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*Editorial review*

## Past, Present and Future of Nephrology

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*The aim of science is not to open a gate to endless wisdom, but to put a limit to endless error.  
[Berthold Brecht: Life of Galilei]*

The rapid proliferation of medical science since the last world war naturally resulted in its division into specialties and subspecialties. Nephrology was a rather late branch of this 'tree of knowledge'. Pioneers like Jan Borst from Amsterdam and Robert Platt from Manchester did not accept the term nephrologist. The latter preferred to be a 'nephrophile' (friend of the kidney). This was in the line of Starling, who once characterised the kidney as 'an organ almost endowed with intelligence'. What these and other 'founding fathers' had in common was their fascination by the kidney's regulatory functions. An important concept of Borst was, that hypertension is the result of a deranged kidney function [1]. This concept was later extended by the brilliant physiologist Arthur Guyton, who was for some reason never popular at nephrological meetings.

With the first international congress of nephrology in Evian (1959), stimulated by Jean Hamburger of Paris, nephrology had come of age, and today there are dozens of nephrological journals all over the world, one being the present BANTAO journal. The Evian congress also witnessed the presentation of two patients with terminal renal insufficiency who had been kept in good health by intermittent haemodialysis treatment. In retrospect it seems odd, that this revolutionary concept of Belding Scribner, that would soon save thousands of lives, was not greeted with enthusiasm by the nephrologists. They feared that the psychological burden would be too heavy, but particularly that the financial burden would be prohibitive. However it appeared that high costs are an incentive for development. Without interest of the industry, dialysis treatment would not have boomed as it did. But at the same time, intense commercial interest heralded a new era, where profit seems to be the aim of all human effort, including medicine. One of the consequences is that cheap treatments and simple, logical principles are being neglected.

With some exaggeration it might be said that the advent of chronic dialysis also marked a downward trend of nephrological science. Eating from the tree of knowledge can be hazardous. In this case, the serpent was the commerce, the apple easy gains. It is beyond the scope of this editorial to analyze the complicated interactions of commercialisation, mass psychology, fashion and indolence. Thus I only will mention here some striking examples of 'scientific' aberrations that are verging on sheer madness.

When the euphoria after the first years of dialysis treatment was over, it became evident that the results of this life-

saving method lagged far behind expectation. In the US, a National Cooperative Dialysis Study introduced concept of the 'Urea kinetic modeling'. Gotch and Sargent [2] subsequently proposed the famous KT/V formula, in which the 'dialysance' of the apparatus during the week is related to the 'urea distribution volume', a scholarly sounding term, which for convenience is usually replaced by body mass.

It is amazing how this simplistic concept conquered the dialysis world as if it was a new evangelic. In this 'mechanistic analysis', the KT/V was promoted to 'a rigorous statistical tool, further detracting the physician's attention from sound judgement' [3]. It is based on two basically wrong ideas: The first is that urea is an adequate substitute for uremic toxicity, while it is only a marker. But the second even worse error is the implicit assumption that the only task of the kidney is to remove toxic products. However, control of the body fluid volumes is not only an essential task of the kidney, it is also evidently related to circulation and blood pressure and thus to cardiac morbidity [4]. While good volume control is not easy to assess, blood pressure is routinely measured in all dialysis centers. Yet, for reasons I can only guess, no opinion leader has incorporated blood pressure into the 'adequacy' concept. A curious idiomatic usage: 'dialysis dose', has become accepted, as if dialysis treatment is a drug, of which one only needs to know how much has to be 'administered'.

Admittedly, the promotion of KT/V has put an end to the detrimental tendency towards ever shorter dialysis sessions. But increasing KT/V beyond a certain value does not improve the outcome. The reason is that without restriction of salt consumption, dialysis patients will remain 'volume expanded'. If a patient gains 3 to 5 Kg body weight between 2 sessions, this means an excess of 3 to 5 liters extracellular fluid and a proportionate excess of blood volume. It is not amazing that it is virtually impossible to remove this amount within the short dialysis period. But even if this were achieved, the mean volume during the week would remain above normal. As a result, blood pressure will be elevated and as long as the cause (overhydration) is not corrected, antihypertensive drugs will often be ineffective. However some authors who are not aware of these logical principles have used the number of (ineffective) drugs consumed as a measure of the 'severity' of the hypertension, thus blaming the patient for their own ineffectiveness.

All this means that a doctor treating dialysis patients should not be a nephrologist, but a 'metanephrologist', that is

someone with knowledge of salt and water homeostasis and its relation to the heart.

The fact that many doctors in charge of dialysis units are not aware of these well known physiologic principles has led to strange aberrations. A group of Dutch nephrologists has started investigation how to contain the excessive thirst of dialysis patients. Disregarding the evident reason, salt consumption, they try to decrease drinking by saliva supplements and chewing gum (!)

The consequences of all this are serious. Dialysis units are threatened to become rinsing factories. The fact that in the USA spontaneous discontinuation of dialysis (hidden suicide) is among the main causes of death should alarm us. Of course the human factor is also being neglected. Dialysis treatment is no longer a continuing engagement between doctor and patient 'for better and worse'. Time to communicate with the patient is an increasingly scarce commodity.

What will be the future? A change in intellectual, social and moral attitude is not easy to achieve. Predicting the future is notoriously hazardous. But shaping the future lies in our own hands. Gabriel Richet once wrote: 'Moving away from

physiology sooner or later results in intellectual suicide'. There is too much intellect and common sense in the nephrological community for this to happen.

*Therefore I am optimistic. It only can become better!*

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