Health and Social Care through the National Institute for Health Research as part of the UK Government's rapid research response fund.

Source: University of Oxford News Release, 12 April 2021
Declaration: No financial interest



An interview with Director of Central Institute of Psychiatry of Ranchi: Dr Basudeb Das

Edited by Avinash Sharma, Associate Professor of Psychiatry

Ranchi is the capital of the Indian state of Jharkhand that was separate state for the tribal regions of South Bihar, northern Orissa, western West Bengal. Prof Nandini Chokraborthy intervied the newly appointed Director of Central Institute of Psychiatry, Dr Basudeb Das.

1. How does it feel to be the newly appointed Medical Director for Central Institute of Psychiatry, Ranchi?

I feel a sense of immense responsibility in heading the Institute. I am keenly aware of the challenges as well as the opportunities that the Institute faces and I am hopeful of being able to do the very best job I can possibly do.

2. Tell us a bit about your journey since Medical College and your choice of psychiatry as a specialty?

Psychiatry typically tended to be given minimal emphasis in the under-graduate curriculum, at least when I was a medical student during 1989-94 at R G Kar Medical College, Kolkata. I must confess here that psychiatry was not my first choice though I was inquisitive about it while doing my House Officership in the Department of General Medicine there. I started the journey in the year 1998 along with my now accomplished colleague Dr Nandini Chakravorty, after getting selected at the Central Institute of Psychiatry, Ranchi. I started loving it then because of its uniqueness in many aspects and the satisfaction it gives after healing the troubled minds. The suffering mental health issues causes in our society is immense, yet under-appreciated. People suffering from mental health problems face an uphill task when it comes to employment opportunities or even integrating into their communities in a meaningful way. I felt a strong urge to work for those afflicted with mental illnesses and improve the services that are provided to them. It's like a dream come true for being appointed as the Director of the same after serving it for more than two decades in various capacities.

3. How has the practice of psychiatry changed in the last 15 years in India?

The most notable change, which also happens to be fairly recent, is the widespread use of tele-mental health all across the country. The ongoing COVID-19 pandemic has catalysed the introduction of both the Guidelines for Telehealth in India as well the adoption of this technology. Given the severe shortage of psychiatrists in the country, and the fact that most psychiatrists tend to be clustered in urban or metropolitan areas, tele-mental health should go a long way in enabling much needed access to residents of rural and remote parts of India.

The other major change, which too is relatively recent, is the enactment of The Mental Healthcare Act of 2017. This is an impressively progressive legislation which has introduced a whole new set of mechanisms in the care of the mentally ill, be it advanced directives, nominated representatives, setting up of mental health tribunals, mandatory use of modified electro-convulsive therapy (ECT), etc. In my opinion, in the last 15 years, there has been a slight but palpable decline in the amount of stigma associated with mental illnesses – people are less hesitant to contact mental health professionals now, especially in urban settings.

Dr Basudeb Das.

4. What is your vision for the Central Institute of Psychiatry for the future?

As your readership might be aware, this century old Institute has many firsts to its credit – be it the setting up the first postgraduate training in Psychiatry in the country in 1922, to the first Occupational Therapy department anywhere in India, the use of ECTs in the early 1940s, the use of psychotropics such as chlorpromazine and lithium soon after their introduction in the West, etc. I would very much like to carry forward this legacy of providing excellence in clinical care, with patients and caregivers having access to the latest, evidence-based care at the Institute. Providing quality training to the next generation of mental health professionals is a top priority area too. In this regard, I am attempting to expedite recruitment of faculty for any positions that are lying vacant. We have a fantastic library and have other resources to enable us to optimise research output. Attracting research grants and collaborating with top research institutions, nationally and hopefully, internationally, is another area which will receive adequate focus. ❑

INDIA Under-prepared for the second wave of mutant COVID19 surge.

By end of the March 2021, the population in India began to witness a steep rise in COVID infections in some states. The month of April saw surge in patients seeking admission into local hospitals and subsequent unmet demand for oxygen.

Some epidemiologists and scientists have been predicting a potential for a huge surge since last year. The overwhelming evidence that has emerged indicates that the government of India have been caught almost unprepared to respond for such a calamity affecting the country. The B1.617 double mutation of the corona virus changed the dynamics of transmission, resulting in wildfire spread. This was compounded by low vaccination uptake in a densely populated country and mass political and religious gatherings.

India is not short of resources –there has been long-term misguided priorities with chronically underfunded public health care.

There has been inheritance of both chronic underfunding - about 3.6% of GDP, of the public health services for decades as well as dereliction of much needed infrastructure to provide sustainable development of these services. Particularly, the exponential growth of the private healthcare sector over the past decades has dwarfed the public sector provisions, leaving the most valuable to be left out of the accessibility to any affordable healthcare, when needed.

On 28 January 2021, addressing Worlds Economic Forum's Davos Summit the Prime Minister PM Modi had said that India is one of the countries that has successfully controlled coronavirus. He explained, "India took a proactive public participation approach and developed a COVID-specific health infrastructure and trained its resources to fight COVID."

In contrast, by late April, reported India reported the world's biggest-ever daily surge in COVID-19 infections with over 3.32 lakh new cases recorded the last 24 hours. Emergence of shortage of vaccines, shortage of hospital beds and oxygen cylinders unveiled a nightmare of horrors.

Each day, the media had images and video clips of people gasping for 'air' and dying without oxygen or medical assistance. Medical staff were seen battling to save lives while the supply of oxygen was running out, in some places the doctors and nurses deserted their posts, fearing for their safety as the public anger grew day by day.

The international communities led by Non-Residential Indians are organising to fund oxygen generators and concentrators to ensure that these were reaching India to aid those in most urgent need.

India is one of the largest manufacturers of oxygen and has the potential to cope with the crisis. Yet, it lacked storage, transportation, and distribution infrastructure for such purposes.

There are many debatable issues –adequacy of vaccines orders and distribution strategies. Also, there has been huge uncertainty in the policy for 'lock downs' to promote social distancing protocols, to prevent the spread of the pandemic. Finally, the complacency of the 'scientific' task force which met in late April, since the previous meeting in January 2021.

There is no doubt that there are many other reasons behind the current covid crisis in India beside the poor response of the Central and state administrations, which includes relying on false hopes in the belief that India has truly controlled spread of COVID. The system involving Public Health and Disease Control agencies- ICMR, had totally failed or not being able to instigate appropriate response from the Central government about the rapidly rising cases in the community.

The Indian diaspora living aboard have lost many family members and friends and are still caught in the 'war of shortage' of vaccines and access to medical help; it is most anxious and stressful time for all. We owe it to the medical professionals and their supporting colleagues who have risked their lives in treating the patients and are doing their utmost to help the humanity.

We also owe our gratitude to a huge pool of volunteers and community organisations for their prompt and most timely efforts in organising essential aids for India to cope with the mutant virus surge.

It is, indeed, a testing time for the nation trying to cope with the deadly second wave and we hope that the mutant COVID surge will end soon.

Buddhdev Pandya MBE
On behalf of the Swasthya Editorial Team

COVID-19 situation in India

Statement by
the Commonwealth Secretary-General

Speaking on the impact of the latest surge in COVID-19 cases in India, the Commonwealth Secretary-General Patricia Scotland said:

"On behalf of the whole Commonwealth family, I want to express our deep concern and solidarity with the people and the Government of India as your national agencies mobilise to contain the COVID-19 pandemic and as the latest wave of infection continues to spread so distressingly in your country.

"We are immensely grateful for the support provided by the Government of India to small and vulnerable member countries of the Commonwealth earlier in the COVID-19 pandemic, it was an immensely generous and practical response to this global emergency.

"And as your country so compassionately acted to support others in their time of need your fellow Commonwealth nations and the institutions which serve them would wish to do all we can to reciprocate in that same spirit of mutual support.

"As such we stand ready to assist in any way that we can and have called a Commonwealth Secretariat rapid response meeting to consider what practical support the Commonwealth Secretariat and our member countries might offer together to be able to help you with your heavy burden.

"As a family of nations, we value our brothers and sisters in India and we, along with the wider Indian diaspora, all of whom have family and friends affected, share your anguish at the impact of this devastating and terrible disease and commit to supporting the Government and people of India in any way possible."

Source: Commonwealth secretariat

Salford Royal NHS Foundation Trust to provide pioneering spinal treatment

Picture credit: lifescienceindustrynews

Salford Royal NHS Foundation Trust has announced that it has become one of only 11 centres in the country able to provide the Nusinersen drug to treat spinal muscular atrophy (SMA) in adults.

Honorary Consultant Neurologist at the MDU at Salford Royal, Dr James Lilleker, said: "The launch of the service is an important step forward for patients being able to access disease modifying treatments. He explained that this is the first time this treatment has been available to adults living with SMA in the North West and represents an important milestone in the expansion and development of the Muscle Diseases Unit.

It is expected that up to 100 patients are set to receive the treatment at Salford Royal over the next 12 months. This pioneering treatment will help improve the lives of people living with muscle debilitating conditions."

Nusinersen has commonly been used to treat spinal muscular atrophy (SMA) in children. Noe for the first time this has been approved for use in adults. MA affects the nerves in the spinal cord, making muscles weaker and causing problems with movement, breathing and swallowing. Nusinersen is the first treatment that targets the underlying cause of SMA. The treatment works by increasing the levels of a special protein produced by nerve cells in the spinal cord.

Nusinersen, marketed as Spinraza, and used in treating spinal muscular and a rare neuromuscular disorder. First approve din December 2016, it became the first approved drug, has been orphan drug designation in the United States and the European Union.

Phillip Kelly, Neuromuscular Specialist Nurse and Care Advisor in the Muscle Diseases Unit (MDU) at Salford Royal, said: "Despite being in the midst of a global pandemic, we have been working incredibly hard to develop this new service, which we hope will vastly improve quality of life for patients living with SMA."

Dr Santosh Mudholkar

Finalist, Psychiatrist of the Year 2000 RCPsych Awards 2020

Dr Mudholkar is Consultant Forensic Psychiatrist with Nottinghamshire Mental Healthcare NHS Foundation Trust. He is the immediate past President of British Indian Psychiatric Association (BIPA) and Associate Registrar (Membership Engagement), Royal College of Psychiatrists, London. He was awarded the prestigious Priory Research Fellowship at the Academic Department of Psychiatry, Charing Cross Hospital, Imperial College London. He is lead Editor for Mental Health Section of Swasthya, a Journal for Healthcare Professionals.

Dr Fabida Aria

Chair-elect, Transcultural Psychiatry, Special Interest Group (SIG), RCPsych

Dr Ariy is Consultant psychiatrist in assertive outreach team and pave team Associate Medical director for adult mental health and mental health services for older people, Leicestershire partnership NHS Trust, Royal college regional advisor for Leicestershire, Northamptonshire and Rutland. She is a member of Swasthya's Editorial Advisory Board

Mr Buddhdev Pandya MBE

Awarded: Fellows of the Institute of International Organisational Psychological Medicine

Mr Pandya is Founder and Managing Editor of Swasthya, a Journal for Healthcare Professionals. One of the key founders of British Association of Physicians of Indian Origin and served as Director for 22 years. Helped to found Medical defence Shield worked as Dpt CEO. Served a Director of Racial Equality. Also, worked as Chief Officer for British International Doctors Association and as Director for the British Indian Psychiatrists Association. He has established many mental health projects.

Prof Dua to becomes High Sheriff

Prof. Harminder Singh Dua CBE has also the 453rd High Sheriff of Nottinghamshire, UK. Prof. Dua is ophthalmologist. In 2013, Dr. Dua & his team discovered a previously undetected layer in the cornea which was named after dubbed Dua's Layer after Dr. Dua's discovery.

Currently he is the President of the European Association for Vision and Eye Research Foundation (EVERf) (2016-) and Editor in chief of the Journal of EuCornea (European society of Cornea and Ocular Surface Disease Specialists) (2015-). He is a Bord Member, International Council of Ophthalmology (2018-).

Chair and Professor of Ophthalmology, Head of the Academic Ophthalmology and Visual Sciences, University of Nottingham, And Consultant Ophthalmologist, University Hospital, Queen's Medical Centre NHS Trust, Nottingham.

Commander of the most excellent order of the British Empire (CBE). 2019, For services to Eye Healthcare, health education and Ophthalmology.

Recognised in the Queen's Honours List

Dr Mohammad Tayyab HAIDER Medical Director, Basildon and Thurrock University Hospitals NHS Foundation Trust. For services to the NHS, particularly during the Covid-19 Response and to the community in Essex.

Professor Partha Sarathi KAR Consultant and Endocrinologist,Portsmouth Hospitals NHS Trust. For services to People with Diabetes.

Professor Farah Naz Kausar BHATTI Consultant Cardiothoracic Surgeon. For services to Diversity in the NHS in Wales-Swansea.

Marianne Saleisha CWYNARSKI Managing Director, Governance Office and Secretary, House of Commons Commission. For services to Parliament

Dr Harnovdeep Singh BHARAJ Consultant, Diabetes and General Medicine, Bolton NHS Foundation Trust. For services to People with Diabetes in the South Asian Community (Bolton, Greater Manchester)

Dr Nalini Jitendra Modha, General Practitioner, Thistleminor Medical Centre, for services to NHS.

Harjinder Kaur KANDOLA Chief Executive, Barnet, Enfield and Haringey Mental Health NHS Trust. For services to Mental Health, particularly during the Covid-19 Response (Arlesey, Bedfordshire)

Renuka Priyadarshini Dent Chartered Educational Psychologist, Director of Operations and Deputy CEO of Coram UK, for services to Children and Families.

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