

## The contribution to nephrology of Professor Josef Erben (1926 - 2015)

Josef Erben

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### ABSTRACT

Professor Josef Erben, MD, DSc. died on May 24, 2015 in Hradec Králové, Czech Republic. He was one of the most outstanding Czechoslovak medical personalities who lived in the 20<sup>th</sup> and at the beginning of the 21<sup>st</sup> century. His work significantly influenced the development of general internal medicine and clinical nephrology, especially renal replacement therapy and kidney transplantation. He finished his medical studies at the Medical School of Charles University in Hradec Králové in 1951. From 1956 to 1993 he worked at the 1<sup>st</sup> Internal Clinic in Hradec Králové. From 1990 to 1993 he was the Head of this Clinic. Professor Erben's principal contributions were at the national level: 1) He was a founder of regular dialysis treatment of chronic renal failure in Czechoslovakia; 2) He designed the project and production of the Hradec hemodialysis system; and at the international level: 3) Using the Subclavian vein, as vascular access for hemodialysis; 4) The development of a hemodialysis coil of Czechoslovak production of the Chiradis type for hemodialysis.

**KEYWORDS:** clinical nephrologist, dialysis; subclavian vein catheterization; simultaneous hemodialysis system, scientist and organizer

## The life of Josef Erben

Josef Erben was born on May 24, 1926 in Nova Paka, Czechoslovakia, and he died on May 24, 2015 in Hradec Králové, Czech Republic (Figure 1). He completed his medical study at the Medical School of Charles University in Hradec Králové in 1951. After the graduation he began to work at the Hospital in Nova Paka until 1956. From 1956 to 1993 he worked at the 1st Internal Clinic of the Faculty Hospital in Hradec Králové. At first he was an internist charged for the development of nephrology, from 1961 he was the Deputy Head of the Clinic, and from 1990 to 1993 he was the Head of this Clinic. Professor Erben defended his academic title “Doctor of Medical Sciences” (DSc) in 1982 on the thesis of “Residual renal function in chronic renal insufficiency during regular dialysis treatment”. He became Associate Professor in 1990, 25 years after the defense of his habilitation thesis because of his past political positions in 1968. In 1991 he was appointed as the full professor of Internal Medicine.

Figure 1



Professor Josef Erben, MD, DSc.

In 1958 he performed the first hemodialysis in Hradec Králové, which was the second in the former Czechoslovakia. The first clinical kidney transplantation in Czechoslovakia was carried out with a team of physicians together with Professor Erben on November 29, 1961 in Hradec Králové. Coincidentally, it was in the 16-year old girl from Košice, after removal of the right kidney for stones in the presence of a non-functional left kidney. The donor was her mother.

At the initiative of Professor Jan Brod MD, DSc., the Head of the “Institute of Cardiovascular Research” in Prague, Professor Erben completed a one-year internship at the “Cleveland Clinic Foundation” in the United States. He worked at the Department of Artificial Organs of Professor William J. Kolff, the “father of artificial kidney”, in 1966 (Figure 2). Here he was exposed to the problems of regular dialysis treatment and kidney transplantation.

**Figure 2**



**Professor Erben at the "Cleveland Clinic Foundation" in the United States, at the Department of Artificial Organs of Professor William J. Kolff. Professor Erben is at the dialysis device and Professor Kolff at the patient's bed.**

After completing the Examinations for Educational Council for Foreign Medical Graduates (ECFMG), he was also allowed to work at the bedside of dialysed and transplanted patients. He also worked in the "emergency rooms" where patients were admitted for hemodialysis or for evaluation for kidney transplantation in the State of Ohio.

After one year he returned to Czechoslovakia. Under his leadership a project was created as "Hradec simultaneous hemodialysis system (HSHS)" with central distribution of dialysis solution and with the central control units of 6 monitors, which allowed for the simultaneous hemodialysis of 6 patients (1st contribution of Professor Erben) (1). Professor Erben was involved into research on using his own method of determination the active dialysis area using the Berlin blue (2). Together with J. Macek, MD, they developed a hemodialyzer coil of Czechoslovak production of the Chiradis type (3). The coil was inserted into the metal cylinder with an active recirculation of the dialysate using an electric pump (Figure 3). Hydrostatic pressure was used for the distribution of dialysis solution to each dialyzer using the elevation of two 300-liter reservoirs of dialysis solution above the level of dialysis beds. Hradec simultaneous hemodialysis system was successfully used in many dialysis facilities in Czechoslovakia and abroad (Hungary and German Democratic Republic). At the 1st and later at the IV<sup>th</sup> Internal Clinic of the Faculty Hospital in Košice HSHS was used from 1972 to 1990. Professor Erben was a founder of regular dialysis treatment of chronic renal failure in Czechoslovakia. His proposal for this treatment was accepted by the Advisory council of the Ministry of Health in 1967. It was not easy to introduce this concept into practice, because it was a financially demanding program.

**Figure 3**



**Coil kidney of Hradec Králové type. From left side: finger pump, coil dialyzer of the Chiradis type; recirculation reservoir for coil dialyzer with a pump to recirculate the dialysate.**

In 1969 at the VIth EDTA Congress in Stockholm Professor Erben lectured about using the Subclavian vein for vascular access in hemodialysis therapy, first in the world. Catheterization of the subclavian vein was performed by the Seldinger technique (4, 5). This world contribution of Professor Erben was recognized by Professor Scribner at the EDTA Congress in Madrid, 1990. He was awarded many honors, the most important being the award of the State Prize for contribution in the field of kidney transplantation in 1979. From 1980 to 1990 he served as an expert consultant to the Ministry of Health for Nephrology. Professor Erben published more than 260 scientific papers, including 48 in international journals. He was the author of 13 scientific patents, in five as the first author. He organized The First National Nephrology Conference in Hradec Králové, 1969.

Professor Erben became the undisputed leader of Czechoslovak clinical nephrology.

### **Summary**

Professor Erben was a founder of regular dialysis treatment for chronic renal failure in Czechoslovakia. A contribution of Professor Erben to international nephrology was using the subclavian vein for vascular access in hemodialysis (1969). The scientific and research work that Professor Erben performed during his active life will remain the stimulus of the contributions of the next generation of nephrologists. His impact on the field of nephrology in Czechoslovakia was manifold. It included his work in clinical nephrology, his teaching activities, and last but not least his excellent organizing and research abilities. He left a historical impact in the international medical and scientific community.

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