

Swāsthya *Health*

HEALTHCARE JOURNAL FOR PROFESSIONALS **स्वास्थ्य**

Design Thinking for Value Based Medical Education

4

Augmenting the Crumbling Spine

11

Enhancing transition from Children and adolescent

22

EARLY DIAGNOSIS OF CANCER AND NEW BLOOD TEST TRIAL.

36

Promoting access to affordable healthcare

Summer 2021



- 3 **SWASTHYA EDITORIAL**
Buddhdev Pandya MBE
Managing Editor
- 4 **DESIGN THINKING FOR VALUE BASED MEDICAL EDUCATION**
Prof. Dr. Arun Jamkar
Fellow Distinguished Professor & Consultant, Healthcare
Prof. Dr. Suptendra Nath Sarbadhikari
Physician and Biomedical Engineer
- 8 **EDITORIAL: SURGERY**
Mr C R Chandrasekar
Orthopaedic Surgeon
- 9 **RECENT TRENDS IN OBSTETRICS**
Dr Santhi Chidambaram
Consultant in Obstetrics & Gynaecology
- 11 **AUGMENTING THE CRUMBLING SPINE**
Mr Sathya Thambiraj
Spinal Surgeon
- 15 **CURRENT TRENDS IN MINIMALLY INVASIVE PAEDIATRIC UROLOGICAL SURGERIES**
Dr M Ramalingam
Urologist
- 20 **EDITORIAL: MENTAL HEALTH**
Dr Santosh Mudholkar
Consultant Psychiatrist
- 21 **MIND OVER MATTER: A RECENT SURVEY CONDUCTED**
Ms. Nandini Sinha
Founder of Mind Over Matter
Mr. Shaurya Vira
Founder of Mind Over Matter
- 22 **ENHANCING TRANSITION FROM CHILDREN AND ADOLESCENT LESSONS LEARNT FROM A SERVICE IMPROVEMENT PROJECT**
Dr. Sharada Deepak
Consultant Child & Adolescent Psychiatrist
Dr. Roopa Gopalakrishnan
ST4 Child & Adolescent Psychiatry
- 25 **HOW MATCHING MIND SEEKS TO IMPROVE THE EFFECTIVENESS OF TALKING THERAPIES**
Dr. Bela Prasad
Healthcare Consultant & Government Health Strategy Advisor
- 27 **NUTRITION AND CHRONIC PAIN: THE MISSING LINK?**
Dr Deepak Ravindran
Consultant Pain and MSK Medicine
- 31 **THE PAST, PRESENT AND FUTURE OF EPILEPSY - TIME TO BE COUNTED!**
Professor Rohit Shankar MBE
Neuropsychiatry
- 34 **HEALTH CARE AND CARBON FOOTPRINT**
Dr Damodar Chari
- 36 **EARLY DIAGNOSIS OF CANCER AND NHS-GALLERI™ MULTI-CANCER BLOOD TEST TRIAL**
Overview by Mr CR Chandrasekar
Orthopaedic Surgeon
- 38 **PRIME OF CLEANING GANGA**
Buddhdev Pandya MBE
MANAGING EDITOR
- 41 **TRIBUTE TO LATE DR KAILASH CHAND OBE**
Swasthya Team
- 42 **INDIA-UK HEALTHCARE CONFERENCE 2021**
NEWS

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

Disclaimer: Views and opinions expressed in the articles are those of the contributors and not to of the publishers. However, the publishers does not accept responsibility for any errors or omissions resulting from information supplied.
We welcome different opinions regarding management of COVID19 or any other health conditions. However

Swasthya is an independent publication aimed at promoting debate on hot-topics and not for making profits.

First, I must congratulate the team of Swasthya for their contribution in ensuring a successful year. Without their support and dedication, it is not possible to compile high-quality contents for each of the issue of Swasthya.

I am indebted to the section leaders for their efforts in developing the speciality sections which have added real value to the publication in its progress to become a clinical journal.

Covid-19 continues to remain a significant threat for our NHS although a very successful vaccination drive in the UK has managed to curb hospitalisations and kept death rates from Covid

relatively low. The risk of emergence of new strains of Covid remains real and possibility of seasonal flu during forthcoming winter months can become a serious threat to all of us. Our NHS must gear up and prepare for any such crisis. Worldwide research on Covid is on-going and we hope to present appropriate news on research and innovations in our publications during the next year.

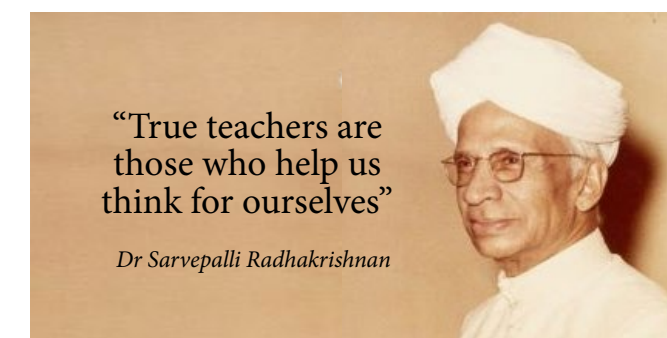
In their article 'Design Thinking for Value-Based Medical Education Prof' (Dr.) Arun Jamkar and Prof. Dr Suptendra Nath Sarbadhikari have quoted Swami Vivekanand: "Education is The Manifestation of The Perfection Already in Man". Adding to this, I would remind us of the wisdom of Dr Sarvepalli Radhakrishnan; " True teachers are those who help us think for ourselves". We hope that Swasthya would be worthy of promoting these educational values to the medical fraternity. I am grateful to both, Dr C R Chandrasekar and Dr Santosh Mudholkar have introduced new topics and developed a competent team for their relevant sections as editors.

Sadly, we miss Dr Kailash Chand OBE, one of the most reliable friends of Swasthya. His counsel and advice were invaluable to us in our quest to initiate and develop this publication. We also remember Dr K K Aggarwal, one of the active contributors and a voice for the medical fraternity in India. We pay our tribute to these two great professionals who have dedicated their lives to the interests of medical practitioners and professionals.

Relying on peer overview, I like to report that there have been satisfying reviews of the journal over the years from our contributors and readers. Currently, we have Surgery, Cardiology and Mental Health sections. However, in due course, we would be adding Emergency medicine as more colleagues have shown enthusiasm and commitment to enhancing the quality of Swasthya.

I like to thank our readers and contributors for their unstinting support for Swasthya.

Buddhdev Pandya MBE
Founder and Managing Editor



"True teachers are those who help us think for ourselves"

Dr Sarvepalli Radhakrishnan

Design Thinking for Value Based Medical Education

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“Education is The Manifestation of The Perfection Already in Man”.
~ Swami Vivekananda

Abstract

Education is a medium through which we explore and polish the values within us. Value based education is source for revealing these values. Value based medical education is expected to impart and instill values, which will enable one towards appropriate choices and decisions especially when in dilemma. In India, Attitude, Ethics and Communication (AETCOM) curriculum was developed to facilitate a shift towards value based medical education. The seven pillars of principles offer a practical approach towards Values-based Education (VbE). Design Thinking is a mindset and approach to learning, collaboration, and problem solving. Here we propose a framework that uses design thinking principles acting through those the seven pillars, to impart value based health professional education.

Introduction

Education is a medium through which we explore and polish the values within us. Only Value based education is source for revealing these values. Education will make one outshine, aware, civilized and independent.

“Design thinking is a non-linear, iterative process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test. Involving five phases—Empathize, Define, Ideate, Prototype and Test.”¹ For the second phase of defining and third phase of ideation, explanations need to be communicated very well. Finally there has to be experimentation that may culminate in blueprinting and plot tests.

Value based medical education (VBME) is usually expected to impart and instill values, “where values represent morals that trigger ones beliefs, choices and decisions especially when in dilemma.”² Therefore, design thinking can work well in value based medical education. The role of communication, especially in the rapidly evolving digital



Prof. Dr. Arun Jamkar



Prof. Dr. Suptendra Nath Sarbadhikari

world, will be paramount.³

“Design thinking is a versatile approach for orchestrating conflicting ideas, identifying singular needs and common goals, making productive use of diverse backgrounds, enhancing empathy, and developing a shared vision. While the situated practices of design thinking are diverse, we identified characteristic themes that explain why design thinking is heralded as a problem-solving approach in education and beyond.”⁴

In India, Attitude, Ethics and Communication (AETCOM) curriculum was developed to facilitate a shift towards value based medical education. Teaching of values can be through role plays, discussions, case vignettes, reflections, group activities, projects debates and volunteer work.⁵ There has been a recent publication that has used design thinking, particularly a human-centred and solutions-focused framework, which fosters critical reflection, for medical curriculum development. An innovative online education tool⁶ has successfully demonstrated teaching of self-directed learners to provide care emphasizing trans people’s self-determination and autonomy for medical decision-making.

We propose that using design thinking methods can ease the implementation of value based medical education.

Proposed Framework

Maharashtra University of Health Sciences (MUHS) has managed to create, validate and implement the “Values in Health Care – A Spiritual Approach” (VIHASA) protocol⁷ in various medical Colleges. This is the model developed on entirely Indian concept of yoga, meditation, visualization and internalization to imbibe seven values in medical students. Value based education has been a need of hour. Several models and concepts are available. We need to take a stock of it and create a VBE system in world acceptable to all cultures and geographies. Therefore, Value Education not only grows roots but also gives wings to our society / Nation.

Neil Hawks, Teacher and Founder of Values-based Education (VbE) has set concrete value structure on inquiring human mind using seven pillar principles.⁸ We have modified to suit new context the basis of critical analyses to include best of system.

Pillar no 1: Modelling and Role modelling

Modelling of a value like “Respect” is a tedious task but it can be done by a role model. Role models inspire and used as the blueprint for how we should behave. Role models help to set the principles and ethics for the society. Neurophysiology research has proven that Mirror Neuron⁹ in the brain respond equally when we perform an action and when we witness someone else (Role model) perform the same action. In both aspects, we experience the situation in the same manner. We learn by imitating actions and values in inner curriculums are developed by family and parents, and value ecosystems at home Child learn by imitating his near and dear by through mirror neurons system.

Pillar No 2: Inner curriculum:

The inner curriculum is a technique for exploring consciousness. Inner curriculum deals with emotions, feeling which is present in students by birth or values carried forward through the family. Few such techniques for enhancing inner curriculum are

1. Prayers or meditation medium: students get calmed easily.
2. Music: students can feel many emotions like inspiration, happiness, hope.
3. Sports: students can be always in team spirit, social binding.

Another important aspect here is the role of communication³. The communication pattern in the digital world is going to be drastically different. This has been a significant issue, especially during the COVID 19 pandemic. Therefore, health professional educators must be prepared to harness their capabilities in a responsible manner following the netiquettes.

Pillar no 3: Reflection:

Reflection is a technique which helps to develop the imaginative side of the brain that promotes creativity and problem-solving skills. Our actions are basically a reflection of our mind. Reflection of student’s mind can be done by spiritual teachings. The reflective method involves learning from experience to evaluate concerns and improve present situations. Its helps students to take a calm, detached view of themselves, rather like an observer, so that they can examine their own emotional reactions and release them. Reflection is used to identify and affirm positive experiences as well as facilitate a degree of detachment.

Pillar No 4: Curriculum:

Teachers designing their curriculum must consider how the environment of the classroom will impact students. A student will learn from what is taught in a class and from how that class is taught. Therefore, the student will also take lessons from how his/her class and school are organized. These are the concepts of explicit and implicit curriculum, and they will help educators think about the different ways students learn. So, they can design more effective methods of teaching.

Pillar no 5: Atmosphere:

A positive classroom atmosphere is a big need for students to learn and develop. Whereas if a student does not get a welcoming atmosphere, the student gets threatened and miserable. Therefore, we must consider the following fact to

make the classroom more welcomed:

- Acknowledge students each day and induce positive encouragement.
- Promote two-way respect.
- Share something inspirational with students.
- Restrict bullying behaviours.
- Storytelling and sharing experiences.

Creating an ecosystem that follows ethics and values in schools, colleges, universities and society will tempt students to follow. Panke⁴ has found that taking part in design thinking activities can universally be a transformative experience of amazement, camaraderie and joyful discovery. The characteristics in pedagogical setting are “Tacit experiences, increased empathy, reduced cognitive bias, playful learning, flow, verve, inter/meta-disciplinary collaboration, productive failure, resilience, surprising solutions and creative confidence.”

Pillar No 6: Ethical leadership with integrity and honesty

Being a leader means defining and exhibiting moral and ethical courage and setting an example for everyone in society. A leader inculcated with ethical values will grow up from becoming a crisis manager to a visionary leader. Leaders should create leaders and not followers. Also, ethical leaders should create an ecosystem to promote an educational system that promotes universal values, at the end value of society will improve.

Pillar No 7: Ethical vocabulary and Vocabulary of Universal values

Ethical vocabulary is also known as Ethical Intelligence which helps to provide principles for various aspect of social life.

- a. Society aspect in Inculcating Values: Social values play a predominant role in running and maintaining the social order.
- b. Education aspect in Inculcating Values: Students are being groomed to be professionals to capture the top salary jobs in the market. Without telling them how to take a stand ethical and morally in various circumstance. The objective of education should be to educate a student of the value system which is indispensable to live a successful life.
- c. Family aspect in Inculcating Values: Parents’ communication with their students is one aspect of students’ social experiences that may be used in the construction of moral knowledge.
- d. Religion aspect in Inculcating Values: Religion may act as a boon to our society. It makes sure people should follow some discipline and attitude towards themselves, society and nations. Let’s have a look at the religious value which help humanity safe.

Further, it has been felt that in the post-pandemic era, the healthcare delivery workforce must be technology-enabled, and at the same time safe and ethical¹⁰. It will be prudent to utilize the digital health technologies, including Artificial Intelligence (AI), in enhancing the capacity of the health care professional education and delivery. However, it has to be ensured that an ethical and safe approach is adopted to (i) develop and (ii) utilize digital health technology, and, (iii) ethically appropriate training is imparted, to enhance the capacity of the human resources for health, leading to an overall health system strengthening.

To summarize, these seven pillars can be implemented in the following steps (Table 1) of design thinking:

Table 1: Proposed Framework for Design Thinking for Value Based Medical Education

	Role Modelling	Inner Curriculum	Reflection	Curriculum	Atmosphere	Ethical Leadership	Ethical Vocabulary
Empathize	Find out the Role Models of the students	Find out the storytelling capabilities of the students	Find out the students' abilities to reflect upon a specific learning	Find out the predominant learning type for each student – visual (spatial), aural (auditory), physical (tactile), verbal (linguistic), logical (analytical), social, solitary, or natural	Find out the factors that the students want for the classroom atmosphere to become positive	Find out the academic administrator(s) whom the students found to be honest and ethical	Find out the students' views on the role of ethics in their professional careers
Define	How might we provide better role models to the medical students?	How might we enhance the storytelling capabilities of the students?	How might we improve upon the students' abilities to reflect upon a specific learning?	How might we design the curriculum, keeping in mind all the different types of learners?	How might we augment the positivity of the classroom atmosphere?	How might we encourage the academic leaders to become more ethical and honest?	How might we encourage the students to become more ethical and honest?
Ideate	Brainstorm to find the desirable attributes of the role models and how to achieve those	Brainstorm to find the ways to enhance the storytelling capabilities of the students	Brainstorm to find the ways to improve upon the students' abilities to reflect upon a specific learning	Brainstorm to find the ways to design the curriculum, keeping in mind all the different types of learners	Brainstorm to find the ways to augment the positivity of the classroom atmosphere	Brainstorm to find the ways to encourage the academic leaders to become more ethical and honest	Brainstorm to find the ways to encourage the students to become more ethical and honest
Prototype	Discuss, and if possible, invite, a role model for value based medical education	Discuss, and if possible, invite, a good storytelling health professional educator	Discuss, and if possible, invite, a versatile and popular health professional educator	Discuss, and if possible, invite, an innovative health professional educator	Discuss, and if possible, invite, a cheerful and positive health professional educator	Discuss, and if possible, invite, a leading health professional educator known for integrity	Discuss, and if possible, invite, a leading health professional student known for integrity
Test	Find out from the role model how have his / her mentees carried on the lessons learnt from him / her and are furthering the cause	Find out from the invitee how have his / her mentees carried on the lessons learnt from him / her and are furthering the cause	Find out from the invitee how have his / her mentees carried on the lessons learnt from him / her and are furthering the cause	Find out from the invitee how have his / her mentees carried on the lessons learnt from him / her and are furthering the cause	Find out from the invitee how have his / her mentees carried on the lessons learnt from him / her and are furthering the cause	Find out from the invitee how have his / her mentees carried on the lessons learnt from him / her and are furthering the cause	Find out from the invitee how have his / her mentees carried on the lessons learnt from him / her and are furthering the cause

Way Forward

Value based medical education covers the gaps in the current way of imparting health professional education. It thus impacts the young minds making the world a better place to live in. We need to critically evaluate these efforts and validate and amplify better approaches for the benefit of mankind.

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SURGERY

Swasthya Health Journal for Professionals SUMMER 2021



Contents.....

- RECENT TRENDS IN OBSTETRICS
- AUGMENTING THE CRUMBLING SPINE
- CURRENT TRENDS IN MINIMALLY INVASIVE PAEDIATRIC UROLOGICAL SURGERIES



Swasthya Surgery

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Surgeons always want to improve and provide solutions for the challenges that face them.

Minimally invasive interventions are on the rise, reducing morbidity and providing equal or even better outcomes than conventional surgery. Even with the prerequisites of the heart of a lion, the eyes of an eagle, the mind of a genius and the dexterity of a robot, the modern surgeon is required to continue evolving.

The Summer issue of Swasthya touches on some facets of diverse specialities including Obstetrics, Spinal Surgery, Paediatric Urology, Neurology and Oncology.

One of these facets is obstetrics; Dr Santhi Chidambaram discusses the Recent trends in Obstetrics. The advances in prenatal diagnosis and treatment are astounding and push the possibilities of advanced foetal diagnosis and even foetal surgery.

Osteoporosis is a ubiquitous problem and resulting painful vertebral fractures are common. Mr Sathya Thambiraj provides an insight into this common problem from the viewpoint of a spinal surgeon, taking into consideration minimally invasive interventions that can be helpful for carefully selected cohort of patients

Paediatric Urology is yet another niche speciality and Dr Ramalingam discusses current trends in minimally invasive paediatric urology. In general, robotic interventions are increasing, and Urology has been a pioneering surgical speciality in embracing technological advances.

Epilepsy is a disorder that carries associations mystery and stigma that date back to the medieval period. Prof Rohit Shankar discusses the past, present and future of this disorder. The importance of predicting, monitoring and preventing seizures is as important as treating conditions that cause epilepsy.

Early diagnosis remains the holy grail for many medical conditions. Early cancer diagnosis through 'smart and effective' tests are in development. Large scale, well designed clinical trials like recently launched NHS-Galleri trial, have the potential to reduce the burden of late-stage cancer diagnoses.

I hope the summer issue of Swasthya will provide some insight into futuristic and minimally invasive interventions. Surgery still requires bloody minded calculated risk taking and there are fine margins between innovation and misadventure. Without the welcome advances of innovative, intelligent surgeons and cutting-edge technologies that tests innovations in practice, surgical science would remain static, dwelling on the glories of the past.

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Recent Trends in Obstetrics

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Obstetric care has responded to the changing roles of women and increasing complexities in them. Optimising influences on maternal and fetal health starts before conception.

Multi-disciplinary Training: Pregnancies in women with complex or rare conditions is now possible due to teamwork involving obstetricians physicians, anaesthetists and specialist midwives, albeit with significant challenges to the teams caring for them. Training of the teams working together with simulation outside the work environment (PROMPT¹) and live drills adopted from aviation training programmes are recent trends to promote cohesive care during obstetric emergencies. This has resulted in significant reduction in maternal and perinatal mortality even in low resource settings. Specialised pathways such as Saving Babies Lives² care bundle in the UK, are employed to improve perinatal outcomes and widely adopted with local variations.

Innovative approaches to tackle challenges such as morbid obesity, social or economic vulnerability and specific circumstances such as political displacement or cancer are developed.

Obstetricians are now familiar with bariatric equipment, safeguarding or judicial processes and support women through chemotherapy or cancer surgery during pregnancy. Obesity and repeated caesarean births require specialised equipment (see Figure 1) to improve access.

Electronic Fetal Monitoring (EFM): EFM has been in and out of favour due to difficulty in interpreting the wide variations in normal and abnormal fetal heart patterns. Computer analysis with Artificial Intelligence (AI) is now being used to overcome the effect of human factors on interpretation.

Screening for pre-eclampsia : After extensive research for candidate markers, an assay of angiogenic factors with Placental growth factor; soluble fms like tyrosine kinase (s-flt) and their ratio⁴ is now available with high negative predictive value (99%) to select women who need intense monitoring

Fetal Medicine: Progress in fetal medicine has been phenomenal due to advances in imaging, minimally invasive access to fetus, and expansive use of genomics and proteomics.

Nuchal Translucency between 11 to 14 weeks⁵ remains the most discriminatory marker for chromosomal and genetic conditions, cardiac abnormalities and twin transfusion (TTTS) in monochorionic twins. Addition of biochemical markers or Ductus Venosus Doppler in early pregnancy increases detection rates of aneuploidies such as trisomy 21 upto 95% with reduction in invasive diagnostic tests to 2-3%.

Middle Cerebral Artery Doppler has reduced the need for repeated amniocentesis in allo-immunisation or in parvovirus infection in pregnancy. Assessing fetal arrhythmias with M Mode Doppler allows in-utero treatment avoiding premature delivery. Using fetal venous Dopplers, delivery can be delayed in early onset growth restricted fetuses without increasing the risk of fetal demise in-utero.



Figure 1. Cesarean birth using Applied Medical's Alexis® O C-Section Protector/Retractor. Photo courtesy of C.Steele.



Figure 2. Fetus with subcutaneous fluid on the back of the neck. Image from "The 11-13+6weeks scan" by Kypros Nicolaides⁵

Magnetic resonance imaging and 3D ultrasound have made accurate mapping of facial clefts, neural tube defects, cardiovascular anomalies or invasive placenta possible. This helps to plan the treatment and enables parents to visualise and participate in the decision making process. MRI adds significantly to the diagnosis of abnormalities involving thorax and abdominal wall, renal and skeletal dysplasia.

Prenatal genetic diagnosis has exploded with succession of technologies such as chromosomal microarray, exome sequencing and whole genome sequencing. Conventional cytogenetic techniques (FISH /PCR) identify numerical abnormalities (e.g. trisomy, monosomy) and large defects on prenatal samples taken in less than half of cases with congenital abnormalities. Now it is possible to study all candidate genes related to a structural anomaly or a combination of anomalies with a thousand times more resolution. Exome⁶ and whole genome sequencing are also employed in special circumstances or research settings when arrays return normal results.

Cell free fetal DNA: Quantitative and qualitative study of free fetal DNA in maternal blood has been available since 2011 and used for fetal blood grouping, fetal sex and some genetic conditions without resorting to invasive procedures. We can avoid interventions in Rh D negative mothers if the baby is predicted to be Rh D negative.



Figure 3. 3D imaging of Bilateral Talipes. From Fetal Diagn Ther 2015;37:179-196

Fetal genotyping is possible for other cell antigens such as Kell or c.

This is currently offered as a screening test for Trisomy 21, 18 and 13 with detection rates up to 99%, 96% and 92% respectively⁷. It is also offered as a first step in prenatal diagnosis of many other genetic conditions (e.g. achondroplasia, DiGeorge's syndrome).

Fetal therapy: Fetoscopic laser treatment of placental vessels has been successfully used in moderate to severe TTTS with intact survival up to 85 % since 1998. Increasing knowledge of the evolution of fetal structural anomalies such as spina bifida or diaphragmatic hernia and advances in minimal access surgery have made in-utero fetal surgery a reality. Insertions of a balloon for occlusion of the trachea (FETO) in cases of diaphragmatic hernia facilitates lung development

improving survival up to 81% in specialised care settings⁸. EXIT procedures are undertaken at birth, for life threatening fetal abnormalities such as lung lesions or sacro-coccygeal teratoma.

Fetal surgery for non- life threatening anomalies, such as myelomeningocele is offered in carefully selected cases to restore the anatomy of the hind brain. This is shown to decrease the need for ventricular shunting after birth and improved neurological function although complicated by maternal morbidity and prematurity.

Conclusion:

Innovation in training and team work as well as advances in diagnostic and therapeutic procedures have enabled the obstetric care to be safe and responsive.

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Augmenting the Crumbling Spine

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Introduction:

Vertebral compression fractures (VCF) are often described as 'crumbling spine'. They have a wide range of causes including osteoporosis, neoplasms (myeloma^[1], metastases, lymphoma and haemangioma), osteonecrosis and trauma. Osteoporosis is the most common cause, accounting for almost 70% of all cases. Most of this morbidity can be attributed to pain (acute and chronic) and the devastating effect that deformity can have on self-esteem, self-image and life expectancy.

Patho-anatomy & Spinal Alignment: Knowledge of the anatomy and morphology of the fractures is key to understanding the importance of timely treatment and the consequences of failed treatment.

The upright posture of human beings is the result of evolutionary enlargement and verticalization of the pelvis leading to the characteristic curvatures of the spine in the sagittal plane^[2]. Hence we have the lordosis seen in the lumbar spine and cervical spine with kyphosis in the thoracic spine. This combined is referred to as 'sagittal alignment'. If this alignment is affected, it is referred to as spinal imbalance or sagittal imbalance. In a well-balanced spine, the actions of the agonist and the antagonistic muscles of the spine are minimised and therefore most efficient^[2].

Spinal alignment can be assessed by measuring the Sagittal Vertical Axis (SVA) in a full-length spinal X-ray. It assesses the location of the head with respect to the normal centre of gravity. It is the plumb line dropped from C7 to the sacral end plate as seen on a whole spine x-ray (**Fig: 1A**). In a neutrally balanced spine, the plumbline falls within 2cm of the posterosuperior corner of the S1 vertebral body.

Vulnerability of Thoraco-lumbar Junction: Any region of the spine can be deformed following a fracture. It is however, felt most in one area, that is between T10 to L2. It is the transition zone, which is the straight part (range 0 to 9 degrees) between the lordotic lumbar spine and kyphotic thoracic spine. If normal alignment is not restored, a fracture here results in angular deformity that moves the centre of gravity forward. This increases the forward bending moment and increases the stresses on the rest of the spine, potentially resulting in a fracture adjacent to the first one.



This forward bending posture and moments produced demands increased counter balancing posterior force from the spinal musculature and ligaments. These stresses felt in the back muscles forces the patient to counteract it by flexing the knees and contracting the posterior musculature to tilt their hips^[3]. This brings the shoulder and head back up but still affects pace of mobility due to tightened hamstrings. This causes para-spinal muscle fatigue and results in chronic pain associated with osteoporotic spinal kyphotic deformity. As time passes, forward position of head and neck and weakening musculature can make upright posture impossible and mobility aids become necessary.

The rib cage ultimately rests on the pelvis causing significant pain from lower ribs. As a result, the abdominal contents are compressed into less vertical space. The abdomen then can bulge out, causing bloating, distension, constipation and reduced forced vital capacity and forced expiratory volume and may contribute to excess mortality (**Fig 1B**).

Management: Due to the complex nature of systemic osteoporosis, coupled with the intricate biomechanics of vertebral fractures, it leads to a clinical setting which is ideally treated interdisciplinarily by the Clinical Biochemist (or Rheumatologist) and the Spinal Surgeon.

The principle aim of treatment is to prevent progression of deformity, restore the height of the vertebral body when possible, reduce pain and prevent occurrence of future fractures through osteo-induction^[4].

Majority of VCFs can be treated conservatively with initial

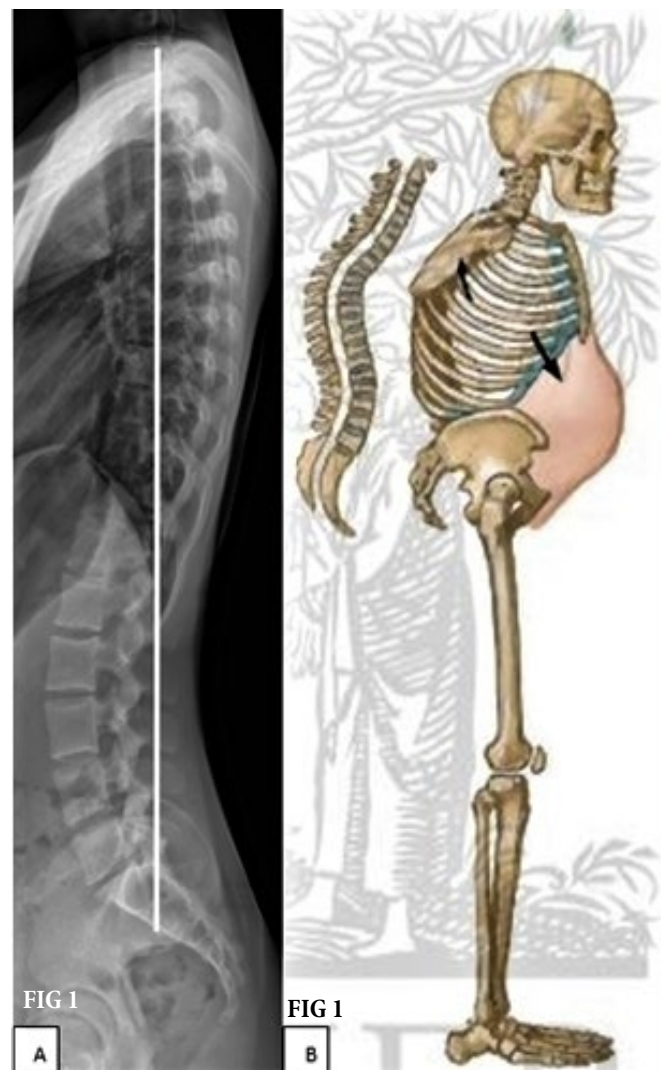


Fig:1 X-ray Whole spine demonstrating neutral sagittal balance showing plumbline from C7 to S1 endplate falling with 2cm of the posterosuperior corner of S1 vertebral body (A) [Case courtesy of Dr Balint Botz, Radiopaedia. org, rID: 63126]. Diagram showing ribs resting on pelvis compressing abdominal contents pushing the abdomen out (B).

rest, analgesia and bracing. But regular monitoring with check x-rays in the first three months is important.

Surgical treatment:

Conventional reconstructive procedures involving implants like screws and rods are generally not suitable option due to poor quality of bone and reduced tolerance of operative trauma in this group of patients^[4]. Minimally invasive treatment like vertebral augmentation using cement is currently the best option. This includes Vertebroplasty, Balloon Kyphoplasty and third generation techniques like implantable titanium devices. Aim of surgical treatment is to consolidate the fracture & prevent progression of deformity, relieve pain and restore height whenever possible.

Vertebral Cement augmentation:

Vertebroplasty: The first use of Vertebroplasty was reported by Galibert in 1984 to treat aggressive haemangiomas and osteolytic tumours. This is a minimally invasive procedure performed under fluoroscopic imaging guidance and can be done under local anaesthesia or general anaesthetic, ideally

in a clean operating theatre set-up. It involves injecting radio-opaque bone cement, made of polymethylmethacrylate, into a partially collapsed & fractured vertebra in order to create a binding cast inside the bone, with the goals of stabilizing the fracture and reducing the patient's pain. This is considered as the first generation of cement augmentation.

Kyphoplasty: This is a second-generation cement augmentation device which can restore the height of the VCF if performed in the first few weeks. This is a minimally invasive procedure performed under fluoroscopic imaging guidance. A balloon is first inserted into the fractured vertebral body. The balloon is then inflated to create a cavity within the bone that is filled with cement (**Fig 2**).

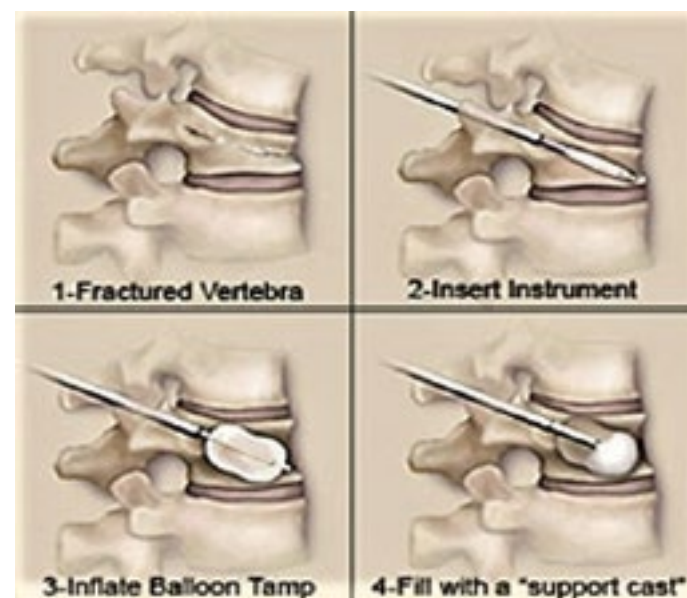


Fig 2 Diagrammatic sequence of Balloon Kyphoplasty™ procedure

Vertebral Augmentation System using Titanium cages: This is a third-generation cement augmentation device, which can also restore the height of VCF. It involves insertion of a titanium mesh cage^[11](OSSEOFIX) (**Fig 3**) or balloon assisted Titanium mesh (Vertebral Body Stenting) or a lifting Jack (Spine Jack). Once, the implant is deployed inside within the vertebral body, it is retained there and cement is injected to strengthen it further.

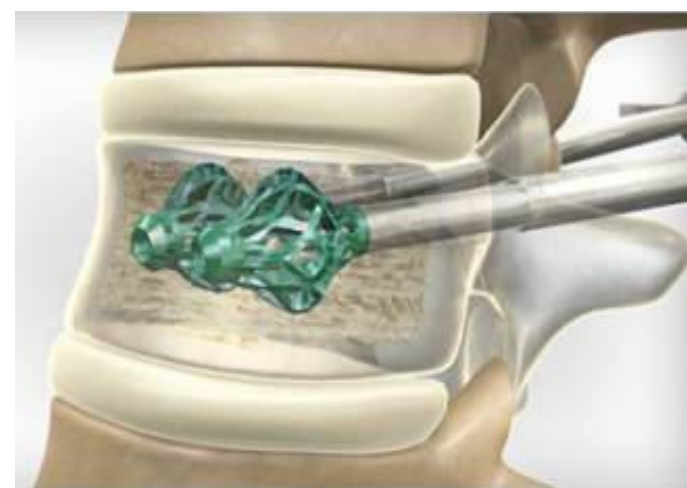


Fig 3 Vertebral Augmentation system using Titanium cages (Osseofix™- Alphatec)

Patient selection and Imaging:

Preoperative imaging is required to identify the fracture, estimate its age, morphology and posterior wall integrity. MRI with STIR sequences is the gold standard and is a must in all patients considered for cement augmentation^[5]. A CT scan is the alternative if patient cannot tolerate an MRI scan or if it is contra-indicated. The VCF level responsible for pain must be identified in all patients considered for cement augmentation. This is identified by pain of the level corresponding to oedema seen in MRI scans.

Indications for Vertebral Cement Augmentation:

1. Persistent significant pain from a fractured vertebral body confirmed with corresponding level oedema or cleft seen in the MRI scanning with STIR images^[6].
2. Persistent significant pain that is refractory to medical management of pain for two to three weeks and bracing. However, it can be done earlier if there is a risk developing medical complications like chest infection or pressure sores^[6].
3. Progressive loss of height in fractures T10 to L2 that could lead to kyphotic deformity and morbid sequelae^[6].

Contraindications for Vertebral Cement Augmentation:

Absolute:

1. Infection
2. Asymptomatic VCF or improving on medical treatment without worsening of deformity
3. Coagulopathy

Relative:

1. Burst fracture or defect in posterior wall of vertebral body, as there is increased risk of cement leakage into spinal canal.
2. Tumour extension in spinal canal or spinal cord compression

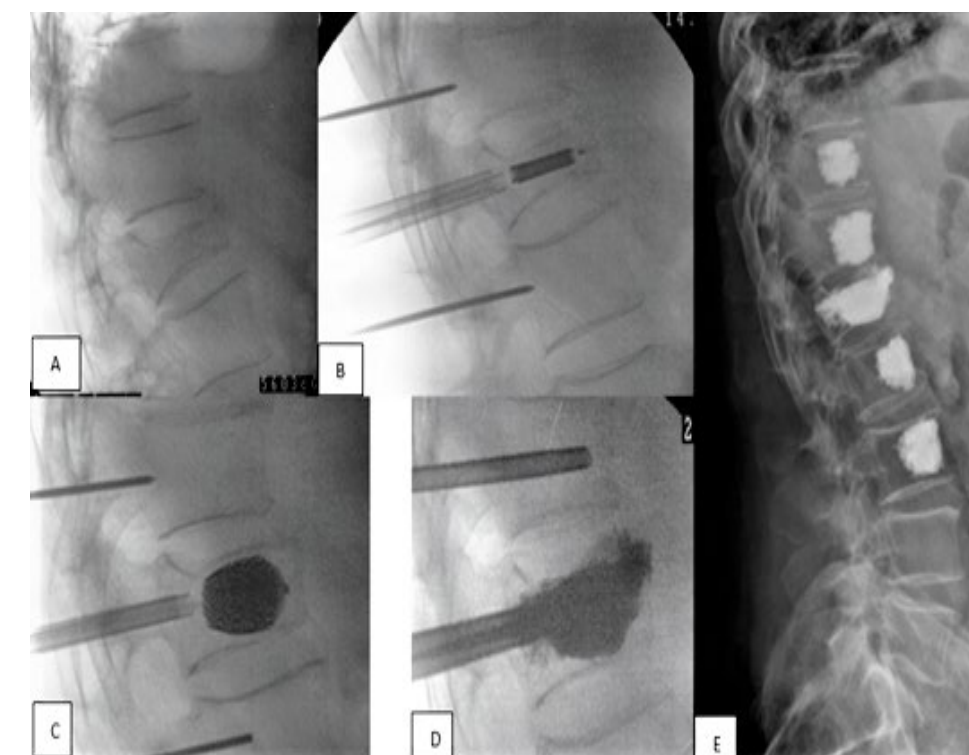
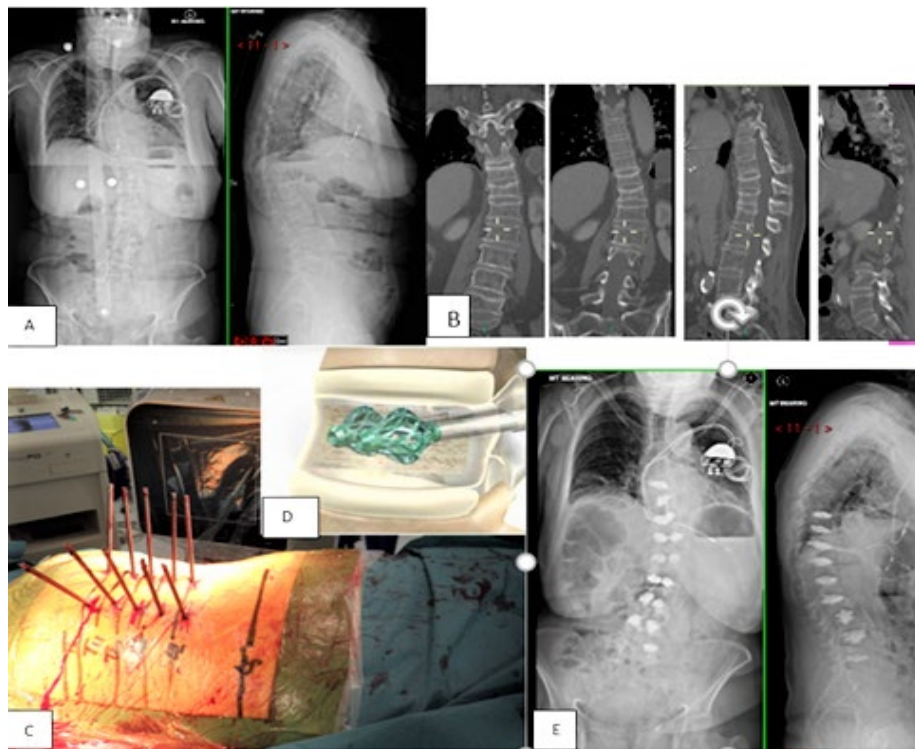


Fig 4 Intra-operative X-ray Lateral view of 78-year-old man showing L1 VCF (A). Vertebral body stent in vertebral body before inflation (B). Image after inflation of balloon and restoration of height of vertebral body (C). Image with vertebral body filled with cement after removal of balloon (D). Final X-ray lateral view showing cemented L1 VCF. T11 T12 L2 & L3 have been prophylactically cemented (E)

2. Multiple Osteoporotic VCFs: A 70-year-old woman was admitted with history of fall with multiple VCFs and severe osteoporosis. She failed pain management and was bed bound. She was on warfarin and had a Pacemaker. CT confirmed multiple fractures. She underwent multi-level cement augmentation using titanium mesh cages and cement (**Fig 5**).

Fig 5: X-rays AP & Lateral view of 78-year-old woman with multiple VCFs and scoliotic deformity; bed bound due to severe pain despite pain relief medications (A). CT scans (MRI scan contraindicated due to Pacemaker in patient) confirming fractures were acute (B). Intra-operative images with inserting cannulas in place (C). Image of bone saw model of vertebral body with Titanium cage in place after expanding (D). Post-operative Whole spine X-rays AP & Lateral view showing cemented levels from T9 to L5 (E).



3. Multiple fractures with Multiple myeloma and rapid progression to deformity: A previously healthy and employed 60-year-old male presented two months following a newly diagnosed myeloma. In the short period, he had developed kypho-scoliotic deformity. Whole spine x-rays, MRI and CT scans showed pathological fractures from T12 to L4. He had finished his first cycle of chemotherapy at presentation and was on anti-coagulants. Due to severe pain

and rapid progression of deformity, he underwent multi-level cement augmentation using Titanium mesh cages. He had a satisfactory outcome with improvement in his radiological parameters and improvement in his sagittal balance and alignment **Fig 6**.

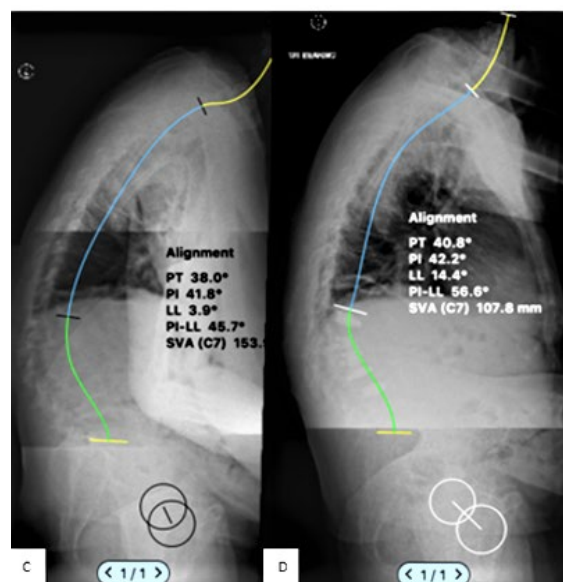
Fig 6 Sagittal view of MRI (STIR) images of Lumbar spine of newly diagnosed myeloma of a 60-year-old male with rapidly progressing VCFs of T12 L1 L2 L3 & L4 (A). Post-operative X-ray lateral view of Lumbar spine after cement augmentation with Titanium mesh cages (B). Pre-operative & Post-operative Whole spine X-rays demonstrating improvement of sagittal alignment with improvement in lumbar lordosis and Sagittal Vertical Axis (D).



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CURRENT TRENDS IN MINIMALLY INVASIVE PAEDIATRIC UROLOGICAL SURGERIES



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Of late, Robot assisted laparoscopy is being practiced in high volume paediatric departments. This has many notable benefits like 3D vision, precision due to seven degree endo wrist movements and above all surgeon's comfort and shorter learning curve⁹. Robotic technology also can filter tremors of surgeon. However surgical robots are too expensive and hence are not widely available especially in developing countries and under developed countries.

INTRODUCTION

Over the past 2 decades technology developments have enabled Urologists to perform most of the reconstructive surgeries for congenital anomalies and some of the ablative procedures like nephrectomy by laparoscopic approach^{1,2}. Over the last 10 years, improvement in design of medical instruments has made keyhole surgery safer even in infants where the working space is small. Miniaturisation of telescopes and development of 3D camera system facilitates better visualisation. Better haemostatic energy sources results in safer outcome, less blood loss and less morbidity to a great extent. Development of articulating hand instruments (Livsmed, Radius surgical system etc) further facilitates precise dissection and suturing. Future technology in developing magnetic anastomosis of hollow organs is also promising. Artificial Intelligence (AI) embedding is another technology that will guide the surgeon to do an optimal technique.

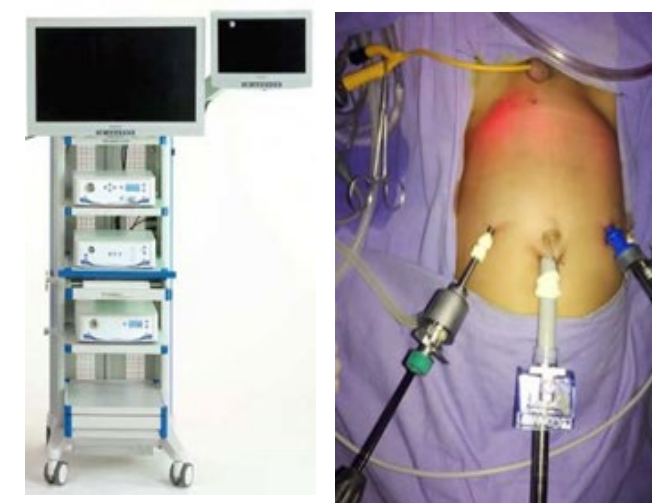


Da-Vinci- Urology Surgical Robotic System



CMR Surgical - Versius Surgical Robotic System

Natural Orifice Transluminal Endoscopic Surgery (NOTES) is another technique of using flexible camera and hand instruments through rectum, vagina, or stomach to perform procedures wherein scars are not visible^{5,6,13}. However they are technically challenging and less practiced. Hybrid NOTES is another technique attempted, wherein camera port is placed at umbilicus and rest of the procedure is done through NOTES⁷.

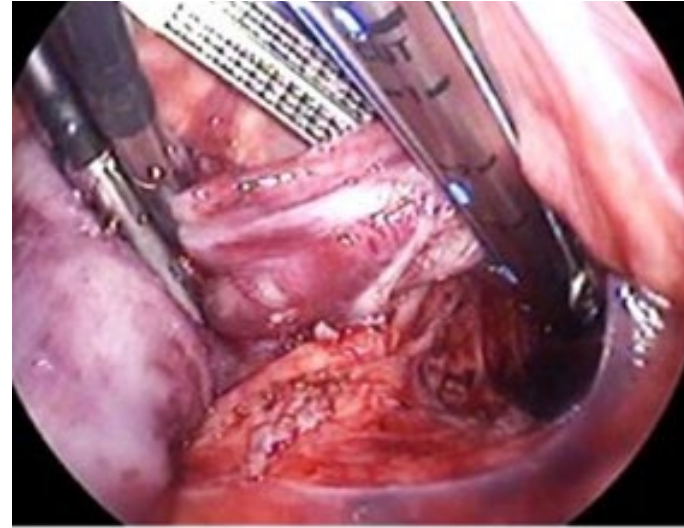


3D CAMERA SYSTEM LAPAROSCOPIC ENTRY RECENT DEVELOPMENTS IN TECHNOLOGY

WELL ESTABLISHED PAEDIATRIC LAPAROSCOPIC UROLOGY PROCEDURES

Laparoscopic Pyeloplasty

This procedure was first reported by in 1995 by winefield. Most commonly, laparoscopy is done through transperitoneal approach using three or four ports. There are few centers using retroperitoneal approach. Though it replicates open approach, the problem is limited working space. Manickam Ramalingam et all published a series of 22 cases of Transmesocolic pyeloplasty as early as 2008 wherein the colon is not mobilised. This is less morbid and saves time¹⁵. The results are comparable to open surgery but is less morbid and children are discharged earlier.



NOTES - Nephrectomy Through -Vagina



Less Instrument

Single port surgery (LESS-Laparo Endoscopic Single Site surgery) which is mostly through umbilicus is also in vogue, is a cosmetically better but technically more demanding technique³. To learn LESS, longer training periods are needed.

Manickam Ramalingam et al¹⁷. have developed less expensive endotainers for the same.

Researches under trial

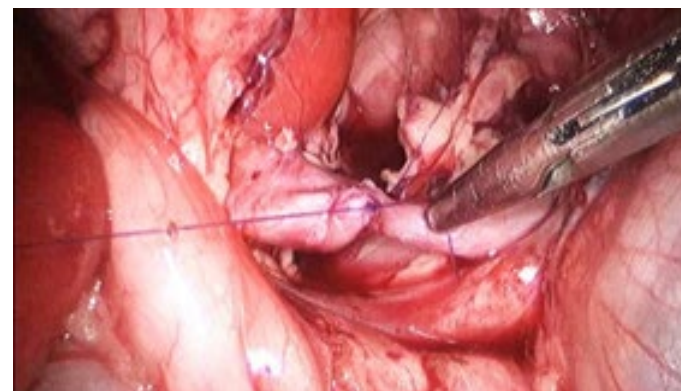
Robotised hand instruments have been developed by few companies with some endowrist movements like a Robotic surgery without the actual robot but at a lower cost than Robotic surgery. Large clinical trial reports are awaited¹⁰. Dexter is another system that encompasses conventional camera-optical system coupled with remotely controlled hand instruments console in an attempt to reduce the cost¹¹. Verb Surgical by Google and Johnson & Johnson is a promising surgical robot that will incorporate AI technology to facilitate decision making during robotic surgery easier¹⁴. Avatera from Germany is another system making smaller instruments suitable for paediatric patients^{4,12}. Still more advanced are the deployable remotely controllable devices (ABI Robot). These are under animal lab trial.



RGP



Ports Position



Pyeloplasty Completed

Laparoscopic Ureteric Reimplantation

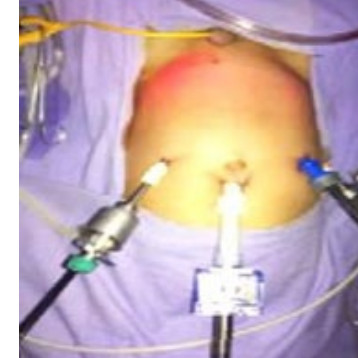
For primary obstructive megaureter, gross vesico ureteric reflux, ectopic ureter and less commonly in ureterocolic; laparoscopic ureteric reimplantation is practiced.

All the various techniques practiced; like Transvesical

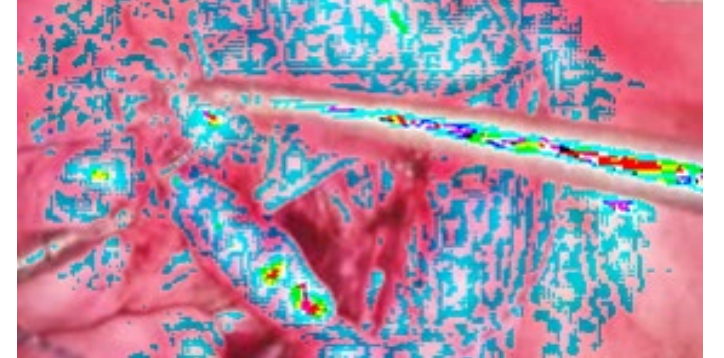
Cohen's procedure, Transperitoneal Lich Gregoir and detrusorrhaphy are doable by laparoscopic approach with comparable results but less morbid. When tailoring of ureter is needed it can be done intracorporeally or by hybrid technique coined as Port site assisted reimplantation by Ramalingam et all¹⁶.



MCU



Ports Position



Ureteric Reimplantation Completed

LAPAROSCOPIC ORCHIDOPEXY AND ORCHIDECTOMY

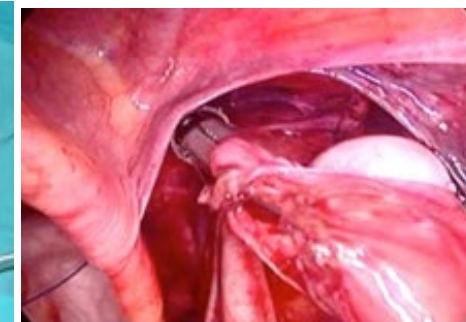
For children with empty scrotum, diagnostic laparoscopy is the rule.

Whatever procedure is practiced by open technique can be done laparoscopically - like staged orchidopexy done for retainable intra-abdominal testis or orchidectomy which is done if the testis is only a nubbin. Even an intracanalicular

testis can be mobilised further by meticulous dissection which otherwise routinely explored by open technique²⁰. Another situation of definite advantage of laparoscopy is that in a case of empty scrotum, diagnostic laparoscopy sometimes reveals a closed internal ring, where there is no need to explore the inguinal region. In the above situation conventional teaching is to do open surgical exploration of the inguinal canal.



PORTs for Lap Orchidopexy



Delivering testis through internal ring.



Testis fixed in scrotum

LAPAROSCOPIC NEPHRECTOMY

In dysplastic kidneys, non-functioning kidneys, and renal tumors laparoscopic approach is less morbid. Morbidity is even less with LESS surgery through umbilicus⁸.

system, uretero ureterostomy in retrocaval ureter, Boari flap ureteric reimplantation, excision of urachal cyst, augmentation ileocystoplasty, undiversion of an ileal conduit¹⁸ and rarely diverticulocystoplasty¹⁹ have all been reported.

Laparoscopy Augmentation Cystoplasty

LESS COMMONLY DONE PROCEDURES.

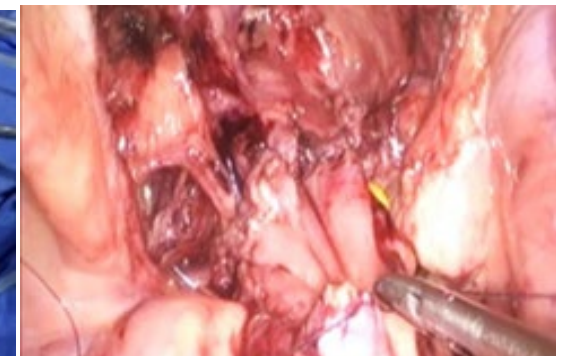
Laparoscopic pyelolithotomy, pyeloureterostomy in duplex



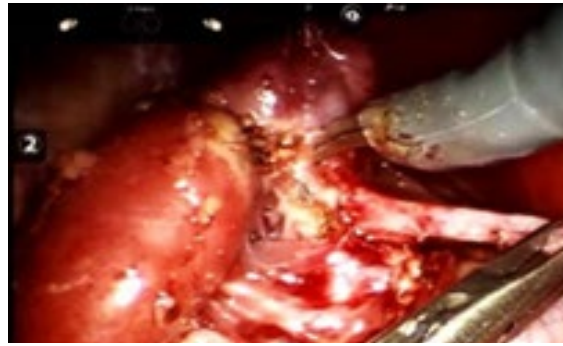
MCU - Neurogenic Bladder



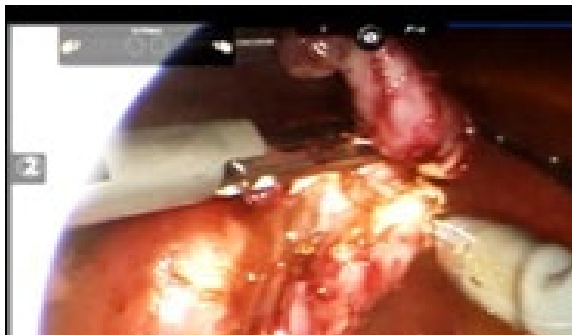
Port Position



Augmentation Cystoplasty in progress



Duplex system with non-functioning upper moiety.



Robotic Heminephrectomy in progress



Laparoscopic Reimplantation Completed

CONCLUSION

Laparoscopic urology procedures are evolving as they have less morbidity and better cosmesis with a comparable success rate. Robot assisted laparoscopy is here to stay but cost is the concern. NOTES with flexible smaller instruments are impressive. Deployable robot instruments through single port and AI embedded robots are in the animal experiment stage. Future of the technology in laparoscopy is promising.

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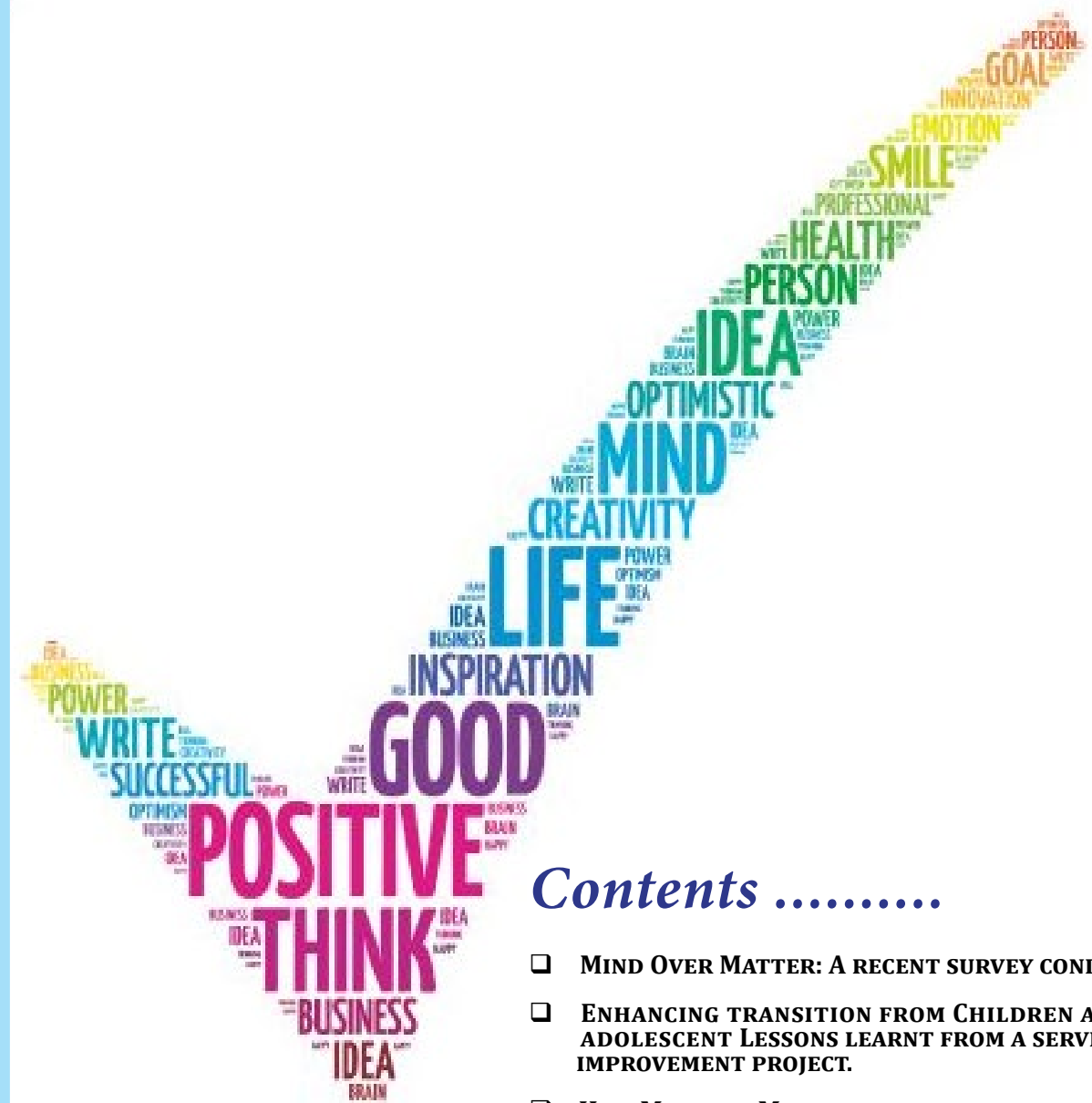
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MENTAL HEALTH

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Contents

- ❑ MIND OVER MATTER: A RECENT SURVEY CONDUCTED
- ❑ ENHANCING TRANSITION FROM CHILDREN AND ADOLESCENT LESSONS LEARNT FROM A SERVICE IMPROVEMENT PROJECT.
- ❑ HOW MATCHING MIND SEEKS TO IMPROVE THE EFFECTIVENESS OF TALKING THERAPIES
- ❑ NUTRITION AND CHRONIC PAIN: THE MISSING LINK?
- ❑ THE PAST, PRESENT AND FUTURE OF EPILEPSY - TIME TO BE COUNTED!



Swasthya Mental Health

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I welcome readers to the mental health section of summer issue of Swasthya health journal. 2021 has continued to be challenging in terms of covid-19 pandemic. However, there seems to be light at the end of the tunnel with robust vaccination programme and public health strategies in U.K. Immunization against covid-19 is also being rolled out Internationally in medium and less developed countries.

In keeping with Swasthya's focus on Innovation we have delighted to put together mental health section covering a range of topics of clinical interest to our readers. Mental health needs of young persons are complex and influenced by peer group influence/ pressure, psychosocial situation, family network and stress associated with higher education and modern living. Mental health issues of the young students are less well recognised and mental health delivery can often fall between Child and Adolescent Mental Health Services (CAMHS) and Adult Mental Health Services AMHS).

Ms Sinha & Mr Vira, founders of "Mind over matter"- a pro bono mental health organisation for youth by youth highlight innovative approaches in addressing mental health issues in University going students in India. They introduce peer support as a "ice-breaker" before expert consultation with mental health specialist is sought. Dr Sharada Deepak has explained how the transition from CAMHS to adult mental services can be improved by developing a transition specialist team.

Dr Bela Prasad, in her article "Improving effectiveness of talking therapies" informs us about how it is important to identify the right therapist for a patient seeking talking therapy for psychological problems. Dr Prasad illustrates how Artificial Intelligence (AI) can be used to match clients and therapist to avoid the trial and error method of randomly selecting a therapist. Although quality of therapist is important so is patient preference and the awareness of life experience, culture and health needs.

We have two specialist articles one on Chronic Pain and the other one on Epilepsy. Management of Chronic Pain can be challenging to clinicians and needs multi-pronged approach. Dr Ravindran draws our attention on role of nutrition in alleviating chronic pain. We conclude mental health section with an intellectually stimulating article by Professor Shankar, a Neuropsychiatrist who discusses the recent advances in diagnosis and management of Epilepsy.

We hope you find this section interesting and enjoyable.
Best wishes

From Mental Health section Editorial Team
Dr Santosh Mudholkar,
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**Mind Over Matter:
A recent survey conducted**

by *Mind Over Matter*
A pro-bono mental health organisation run by the youth, for the youth.

Ms. Nandini Sinha – Founder of Mind Over Matter
Mr. Shauryya Vira – Founder of Mind Over Matter



Ms. Nandini Sinha



Mr Shauryya Vira

Introduction:

There is increasing evidence that students these days are stressed. A recent survey conducted by Mind Over Matter highlighted that 87% of all respondents faced academic and career stress and was the most significant issue concerning them. There are numerous determinants regarding the degree of stress experienced by a student. The most prevalent sources of mental distress for students include anxiety (69%), issues with body image (59%), relationships (47%), conflict at home or with peers (42%) and depression (36%). Abuse (19%), sexual orientation (11%) and addictions and bullying (10%) were other stress-enhancing factors for students.

Need for Mental Health Support:

The COVID-19 pandemic and the new challenges of remote learning has further compounded these stressors. For the youth, academics will possibly become the most significant source of mental distress. While India has the third-largest number of higher education institutions, only a handful of institutions in the country currently provide a facility for the mental well-being of their students. According to a study published in the Asian Journal of Psychiatry, over 50% of students suffer from depression in Indian universities (moderate depression: 37.7%, severe depression: 13.1%, and extremely severe depression: 2.4%) (Grover, et al., 2019). The study's findings emphasise the need for immediate mental health support services, especially for the 15.6% of students who suffer from either severe or extremely severe depression at their universities (Deb, et al., 2016).

Despite the clear need for mental health support, universities may hesitate to create a supportive system on campus, partly due to the stigma associated with mental health and the high costs and uncertain benefits of such a system. Additionally, students may not always feel comfortable approaching a counsellor or psychiatrist, and hence, it is often infeasible for universities to permanently have such staff on their payroll. Therefore, despite professional counsellors and psychologists being powerful resources for students' mental

health, these services are associated with high costs and wait times. Hence, while providing professionally trained counsellors for all students who require such services would be ideal, it is not necessarily feasible.

Rationale for Peer Support:

Peer support is a relatively recent resource used in universities worldwide to address the growing mental health concerns on campus. It has proven to be effective in universities across the UK as well as in Canada. Studies conducted by Jeremy Ng (2013) suggest that while peer support and professional services benefit emotional well-being, peer support is more feasible when professional services cannot be utilised.

While peer support does not replace professional mental health services, it is a significant and holistic addition to existing student wellness systems. One of the considerable benefits of peer support is that it offers a comfortable environment for students seeking help. Many youth peer supporters are students on university and college campuses who have undergone the stresses of being undergraduates.

This is because the people providing support may have encountered similar life experiences and relate to them. As a result, peer supporters can offer authentic empathy and validation to fellow peers, making students feel more comfortable and receptive to the advice and suggestions presented. Furthermore, peer support establishes a foundation for an open conversation or discussion to facilitate a desirable change. The OECD has concluded that the effectiveness of peer support lies in the fact that students are ultimately in the best position to recognise their peers' problems (OECD, 2012).

While many students struggle with their mental health, only a tiny number perceive themselves to need professional help. Therefore, they don't receive the help they need, which further exacerbates their troubles. Peer support, in this case, is beneficial alongside professional services. Additionally, peer support has shown to be helpful for both those

providing and those receiving support. Leading mental health professionals such as Soumitra Pathare, a psychiatrist at the Centre for Mental Health Law and Policy, Pune, believe that peer support is an appropriate and effective measure in the Indian context and should be introduced in universities (Saigal, 2020).

Future Direction and Conclusion:

Recognising the need for peer support in Indian universities, Mind Over Matter sought funding to enhance its reach. It won the Davis Projects for Peace Grant and is in the process of opening peer support chapters in universities across India. This is the first time peer support has been inculcated into universities in India and hence, is a substantial task.

Mind Over Matter is a young organisation. It is continuing to find avenues of growth and reach its aim to destigmatise mental health in India and assist as large a proportion of the Indian youth. A pro-bono mental health organisation run by the youth, for the youth.

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Enhancing transition from Children and adolescent

Lessons learnt from a service improvement project.

Dr. Sharada Deepak

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Enhancing transition from Children and adolescent mental health service (CAMHS) to adult mental health services (AMHS) in Berkshire, England 2015-2019; developing a transitions pathway 2020-present: Lessons learnt from a service improvement project.

Introduction

It is well known that the period of adolescence is a time for tremendous changes in the neural circuitry in the developing brain⁽¹⁾. Late adolescence happens to be a period of high risk for the developmental of psychiatric disorders⁽²⁾. This coincides with the time when youngsters experience stressful events- examinations, deciding on career pathways and for some, moving away from the home environment to university whilst navigating transition to adulthood and the consequent responsibilities.

While it is a likely stressful experience for young people (YP) who do not have significant health needs, for those with mental health conditions and neurodivergence, whose psychological and emotional development has been delayed by mental illness, the move to adult service has been described as 'falling off a cliff'⁽³⁾ with families frantically trying their best to support the young person though the process.

The need for an adequate transition to adult services for young people with mental health needs is well recognised and documented as are concerns over the current situation both nationally in England⁽⁴⁾ and locally in Berkshire⁽⁵⁾.

Berkshire Healthcare Foundation Trust (BHFT) invested in a focussed programme under the Commissioning for Quality and Innovation (CQUIN)⁽⁶⁾ in order to improve the experience of transition and discharge for young people (YP) under CAMHS, in keeping with the requirements of a good transition⁽⁵⁾ and the updated NICE guidance around best transition practice.⁽⁸⁾

Objective

To improve the experience of mental health transitions for YP in Berkshire, identify areas for improvement around the experience for YP transitioning to AMHS at the age of 18 and establish a consistent and effective local process.

Methodology

Following an initial survey of patient satisfaction with the transition process in 2015, we developed a local protocol to inform and improve the experience for YP transitioning to AMHS. A standardised documentation-discharge-transition care-plan, based on the NICE guidance, and with input from the patient participation group, was developed and built on the electronic notes system, Rio. This documentation was used as a standard against which the service was audited.

A training package was developed and delivered to all CAMHS teams in addition to raising transition awareness amongst AMHS colleagues. Champions were identified in the 6 CAMHS locality teams to facilitate monthly meetings with their respective AMHS counterparts to plan joint transition meetings with the patient. A rolling case note audit system was set up to enable the continuous evaluation of the quality of transition planning/preparation and discharge planning.

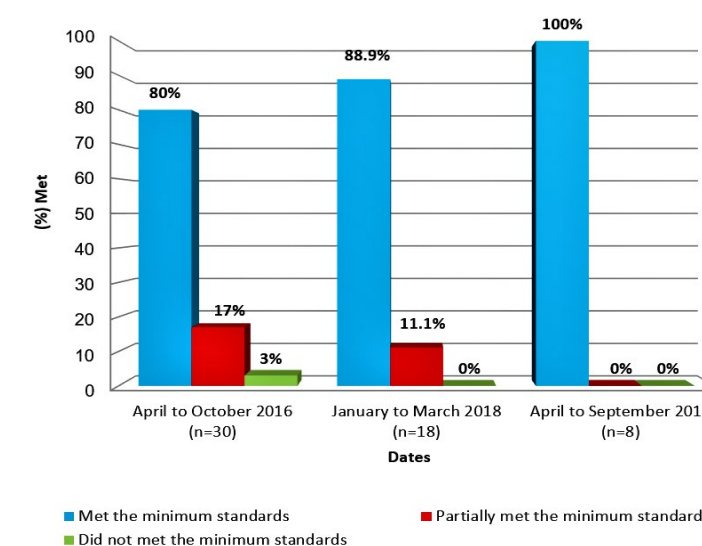
Retrospective case note audit was then used for evidence of joint transition planning recorded on Rio. The CYPF-Discharge transition care plan served as a checklist and a prompt for the clinician to use jointly with the YP through the transition process- from the point where it was identified that the YP would require continued services from the adult mental health team till the point of transfer to AMHS.

Evidence of transition planning for transfer to AMHS by 18 years of age was collected from Rio.

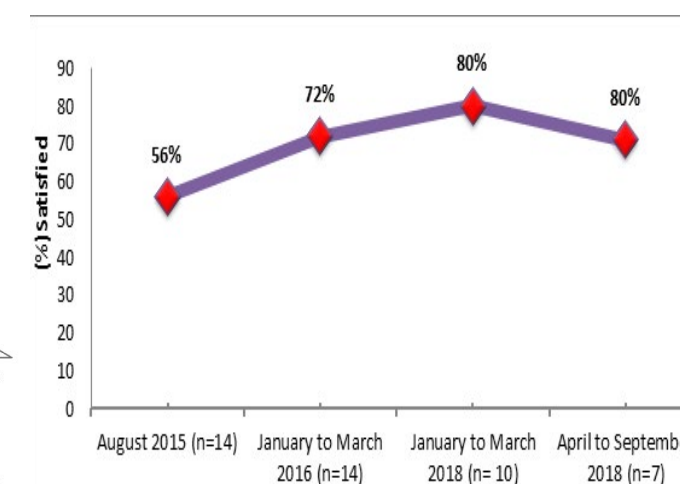
Surveys eliciting the satisfaction with the experience, pre and post transition were developed jointly with the adult service and YP and conducted in person or by telephone.

Results

Multi-Agency Transition Planning



Survey of Satisfaction with transition experience



Survey of Satisfaction with transition experience

Survey responses: "It felt too rushed" "Meeting my care coordinator from AMHS made me feel less anxious" "To meet my clinician more than once from AMHS to feel more at

ease" "I felt listened to" "I was discharged from CAMHS and waiting for AMHS, my GP will not prescribe medication, so I have none. This has been very hard for me." "I have been very supported"

Evidence of Transition planning for transfer by 18th birthday

	Total YP	Completed	Not completed
January to March 2018	44	39	5
April to September 2018	133	122	11

Challenges

Berkshire comprises of 6 Local authorities and 7 CCGs in with a changing commissioning landscape. This poses significant challenges to having a consistent process across the trust given that the local offer differs across the county. The return rate for the survey is to be improved but the responses reflect the national picture.

Discussion

Challenges were identified around transition for YP with neurodevelopmental disorders, particularly around continued prescription of ADHD medication following discharge from CAMHS in Berkshire East.

Specialised services like Eating disorders, Early Intervention in Psychosis and Learning disabilities had better outcomes and ease of transition as opposed to neurodevelopmental disorders. It was not surprising that the specialist pathways did well since they had similar thresholds and clear evidence-based treatments as opposed to neurodevelopmental conditions like ADHD where a lot of work within CAMHS included consultation to school and supporting executive function deficits which becomes unavailable once a young person turns 18. YP appreciated meeting a clinician from AMHS prior to transition and valued it over receiving information and contact details.

Our experience mirrored the findings of McLaren et al's (9). Huge cultural and organizational barriers remain between the CAMHS and AMHS. Busy workloads, varying thresholds between services and practices like clustering need addressing to achieve optimal transition.

Having a CQUIN (Commissioning for Quality and Innovation) certainly helped focus our resources on transition, highlighted the issues and gave a voice to the YP about their experiences and attempts were made to address the challenges at the ground level. However, there was little impetus to continue these efforts once the CQUIN was discontinued.

We also noticed that changes were made mainly around managing expectations within CAMHS and the families so the YP were better informed rather than within the services, barriers or thresholds. The improved awareness of the lack of services might have served to increase the number of young people discharged from CAMHS once they turn 18 as opposed to attempting a transition, thus missing a cohort of YP who have been lost in the gap between the services.

NICE guidance mentions the need for a gap analysis which was only addressed partially by us since we made observations based on our data as opposed to the voice of those YP who were not transitioned at all and whose mental health might have deteriorated in the interim. ⇔

⇒ How MatchingMind seeks to improve the effectiveness

Conclusion, future directions

Setting up a team dedicated to improving the transition experience has improved the standard of transition planning as well as patient experience over a 4 year period.

BHFT CAMHS and GPs in the East of Berks have since developed shared care arrangements enabling a smooth discharge to primary care and follow up by adult ADHD services. A seamless young people's neurodevelopmental pathway is also being piloted in East Berkshire.

CAMHS service in Berkshire is being re-shaped into a pathways model, roughly mapping onto the AMHS. This includes diagnostic and treatment pathways for self-harm, trauma and emotional dysregulation in addition to the existing pathways which would ease the transition process. We are building a digital transitions pathway to ensure consistency of across the trust while continuing to highlight the commissioning gaps for young adults with neurodisabilities.

NICE have acknowledged that the prefrontal cortex does not complete maturation till the age of 25 and advised on developmentally appropriate transitions, not based solely on chronological age. Hence a move to commission mental health services for YP upto the age of 25 years or a bespoke youth mental health service(14-25 years) might be the way forward to support YP during this vulnerable time.

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The Queen's Birthday Honours List 2021 included a number of recipients of Indian origin healthcare experts involved during the pandemic.



Cornwall: Britain's Queen Elizabeth II, centre, cuts a cake as Camilla, the Duchess of Cornwall, background centre and Kate, the Duchess of Cambridge stand by (AP)

The Queen's Birthday Honours List in June 2021 included a number of recipients of Indian origin healthcare experts involved in the field of COVID-19 vaccine trials and community support efforts during the pandemic.

Of the 1,129 recipient of an award this year, 567 are women which is 50 per cent of the total and 62 per cent of the recipients have undertaken outstanding work in their communities, either in a voluntary or paid capacity. Among these over 30 Indian-origin were honours recipients for 2021

Divya Chadha Manek has been honoured with an Order of the

British Empire (OBE) for services to the government during the COVID-19 response for her involvement in the research and development of vaccines and the resulting clinical trials. He is at the British government's National Institute for Health Research (NIHR) Clinical Research Network.

Andrew Pollard, professor of Paediatric Infection, University of Oxford, receives knighthood for services to public health, particularly during COVID-19, for his role in the Oxford/AstraZeneca vaccine development as the director of the Oxford Vaccine Group.

OBEs for Jasvinder Singh Rai, founder and chairman of the Sikh Recovery Network for services to the Sikh community during the pandemic, and Jasjyot Singh of Lloyds Banking Group for services to financial services during the pandemic.

Members of the British Empire (MBE) was awarded to Devina Banerjee, from Vaccine Taskforce, Department for Business, Energy and Industrial Strategy, for services to COVID-19 vaccine development;

Anoop Jivan Chauhan, professor of respiratory medicine and executive director of Research, Portsmouth Hospitals University NHS Trust, for services to respiratory medicine; and Dr Ananthakrishnan Raghuram, consultant physician, Gloucestershire Hospitals NHS Foundation Trust, for services to the NHS and COVID-19 response.

Sumit Goyal, consultant oncological surgeon, Cardiff and Vale University Health Board, for services to breast cancer and Cardiff Breast Centre Charity.

How MatchingMind seeks to improve the effectiveness of talking therapies

Dr. Bela Prasad



Dr Bela Prasad

Summary

Mental health problems are a major cause of ill-health and talking therapies, such as counselling, are increasingly recognised as an effective treatment. Therapist 'fit' is an important factor in recovery and MatchingMind helps consistently match clients with therapists that are a good personal fit for them and cuts down trial and error. It is geared to be inclusive and improves access to mental health support for ethnic minorities, LBTQ+ and marginalised groups. It uses Artificial Intelligence to match clients with therapists, considering individual's health needs, life experiences, culture, personality and preferences.

MatchingMind has been awarded funding from Innovate UK and the Greater London Authority. The benefits of intelligent matching are not limited to professional therapy and can be extended to other interventions, such as peer support.

Introduction

Globally, one-in-four people suffer with mental health problems, making it the world's biggest cause of ill-health (The World Health Report, 2001) and talking therapies, such as counselling, are increasingly recognised as an effective treatment. A recent survey found that 86% of people believe it is better to talk about your problems than taking medication (YouGov and British Association for Counselling and Psychotherapy, 2020)

In the UK, the National Institute for Clinical Excellence recommends talking therapies as a first treatment for common mental health issues like anxiety and depression. To provide this, the National Health Service launched, and subsequently expanded, its Improving Access to Psychological Therapies (IAPT) programme which provides easy, no-referral, access to talking therapies. Over 1.69 million people were referred to NHS talking therapies last year. But, while a welcome expansion, such schemes are not without problems. Delivering psychological therapy at scale has required care pathways that focus on getting people into treatment, and this has become an administrative process, rather than a clinical one. For many clients, it means they can be seen rapidly by a qualified therapist, but they might not be the right clinician for them. Therapist 'fit' is an important factor in recovery, and seventy per cent of clients report feeling uncomfortable being honest with their therapist (Blanchard & Farber, 2016).

Seeking support through intelligent matching

MatchingMind's founder had lived experience of this. Seeking support for her mental health, Dr Bela Prasad found that it took several attempts before finding one that worked well for her, after a recommendation from a friend. Although Dr Prasad was able to undertake research and get

advice, most clients seeking support will not be so fortunate. And what works for one person may not work for another. The challenge, Dr Prasad realised, was not merely creating a clinical pathway and structure for therapy, but also consistently matching clients with therapists that were likely to be a good personal fit for them.

There are many factors that can contribute to a good client-therapist match, as people bring the intersectionality of identities, life experiences and values into therapy. While some clients may be relaxed, and recover with any therapist, most clients will have some preferences — whether conscious or not — that will affect the relationship and, therefore, clinical outcomes. Like any relationship, the closer the personal match, the more productive the relationship is likely to be. One of the most obvious might be cultural differences. Research by Mind found that 90% of minorities feel their background is not adequately taken into account by mental healthcare. However, there are a range of other factors. For example, therapist fit has been identified as a major factor in disengagement by young people (Garcia & Weisz, 2002).

A clinical match is the most important aspect. While therapists have general expertise across areas, those who have more experience in a particular mental problem may have greater competency to treat clients presenting with those issues. Other factors can include therapeutic orientation, to ensure the talking therapy style is one to which the client will respond. Client personality can play a large part in this, some may greatly prefer the practical approach of CBT-based therapy, while others may find counselling, and the space it offers to explore issues, more effective. Finally, along with the cultural affinity, are the personal preferences of the client. These might be as simple feeling more comfortable with a specific gender, to avoiding a therapist who might remind a client of a previous trauma.

MatchingMind's approach encapsulates these factors into matching algorithms. The system starts with the individual's needs, preferences, experiences, and culture to match clients with therapists or peers. It uses AI technology to actively adapt and advance the matching based on choices, feedback and clustering of key insights as the data grows. Using supervised and unsupervised machine learning, we take an ethical approach and our data framework is designed with diversity in mind, to remove bias and improve fit.

MatchingMind's intelligent matching was developed using two Innovate UK grants, first to establish proof-of-concept and then to implement an extended pilot. It is also a finalist for the Greater London Authority and the Mayor's Resilience Fund for a project to match bereaved Londoners — especially those from minority communities — with appropriate support. Although MatchingMind is an end-to-end product, it can also be white-labelled to integrate with

peripheral inflammation which means that the gut can influence the mind. The discovery of the occurrence of local signalling and immune sensitisation by the micro biome across the single cell thick intestinal lumen means that the brain gut axis is actually a brain-microbiota-gut axis.

BIDIRECTIONAL ROLE

Neural networks are often quick hard wired shortcuts that allow us to deal with stressful situations and help us survive and thrive. These emotional or neural networks are most often developed in connection with fear, anger and other emotions and each of these triggers can occur throughout life and prime the microglia which are the representatives of the immune system in the brain.

Our intestines are responsible for producing 90% of the our serotonin and over >50% of the dopamine⁽⁷⁾. Serotonin is an important signalling molecule not just for digestion but also for such vital functions like pain sensitivity, sleep, appetite, mood and overall well-being. It also acts to regulate the function and development of the microglia.

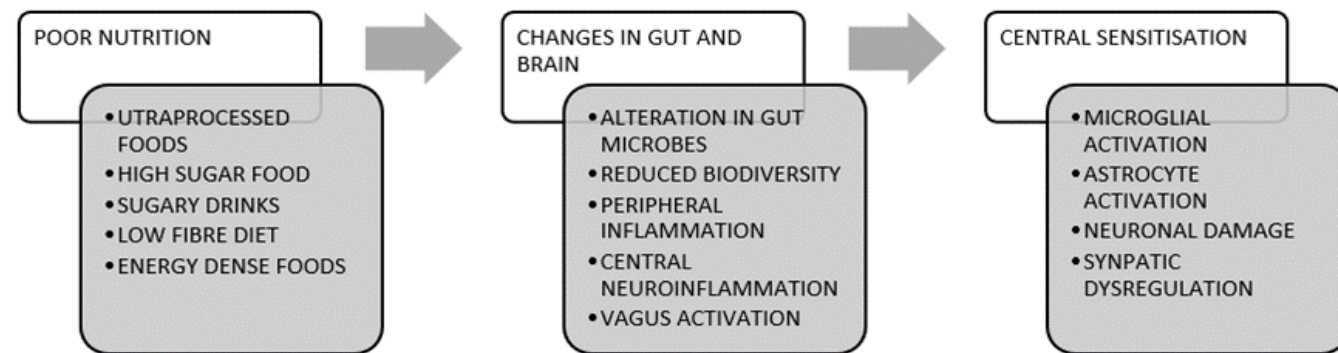
This bidirectional nature of communication from the gut to the brain and back through the vagus integrates the immune,

nervous and hormone system and helps us understand why the microbes are now considered to be fundamental in maintaining the balance between the systems. In conditions like irritable bowel syndrome or inflammatory bowel disease, dysregulation of this communication can actually worsen the pre existing condition as well as other diseases like obesity, diabetes, liver problems, Alzheimer's disease, autism, parkinsonism and even depression.

Stressful circumstances that may be emotional or physical can all disturb this delicate balance between the three systems can often cause local gut related microinflammation and breakdown of the tight junctions within the luminal wall causing "Leaky gut". The persistence of leaky gut and further inflammation can all cause low biodiversity. This low biodiversity can happen at any age and is accompanied by many mental health and neurological disorders.

Low biodiversity is also the consequence of dietary choices. Our adoption of the SAD (standard American diet) which is characterized by high intakes of red processed meat, pre-packaged foods, fried foods, refined grains, corn (and high-fructose corn syrup) and high carbohydrate drinks contributes significantly to low biodiversity over time.

Fig 2: Evolution of central sensitisation



Understanding and restoring the microbiome can help in managing the central sensitisation, and can influence many aspects of our physical and mental health. This attention to diet and the foods we ingest has to start right from our infancy and is vitally important to the developing organs. Introducing diversity and having a healthy gut is essential to developing a normal inflammatory pain response⁽⁸⁾. Experiments on germ free mice show reduced perception of pain to any inflammation thus showing that modifying the intestinal microbiome using nutrition can alter the pain response.

Poor dietary choices which are low in fibre and energy dense but no long term proteins, vitamins or nutrients have a higher chance of producing inflammatory chemicals including free radical formation that can be cytotoxic. Cytokine activate the TLR (Toll Like Receptor) which trigger a sensitisation along with inflammation in the spinal cord and the brain. In the brain they cause an activation of the glial cells thus contributing to central sensitisation. Obesity in itself can cause pain not just due to excess mechanical loading but reduced blood flow and flare up of widespread inflammation also occurs due to the release of adipokines, which are small inflammatory chemicals released by the adipocytes (fat cells)⁽⁹⁾. Thus, obesity is a proinflammatory state that can increase cortisol (stress hormone) and this kind of chronic stress then

ends up activating the central neuroinflammation as well. So attention to nutrition is paramount in terms of reducing inflammation and chronic pain especially nociplastic pain.

THE ROLE OF ANTIINFLAMMATORY DIET

For many decades the prevailing thought of fats being harmful prompted a move to low fat diets. This of course meant that fat was being replaced by more sugar and more processed carbohydrates contributing to the increase in obesity and Diabetes and overall creating a proinflammatory state.

Sugar is a proinflammatory substance and an important aspect is the amount of added sugar (or free sugars that are added to foodstuffs) to our diet. The recommendations are that no more than 5% of the daily energy intake should come from these free sugars. That equates to 30g per day for adults and 24g for children. Assuming roughly that 4g is one teaspoon that works out to average of 7.5 teaspoons per day and even lower for children⁽¹⁰⁾. The WHO recommends that free sugars are less than 6 teaspoons per day.

Thus aiming for an anti-inflammatory diet would be the first step. A good starting point would be a Mediterranean diet but combined with more specific food stuffs that have anti inflammatory properties. such a diet is high in antioxidants,

vegetables, fruits, whole grains, legumes, nuts and seeds with olive oil being quite prominent. Red meat consumption and dairy products should be restricted alongside low added sugar. ⁽¹¹⁾

INTERMITTENT FASTING: Intermittent fasting with time restricted eating windows (12-16hr fasting windows with all the food then consumed within the 8-12 hours) can also achieve ketosis which reduces inflammation.

ELIMINATION DIETS: The realisation that gluten and other heavier starches and sometimes dairy products are not broken down effectively and can paradoxically contribute to inflammation and "leaky gut" has increased the popularity of elimination diets. These usually consist of eliminating with gluten or sugar or dairy for a period of 4 to 6 weeks one after another to see if they can improve symptoms and reduce inflammation.

FATS AND OMEGA 3 AND OMEGA 6

It is now understood that not all fats are bad and that cholesterol is essential for your brain function and health. The dietary cholesterol does not really impact on your blood cholesterol levels⁽¹²⁾. Trans Fats are a particularly nasty variety of fats that come from hydrogenated vegetable oils that can provoke and incite inflammation in the gut and in the brain. High quantities of saturated fatty acids can increase levels of LDL (the bad) cholesterol.

Omega 3 and Omega 6 are two kinds of polyunsaturated fatty acid. Omega 3 has more anti-inflammatory properties while Omega 6 in high doses promotes inflammation. In unprocessed foods, the ratio of omega6 to omega3 was 1:1. However with our diet change to ultra-processed foods especially with an increase in the intake of sugars, this has changed the normal dietary balance and the ratio is now around 15-25:1 which is heavily proinflammatory and can cause or worsen pre-existing pain.

Foods rich in Omega 6 include poultry, vegetable oils and soybean oil, all of which are used in the production of fast food and snacks. High levels of omega-3 are found in fish especially the cold water fish such as mackerel, herring and salmon as well as in other foods like flaxseed and almonds.

Reducing the amount of Omega 6 and Increasing the dietary intake of omega-3 therefore can reduce the morning stiffness and joint aches. Optimising the ratio is important and options could be Virgin olive oil and coconut oil as ways of increasing Omega 3.

ESSENTIAL NUTRIENTS AND MULTIVITAMINS

Another problem of highly processed foods and the take away culture is the reduction in essential nutrients and various vitamins. Vitamin deficiencies contribute to chronic pain and mood disorders. A balanced quantity of vitamins and minerals are needed and if natural food is not having enough quantities then the use of multivitamins and other supplements need to be considered⁽¹³⁾.

Vitamin A is best taken as beta-carotene and help in detoxifying certain harmful substances. Vitamin B is a complex of 8 vitamins with B12 being most relevant for pain worsening especially when it is deficient. Vitamin B2 can be useful in Migraine relief and Vitamin B6 in premenstrual cramps. Vitamin C is a powerful antioxidant and is needed

for muscle and ligament repair. Other vitamins include Vitamin D, minerals like Calcium, Magnesium, Zinc and Selenium both have antioxidant properties and are increasingly recommended for pain conditions. Other antioxidants include L glutamine, Quercetin, CoQ10, N-Acetyl Cysteine and Alpha lipoic acid. Another group is the anthocyanins found in blueberry skins and cherries and they can also help in reducing pain. Overall, the aim is to eat more vitamins by consuming lots of fresh vegetables, more coloured vegetables and leafy ones and less red meat(rainbow diet).

RECOMMENDED FOODS

Broadly, avoid the pro inflammatory foods and increase your anti-inflammatory options.

ANTIINFLAMMATORY FOODS

1. **WHOLE GRAINS:** whole grain bread, oats (steel cut), brown rice, barley, bulgar wheat, quinoa, cous cous, polenta and rye bread
2. **BEANS/NUTS/SEEDS:** black beans, kidney beans, chickpeas,hummus, nuts and seeds like walnuts, almonds, pecan and peanuts,
3. **FRUITS:** Berries, cherries and dark coloured fruits.
4. **VEGETABLES:** peppers/tomatoes/spinach, kale, leaf lettuce, mixed greens
5. **OLIVE OIL** and coconut oil
6. **FISH:** preferably cold water fish including salmon, herring, anchovies, sardines and mackerel
7. **TEA:** black tea/gren tea/white tea/herbal tea
8. **CHOCOLATE:** dark chocolate >70% cocoa
9. **WINE:** red wine, upto 1 drink a day for women and 1-2 if you are a man
10. **Sources of Fiber:** raspberries, blueberries, avocado, broccoli, nuts, seeds, beans,cauliflower, kale and apples

FOODS TO BE CAUTIOUS OF

1. Red meat including processed versions such as hamburgers/steak/ribs
2. Certain oils and fats that come from soybean/safflower/ corn and sunflower
3. White bread, Rice and corn cereals
4. White rice
5. Soda including diet and fruit juice and energy drinks and flavourings
6. Sweets and cookies/cakes/pastries/donuts/pies and sugary desserts

CONCLUSION

Patients with chronic pain are likely to have poor dietary intake. The new concept of nociplastic pain and central sensitisation and neuroinflammation has helped us to understand complex kinds of chronic pain better. There is an urgent need to increase awareness and inform clinicians about the therapeutic potential of dietary interventions and this can be a new innovative way to manage chronic pain in a multimodal manner with less potential for side effects and long-term benefits both for the patient and the environment.

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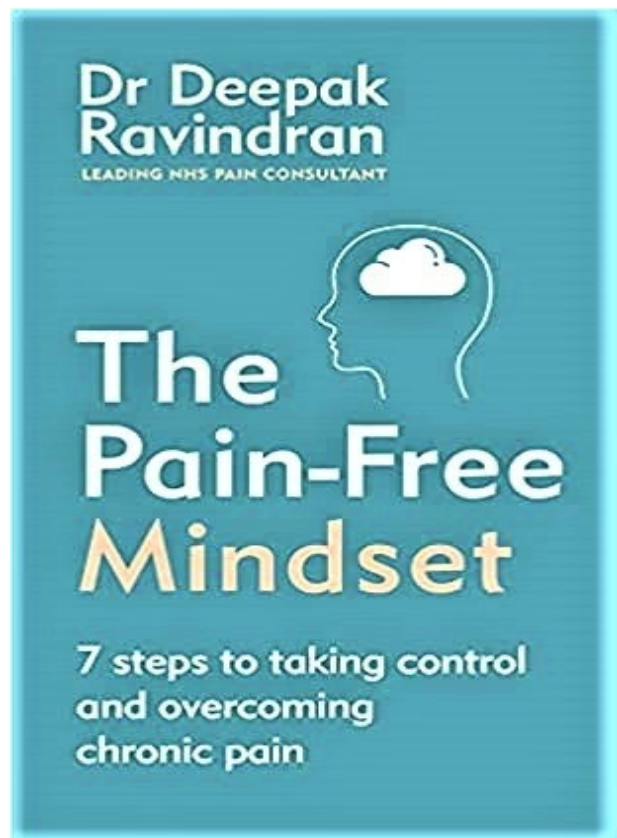
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"The Pain Free Mindset"



Take back control and live pain-free

There is no easy fix when it comes to chronic pain. Opioids are often the first, addictive resort and surgery rarely achieves the pain free outcome promised. But while there is no single fix, there is a way out and it starts with your mindset.

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- Learn how you can change the way you perceive and respond to pain – without taking addictive medication
- Find the best pain-management plan for you and your lifestyle

Packed with science-backed tips and inspiring case studies this book will transform your mindset and show that you have the power to live pain free.

The book "The Pain Free Mindset" is available via Amazon.



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The past, present and future of epilepsy - Time to be counted!



Professor Rohit Shankar MBE, FRCPPsych
Neuropsychiatry

The history of seizures is as old as the origin of humankind after all it has evolved via other animals including monkeys! Mystery and awe have sustained both a fear and fascination towards epilepsy. Understanding (or the lack) of seizures evolved through the ages. Ancient doctors were astute in their clinical observations but wrongly attributed it to causes such as excess saliva in the brain. Treatments consisted of a range of interventions from skull trephination, blood letting to more benign dietary modifications. These treatments, often ineffective, had the intellectual advantage of being based on pathophysiological principles, unlike current, more empirical, therapies.

Religion too had its say with theological interpretations for the sporadic seizure activity. The Renaissance era tried to promote seizures as a physical rather than a moral or occult affliction but only in recent times, helped by advances in anatomy, physiology, pathology and pharmacy have epilepsy nearly arrived into the age of enlightenment. Seizures still in many parts of the world especially the developing countries are viewed with the mystic prism. Figure 1 provides a quick oversight of how epilepsy diagnosis and treatment has been shaped with the other key developments across the last 150 years.

So what are seizures?

Unbridled electrical activity across brain cells affecting significant areas of the brain leading to temporary dysfunction of the activities of that brain section are termed seizures. Seizures can both be idiopathic (brain tissue and genetics which predispose to activity like earthquakes in Japan or San Francisco) or secondary (due to a range of issues from infections to sleeplessness to stress inducing seizures as a symptom – like fracking leading to earthquakes!).

It is considered that around 1% of the developed world have epilepsy but worsens in developing countries where 3% of the population are affected. This is due to a range of issues including treatment unavailability, beliefs, stigma etc. If diagnosed early and treated well in theory up to 70% of people with epilepsy can have a remission of the problem however in practice this drops to less than 60%. Again, outcomes between developed and the developing world are significant, understandably.

Sadly, epilepsy is not usually a standalone condition. There are major co-morbid physical, psychological and social impact with it. The co-morbidity burden including dementia, migraine, heart disease, peptic ulcers, and arthritis are up to eight times more common in people with epilepsy than in the

general population. Around 75% of people with epilepsy are thought to encounter a major mental illness in their lifetime including suicide rates being 2.5 to 5 times greater than general population. Depression and anxiety are common presentations. Around 30% of people with epilepsy have a co-morbid neurodevelopmental disorder such as autism, ADHD or intellectual disability. Obviously in such individuals there is likely to be a genetic underpinning making the seizures a part of a larger syndrome with higher likelihood of treatment resistance. Several mechanisms explain how epilepsy and comorbidities are associated, including shared risk factors and bidirectional relations.

Epilepsy related risks

Very few people appreciate that epilepsy is at least 10 times more dangerous than asthma. In the UK research has shown that approximately 5.5 million people have asthma and on an average 1300 people die directly due to asthma yearly. The same numbers of people die yearly due to epilepsy as a direct cause, but the numbers afflicted are around 600,000. Common causes of death are prolonged and uncontrolled seizures called status epilepticus and Sudden Death in Epilepsy (SUDEP). SUDEP is seen as the 2nd most relevant cause after stroke to account for human man years lost among all causes of neurology deaths and features in the top 10 causes of death for under 70 in developed countries. In addition to these two causes accidental death by drowning during a seizure and other similar issues account for the increased mortality.

Treatment and prevention

Many books and papers have been written on treatment and prevention. However, all the wisdom can be distilled into some key messages –

1. Information, information, information – the most important aspect of managing a chronic condition which waxes and wanes is providing person centred information on all aspects of care. Epilepsy care lends itself well to self-empowerment. Recent technology such as developed Apps like EpSMon are evidenced based to do that <https://sudep.org/epilepsy-self-monitor> which are free to download (figure 2). Similarly a regular check with clinicians using the Seizure safety Checklist <https://sudep.org/checklist> currently available across 50% of all primary care practices in the UK and used by over 1000 epilepsy professionals would be a good “wellbeing check” to ensure no major fluctuations in seizures or its adjoining areas of influence has occurred. These tools allow the

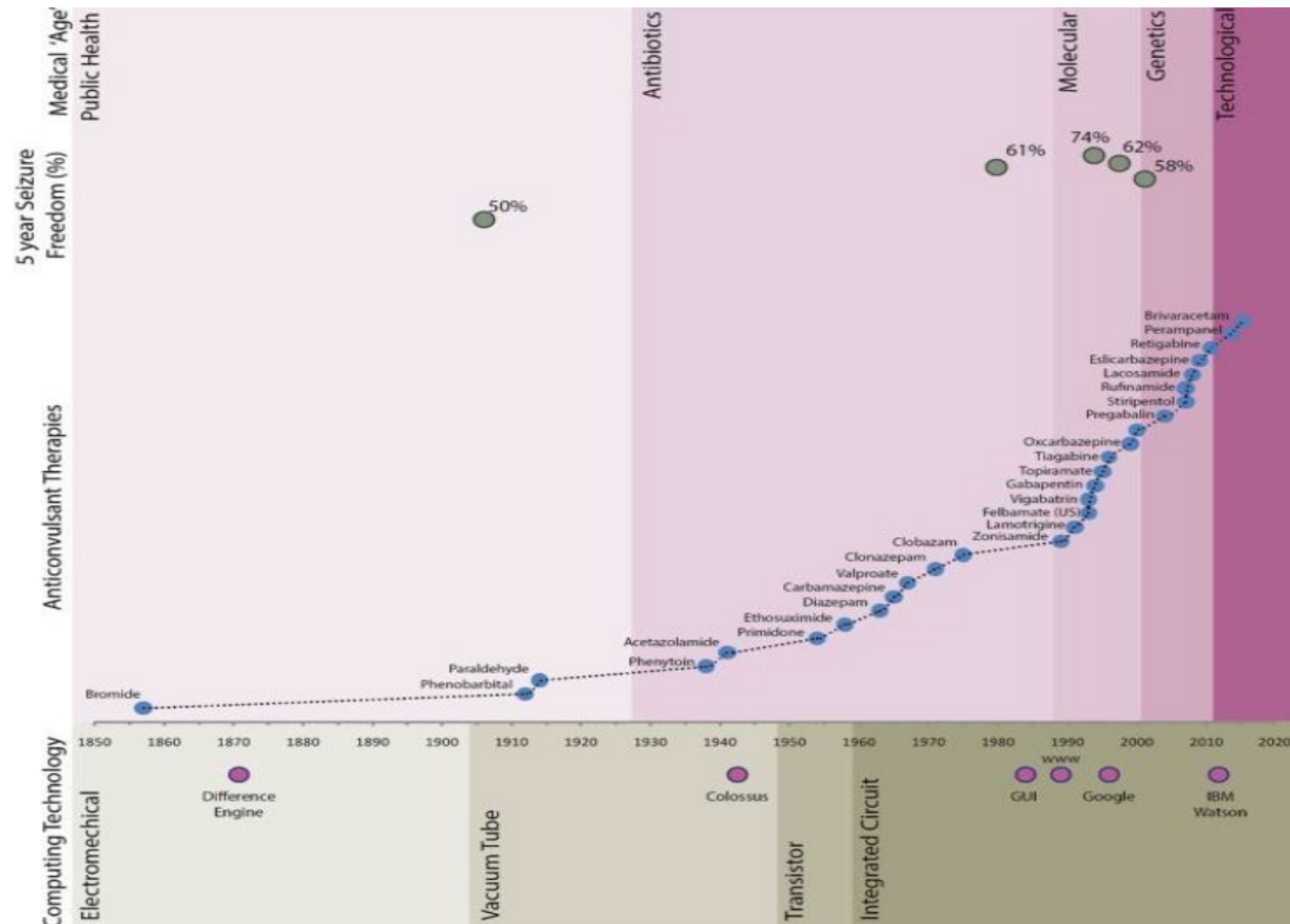


Figure 1 Evolution of epilepsy diagnosis and care - <https://doi.org/10.3389/fneur.2018.00099> (Free download)

individual insight to the influences of their physical, psychological and social situation on their seizure health. Issues such as impact of alcohol and work stress are inquired into. A rudimentary risk score to allow for the person with epilepsy to focus on key targets is provided.

2. Medication - there are over 30 licenced anti-seizure preparations for management of seizures. There are a plethora of options emerging in the last three decades (figure 3). As with drugs these require careful consideration based on a host of patient related characteristics including the type, nature and frequency of seizures and their co-morbidity. Drugs work only if people take them. Medication optimization, compliance and concordance are key benchmarks in seizure outcomes. People with epilepsy not only need to be part of the discussion on medication choice but need to take responsibility to provide high quality insights to the effects of the drug.

3. Genetics - much had been expected of genetics in the early part of the century. However, little practical solutions came from it. The times are changing and research such as the 100,000 genome project (<https://www.genomicsengland.co.uk/about-genomics-england/the-100000-genomes-project/>) and the National organization for rare diseases (<https://rarediseases.org/>) are igniting new interest in the area. Particular to epilepsy there has been productive new insights (figure 4).

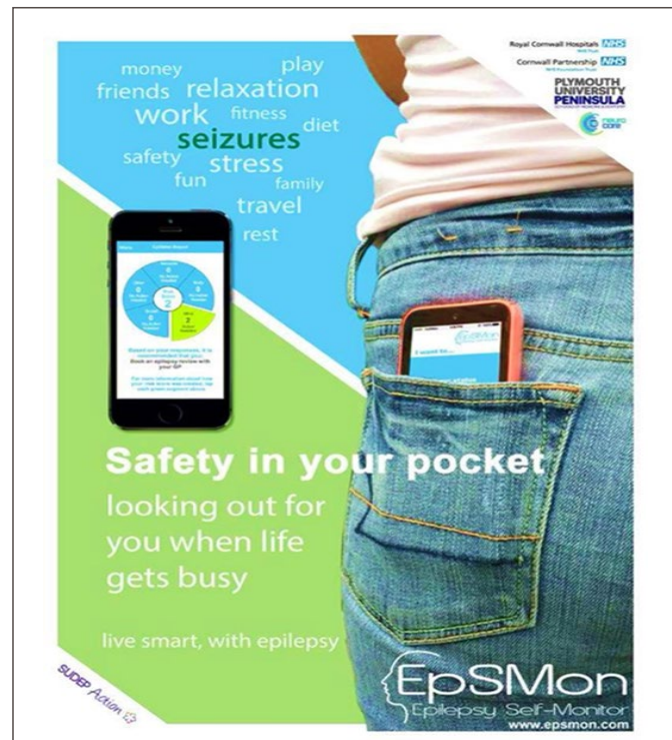
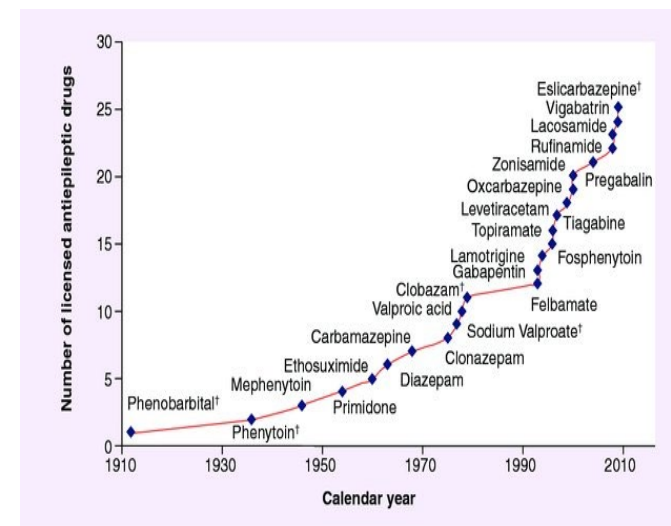


Figure 2 - EpSMon - https://youtu.be/_cBDPEaszdA

4. Technology both user led and medical are taking significant strides. We are not far from predicting seizures even before they happening. Mathematical modelling like Neuronostics Bio-Ep markers are revolutionary <https://www.neuronostics.com/> and can transform how we view and manage seizures (Figure 5). However, there is an ethical debate too. As seizures can significantly impair social lifestyle by impact on driving, socialization etc how right is it to prescribe before a person even has a seizure? Well that is a debate for another day! Likewise big data and genetics are ushering new and radical steps in overcoming seizures. While the future looks promising it still is not of any hope to the millions afflicted especially in the developing regions where priority is rightly on acute concerns like infections, nutrition etc.

Figure 3 - A timeline of AED launch (Cavalleri GL, McCormack M, Alhusaini S, Chaila E, Delanty N. Pharmacogenomics and epilepsy: the road ahead. Pharmacogenomics. 2011 Oct;12(10):1429-47)



Disclosures -

Professor Shankar is the medical lead of the not for profit 'SUDEP and Seizure Safety Checklist', the mobile app based on the checklist - EpSMon and the Neuronostics program featured here. He is on an Epilepsy Research UK grant to evaluate the Checklist, a NHS England grant to explore using EpSMon in people with developmental disabilities and an NIHR AI 2nd stage grant to evaluate Neuronostics. He has no commercial interests in any of the products discussed.

Professor Rohit Shankar MBE, FRCPsych

Rohit is a professor in Neuropsychiatry with University of Plymouth Medical School and director of its Cornwall Intellectual Disability Equitable Research (CIDER) unit <https://www.plymouth.ac.uk/research/cider-cornwall-intellectual-disability-equitable-research>. Awarded an MBE (2018) for services to the learning disability community he has national/international awards including the BMJ awards for mental health (2020), Education (2019) Neurology (2016), Innovation (highly commended-2017), ILAE Epileptic Disorders best paper (2017) and Epilepsy Foundation America SUDEP Challenge (2016). His interests are in co-producing translational clinical research in neurodevelopmental/neuropsychiatric disorders, risk management, and health technology. He has over 150 index-linked publications/book-chapters/presentations and led/contributed to various national reports. Publications are on <https://orcid.org/0000-0002-1183-6933> & <https://www.plymouth.ac.uk/staff/rohit-shankar>

5. Then the long term prognosis of short term gain with medication versus long term harm on issues such as bone density, metabolic concerns, teratogenicity impact are still being scrutinised. Big data modelling is looking to achieve the holy grail of providing suitable decision support tools to enable user led decision making.

6. It could be concluded that epilepsy has been among the forefront of the challenges posed to doctors since the dawn of humankind, not because of its effects but because of its persistence. We might be at the cusp of opening the door to overcome this "devilish" disease!

Figure 4 - Genetics in epilepsy history timeline (Helbig, I., Heinzen, E.L., Mefford, H.C. and (2016), Primer Part 1—The building blocks of epilepsy genetics. Epilepsia, 57: 861-868. <https://doi.org/10.1111/epi.13381>)

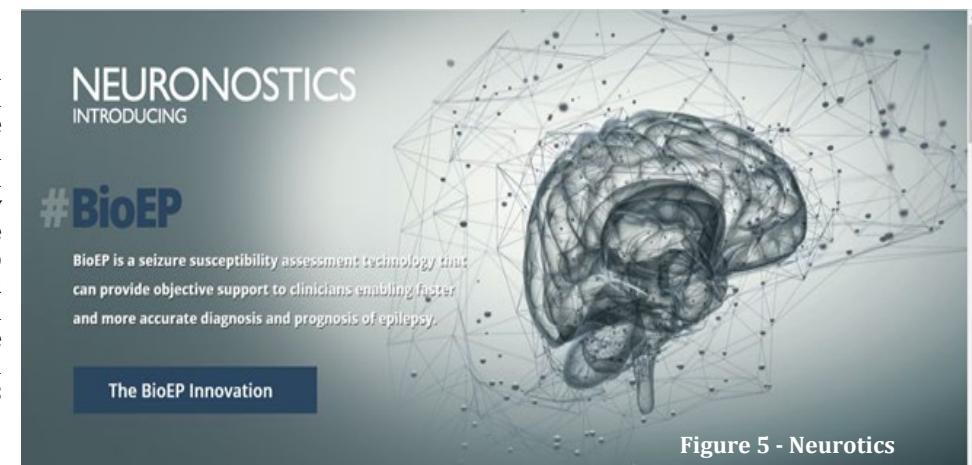
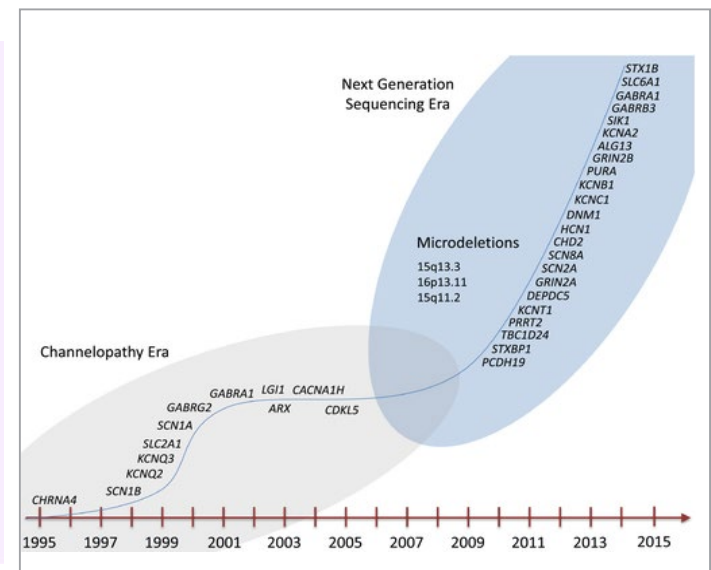


Figure 5 - Neuronostics

CARBON FOOTPRINT

What does it mean for Healthcare sector?

Health care and Carbon Footprint

Dr Damodar Chari

Speciality Doctor

Leicestershire Partnership NHS Trust



Sources of healthcare emission

The healthcare sector directly or indirectly produces greenhouse gases while delivering care or while obtaining products. Direct sources of emissions arise from health care facilities which include energy expenditure for various procedures, building infrastructure, energy consumption of vehicles and use of disposable products.

Indirect emissions come from energy consumption for heating, cooling, electricity, steam, etc. The biggest contribution to greenhouse emissions comes from healthcare supply chain. This includes production, delivery of services such as pharmaceuticals, food products, medical devices, and equipment.

One of the largest sources of healthcare emissions is pharmaceutical products amounting for nearly 20% of NHS total carbon footprint. Pharmaceuticals have

a wider impact on the environment, nearly £300million of medicine go unused which are then discarded. This has further implications on cost and environmental issues, as sometimes traces of medication can be found in soil and water.

Health care delivery, in particular secondary level care, is associated with greater environmental impact than primary care. Inpatient care and longer period of length of stay can generate 708kg CO₂ equivalent which is far more significant than 6kg CO₂e generated by GP practice.

Furthermore, fossil fuel consumption, makes up for over half of health care's carbon footprint. This includes travel that's directly related to health care delivery such as staff, visitor, and patient travel as well as travelling associated with product delivery. This can further impact air quality and thereby affects patients' health.

Effect on health and economics

Climate change can directly affect the health of people such as by increasing the spread of vector borne diseases, sudden climate change resulting in periodic droughts, storms, floods, and famines. It is noted that these are more likely to affect the most vulnerable and marginalized segments of the society. 80% of premature deaths due to non-communicable illness occur in low to middle income nations. Medical professionals are among the first responders to most of the natural disasters and they themselves are likely to face the brunt of the ill effects

of climate change. This is only likely to get worse with the passage of time.

Air pollution kills nearly 7 million people prematurely, it is associated with long term hospital admissions and treatment, which in turn results in more carbon emissions. Air pollution can further contribute towards worsening of chronic illnesses such as asthma and cardiovascular diseases.

Apart from the direct effect on people's health, indirect damage due to climate change is largely unrecognised. There is an increased burden due to the financial cost arising from an increase in demand on healthcare. Economic impact figure of £345m has been estimated for the potential mortality effects and costs to society of air pollution from NHS related travel. Current covid pandemic has made us painfully aware of the effect of added burden on already stretched resources and health care delivery to the patients as seen by long waiting lists, and exhaustion among health care professionals.

Steps for reducing carbon footprint of healthcare

England is one of the only four nations that has undertaken analysis of green house effect of the health care sector with the aim of developing an NHS sustainable development unit. The NHS has also launched 'For a greener NHS program' in 2020, outlining interventions needed to achieve its target by 2050. Others such as Lancet commission on health and climate change aims to deliver healthcare under the accords of Paris agreement.

Hospitals can reduce energy expenditure by taking actions on insulation, heating, lighting, etc. this can be achieved by using modern architectural designs (WHO has identified seven elements of climate friendly hospitals that can act as a guide to achieve energy

Similarly, NHS sustainable development unit report has identified five key action plans. One key way is by using alternate/renewable sources of energy onsite to ensure resilient and reliable operations.

Another way of reducing carbon footprint is by reducing wastage and lowering waste material. The Academy of medical royal colleges report has made recommendations on cutting waste in clinical care. To reduce wastage of pharmaceutical products various strategies could be used, this includes shared decision making with patients, using starter packs to ensure only short-term supply of medication, avoiding polypharmacy.

Product procurement generates 2/3rd of carbon footprint. The NHS has a significant purchasing power, and it has tried to use this to influence its suppliers to adapt sustainable strategies during production. NHS supply chain has shown commitment towards climate protection by aiming for efficiency in the services they deliver.

Making healthcare pathways more sustainable is critical. Reducing hospital admissions and length of stay can reduce both the cost and energy demands. Transforming health systems to have a stronger focus on disease prevention and chronic disease management to reduce emergency admissions can result in lower environmental impacts as well as lower financial costs. Telemedicine, which has become specifically relevant during the covid pandemic, can reduce the cost and carbon footprint by avoiding the transportation. Staff travel significantly contributes to carbon footprint of the health sector. Adopting active transport (walking or cycling), use of public transport, car sharing schemes and providing health care delivery through telemedicine can reduce 'care miles'

Conclusion

The Healthcare sector is a major contributor to carbon footprint and adversely effects the environment. Despite our mission "to do no harm" we inadvertently cause adverse health issues and lead to added disease burden. Health organisations should take concrete measures to assess and then reduce their carbon footprint. Sustainable healthcare can help us reduce the considerable human and environmental effect associated with health care delivery, which in turn will result in improved quality and safety of health care.

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Early Diagnosis of Cancer and NHS-Galleri™ multi-cancer blood test Trial.

Overview by
Mr CR Chandrasekar

Cancer is a diagnosis that causes more alarm, anxiety and distress. It is often perceived as a terminal diagnosis. To the contrary, the majority of cancers can be cured especially if they are diagnosed early.

Lack of awareness, lack of access to costly radiological investigations, vague symptoms mimicking common conditions, fear of cancer diagnosis are some of the factors in delayed diagnosis and late presentations. Stage four presentations (when

there is distant spread of cancer) and cancers diagnosed after presentation to emergency departments are still common.

Sensitive diagnostic imaging modalities like CT scan, MRI scan, PET CT scan are often limited by timely availability. The cost of late cancer presentation is high, due to the morbidity and mortality. Hence there is a constant quest of promoting early diagnosis.

Improving public and professional

awareness, ease of availability of timely diagnostic tests, early accurate diagnosis and treatment will improve cancer cure.

There has been constant search for simple tests to diagnose cancers. A single test that has the capability to diagnose different types of cancers is a dream for the professionals.

Recent advances in genomics and testing has enabled detection of circulating cell free DNA (cfDNA) shed

by tumour cells in the peripheral blood enabling early diagnosis by a simple blood test before symptoms appear.

Galleri™ test developed by a company called GRAIL has the potential to diagnose 50 different types of cancers including head and neck, colorectal, lung, and pancreatic cancers. The test has shown early promising results with a 0.5% false positive rate ie. 1 out of 200 'positive' blood tests may not be diagnostic of cancer. In other words the test is quite specific when it is positive. The test was able to correctly predict the site of cancer in 89%. The test was able to detect late stage cancers due to higher volume of cfDNA in peripheral blood. However the potential to diagnose early cancers needs to be confirmed by large scale clinical trials

Recognising the potential of a simple blood test to diagnose cancers early, the National Health Service in England has commissioned a large clinical trial. The NHS trial has the potential to test a larger cohort of individuals and longer follow up of people testing negative.

The clinical trial is organised by GRAIL in partnership with NHS England.

It will be run by the Cancer Research UK (CRUK) and Cancer Prevention Trials Unit at King's College London.

The trial is led by Prof. Peter Sasieni who said "We need to study the Galleri test carefully to find out whether it can significantly reduce the number of cancers diagnosed at a late stage. The test could be a game-changer for early

cancer detection and we are excited to be leading this important research. Cancer screening can find cancers earlier when they are more likely to be treated successfully, but not all types of screening work."

Galleri™ NHS Study - GRAIL Galleri™ Trial

The study has started recruiting on 13th September 2021 in eight NHS Cancer Alliances across England that span Cheshire and Merseyside, Cumbria, Greater Manchester, the North East, West Midlands, East Midlands, East of England, Kent and Medway, and South East London. For the purposes of the trial, only people living in these areas will be invited.

It is a Randomised control trial (RCT)

- Target: 140,000 people
- Age group: 50-77 identified through NHS records (no cancer diagnosis in last three years)
- Inclusion - all eligible people are identified and invited based on NHS records. Aims to recruit participants from different background and ethnicities
- Method: Participants will have three blood tests (at the time of recruitment, years 1&2) 70,000 50% of randomised blood samples will be stored for future analysis 70,000 samples will go through Galleri test -If cfDNA detected they will receive appropriate early NHS referral

Initial results are expected by 2023. There will be longer term follow up of participants to see if there are real improvements in early diagnosis and

survival

The trial will identify if the test can significantly reduce stage 3,4 cancer diagnoses compared to those whose samples are not tested. It will also help to identify negative impacts of the test-people who test positive who do not have cancer and people who test negative but develop cancer.

If the study is positive there are plans to expand the study to one million participants in 2023, 2024.

SYMPLIFY Study

Another study that uses Galleri test will recruit 25,000 patients who are referred with cancer symptoms to NHS hospitals. In addition to routine blood tests they will also have Galleri test. The aim of the study is to analyse the usefulness of Galleri test in patients referred with cancer symptoms with the aim of designing further trials.

Large scale clinical trials will aim to answer key clinical question- efficacy of Galleri test in detecting cfDNA and early cancer of different types.

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- Early Detection of multiple cancers by a blood test
- Blood test that detects cfDNA (shed by cancer cells)
- Galleri™ blood test, by a company called GRAIL claims to detect 50 cancers
- Large scale RCT launched by NHS England on 13/9/2021 with CRUK, led by KCL
- Aims to recruit 140,000 participants -50-77 age group
- Each individual gives three blood samples - at the time of recruitment, year 1 and 2
- Early results expected by 2023

Cancer incidence

In the UK, 366,303 cases of cancer were diagnosed in 2017, Of these cancer cases, 186,883 were in men, and 179,420 were in women. 1 in 2 people in the UK will be diagnosed with cancer in their lifetime.



Prime of cleaning Ganga

Buddhdev Pandya MBE
Managing Editor-Swasthya

Annually about 37.7 million Indians are affected by waterborne diseases, 1.5 million children die of diarrhoea and 73 million working days are lost leading to an economic decline. *Buddhdev Pandya MBE* in this special feature article raises discusses the state of attempts for rejuvenating of the Ganga.



A December 2017 report of the Comptroller and Auditor General (CAG) showed that unused funds, the absence of a long-term plan and the lack of pollution abatement works are hampering the rejuvenation of the Ganga. Nearly five years later, how much of these has changed?

A decade of debate on 'Clean Ganga' has kept most of us with religious sentiments hypnotised about the river Ganges which has special spiritual space in our hearts.

The Ganga Basin represents far more deeper meaning for the people of India as a source of survival. Yet it has been allowed to be polluted, creating challenges for ever increasing requirements of clean water for drinking, cooking, agriculture, and industrial needs.

India with its industrial growth and urbanisation, adding more challenges as water bodies are getting more and more toxic. It's estimated that around 70% of surface water in India is becoming unfit for consumption. Every day, almost 40 million litres of wastewater enter rivers and other water bodies with only a tiny fraction adequately treated.

In Oct 2019, a World Bank report

highlighted that the release of pollution upstream has huge impact on lowering economic growth in downstream areas. The knock-on impact can be seen in the reduction in the GDP growth in these regions by up to a third. India has a greater water pollution problem resulting in an approximate a loss of almost half of GDP growth. Another study estimates that being downstream of polluted stretches in India is associated with a 9% reduction in agricultural revenues and a 16% drop in downstream agricultural yields.

The Eco system and Health impact

Annually about 37.7 million Indians are affected by waterborne diseases, 1.5 million children die of diarrhoea and 73 million working days are lost leading to an economic decline.

A study by the watchdog organization Environmental Working Group (EWG) in May 2020 says carcinogens in drinking water in the USA are linked to thousands of cancers.

The report asserted that drinking water containing carcinogens contamination may be responsible for more than 100,000 cases of cancer. Contaminants included arsenic; radioactive materials, such as uranium and radium; and disinfectant by-products, which are substances produced when chlorine and other additives are used in the treatment process.

Interestingly, the systems that rely on groundwater sources, such as aquifers, have higher concentrations of arsenic and radioactive materials and contribute to a higher risk of cancer. The study also says, that in some cases, the levels of contaminants are considered acceptable by government standards. According to Dr Olga Naidenko, EWG's vice president for science investigations, "The vast majority of community water systems meet legal standards, yet the latest research shows that contaminants present in the water at those concentrations ... can still harm human health.

The modern craze is to opt for bottled water. But, EWG says to think again. It claims that the bottled water is not always better quality and wastes energy while adding millions of empty bottles into the garbage. The report prefers that filtering water at home as the better option for getting clean water.

Maurie Markman, MD, President of Medicine & Science at Cancer Treatment Centres of America® (CTCA), also comments that "It is important that such reports be appropriately communicated to the public and not spread fear, there is no question that this report is concerning, and further quality investigation is mandated to both understand the magnitude of the issue and appropriate action steps to mitigate the potential risks."

Systems that rely on surface water sources, such as reservoirs, have a lower risk, but serve larger populations. Water systems where droughts are more common may pose a higher risk, in part because drier conditions create an environment where contaminants become concentrated as water levels are reduced.

The report also goes on to claim that the contaminants in our water supplies include those found in pesticides and fertilizers and lead from old pipes. Other pollutants found include per- and poly-fluorinated substances, or PFAS. These chemicals are used to manufacture plastics, rubber and dozens of other common products. Researchers conclude that contamination from water sources poses as much of a risk as air pollution.

According to the report released by the ICMR and the Bengaluru-based National Centre for Disease Informatics and Research, in India, the total number of cancer cases in men is estimated to be 6,79,421 in 2020 and may reach 7,63,575 in 2025 (Reported by All India Press Trust Aug 19, 2020). The number of cancer cases in India is estimated to be 13.9 lakh this year and may increase to 15.7 lakh by 2025, with its prevalence being marginally higher among women, according to a report. Like the USA, India still is a long way to undertaking such a research to make a relevant connect to water pollution.

Good water quality is essential to ecosystem related to human health. Use of pesticides and chemically rich fertilisers eventually seeps into the underground water sources as well as into the drinking water and food chain together. It adds to the human and animal wastes, that is untreated sewage.

There is a huge gap in genuine debate about the waterways across the nation, as well as droughts and floods faced every year by millions. India's social-politico civilised society needs to wake up beyond treating the 'water management' as a flavour of the month only to be a sentiment for exploiting during the election campaigns. The reason being that many Indian rivers are being polluted despite the pretention of having policies and promises of good governance. Farmers are desperate in many regions for a reliable and affordable water irrigation system. Others, face droughts and many of the urban and semirural cities have to dig deep for accessing fresh drinking water. Then, the process of

purification adds ingredients that are often harmful to drink for the humans. Let alone this, millions still have no access to drinkable water as a basic need for human wellbeing!

We are hyped to limit when we are represented at the international forums of reducing 'carbon blueprints', with a momentary soundbite. Then prefer to look away from the piles of research reports left on departmental shelves full of initiatives gathering dust due to lack or loss of political interest or availability of adequate resources. Political forums in the parties have gone beyond amnesias on the public interest issues of healthcare, education and clean drinking water that could shift the agenda of priorities and focus. Academics and intellectuals debate this issue intensely with the scientific communities as a flavour of the month topic, but it fails to hold the planners and policy makers at national, and regional states administration, to account for inconsistencies and lack of sensitivity of the urgency.

The erosion and damage are compounding and pushed under a rising mountain of slogans and soundbite with sporadic announcement of few crores rupees allocations, here and there, as a gesture to look good.

The system, when forced to account for its efforts, seemed to be only tinkering at the edges of the challenge. The sporadic responses evidently lack any coherent strategic short, medium, or even any long-term plan for the redress needed. Its challenges are compounded by lack of any potential for well-informed larger public debate, prohibited under a culture that lacks openness and accountability.

A December 2017 report of the Comptroller and Auditor General (CAG) showed that unused funds, the absence of a long-term plan and the lack of pollution abatement works are hampering the rejuvenation of the Ganga.

In recent years most in the scientific communities have been expressing serious concerns about data disclosure and public policy access to information on many issues. Without having more advanced system of networks for collecting reliable and authenticated data on environmental issues much of the planning remains on an ad-hoc basis. The notion that "information increases the effectiveness of participation" of all the stakeholders and the communities - is widely accepted in almost all the

economics and other social science literature.

Availability of reliable data and thereafter the interpretation processes are most important steps towards efficient regulation. Equally, making the process transparent and disclosing data to the public brings many additional advantages.

Such disclosures create an environment of competition among environmental industries for improving performance on their social responsibilities. It can only lead to public pressure from civil society groups, as well as the public, investors and peer industrial plants, and nudge polluters towards better behaviour.

There is a missing focus of developing through genuine consultations for a cohesive strategic central planning. The low level of sensitivity in executions and monitoring of progress that all matter. Nothing can replace adequate allocations of resource with a 'year on year' commitment.

The Cost

The cost of environmental degradation in India is estimated to be INR 3.75 trillion (\$80 billion) a year. Most associated cost of \$7 billion per year accounts for diarrheal mortality and morbidity of children under five and other population morbidities. In addition, lack of water, sanitation and hygiene results in the loss of 400,000 lives per year in India.

The increase in population in India brings changes in consumption patterns and dietary preferences. The addition of diversity in diets also drives agricultural expansion, all intensify impacts on water quality. From the consumption of basic food to the new habits of the diets; from basic grains and carbohydrates related products to meat, eggs, dairy, oils and others increases the pressure on the producers. Adding the post-harvest losses and waste to increase environmental footprints, which includes the degradation of water quality. (FAO, WFP and IFAD, 2012).

Allocation and Usage of Funds

Finance plays a significant role as a key catalyst in shaping the culture of behaviour in society. At a glimpse, the dithering can be seen in the recent expenditure history.

In Feb 2020, the central government

budgeted Rs 800 crore, increased from Rs 750 in 2019-2020 for Namami Gange. The revised budget showed that only Rs 353.42 crore was expected to be spent during the financial year 2019-20 against the total allocation of Rs 750 crore.

The steepest drop in both, allocation and spending, was recorded in the financial year 2019-20. The 67.39% lower than the preceding year's allocation. Anticipated spending (Rs 353.42 crore) is about half the Rs 687.5 crore spent in the preceding year. (Ref: Down to Earth reported (Shagun Kapil, 02 February 2020).

The ordinary people at local levels are familiar with the issue of raw sewage and industrial wastewater contaminated with metals and chemicals irrigating much of the nation's food production. The Yamuna River, a tributary of the Ganges, is widely recognized as India's most polluted river. A recent report from NITI Aayog, a government-chartered think tank, warned that Delhi, along with 20 other Indian cities, could reach "zero groundwater levels".

In the urban and semi-urban areas, there is the widespread use of untreated wastewater supply, with coupled with current inaction from

officials, has converged to produce, say some scientists, a toxic time bomb in a nation that soon will overtake China. The impending public health crisis is ignored as only 30 percent of wastewater undergoes any sort of treatment before being discharged in a wretched stream of industrial effluents.

Sadly, the data reliability is questionable, and most experts are crying out for developing an effective regulatory framework for testing primary products including essentials such as vegetable and fruits, for toxic contaminants.

There is much discussed by academics and pressure group leaders about understanding of environmental governance structure of the country and any implementation plans with statistics. The responses from the industry and individuals under various environmental laws and regulations is a real mess when looking at the larger picture in the country.

As the country pumps out more groundwater than the water supply, food safety reckoning exposes greater threat to the long-term public health. The view among experts is that India faces "worst water crisis" in history. Groundwater scarcity and pollution is a cocktail combination which threatens

India's health, economy, environment, and food supply.

In a special report, building on years of on-the-ground coverage, Circle of Blue reveals how a nation of 1.3 billion people, by failing to protect its water, is courting disease and economic hardship as well as social upheaval.

A new promise before elections

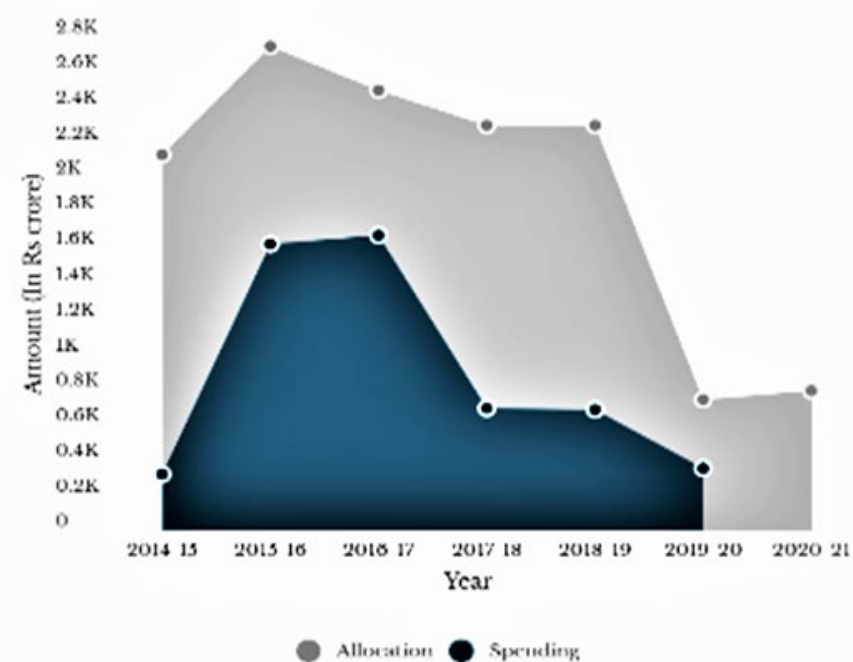
The government's planning body projected that in 2018 India was "suffering from the worst water crisis in its history and millions of lives and livelihoods are under threat." Access to water is becoming a more urgent political issue: demand will be twice the available supply by 2030, leading to shortages for hundreds of millions of people that will hurt economic growth. Now, impending assembly elections in three crucial regional state of political significance; Gujarat, Punjab and Uttar Pradesh, assembly elections undoubtedly, the ruling party wants every rural home to have water by the next national election in 2024. The Water projects expect to be ready ahead of 2024 elections as the government is expecting to rely on announcing contract projects worth \$27 billion in 2021.

The 3.6 trillion-rupee (\$49 billion) program will put piped water in all of India's 192 million rural homes -- more than all the houses in the U.S. -- over the next four years. That won't be easy: Currently only 70 million Indian households have piped water, or about 36% of the target.

In an interview Bharat Lal, who heads the Jal Jeevan Mission, a special division for piped and potable water in India's Water Ministry said, "The mission is an acknowledgment that if we in India don't fix our water availability this might become a limiting factor in our quest for faster socio-economic development." Adding, "Water is critical, the most important fundamental." Aditya Bhol, a researcher at New Delhi's Centre for Policy Research said, "This is an ambitious plan and going by the earlier projects in this field, the government will have to ensure it is thinking long term."

Most available published reports indicates that except making eye catching announcements of fund allocations and sporadic schemes, there seemed to have been little evidence of any coherent, both reliable and sustainable approach with the much-needed emphasis on the utilisation of matching funds! There is a significant

Namami Gange: Budget Allocations & Spendings 2014-2020



Source: India Budget 2020-21, 2019-20, 2018-19, 2017-18, 2016-17, 2015-16, 2014-15
Note: Spending figures for 2019-20 are revised estimates

miss on monitoring and action with no reference to the accountability, giving a dismal hope for expecting much improvement.

Most of international treaties and 'agreements between the Government of India and investors under the Foreign Direct Investment are camouflaged under the 'easy to do business' and removing of red tapes' policies has not come with a warning for the impact of non-compliance on 'clean water environment'.

Many of the new environment laws introduced since 2014 provides for little comfort and the regime that should be monitoring for non-compliance, seems

to be more keen and busier with pleasing the masters in the government.

The current serious status of India's economic with downturn till 2019 and now the COVID pandemic would compound many such issues. Funds allocation would be expected to change course and there would also be further initiatives to help easing of the regulations and favouring privatisation growth.

This inevitably will be further fueled by regulatory relaxations; it leaves little to imagination to the state of the future for the water management.

The good old mother nature has given everything in abundance for our needs on earth, we need to find ways of managing it so as not to disturb the

balance of nature but serve the survival of human race.

Buddhdev Pandya MBE
Buddhdev is Political Columnist, member of Commonwealth Journalists Association. Former Chief editor of awarding winning ethnic paper Asian Lite. He is publisher and founder of Swasthya -a journal for healthcare professionals and Gujarat UK Journal. He is a member of the New York Academy of Science. He is currently holding an advisory position of Director of policy with the British Association of Physicians of Indian Origin. Formally Director of British Indian Psychiatrist Association, Dept CEO of Medical Defence Shield and British international Doctors Association. Founder and former Managing Editor of The Physician -a medical journal. buddhdevp@gmail.com



Tribute to to Late Prof (Dr) Kailash Chand OBE



Professor Kailash Chand OBE was a "fearless defender" of the NHS has left a legacy of true leadership in dedication to service to his patients and fellow doctors.

He was a Patron and leading editorial member of Swasthya, journal for healthcare professional. A source of inspiration and wise counsel will be deeply missed by all the members of the Editorial Team.

Buddhdev Pandya MBE, Managing Editor of Swasthya said, "He was a dear friend both humble and straightforward whose wisdom has always a point of reliability and strength for me." Adding, "What impressed me about him was his commitment to public service, assertive in the campaign to improve our national health service and to preserve its true values". His contribution to the cause of anti-racist campaign was highly valued by the international medical doctors.

We offer our sincerest condolences to his son Dr Aseem Malhotra and family at this loss and pray that All Mighty would bless his soul to rest in peace.

Dr Santosh Mudholkar, Mr C R Chandrasekhar, Dr Sharad Agrawal, Dr Sridhar Kalyanasundaram, Mr Amit Sinha, Prof Nandini Chakraborty, Dr Fabida Aria, Dr Anand Deshpande, Dr Satwinder S Basra and Buddhdev Pandya MBE

Swasthya Team
13th August 2021
editor.swasthya@gmail.com

Prof (Dr) Kailash Chand OBE, who suddenly died at the age of 73 after cardiac arrest at his home in Manchester on 26th July 2021. His funeral was held on 13th August 2021.



India-UK Healthcare Conference 2021

The Consulate General of India in Birmingham, in partnership with the Department for International Trade, Government of UK, University Hospitals Birmingham and other prominent partners held a successful India-UK Healthcare Conference on September 23, 2021.

Swasthya congratulates The Consulate General of India in Birmingham and partners for the successful event

The conference India-UK Healthcare organised by the Consulate General of India in Birmingham on September 23, 2021 at the Edgbaston Park Hotel, Birmingham

Among other partners included Birmingham City University, Infosys, Federation of Indian Chamber of Commerce, Confederation of Indian Industry and several other organisations joined delegates to discuss a many issues in relation to innovation, digital developments and post COVID issues.

The Conference was preceded by a curtain raiser event on the previous evening. Attended by Dignitaries which included Prof Dr Balam Bhargava, Secretary, Department of Health Research and Director General of Indian Council for Medical Research, Deputy High Commissioner of India to UK, Mr Sujit Ghosh, The Lord Lieutenant of West Midlands Mr. John Crabtree, Vice Chancellor of Birmingham City University Prof. Philip Plowden and British Deputy High Commissioner.

Consul General Dr. Shashank Vikram said, "Healthcare sector provides a huge opportunity for collaboration between India and UK. Adding, 'We are hopeful that these deliberations will help provide concrete outcomes in ensuring robust cooperation in the area to ensure quality healthcare for people across India and UK'.

He remarked that the Healthcare has become one of India's largest sectors both in terms of revenue & employment. Recently, despite the pandemic hurdles, the Indian stock market has outperform showing the emergence of Aatma Nirbhar Bharat.



Prof (Dr) Balam Bhargava, Secretary, Department of Health Research and Director General of Indian Council for Medical Research,



Mr Sujit Ghosh addressing Conference Deputy High Commissioner of India to UK



Lord Prior
Chairman of NHS England, UK



Prof Parag Singhal
Consultant Endocrinologist



Prof Kiran Patel
Consultant Cardiologist



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