Critical Care Nephrology: From the Original Vision to Today's Reality

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In 2025 Professor Rinaldo Bellomo, the most representative figure in the history and development of the discipline of Critical Care Nephrology, passed away. Of Italian origin, Rinaldo Bellomo moved to Australia in 1980 where eventually became director of intensive care at Austin and repatriation medical center, in Melbourne, and foundation chair of the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS-CTG). Besides the numerous achievements and awards, Rinaldo was a man of incredible curiosity, extremely sensible to all aspects of human culture. He cultivated history, politics and philosophy trying to learn from the contact with different cultures, colleagues and disciplines.

One day in the early 90's he entered unexpected my small office in Vicenza and candidly told: "Dr. Ronco I want to learn from you about continuous therapies". Since then, we spent hours together in Vicenza, Pittsburgh, and Melbourne discussing about science, research, and philosophy, and we published the very first editorial on our vision on the multidisciplinary approach to acute kidney injury in the critically ill patient.[1] Together we pioneered critical care nephrology as a discipline and we described our vision for the future development of this area of medicine.

In our editorial we described many problems affecting the limited interaction between critical care and nephrology. However, we clearly stated why the times for a more intense collaboration were mature. The two previous decades had seen major changes in the practice of medicine, with the establishment of intensive care medicine as a structured discipline. Its evolution also produced major implications for clinical nephrology with advances in the understanding of pathophysiology and management of severe acute renal failure (ARF).

In our mind, it was clear that management of this type of disorder demanded knowledge and application of new technologies and skills that were not part of standard training in intensive care medicine nor in nephrology. Such expertise could only come from a multidisciplinary approach in which nephrologist and intensivist were willing to work side by side to achieve optimal care for the critically ill patient. In other words: "The formal development of a specialty area called *Critical Care Nephrology* was something whose time had come". Our vision was certainly ahead of times, however; while this topic was certainly spurred by the emergent role of continuous renal replacement therapies,[2] several obstacles and problems appeared immediately evident underlining the reasons for delays in the implementation of the visionary plan.

First of all, postgraduate medical training was historically specialty-oriented leading to an adversarial "us and them" mentality. Specialists were consulted for organ-specific problems while a patient's global view was never really implemented. This approach often resulted in inadequate communication with relatives and inappropriate therapeutic strategies. Physicians had often a sort of antagonism rather than a true cooperation. The intensivists were often unresponsive to sound advice by the nephrologists, while the latter often reached the intensive care unit too late for an effective and useful consultation. The clash of these cultures has significantly impeded the development of a combined strategy in the management of patients with ARF.

Another reason for a clash instead of cooperation was the desire to "control" the patient in the system, seeking an increased perception of the importance of this or that specialty and relevant

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services in the hospital. Financial issues and budget requirements were also frequent reasons to make units and specialties one against the other. This of course had implications on resource allocation and personnel assignment. The question about control and reimbursement for procedures or extracorporeal therapies was also at the base of the eternal discussion in those times between continuous and intermittent renal replacement therapies, especially in regions and countries were a "fee for service" policy was in place.

Professor Bellomo and myself wanted to disrupt the inertia and the immobilism due to the above-mentioned reasons and we strongly advocated a closer cooperation between intensive care and nephrology. We clearly stated that this new deal was definitely needed and ultimately inevitable. To corroborate this vision, it became progressively clear that acute renal failure was part of a more complex syndrome with significant organ interactions. Thus, the participation of different specialists to the decision process about diagnosis and treatment was considered almost mandatory. To make a practical step forward we decided to apply what later was called the "Vicenza model":[3] a practical approach to the critically ill patients were different specialists were called at the bedside of the patient for a collegial discussion and a shared management strategy. The nephrologist was going to ICU several times a day even without request, while the intensivist was actively participating in the nephrological and dialytic procedures. Starting from this experience we founded a consensus group called ADQI (Acute Dialysis Quality Initiative) that utilized the achieved results to establish recommendations and to pursue a thorough research agenda.[4-6] Results became soon evident while outcomes of critical kidney patients definitely improved.[7] Based on this, prof. Bellomo and myself suggested a sort of pathway for Critical care Nephrology implementation in various continents and facilities:

All nephrology fellows who intend to be involved in the care of acute renal failure should spend at least a year in an intensive care fellowship program.

1. All critical care medicine fellows who intend to take an active role in the management of acute renal failure should spend at least a year in a nephrology fellowship.
2. It is desirable, in large institutions, for one or some individuals to have completed a full fellowship in both specialties.
3. A tertiary institution should have a 'task force' allocated to the combined management of ARF and to the development of a research program dealing with multiple aspects of this condition.
4. An integrated critical care nephrology training program should be made available in large institutions for those who wish to pursue an academic
5. Specific courses and educational events should be planned with dedicated faculty and scientific agenda (clear reference was made to the conferences in San Diego, Melbourne and Vicenza).
6. The intense effort in this direction even resulted in multiple editions of a huge textbook entitled "Critical care Nephrology".[8]

Our original vision has become today a reality. Universities, hospitals and scientific societies have taken into consideration these recommendations and have structured curricula and courses for training and implementation of Critical Care Nephrology programs even utilizing the new possibilities offered by artificial intelligence.[9] Postgraduate training in intensive care and nephrology include collaborative courses and events aiming at a true collegial management of the patients with acute kidney injury (in the past defined as acute renal failure) and related syndromes including cardiorenal syndrome, hepatorenal syndrome etc.[10]

This is the legacy of professor Rinaldo Bellomo, a scientist, a great physician and a friend. The vision of more than thirty years ago has become a reality. All young fellows and investigators in the field of Critical Care Nephrology should be aware of the contribution of Rinaldo to this field. He has populated the journals and books with his articles, studies and wisdom: a legacy that cannot be forgotten in the years to come.

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