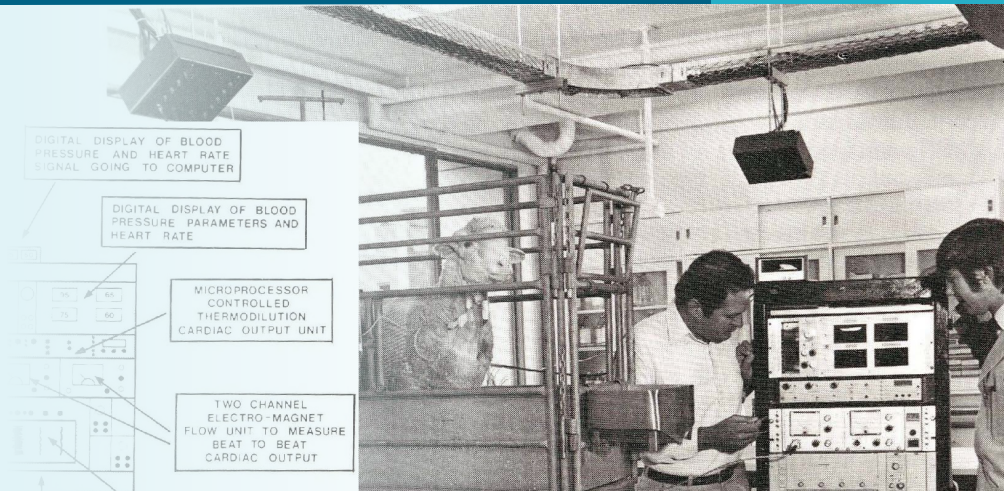




Better health through body chemistry

Disturbances in body chemistry commonly develop during many forms of illness and following surgery. If left untreated they can lead to death. NHMRC-funded researchers at the University of Melbourne and The Florey Institute made major contributions to understanding how body chemistry is regulated and to introducing practical methods for measuring and managing these processes in patients. This work laid the foundations of modern intensive care and underpinned the development of widely used medicines for hypertension, heart and kidney disease.



Origin

Before intensive care units (ICUs) were first established, little was known about how body chemistry affected patient health and disease. Training for hospital clinicians didn't include much instruction, some existing instruction was based upon incorrect understandings, and clinicians were not able to make fast accurate measurements.

Improved understanding of body chemistry and its regulation was needed if health outcomes were to be improved.



Investment

Over several decades, NHMRC funded a team of researchers, at the University of Melbourne and then the Florey Institute, to advance knowledge in the area of body chemistry. This team included Derek Denton, Victor Wynn, Roy Wright, Judith Whitworth, John Coghlan and Bruce Scoggins.

Their research was also supported by grants from the US National Institutes of Health, the Myer, Packer, Kleberg and Rothschild families, the Ian Potter Foundation and the Rockefeller Foundation.



Research

The team developed a method for rapidly measuring blood chemistry, and pioneered its use as part of clinical practice. This approach replaced delayed and uncertain diagnosis with immediate, effective and evidence-based treatment.

Their work expanded into physiological research and led to major advances in understanding of the renin-angiotensin-aldosterone system (RAAS), clarifying how the body regulates blood pressure and fluid balance and the chemical relay that connects this with the brain and cravings for salt.



Translation

Wynn moved to the UK and established one of the first hospital-based metabolic units. He also contributed to a widely read US-published textbook on metabolic medicine.

The Florey team's research on salt and hypertension informed public health policies internationally, advocating for population-level reduction in dietary salt.

Their discoveries related to the RAAS enabled development of new pharmaceuticals (ACEIs and ARBs), which lower blood pressure and protect kidney function.

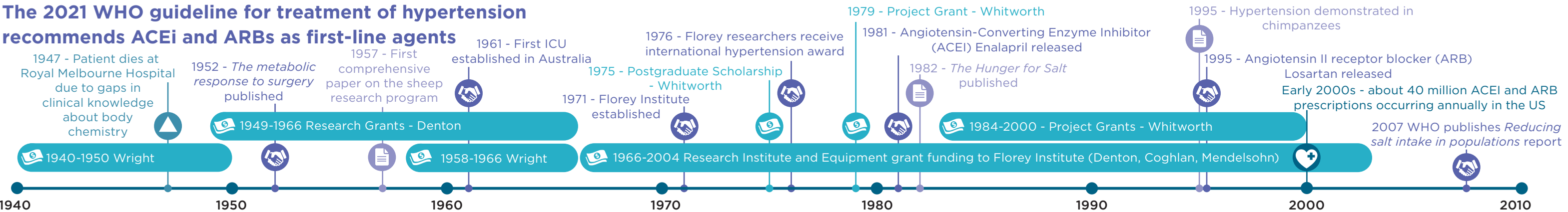


Impact

Managing electrolyte balance is now a continuous, high-volume component of ICU work that directly impacts nearly every critical care patient.

Worldwide, in 2024, approximately 630 million adults with hypertension were receiving some form of treatment, and ACEIs and ARBs are recommended by the World Health Organisation (WHO) as first-line agents. ACEIs produce a 10% reduction in all-cause mortality and reduce risk of end-stage renal disease by 20-25%.

The 2021 WHO guideline for treatment of hypertension recommends ACEi and ARBs as first-line agents



Researchers

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