



**THE HARVEIAN SOCIETY OF LONDON  
REVIEW OF THE YEAR 2022**

**President:**

**DR ROBINA COKER BSc MB BS PhD FRCP**

**President Elect:**

**DR DAVID TREACHER MA FRCP**

## **Introduction By The President**

While we had all hoped to see a clear end to the Covid-19 pandemic in 2022, this was not to be. A last minute decision had to be made to hold the January lecture on Zoom. Although disappointing to many, this meant that we were able to welcome a global audience, with guests joining from as far afield as Boston in USA, and New Zealand. February's lecture returned to the usual convivial format in Lettsom House, but Covid-19 infection laid low our guest speaker for March. We are most grateful to Dr Michael O'Brien for stepping into the breach at short notice and giving us a fascinating review of Hindu Temple Architecture.

We are delighted that all subsequent meetings could be held in person, although numbers took some time to return to pre-pandemic levels. Technology perfected during the pandemic allowed our April and October speakers to deliver their lectures remotely, and we are very grateful to the Medical Society for the use of their excellent equipment in Lettsom House.

The annual visit to Folkestone in June to process to the William Harvey statue was a most enjoyable event and attended by 12 members.

The return to an in-person Buckston Brown-Gray Hill dinner was extremely welcome, with members and guests able to enjoy the stunning French interiors of the Savile Club alongside excellent food, wine, and company. Professor David Nutt provided a suitably entertaining and thought-provoking after dinner speech.

By September it became clear that members were relishing the prospect of overseas holidays, and it was decided not to repeat the informal evening event in September. The excellent Christmas lunch in December was complemented by harp music from our first Associate Member, Dr Diana Shroff, and magic from magician Peter Dove.

To help ensure the future of the Society and extend the audience benefiting from such a range of distinguished speakers and informative lectures, I am delighted that we were able to approve a new Associate Membership category for those under the age of 40. This is open to graduates and Year 6 MB BS undergraduates, at half the annual subscription of full membership.

Such a programme of lectures, dinners, and entertainment could not possibly be orchestrated by any single individual. I should like to take this opportunity to thank the members who attended these events; our distinguished speakers; our Council members for their constructive support and advice; our Executive secretary Mike for his unfailingly calm, professional help and expertise; Betty for her tireless work behind the scenes liaising with speakers and ensuring that members pay their subscriptions; the Medical Society for the use of their facilities, Celia and her amazing catering team; and last but not least, Leon, the first person to greet each and every one of us at the door of Lettsom House, whatever the weather.

**DR ROBINA COKER BSc MB BS PhD FRCP**

## **Minutes of the Meeting of the Harveian Society**

**Held on Wednesday 12 January 2022**

The President, Dr Philip Ind, welcomed guests to this meeting, which was held on Zoom, and reminded those watching that this was a private meeting.

The Minutes of the meeting on 10 November 2021 were read by the Honorary Secretary and approved.

The President thanked Dr Robina Coker for her work as Senior Honorary Secretary and then inducted her as his successor. She thanked Dr Ind for his Presidency with its stimulating programme and presented him with his miniature badge of Office. She welcomed members guests and noted that the Zoom format of this meeting had allowed guests to participate from as far away as New Zealand. She gave a brief overview of her programme for her year in office. Dr Coker then nominated Professor Jadwiga Wedzicha for membership of the Society and stated that, provided no objections were received by the next meeting, she would be duly elected.

Dr Coker then introduced Professor Dame Sally Davies to deliver the 2022 Harveian Lecture. Dame Sally has had a distinguished career as Chief Medical Officer for England and Chief Scientific Adviser at the Department of Health, following which she was appointed Master of Trinity College, Cambridge. She is the UK Special Envoy on Antimicrobial Resistance and is a Fellow of the Royal Society and a Member of the USA National Academy of Medicine.

Professor Davies then presented her Harveian Lecture:

### **Delivering Research in the NHS – Our Story**

She opened by stating that she wanted to tell the story of what had been done to improve health research in the National Health Service. When she became NHS Director General of Research in 2004 she considered the role of research in the health service as she felt that research was fundamental to the maintenance of quality. The problems of doing research were already known, but she set out to establish what could be done about solving them and making progress. She extolled the value of research both to the leaders of the NHS and to government and her ideas led to the foundation of the National Institute for Health Research (NIHR). Evidence was needed to improve healthcare and she also recognised the need to include the life sciences industries in the NIHR project. While much research was being done by bodies such as the Medical Research Council on the basic sciences and aetiology of disease, very little was done on the application of those findings. She felt that applied research genuinely enhanced knowledge and that it needed to be increased.

Government provides infrastructure, training and education including higher education, regulation and governance in the NHS, so it was necessary to persuade the government to make NHS research part of government structure and not just a short-term project. The aims of the NIHR were to help the NHS increase quality and decrease costs, to foster excellence in the life sciences and reduce the brain drain, and to improve the employment prospect of those involved in research. She believed in the need to allow anyone in the NHS (whether patient or clinician) to join in research, not just those in existing cutting-edge research institutions. The NIHR should be a research system, not just a research funder. As far as possible,

decision-making should be devolved and not central, and particularly should not be part of government. The Local Clinical Research Networks were established to help achieve this.

The NIHR was launched in April 2006, with an ethos of maximum transparency. It is structured to be a distributed and flexible organisation, with decisions made by researchers and not by government or funding agencies. It is a very professional, managed system, ensuring a cooperative research network across England and funding good studies, to achieve maximum inclusion. The implementation plans were transparent and freely available from the start. The number of clinical trials supported and the number of patients recruited grew steadily over the years. For example, data from 2020-21 showed that over 3800 patients were recruited to trials every day. Biomedical research units were converted into biomedical research centres and have produced world class research results. Healthcare professionals of all types can be trained to be researchers at those centres. Funding has been the subject of discussion and there is now a mix of funding via the Medical Research Council, partnerships and the NHS infrastructure.

Studies may be commissioned or research-led and while the balance is normally fairly stable, over 2020 and 2021 there were far more commissioned studies because of Covid-19. One advance was the development of the requirement for systematic reviews before the initiation of clinical trials so that there was clear appreciation of existing evidence and how to develop it. As an example, one important trial led by the NIHR was the CRASH 2 trial of the early administration of tranexamic acid for bleeding trauma patients. The size (20,000 patients randomised worldwide) and design of this study helped to establish unequivocally that this simple intervention could safely reduce the risk of death and that it was highly cost effective. The use of pre-trial systematic reviews reduces research waste by eliminating the need for a trial by avoiding duplication, or by ensuring that a trial has the most appropriate design, or by reviewing previously unpublished studies.

The NIHR is now established as a global leader in translational medical research. Developments have included the establishment of research professorships, leadership management training, the establishment of a Global Health Programme with funding from government Overseas Development Aid, and the establishment of a recognisable NIHR brand. At the time she stepped down from her leadership of the NIHR in 2016, Professor Davies felt that we were in a time of unprecedented opportunity for clinical and applied health research, with political drive, a clear national strategy, supportive national structures, alignment between major funders, increased funding and with scientific advances across the disciplines. These aims were supported by the establishment of a clear governance structure for the NIHR, and by remaining within the Department of Health, research and the NIHR have been included in every important government document relating to NHS development.

The principles on which the NIHR was founded have continued after 15 years. A 2016 review of 6 months of practice-changing studies in leading medical journals showed that the NIHR is second only to the US NIH for the number of studies published. The NIHR's current mission has been laid out by its two new leaders, who are women. Its response to Covid-19 has been unprecedented, but the basis for that research response was laid in the 2009-10 flu epidemic, when it was still very difficult to start studies. Now over a million people have been recruited to Covid studies across numerous different fields, from vaccine development to supporting the global response. Research via the NIHR is of clear value to the NHS, to academics and to industry, thereby benefiting the UK economy and employment. NIHR investment has leveraged massive spend by commerce and by the MRC. A recent

report from KPMG showed that for every pound invested through the NIHR, there is an overall return of over £19. Professor Davies concluded that by working in partnership with its many interested parties, the NIHR has delivered on its aims, for the benefit of patients and the public.

After several well-informed and stimulating questions a vote of thanks was proposed by the outgoing President, Dr Philip Ind.

68 Members and Guests Attended

### **Minutes of the Meeting of the Harveian Society**

#### **Held on Wednesday 9 February 2022**

The President, Dr Robina Coker, welcomed guests to this meeting, happily in person rather than virtually, and reminded those present that this was a private meeting. The minutes of the meeting on 12<sup>th</sup> January were then read by the Honorary Secretary and approved

The President then nominated for membership of the Society Professor Edwin Chilvers & Dr Jennifer Bennett and stated that Prof Wedzicha, nominated at the last meeting, was now elected as a member of the Society.

The President also announced that the Society had received a large legacy from the estate of the late Mr Evan Stone QC, a former member of the Society. Most of the funding will go to assuring the future of the Society but a prize in his name will be set up at Berkhamsted school where he was educated.

Dr Coker then introduced Professor Charles Knight, a consultant cardiologist and Chief Executive of St Bartholomew's Hospital. He has held several senior positions in leading cardiovascular societies in the UK and is Associate Editor of the Heart journal. In July 2020 he was seconded to lead the NHS Nightingale hospital and in October 2020 he received an OBE for services to the NHS and people with heart disease.

Dr Coker then invited Professor Knight to deliver his lecture to the Society:

#### **‘St Bartholomew’s: William Harvey’s Hospital from 1123 to 2022’.**

Professor Knight started by acknowledging that he had a difficult task in covering almost 900 years of history in 40 minutes and also confessed that was not a graduate of St Bartholomew's.

The history of St Bartholomew's begins with Rahere who was a cleric, minstrel and reputedly also a jester. He was a key figure in the court of King Henry 1. On a pilgrimage to Rome he contracted malaria and had a vision of St Bartholomew being flayed alive and was directed to found a hospital/priory at Smoothfield (now Smithfield) in London to help the poor and the sick. In 1123 he started to build the hospital which to this day bears the name of St Bartholomew. Rahere was the first master until he died in 1143.

For the next 4 centuries it remained a religious institution with a master, brethren and sisters but subsequently it became independent of the Priory and had its own seal. The Priory was closed in Henry VIII's reign during the dissolution of the monasteries and its property seized. Although the hospital was not closed it was initially no longer viable having no significant income, but by the end of his reign Henry returned the stolen funds and agreed to support the hospital.

Early in the 17<sup>th</sup> century William Harvey was appointed as ‘Physician to the Hospital’, a post of considerable authority. In 1633 Harvey also produced rules for the care of patients: they should have curable conditions, only be allowed a limited length of stay, should not ‘lurk’ for relief of slight causes, and would be discharged promptly for any bad behaviour! The surgeons had to confer with the Physician on difficult cases and could not operate without Harvey’s approval. Four hundred patients recovered each year, probably largely due to the nursing care.

Between 1730 and 1768 St Bartholomew’s was rebuilt under the direction of James Gibbs, a renowned architect. The Great Hall was built and decorated with plaques commemorating hospital donors and contains magnificent paintings and murals by William Hogarth.

Abernethy founded the first medical college in 1822 and nursing training officially started with Ethel Gordon Fenwick. In 1968 the first nursing degree course was established.

In 1948 Barts entered the newly created NHS and initially thrived but in 1992 under the Tomlinson report Bart’s was threatened with closure. However during a visit by Frank Dobson it was reprieved. Subsequently Professor Knight led the merger of the London Chest and the Heart Hospital to create Bart’s Health in a large new building. This became the second largest Trust in the UK with 20,000 staff, the second largest cancer centre in England and the largest cardiac centre on a single site in the UK.

The need for significantly increased numbers of ICU beds across London during the Covid pandemic led to the commissioning the Nightingale Hospital in the Excel centre, and Professor Knight was seconded as CEO.

Finally, Professor Knight outlined the plans for Bart’s 900<sup>th</sup> anniversary. Professor Knight concluded by saying that St Bartholomew’s is a remarkable institution which over the past 900 years had seen huge advances in health care, free at the point of delivery, and survived the dissolution of the monasteries, the Great Fire, both World Wars and Patricia Hewitt’s attempt to close it.

After several interesting and stimulating questions and a vote of thanks was proposed by Dr Ann Ferguson.

### **Minutes of the Meeting of the Harveian Society**

#### **Held on Wednesday 9 March 2022**

The President, Dr Robina Coker, welcomed guests to this meeting, which was held at Lettsom House, and reminded all attending that this was a private meeting.

The Minutes of the meeting on 9 February 2022 were read by the Honorary Secretary and approved.

There were two nominations for membership of the Society:

Miss Diana Shroff – the first Associate Member

Canon Ted Hiscocks – Full member

The President announced that, provided no objections were received by the following meeting, these nominees would be elected.

The President further announced that, no objections having been received, Dr Jennifer Bennett and Professor Edwin Chilvers were duly elected as members. Dr Bennett was inducted and signed the Members' Book

The President then introduced Dr Michael O'Brien and invited him to deliver his lecture:

### **Hindu Temple Architecture and its Place in the Community**

Dr O'Brien started his lecture by stating that there would be two parts to his lecture: the first would be based on pictures taken by him without people but which focused specifically on the structures of Hindu culture whereas the second part would have pictures taken by his wife which included people and showed how the Hindu architecture related to the community.

The earliest examples were the cave temples dating back to the 3<sup>rd</sup> century BC and although originally Buddhist were later Hindu. At Badami there is a series of Shiva cave temples going up the side of the mountain and these were often cut far back into the rock. By the 7<sup>th</sup> century the Cave temples had become much more elaborate with complex carvings.

The next stage was the Monolith temples which were temples carved from free standing, limestone rocks and carved from the top down and often not finished at the bottom. They were massive structures of considerable complexity with amazing detail carved from the basic rock.

The final examples were the free-standing temples which were constructed from the 7<sup>th</sup> century onwards in either the northern or southern style. There was a tower constructed over an inner temple that had amazingly detailed carvings. These were made of a relatively soft sandstone which made such intricate carvings possible. The Terracotta temples were unique to the west Bengal area & neighbouring Bangladesh and were made of terracotta panels, one foot square, and which displayed images of Hindu mythology in fantastic detail. The Yogini temples were built by a secret sect who worshipped the goddess, Kali. These temples were outside the towns and were circular temples with no roof but inside displayed 64 female deities.

Dr O'Brien then moved on to describe the 'people pictures' taken by Mrs O'Brien and how the temples are used by the people that they serve. These show just how many people there were around these temples making it difficult to avoid having people in photographs! At times there could be several million people in a single town. These pictures show stalls selling a huge range of religious articles. Outside the temple there would be people dancing, with bands and a great deal of noise! All temples are dedicated to either Shiva or Vishnu and the followers wear distinguishing markers on their foreheads. All Shiva temples contain in the inner sanctum a linga which is a votary object symbolising the God Shiva. Typically, water would flow over the linga into a drain and outside women would collect this now holy water. Surrounding the inner sanctum would be a circumambulatory which would also be dark and narrow with priests officiating at various ceremonies. Then, often separate from the main temple would be a mandipal often with the most elaborate architecture with very detailed pillars: a 16<sup>th</sup> century example showed a chain carved directly from a single stone. The mandipal acted as a meeting place for the local community and they would pray, sleep &

have weddings there. Fire ceremonies conducted by the Brahmin were also held there. In Shiva temples there would be a shrine attached to the main temple dedicated to Nandi who was the bull that carried Shiva whereas in Vishnu temples there is an image of Vishnu or one of his manifestations in the inner sanctum and there would be a shrine representing Garuda, a beast with wings, claws and a beak and who was the mount of Vishnu. Otherwise, the design of these temples was similar.

Finally Dr O'Brien showed a picture of a group of people at prayer and concluded by saying that these temples were not just tourist traps but important places of worship.

After prolonged applause and many questions, a vote of thanks was proposed by Dr Elizabeth Price.

35 Members and Guests attended

### **Minutes of the Meeting of the Harveian Society**

**Held on Wednesday 13 April 2022**

The President, Dr Robina Coker, welcomed guests to this meeting and reminded them that this was a private meeting.

The Minutes of the meeting on 9th March 2022 were read by the Honorary Secretary and approved.

The President invited a new Society member, Canon Ted Hiscocks, to sign the Obligation Book and to introduce himself.

Dr Coker then invited Dr Michael Farquhar, Consultant in Sleep Medicine at the Evelina London Children's Hospital, to present his lecture entitled:

#### **Sleep: why we need it**

Dr Farquhar presented his lecture remotely. Zoom communication with the audience in Lettsom House functioned very effectively.

Dr Farquhar introduced his lecture by stating that he would cover the reasons why sleep is important and why we should think more about it.

Sleep is the foundation of health and wellbeing and lack of sleep increases many health risks. Overall we spend about one third of our lives sleeping. Yet it is difficult for many people to follow advice to get enough sleep. The brain and the body are complex and the need for sleep is best understood in terms of it permitting regular repair and maintenance of their function. Acute, short-term, sleep deprivation has a significant impact on our ability to function on the following day, but chronic deprivation of even small amounts of a person's necessary sleep has insidious effects and longer-term consequences. Demonstrated consequences of sleep deprivation include effects on the immune system, with slower response to vaccinations, greater risk of developing symptoms following exposure to respiratory viruses and increased recovery time from illnesses. The need for extra sleep during illness is well known and it is paradoxical that hospital patients are prevented from



having adequate periods of sleep. Sleep deprivation inhibits normal recall of data and reduces normal emotional regulation.

There is evidence that sleep is associated with expansion of intercellular spaces in the brain, permitting removal of toxins, and even one night of sleep deprivation has been shown to increase brain beta amyloid. These effects may interfere with the brain's ability to process and integrate acquired information.

The average adult needs 7-8 hours' sleep per night. Missing just one hour's sleep per night therefore loses the equivalent of a whole night's sleep over the course of just one week. Many, if not most, people are sleep deprived and it has been calculated that sleep deprivation costs the equivalent of 3-4% of a country's GDP.

Dr Farquhar then presented the hypnogram, a graphical representation of normal sleep patterns, and demonstrated that the night's sleep consists of cycles of around 90 minutes, with REM sleep (dreaming), two stages of light non-dream sleep, and deep sleep, with brief moments of waking (which may not be remembered) between the cycles. The final, longest period of REM sleep may be the most important, with the greatest impact if this is lost. Sleep forms part of the circadian rhythm of alertness, with a powerful alerting signal during the day dwindling virtually to zero in the middle of the night. Interference with this rhythm causes serious problems of body function, as evidenced for example in jetlag and in the response to the time of day when cardiac surgery is performed.

He went on to discuss strategies to help sleep problems, including a comfortable bed, decreased light, appropriate room temperature, and noise reduction. The most important factor is consistency. The optimal duration of a night's sleep is a biological variable, differing by life stage. While some prominent persons have boasted about not requiring much sleep, decision-making may be less robust when sleep-deprived. Natural light during the day, exercise, relaxation at the end of the day and mindfulness can all promote better sleep, while anxiety, stress and worry, caffeine, alcohol and bed sharing with children can all interfere with normal sleep.

Many people consider that their daytime and leisure activities are more important than time spent sleeping, with a recent challenger to sleep being the ability to stream lengthy television programmes deep into the night, but adequate duration and quantity of sleep remain vital to people's health and wellbeing.

After several stimulating questions a vote of thanks was proposed by the Honorary Secretary, Dr David Treacher.

36 Members and Guests attended

### **Minutes of the Meeting of the Harveian Society**

**Held on Wednesday 11 May 2022**

The President, Dr Robina Coker, welcomed guests to this meeting, which was held at Lettsom House, and reminded all attending that this was a private meeting.

The Minutes of the meeting on 13 April 2022 were read by the Honorary Secretary and approved.

The President announced that, as no objections had been received, the following were elected to the Membership: Dr David Mummery, Dr Marlies Ostermann and Mr Hugo Treacher.

The President then introduced Dr Saira Hameed who presented her lecture:

### **Tipping The Balance: How to Solve the UK's Obesity Crisis**

In 1980 only 7% of adults in the UK suffered from obesity whereas today 28% are obese & by 2038 this figure is predicted by WHO to rise to 40%. In her specialist clinic at Imperial College Dr Hameed treats patients generally with BMI >35 and associated weight related co-morbidities. These patients have previously been told to eat less and exercise more. However, this approach does not work and she prefers to ask what has gone wrong with our weight control physiology over the past 50 years.

She explained that nowadays a typical diet focuses on calorie control whereas it should address glucose intake and the resultant insulin response. Insulin initially results in glucose uptake into muscles to provide energy and into the liver but these two 'fuel tanks' have limited storage capacity and any extra glucose is taken into adipose tissue & stored as fat. In type 1 diabetes where there was an absolute lack of insulin the patient loses weight, which is only restored when they receive insulin injections. In type 2 diabetes there is a high glucose but an excess of insulin with relative resistance to uptake by the muscles & liver, and increased uptake by adipose tissue leading to excess fat and obesity. In normal circumstances adipose tissue acts as a fuel tank that allows us to survive periods of famine. Communication between these body fat stores and the hypothalamus is controlled by the hormone leptin which promotes satiety & increases the sympathetic drive increasing activity & depressing appetite. Leptin levels are proportional to the amount of adipose tissue: thin people have low leptin levels, fat people have high leptin levels. However, in people with BMI > 35, the hypothalamus becomes resistant to leptin & this promotes increased appetite, reluctance to exercise & an addictive attitude to food. Laboratory experiments have shown that fibre intake & the gut microbiome is crucial in correcting this anomalous situation. Fibre feeds the gut microbiome leading to the production of short- chain fatty acids which act directly on the hypothalamus to suppress appetite. Analysis of stool samples can predict whether the patient is overweight or not.

Type 2 diabetes accounts for 10% of the NHS budget & Dr Hameed has produced a programme (iSatPro) which emphasises the following solutions for severe obesity: a low sugar intake, a high fibre intake, reduced availability of highly processed foods, which are promoted by the food industry, sharing of the evidence with the patient and the government to take action to reduce the availability of ultra-processed 'junk' food in the way in which smoking has been so successfully reduced.

After several questions about the role of giving leptin injections and a possible role for GLP1 a vote of thanks was proposed by Ms Catriona Head.

30 Members and Guests attended

## **Minutes of the Meeting of the Harveian Society**

**Held on Wednesday 12 October 2022**

The President, Dr Robina Coker, welcomed guests to this meeting and reminded them that this was a private meeting.

The Minutes of the meeting on 11th May 2022 were read by the Honorary Secretary and approved.

The President invited a new Society member, Dr David Mummery, to sign the Obligation Book.

Dr Coker then invited Professor David Nott OBE to present his lecture entitled:

### **Life as a War Surgeon**

Professor Nott has been a full-time consultant trauma and vascular surgeon at St Mary's, Chelsea and Westminster and the Royal Marsden hospitals for over 30 years. Since his first experience working as a surgeon in a conflict area with Médecins Sans Frontières in Sarajevo in 1992, he has spent 6 to 8 weeks per year working as a war surgeon with MSF and other aid agencies.

Hospitals are often targeted as weapons of war. In Sarajevo the state hospital was targeted all the time and activities had to move underground. There were vast numbers of casualties and he found that his vascular surgery skills were much in demand. He described this experience as a young surgeon as exciting and exhilarating, and he found that these feelings did not diminish over the subsequent 30 years. He has been on 31 missions to war zones and two to scenes of natural disasters. He described these experiences as his passport to go around the world to see things one would never otherwise see and to witness history. For example, he was present when the Taliban took over Afghanistan in 1996. Surgery in these settings requires a wide variety of surgical skills, even those of an obstetrician. He sometimes found himself working as the sole surgeon in an aid agency hospital.

In 2011 he was working with MSF at Misrata in Libya. The situation was chaotic. Local medical teams were present, but they had no war surgery experience. There were no mass casualty plans. He then realised the importance of training local surgeons in the techniques for treating casualties of conflict.

There were basic lessons to be learnt about the treatment of war wounds. Primary closure must be avoided because such wounds are dirty or already infected. Chest wounds are best managed with chest drains initially, following which decisions can be taken on the most appropriate approach to treatment. Abdominal wounds need adequately large incisions for laparotomy. Limb injuries need debridement and external fixation, never internal fixation, because of the risk of osteomyelitis and fasciotomy must be performed at an early stage, particularly after gunshot wounds, to avoid the almost inevitable compartment syndromes. By this time in the UK he was the director of the Royal College of Surgeons Definitive Surgical Trauma Skills course. He taught local surgeons in Libya and he realised the importance of trainers staying with surgeons in theatre and advising on technique.

In 2013 he started the RCS Surgical Training for Austere Environments course. The five-day course includes the detail of all the relevant surgical procedures and is very practical, with procedures performed on cadavers under the supervision of experienced war surgeons. The course covers the management of fragmentation wounds, blast injuries, crush injuries, burns, head injuries and many other important issues. Examples include the importance of covering exposed bone within 72 hours, which may involve the need to raise muscle flaps; skin grafting; external fixation with teaching on the application of traction; Caesarean section and the management of postpartum haemorrhage.

The aim of resuscitation is to deliver oxygen to the vital organs. After analysis of many cases, Prof. Nott and colleagues found that a haemoglobin level of 6.2 g/dL is the minimum required for the continuation of aerobic respiration and their study was published in *The Lancet* in March 2022.

The cost to participants on the RCS Surgical Training for Austere Environments course is £3500. This was clearly beyond the means of the many surgeons from abroad who would benefit from participation, so in 2015 Prof. Nott set up the David Nott Foundation to enable people from abroad to attend the course in order to improve standards in humanitarian surgery around the world. The foundation then extended its scope to take the course abroad under the name Hostile Environments Surgical Training course ('HEST'). They have developed a readily transportable anatomically correct silastic manikin ('Heston') to enable all the surgical techniques that they teach to be demonstrated, including neurosurgery for head injuries, skin grafting and the lung twist technique to control hilar haemorrhage. There have now been 37 HEST courses and 1010 surgeons have been trained. Local surgeons in conflict zones have been empowered by the courses. The David Nott Foundation has been recognised internationally as a non-governmental organisation.

Prof. Nott dealt briefly with the dangers of his work, referring to them as dicing with death. Checkpoints on roads in conflict areas in Africa are particularly dangerous, particularly because of the notorious child soldiers who in 1998 were amputating hands of people going to vote. He worked as a reservist in Basra, Iraq, where the hospital and its surroundings were continuous targets of rockets and bombs.

Finally, he spoke about the current conflict in Ukraine. He trained 573 surgeons there by Zoom with Henry Marsh soon after the war started; in April 2022 he spent 10 days there, performing surgery and training on the management of war wounds; but he has since conducted HEST courses in Dnipro and Kharkiv and conducted two practical surgical courses in person, training 80 surgeons in Odesa and Mykolaiv on the Black Sea. His war surgical training programme for maxillo-facial and eye injuries has been translated into Ukrainian and local surgeons have it available on their mobile phones. He said that while it is up to politicians to resolve the conflict, we can still provide humanitarian help.

Following several stimulating questions, the vote of thanks was proposed by Dr Helen Graham

41 Members and Guests attended

## **Minutes of the Meeting of the Harveian Society**

### **Held on Wednesday 9 November 2022**

The President, Dr Robina Coker, welcomed guests to this meeting and reminded those present that it was a private meeting. The Minutes of the meeting on 12 October 2022 were read by the Honorary Secretary and approved.

The following were nominated for membership:

Dr Leda Yazbek -nominated by Dr Robina Coker

Prof Julian Walters – nominated by Dr Robina Coker

The following were elected to the membership:

Dr Caroline Dimian

Dr Freda Yang

The President then invited Dr Caroline Dimian to sign the Members Register.

The President then delivered her Presidential Address entitled:

#### **Air Travel and Lung Disease**

Dr Coker's address covered work that she pioneered with the British Thoracic Society on commercial air travel and lung disease over the last 20 years. The first challenge encountered by patients is the hypobaric environment. Commercial airlines fly at 30,000 feet but are pressurised to at least 8,000 feet. This results in a fall in the partial pressure of oxygen, such that arterial PO<sub>2</sub> falls from around >12kPa to around >8.5kPa in healthy adults. The oxygen dissociation curve, which plots PO<sub>2</sub> against the corresponding oxygen saturation of haemoglobin, is a sigmoid shaped curve. It is nearly horizontal from PO<sub>2</sub> 12kPa down to 8kPa but thereafter the slope of the curve is much steeper, resulting in a far greater fall in oxygen saturation. A healthy person's saturation only drops from around 98% to around 95% at cabin pressure when awake, although it can fall below 80% during sleep. A patient with significant COPD or interstitial lung disease with resting oxygen saturation <92% at sea level has the potential to experience much greater falls in saturation.

The second challenge is for patients with intrathoracic trapped gas, such as a closed, untreated pneumothorax or a loculated bulla. At the lower ambient pressure, humidified air expands by nearly 40%, with the potential to compress intrathoracic structures and ultimately cause death.

Further challenges for patients with respiratory disease are the risk of developing a DVT and subsequent pulmonary embolus or contracting respiratory infections such as TB or COVID-19. Obesity and other co-morbidities also increase the risks of flying. The overall likelihood of in-flight medical incidents increases as flying becomes ever more popular, larger aircraft accommodate greater numbers of passengers, flight durations increase, and the average age of Western passengers rises.

In-flight medical emergencies are a great concern for airlines: the cost of diverting a flight was US \$250,000 even in 2002. The top in-flight medical emergencies are neurological, respiratory, and cardiac in origin, but, interestingly, respiratory patients who undergo pre-flight screening rarely become unwell during the flight. In 2000 a BTS working party chaired

by Dr Coker was set up. The publication of 'The impact of flying on passenger health' by the BMJ in 2004 indicated greater recognition of the challenges posed by air travel. Subsequent studies showed that although sea level resting oxygen saturation and spirometry were regularly measured, they were not of value in predicting the need for supplementary oxygen during flight. Furthermore, hypoxic challenge testing (assessment by breathing a reduced FiO<sub>2</sub> of oxygen, around 15%) is labour-intensive, fails to predict the effect of exercise or sleep, and puts pressure on NHS resources. In Dr Coker's UK Flight Outcomes Study of over 600 respiratory patients, 431 patients flew as planned and of these only 5 (1%) died, 2 from cardiac causes. However, 20% required unscheduled post-flight healthcare and patients with ILD required most help. The importance of taking a thorough history, recording the patient's MRC dyspnoea scale, and considering a 6-minute walk test to assess cardiorespiratory reserve, are increasingly emphasised. Patients with chronic airflow limitation, resting sea level oxygen saturation >95% and a score of 2 or less on the MRC scale do not require supplementary oxygen. A 6 minute walk test helps identify patients with interstitial lung disease who may require further assessment including hypoxic challenge testing. The practicalities of supplying supplementary oxygen include the need to get permission to take an oxygen concentrator on board and to have battery packs with a battery life >1.5 times the flight time.

These studies have established the importance of passenger health during air travel, have improved patient safety, and provided a wealth of information for patients, passengers, and primary care personnel. They have also identified the need for further well-designed scientific studies, but expert consensus opinion still has an important role to play when evidence is lacking.

Dr Coker concluded by acknowledging the contribution of her colleagues to this work, in particular Prof Mike Hughes and the British Thoracic Society.

A vote of thanks was given by Dr Elizabeth Shanson.

46 Members and Guests attended.

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**St Andrew's Church Hempstead  
In 2022, the Harveian Council Agreed to Donate £1000 for the renovation of  
Dr William Harvey's Sarcophagus**

