

**PROPOSAL FOR A PROFESSORIAL CHAIR
IN INTENSIVE CARE MEDICINE**

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The post will be based at St Bartholomew's Hospital, London



and the William Harvey Research Institute, Queen Mary University of London
Charterhouse Square, London

William Harvey Research Institute



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Executive Summary

This is a proposal to raise external funding for a **Professorial Chair of Intensive Care Medicine** based at **St Bartholomew's Hospital ("Barts")** and the **William Harvey Research Institute, Queen Mary University of London**.

This full time Clinical Academic post will be for an initial five years and will allow the appointment of a world-class expert with an outstanding international reputation in the field of translational Intensive Care Medicine as evidenced by publications, presentations, grant funding, fellowships, awards and prizes, and senior leadership roles. After the initial five year term, Queen Mary University of London and Barts Health will take over funding, so this initiative will establish a durable legacy and a team of researchers who will continue to deliver world class intensive care research in one of the largest centres for Critical Care in the UK.

The overall funding requirement is GBP 1.675 million over a five year period. The NHS will contribute GBP 484,000 towards the full time Professorial post, leaving **GBP 240,000 per annum for five years or GBP 1.2m in total**.

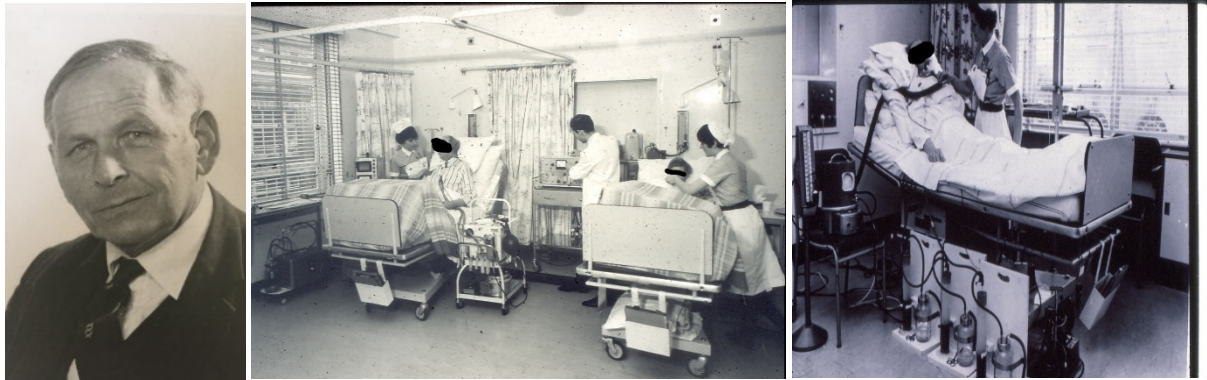
The new Professor will build on the achievements of our research under the leadership of **Professor Charles Hinds** (now Professor Emeritus) to date, and the unrivalled research opportunities provided by the internationally renowned bench to bedside environment of the William Harvey Research Institute, together with the clinical opportunities and scale of Barts Health, to transform the NHS care of critically ill patients. This appointment will address a gap following Professor Hinds' retirement in intensive care research and will create new, and foster established, interdisciplinary collaborations with clinical and scientific colleagues throughout the University, as well as nationally and internationally.

COVID-19 has shone a light on the vital importance of intensive care research and the potential for innovative studies to influence the course of the pandemic. British researchers including Barts/William Harvey Academics have identified 7 areas of the genome that make people more susceptible to severe COVID-19 and three of these are potential drug targets. The UK has led the world in major trials such as RECOVERY where dexamethasone (a steroid) has been shown to save 1 in 8 of the most severely ill patients. These achievements highlight the quality of Critical Care Research that is possible in the UK and the importance of building a cadre of excellent academic intensivists to ensure we maintain the momentum established during COVID-19. We believe, therefore that this is the right moment to raise funds for this new Chair.

Professors Hinds and Caulfield would be delighted to meet potential donors in person. Meetings with other leaders and key individuals from Barts and QMUL can be arranged as required.

The history of intensive care at St Bartholomew's Hospital

Intensive care is a relatively new specialty which arose following a severe polio epidemic in 1952, at the Blegdam Hospital in Copenhagen, during which invasive, positive pressure mechanical ventilation was used for the first time to treat large numbers of polio victims (including many children) who were paralysed by the disease and unable to breathe adequately. In the 1960s Dr Tom Boulton established a “respiratory care unit” at St Bartholomew's Hospital in a side room of the cardiothoracic ward, while the adjacent side room became a post cardiac surgery intensive care unit.



These seven beds in the Queen Elizabeth II wing comprised the first intensive care unit at Barts until a new ten bed unit was officially opened in a converted ward of this wing in 1981. Charles Hinds (<https://www.qmul.ac.uk/whri/people/academic-staff/items/johnstonhindscharles.html>), who had trained at Barts was at this time appointed as Consultant and Senior Lecturer in Anaesthesia and Intensive Care, his remit being to develop the clinical service and the academic activity of the department.



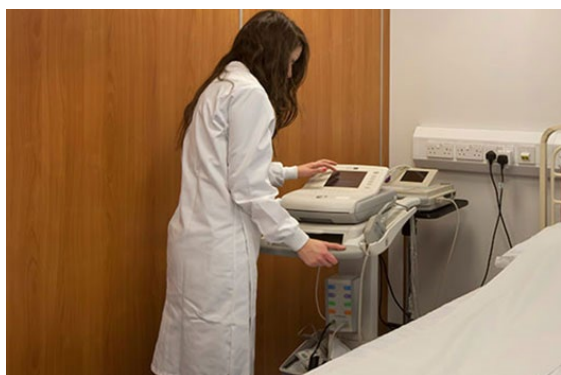
Over the ensuing years the department continued to expand and was influential in the development of intensive care as a specialty both nationally and internationally, as well as acquiring a worldwide reputation for excellence in research and education. In 2004 Charles Hinds was awarded a Personal Chair in Intensive Care Medicine in recognition of his academic achievements.

About Barts and the William Harvey Research Institute at Queen Mary

Barts Health is one of the largest NHS Trusts in the UK serving a richly diverse community in East London of 2.5 million people drawn from 97 Nations but extending to a population of 6 million for the Barts Heart Centre. Both St Bartholomew's Hospital and the Royal London have undergone major rebuilds in the last decade and the Trust was enlarged to include Newham General and Whipps Cross Hospitals, creating one of the largest NHS Trusts in the UK.

The William Harvey Research Institute was founded in 1986 on the Barts Charterhouse Square campus by the Nobel Laureate Sir John Vane FRS, who discovered how aspirin worked and identified prostacyclin (which is used to treat high blood pressure in the lung). Since 2002 the William Harvey has grown to be one of the largest research institutes in the UK dedicated to therapeutic innovation across three themes of cardiovascular, inflammation and endocrinology, and during this time has expanded from 140 to 530 clinicians and scientists. In the most recent Research Excellence Framework 90% of our research was rated as world-leading or internationally excellent. Within our Inflammation theme we have deliberately built a strong basic science and clinical academic base in Critical Care and Perioperative Medicine to enable leading edge research and clinical care.

This proposal benefits enormously from the combined strength of the William Harvey Research Institute at Queen Mary and state-of-the-art clinical facilities provided by the new hospital at Barts, opened in 2015, which is a "Centre of Excellence" for cardiac and cancer care. This ambitious development led to a dramatic increase in intensive care provision and there are now 56 critical care beds at Barts, divided into 4 units (3 on the first floor managing predominately cardiothoracic surgery patients; the specialised unit on the 6th floor admits severely ill, mostly medical patients with heart and/or lung failure, including some with cancer). This huge expansion included the recruitment of a group of intensive care consultants from the Royal Brompton Hospital, bringing particular expertise in managing patients with severe cardiac and respiratory failure, including the use of artificial heart/lung machines which oxygenate the blood outside the body and support the circulation (Extra-Corporeal Membrane Oxygenation – ECMO). In a normal year we treat 50-60 patients with ECMO.



Barts in numbers

Outpatients (2019):

More than 220,000 cardiothoracic surgery, cardiology and cancer outpatients were seen in 2019.

Hospital admissions (2019):

- More than:
- 40,000 cancer patients (many admissions for day case treatment)
 - 13,000 cardiology patients
 - 3,800 respiratory patients
 - 4000 patients underwent cardiothoracic surgery
 - 130,000 imaging procedures (CT scans, MRI scans etc.)

Intensive care activity (2019):

The first-floor units admitted around 2,500 patients (many short stay following cardiac surgery).

The sixth-floor unit admitted around 450 critically ill, long stay, mainly medical patients with severe respiratory or cardiac failure.

During the SARS-COV2 pandemic:

The Barts Health Trust includes 5 acute hospitals (Barts, the Royal London, Newham General, Whipps Cross and the Nightingale London) all of which were in the centre of the COVID-19 pandemic:

At 8am on 31st December 2020 across Barts Health hospitals the position was:

- 701 inpatients had laboratory confirmed Covid-19.
- Of those with confirmed Covid-19, 89 were newly diagnosed in the previous 24 hours.
- 146 patients with confirmed Covid-19 were being cared for in intensive care.

As of 5pm on 30th December 2020 at Barts Health hospitals the impact of the pandemic has been:

- 978 patients hospitalised with confirmed Covid-19 have sadly died.
- Over the course of the pandemic 6,145 inpatients hospitalised with confirmed Covid-19 have recovered and have been discharged.

During the first wave of the COVID pandemic the sixth-floor intensive care unit at St Bartholomew's Hospital was considerably expanded by utilising two adjacent wards. A total of 81 patients with severe respiratory failure were transferred for specialist treatment. Eighteen of these patients had extremely severe lung failure requiring ECMO and 78% survived to go home. Barts was one of 12 hospitals in England with significantly better than average 28 day risk-adjusted survival. In the second wave the unit again received and treated many COVID patients with severe respiratory failure; 15 required ECMO, 5 of whom have died.

Our Critical Care and Perioperative Research

Over the last four decades, under the leadership of Professor Hinds (now Professor Emeritus) the intensive care research group at St Bartholomew's Hospital Medical School, and later Barts and the London, Queen Mary has developed and expanded into a large, world class team of clinical academics, scientists, trial co-ordinators and research nurses (the "Critical Care and Peri-operative Medicine Research Group" – <https://www.qmul.ac.uk/ccpmg/>). Our Group aims to improve patient care through outstanding research and teaching in critical care and perioperative medicine, the overriding objective being the prevention and treatment of acute life-threatening (critical) illness due to severe infection, trauma, and major surgery. Members of this group have published in top journals, won prestigious awards and significantly advanced patient care (e.g. Hinds is one of the international leaders in the genomics of severe infection (sepsis), Pearse, an NIHR Professor, has published seminal work on global aspects of perioperative medicine, Ackland has held the British Oxygen Chair of the Royal College of Anaesthetists, Griffiths is an international leader in severe lung failure and ECMO and Thiemermann is an internationally renowned basic scientist who works on innovative therapies for shock and trauma). With the retirement of Prof Charles Hinds, we have identified a pressing need for an ambitious, world leading Intensive Care clinical academic to make a further step change in academic critical care research and patient care.

At St Bartholomew's Hospital the main focus of our research has always been to better understand and treat patients with severe infection, often called sepsis (in which failure of vital organs such as the lungs, heart and kidneys is caused by a dysregulated immune response to severe infection). This devastating condition is associated with a persistent, unacceptably high mortality of 25-30%, accounts for 5% of all deaths in England, is the commonest cause of admissions to medical intensive care units and is responsible for serious long-term sequelae at an annual cost to the NHS of £2billion. Why some people but not others develop sepsis and why some, but not others suffer serious long-term consequences remains unclear and no effective specific treatments are yet available.

In recent years, our research has focussed on investigating the influence of our genes on individual susceptibility to develop sepsis, its severity and the chances of dying (<https://ukccggains.com>). Importantly we were the first to report that the individual immune and metabolic "genomic" responses to sepsis fall into distinct patterns ("sub-phenotypes"), an observation subsequently confirmed by others. Sub-phenotypes based on clinical appearances have also been identified. These different groups of patients have been found to respond differently to treatments, suggesting that an individually targeted approach to treatment (so called "precision" or "personalised" medicine) has the potential to dramatically reduce sepsis related deaths and complications.

One of the most important organs to be damaged in sepsis is the lung, causing severe respiratory failure, a condition known as "acute respiratory distress syndrome" (ARDS). Again, there are no proven specific treatments for this potentially lethal respiratory complication of sepsis, the mortality of which remains as high as 40%, and sub-phenotypes of ARDS that respond differently to treatment have been identified. Colleagues who recently joined our group from the Brompton Hospital have a particular research interest in the causes, underlying mechanisms and treatment of ARDS, including the use of ECMO to support patients with the most severe form of this condition.

Relevance of our research in the time of COVID

The lethal consequences and long-term complications of sepsis and ARDS have been vividly highlighted by the current coronavirus pandemic. Mortality rates in susceptible individuals who develop a dysregulated immune response are high and a significant proportion of those infected develop “long COVID”, with severe weakness, fatigue, cognitive impairment and psychological difficulties. The most prominent feature of severe COVID requiring admission to intensive care is pneumonia with respiratory failure, low oxygen levels and, in the most serious cases ARDS. Many of these critically ill COVID patients also develop failure of other organs such as the heart and kidneys,

Our group, together with collaborators from across the UK have repurposed our research activities to investigate genetic influences on the individual responses to SARS-COV2, our main focus being to understand why a minority of those infected develop a severe life-threatening illness. Already a large consortium of UK investigators, including **Caulfield and Hinds** has identified variations in the genetic code that significantly increase the risk of developing severe COVID.

Genes could be key to new Covid-19 treatments, study finds - 14 December 2020

Potential treatments for Covid-19 have been identified after the discovery of five genes associated with the most severe form of the disease, in research involving Queen Mary academics.

Genes involved in two molecular processes - antiviral immunity and lung inflammation - were pinpointed. The breakthrough will help doctors understand how Covid-19 damages lungs at a molecular level.

Research involving Queen Mary researchers made the discovery by studying the DNA of 2,700 patients in 208 intensive care units (ICUs) in the UK. Working as part of the GenOMICC consortium – a global collaboration to study genetics in critical illness – the team compared the genetic information of Covid-19 patients in ICU with samples provided by healthy volunteers from other studies, such as UK Biobank, Generation Scotland and the 100,000 Genomes Project.

The team found key differences in five genes of the ICU patients compared with samples provided by healthy volunteers. The genes - IFNAR2, TYK2, OAS1, DPP9 and CCR2 – partially explain why some people become desperately sick with Covid-19, while others are not affected.

Having highlighted the genes, the team were then able to predict the effect of drug treatments on patients, because some genetic variants respond in a similar way to particular drugs. E.g. they showed that a reduction in the activity of the TYK2 gene protects against Covid-19. A class of anti-inflammatory drugs called JAK inhibitors, which includes the drug baricitinib, produces this effect.

They also discovered that a boost in the activity of the gene IFNAR2 is also likely to create protection, because it is likely to mimic the effect of treatment with interferon - proteins released by cells of the immune system to defend against viruses.

Co-author **Professor Sir Mark Caulfield**, Professor of Clinical Pharmacology at Queen Mary University of London and Chief Scientist for Genomics England, said: “This is an amazing result, revealing multiple gene regions linked to the biology of COVID-19 infection.”

<https://www.qmul.ac.uk/whri/latest-news/items/genes-could-be-key-to-new-covid-19-treatments-study-finds.html>

The Proposal to appoint a new international leader in Intensive Care

The retirement of Professor Charles Hinds leaves a gap in intensive care research. The proposed appointment will address this gap and will create new, and foster established, interdisciplinary collaborations with clinical and scientific colleagues throughout the University, as well as nationally and internationally.

We aim to raise funds to attract an internationally renowned researcher to a Professorial Chair of Intensive Care Medicine and need to generate a financial envelope that provides 5 years of funding. With external philanthropic donations we will be able to create a full time Clinical Academic post based at Barts Hospital and the William Harvey Research Institute, Queen Mary University of London. In addition, to attract a candidate of the highest calibre we need to fund essential academic and support staff, as well as initial capital expenditure to ensure they “hit the ground running”. At the end of five years Queen Mary University of London and Barts Health will take over funding, so this initiative will establish a durable legacy and a team of researchers who will continue to deliver world class intensive care research in one of the largest centres for Critical Care in the UK.

The vision for academic intensive care research and this post

The new Professor will build on the achievements of our research to date, and the unrivalled research opportunities provided by the internationally renowned bench to bedside environment of the William Harvey, together with the clinical opportunities and scale of Barts Health, to transform the NHS care of critically ill patients. This post will significantly increase the critical mass of research active members of the team, bring valuable additional resources, and further enhance the institution’s national and international profile. This initiative will transform our ability to use state of the art methodologies (including genomics) to develop and implement new, individually targeted treatments for sepsis, ARDS and multiple organ failure based on a greater understanding of biological mechanisms and individual variation in the host response. The ultimate objective is to substantially reduce the enormous global death toll from these conditions.

The proposed new appointment aligns well with the existing Queen Mary academics who specialise in large scale clinical trials, perioperative medicine, and data science, and will provide additional strength in an important new field of medical endeavour - human translational medicine.

Why is this imperative now?

COVID-19 has shone a light on the vital importance of respiratory intensive care research and the potential for innovative studies to influence the course of the pandemic, almost in real time. British researchers including Barts/William Harvey Academics have identified 7 areas of the genome that make people more susceptible to severe COVID-19 and three of these are potential drug targets. The UK has led the world in major trials such as RECOVERY where dexamethasone (a steroid) has been shown to save 1 in 8 of the most severely ill patients in intensive care. The development of an effective vaccine in record time (the Oxford-Astra Zeneca vaccine) is another UK success. These achievements highlight the quality of Critical Care Research that is possible in the UK and the importance of building a cadre of excellent academic intensivists to ensure we maintain the momentum established during COVID-19. We believe, therefore that this is the right moment to raise funds for this new Chair.

The Intensive Care Candidates

We will identify potential candidates with an established international reputation in the field of translational Intensive Care Medicine as evidenced by publications, presentations, grant funding, fellowships, awards and prizes, and senior leadership roles. Candidates will be expected to have experience as members of National/International committees, boards and working groups. They should be fully committed to undergraduate and postgraduate teaching, as well as education in the community and amongst the wider public.

The proposed research programme will emphasise the importance of patient and public involvement and improving the health of the local population in the East End and City of London. The research themes of potential candidates should be aligned with those of our group and with other academics in the institution. They should also be in keeping with the strategic objectives of the WHRI, the School of Medicine and Dentistry and Queen Mary University London.

This initiative has the full support of both the Medical School (Vice Principal for Health- Prof Steve Thornton) and the NHS Trust (Clinical Leads: Dr Simon Woldman and Dr Jeremy Cordingley), as well as the intensive care clinicians and those in leadership positions at Barts and the Royal London.

The vital funds we need to raise to make this appointment

Professor Hinds' retirement from clinical practice has released NHS money to fund 5 sessions for clinical work on the Intensive Care Unit at Barts. A further five academic sessions, together with support staff and some capital expenditure, are required to create a full time Professorial post, but in the current economic climate, exacerbated by COVID, Universities are not able to fund such initiatives. We are looking for support to fund the Chair for a period of five years as this is a realistic time period over which the future long-term sustainability of the post can be assured.

In summary:

Clinical Professor: £170,000 pa approx. x 5 years

Clinical Lecturer: £75,000 pa approx. x 5 years

Academic and professional support (e.g. Lab manager): £60,000 pa approx. x 5 years

Capital expenditure: £150,000

A Total Cost of £1,675,000

We will provide £484,000 over 5 years from the NHS to add to the package

We therefore need to raise: £240,000 pa approx. for 5 years = £1.2m

Professors Hinds and Caulfield, and the candidate would be delighted to meet potential donors in person. Meetings with other leaders and key individuals from Barts and QMUL can be arranged as required.

Donating

The William Harvey Research Foundation (WHRF) is delighted to be supporting this campaign. WHRF is a member of the Association of Medical Research Charities and, for over 30 years, has promoted and supported medical research at the William Harvey Research Institute and Barts Medical School. The funds raised and awarded in grants by WHRF very importantly supplement the mainstream funding avenues open to WHRI and Barts Health. Please visit our website for further information about WHRF: <https://www.williamharveyresearch.com/foundation/homepage>

Donations for this campaign will be made through WHRF, restricted entirely for this purpose. 100% of what is donated will be given for the campaign. There are no administrative expenses, since WHRF operational expenditure is covered by other sources.

You may donate by going onto the WHRF's campaign webpage and making a Paypal or card donation. Go to: <https://www.williamharveyresearch.com/contact-us/campaigns>

You may wish to find out more first and to discuss making a donation, in which case please contact Professor Charles Hinds: c.j.hinds@qmul.ac.uk

Donations may otherwise be received directly by bank transfer or by cheque, in both cases, please indicate clearly that the donation is for the 'ICM Chair'. For account details and/or an address, please email: development@whrf.org.uk

Appendix I: The history of St Bartholomew's Hospital



St Bartholomew's Hospital is the oldest hospital in the United Kingdom, having been founded, within the Priory of St Bartholomew, in 1123 by Rahere, an Augustinian monk who was formerly a courtier to Henry I. The Priory was closed during Henry VIII's dissolution of the monasteries in 1539 but, following a petition, King Henry granted the hospital to the City of London in 1546, and in 1547 endowed Barts with property to provide an income.

In 1609 William Harvey, who was the first to describe the circulation of the blood whilst at Barts, became physician in charge of the hospital where he remained for much of the rest of his life.



In 1822, Abernethy, one of many famous doctors to have worked at Barts, founded the Medical College of St Bartholomew's Hospital. The Hospital remained open throughout the World Wars, although during World War II many services were evacuated to Hertfordshire and Middlesex. In 1948 St Bartholomew's Hospital became part of the National Health Service.

In 1994 St Bartholomew's Hospital joined with the Royal London Hospital and the London Chest Hospital. In 1995, the Medical College merged with the London Hospital Medical College to create the Barts and the London School of Medicine and Dentistry, part of Queen Mary University of London.

St Bartholomew's Hospital is today the largest specialist cardiac centre in Europe (formed by integrating cardiac services from three hospitals), and is a major centre for specialist cancer care, as well as offering world class specialised respiratory, endocrine and other services. The hospital serves a population which includes some of the most deprived and ethnically diverse people in the country, as well as the large but mostly transient population of the City of London. Barts has one of the busiest heart attack centres in the UK.

In 2023, the hospital will celebrate its 900th anniversary.

Appendix II: The history of the Charterhouse Square campus

In 1371 a Carthusian monastery was founded by Walter de Manny on what is now the north side of the square. It was established near a 1348 plague pit, which formed the largest mass grave in London during the Black Death, where tens of thousands of bodies were buried. The Charterhouse was dissolved as a monastery in 1537, and in 1545 was purchased by Sir Edward (later Lord) North (c. 1496–1564) and transformed into a mansion house. Following North's death, the property was bought by Thomas Howard, 4th Duke of Norfolk, who was imprisoned there in 1570 after scheming to marry Mary, Queen of Scots. Later, Thomas Sutton, a civil servant and businessman, bought the Charterhouse, and on his death in 1611, endowed a hospital and school (almshouse) there, which opened in 1614, supporting 80 pensioners (known as 'brothers'). The boys' school coexisted with the home for pensioners until 1872 when Charterhouse School moved to Godalming in Surrey. Following this, the Merchant Taylors' School occupied the buildings until 1933.

Today, The Charterhouse is mostly formed of Tudor and Stuart buildings, restored after the London Blitz. The complex includes a Chapel, Tudor Great Hall, Great Chamber, and a 40-resident almshouse.

The Charterhouse Square campus of Queen Mary University of London occupies new buildings and some of the former school buildings. It comprises student accommodation and departments of Barts and The London School of Medicine and Dentistry: namely the William Harvey Research Institute (<https://www.qmul.ac.uk/whri>), the Barts Cancer Institute and the Wolfson Institute of Preventive Medicine.

