R.A.F. Halton Renal Unit

Sir Ralph and Joe at the 25th Anniversary celebration

Early dialysis in the RAF Renal Unit at Princess Mary's RAF Hospital Halton.

Many wounded Serviceman, initially saved by the greatly improved surgical and sterile techniques developed during World War ll were only to die subsequently from renal failure. The need for an artificial kidney was given great priority by Service Chiefs in the RAF, who were much impressed by

the results of dialysis on casualties in the Korean War (1950 – 1953). Major Paul Teschan had treated the first battle casualties with acute renal failure (ARF) in this conflict where a reported 1 in 200 of all seriously injured casualties who survived the first 48 hours developed ARF. Using the Rotating drum, mortality fell from over 90% to approximately 60%.

It was this demonstration of the utility of the artificial kidney in survival of ARF following trauma that stimulated the appointment of Ralph Jackson to set up a renal failure unit to support the British Forces around the World.

1956 therefore, saw the founding of the Royal Air Force Renal Unit by Group Captain (later Air Vice - Marshal Sir) Ralph Jackson at Princess Mary's Royal Air Force Hospital Halton. It was the first to have the Kolff Twin Coil Dialysis machine in the United Kingdom and was only the second such specialised kidney unit to be built in the UK. The Kolff Twin Coil machine had the advantage of being the lightest and most easily adaptable for transportation, and so most suitable for the Royal Air Force Renal Unit's aim to have the unique feature of mobility. The philosophy behind this mobile unit was simple: many patients who require kidney dialysis are too ill to be moved to specialised units, therefore the Royal Air Force Renal Unit moves to them. Flexible air and road transport allowed deployment of a mobile dialysis team plus equipment the length and breadth of the United Kingdom and as far afield as Hong Kong, Belize, Nairobi and The Falkland Islands. The facility was to be used not only for servicemen, but also to support patients with ARF and multiple organ failure in the NHS.

Amongst the many visitors from around the world to the new unit was Professor Robson from the University of Edinburgh who strongly recommended that the Kolff Twin Coil be adopted as the machine of choice.

Jackson had been helped and supported in setting up the unit at Halton by Dr A.M. (Joe) Joekes, who had been appointed Civil Consultant in kidney disease to the RAF. His experience at the Hammersmith Hospital in the early post war days with Professor Bywaters in the treatment of ARF was to prove invaluable.

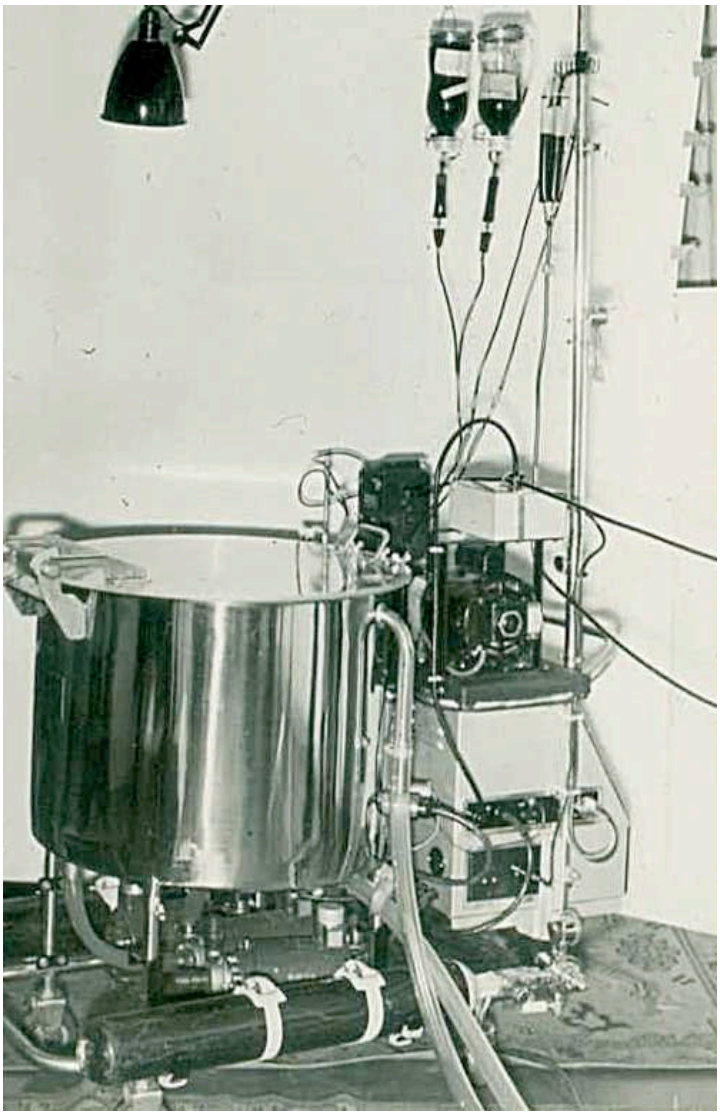
Jackson's enthusiasm and constant improvements to the systems became legendary and clinicians visited from all over the world to learn from him and his team. The original machine was improved by the RAF technical unit to provide better electronic monitoring and more efficient blood pumping.

His initial experiences with the Twin Coil were presented at the Royal Society of Medicine in 1958 and his success published in the British Medical Journal in 1960, 50% of those with trauma and ARF survived.

In the British Medical Journal in 1962, together with Professor Woodruff, who was the Wellcome Professor of Clinical Tropical Medicine at the University of London, Ralph Jackson published a ground breaking paper entitled "The artificial kidney in malaria and blackwater fever".

This described the first ever use of the artificial kidney to treat renal failure associated with malaria and represented a landmark in clinical practice.

By the early 1960s new developments in dialysis meant that patients with chronic renal failure could be treated on a long term basis. So in the later 1960's there began the second phase of the unit's history with the introduction of a chronic dialysis programme. At the same time kidney biopsy techniques were developed that allowed a small piece of tissue to be removed safely and simply. The practice had been pioneered in the UK by Dr Joekes, the RAF Civil Consultant. Investigation of kidney disease therefore became more sophisticated and the emphasis of the unit branched further into prevention and the development of treatments. Further advances saw the installation of a powerful electron microscope at the RAF Institute of Pathology &Tropical Medicine in the early 1970s completing the renal investigation facilities at Princess Mary's Royal Air Force Hospital Halton.



The RAF modified Kolff Twin Coil in action.

Although the first renal transplant from Halton was carried out at St Mary's Hospital in London, a strong liaison was developed with Sir Roy Calne and Dr David Evans at Addenbroke's in Cambridge. Until the closure of the Halton Unit, this continued and all transplants were carried out on Halton's behalf by their outstanding team.

Many well known physicians were trained in the unit over the years. As Jackson moved on to become The Senior RAF Consultant, Wing Commander

CT (Tom) Flynn took command and brought many new techniques to the unit. He had spent some time in Jervis Street Dublin and learned to create his own Brescia-Cimino fistulae in addition to inserting all his own shunts. The “Flynn” shunt continued to be used for many years and vascular access surgery remained the domain of renal physicians until the unit finally closed. He also improved survival in ARF by using frequent dialysis to allow more rigorous intravenous feeding. He moved on to Des Moines Iowa to run the renal unit there after he left the RAF, where he gained great prominence by the innovative use of insulin in the dialysate to control the blood sugar in diabetics treated with chronic peritoneal dialysis.

Squadron Leader (later Air Commodore) David Rainford took over from Tom and took the nutrition work forward by introducing a more balanced parenteral feeding regime as new products had become available. The unit was using intravenous low dose insulin at a dose of 1-2 units per hour to cover glucose infusions for several years prior to the techniques “discovery” and implementation in the management of diabetes with hyperglycaemia. With GI bleeding being a common cause of mortality in hypercatabolic ARF, the first ever intravenous cimetidine was used in treatment and subsequently prevention for this high mortality group.

Among Rainford’s senior registrars were: Charles Pusey, later to become Professor of Medicine at The Hammersmith , Lionel Bloodworth - Renal Physician at Bangor, Ed Peile - Professor of Education at Warwick, John Arm - Professor at Harvard and Paul Stevens- Director of the Kent Kidney Care Centre. Each contributed enormously to the development of renal care at Halton through their innovative ideas and enthusiastic dedication.

In 1986 a new acute renal intensive care unit was opened which was named “The Sir Ralph Jackson Unit”. The unit specialised in the severest of cases, especially those with multiple organ failure.

Following the government’s Defence Costs Study, in 1995 the unit finally closed its doors with the reorganisation of Defence Medicine and closure of all service hospitals. The chronic renal failure programme transferred to

Oxford and haemofiltration techniques (pioneered by Paul Stevens) were to be used to transfer the sick from overseas to NHS units in the UK. After nearly 40 years, the story comes to an end. After 23 years at Halton, Air Commodore Rainford went on to become Defence Postgraduate Medical Dean and retired as Chief Executive of the Defence Secondary Care Agency.