

# RCPE Symposium – Diagnostic medicine – from stethoscope to artificial intelligence

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The Diagnostic medicine symposium was held on Thursday 19 September 2019 at the Royal College of Physicians of Edinburgh

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## Introduction

In the early 1800s, the invention of the stethoscope heralded a new era in diagnostics. Since then, a plethora of diagnostic technologies has been introduced and diagnostic reasoning has become a science and skill in itself.

This symposium brought together clinicians from a breadth of specialties and from around the world to consider the lessons of the past, the challenges of the present and the promises of the future of clinical diagnostic medicine.<sup>1</sup>

## Session 1: The rise and rise of physical diagnosis

Dr Andrew Flapan (Royal Infirmary of Edinburgh) opened the session by tracing the evolution of the stethoscope back to Laennec's original invention of 1816 – a long, rolled paper tube to transmit the sound from the patient's chest to his ear.<sup>2</sup> Dr Flapan reminded the audience that, even in today's era of modern medicine, immense satisfaction can still be obtained by identifying clinical signs and by honing skills in their recognition.

Dr Louella Vaughan (Nuffield Trust, London) reflected on the meaning of diagnosis – 'to know thoroughly' or to 'discern' – and considered how our knowledge and understanding of disease has been influenced over time.

Dr Pauline Wilson (Gilbert Bain Hospital, Lerwick) shared her experiences as a general physician in a small, remote island hospital, 200 miles by sea/air from the nearest tertiary centre. She highlighted the unique way of working amidst a world of increasing specialisation and technological advances. Faced with geographical challenges, remote and rural clinicians rely heavily on clinical acumen and diagnostic

reasoning and must ensure that tests are carried out only for the appropriate reason.

## Session 2: Thinking about medicine

In Session 2, Dr Laura Zwaan (Erasmus Medical Centre, Netherlands) explored the complexity of the diagnostic reasoning process, highlighting how cognitive bias can cause diagnostic errors but may not be recognised in real-time clinical practice. She highlighted the importance of clinical knowledge and practice to inform our 'fast thinking'.

The George Alexander Gibson Lecture was delivered by Professor Abraham Verghese (Stanford University, USA). His central message was that, in a world of rapidly advancing medicine, the timeless constant is the concept of caring, as captured in Fildes' painting, 'The Doctor'. The talk focused on the art of medicine, emphasising the value of physical examination not only in making a diagnosis but also in strengthening the doctor–patient relationship.

## Session 3: Diagnostics in the 21st century and beyond – perils and promise

Session 3 opened with Dr Rosaleen Baruah (Western General Hospital, Edinburgh) championing the point of care ultrasound. She spoke about its value as a bedside diagnostic tool, particularly in intensive care and the emergency department setting, to help reduce diagnostic uncertainty around life-threatening diagnoses.<sup>3</sup> She also highlighted the importance of using it in a robust governance framework.

Dr Brian Garibaldi (John Hopkins University, USA) spoke about strategies to reinvigorate the physical examination. These included teaching the physical examination using an evidence-based approach to increase its value and efficiency,

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and creating opportunities during rounds for intentional practice by junior doctors.<sup>4</sup>

Professor Joanna Wardlaw CBE (University of Edinburgh) emphasised the importance of using imaging methods as an adjunct to address specific diagnostic questions rather than as a replacement for history taking, examination and clinical judgement. She also reminded us that each radiological advancement brings risk. As an example, she discussed how the increasing reliance on MRI in the diagnosis and management of stroke can at times mislead.

#### Session 4: Looking into the future

Mr Iain Hennessey (Alder Hey Children's NHS Trust, Liverpool) guided the audience through different types of artificial intelligence, demonstrating how an innovative app uses the latest digital and cognitive advances to improve children's experiences in hospital.<sup>5</sup>

Dr Orla O'Sullivan (Teagasc Food Research Centre, Ireland) presented research on the microbiome, explaining what it can predict, its relationship with exercise and fitness, and the importance of it being diverse.

#### Take home message

The day guided us from the origins of the stethoscope, through tried and tested methods of diagnosis, to the present day and future horizons.

All of the speakers provided stimulating presentations and, despite the diversity of topics presented, a common message emerged: the future may herald more technology, such as artificial intelligence, but it seems certain that human input will remain essential, with the bedside experience and doctor–patient relationship remaining resolutely at the centre of the diagnostic process.

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