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### Resolved: The case for CKD clinics

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## Resolved: The Case for CKD Clinics

The title of this issue of *Advances in Chronic Kidney Disease* by Guest Editors Davis, Jalal, Weis-Malone, and Zuber is self-explanatory. The tenet is that a nephrology group will derive “more” from initiating a successful interdisciplinary CKD clinic than if it does not. To prove this hypothesis has been a vexing issue and an enraging debate. Part of the problem is that the “more” has been solely interpreted on a cost basis. The cost of establishing an interdisciplinary CKD clinic was generally considered higher than any revenue that could be generated by the clinic, thereby establishing it as a losing proposition. The notion that the clinic could provide cost savings by improving the quality of CKD care was not an “easy sell” to administrative and financial powers, which chafed at the idea of delayed gratification. Consequently, many CKD clinics were designed, but far fewer were implemented because of the polemic of profitlessness.

The concept of the CKD clinic is not a new one.<sup>1</sup> However, what is the definition of a CKD clinic? There is no accepted, universal definition. So, in a sense, a CKD clinic is self-defined, but there are commonalities in concept among the various models that have been heretofore described.<sup>2,3</sup> The Joint Commission has defined an Advanced Chronic Kidney Disease Certification process for CKD clinics and designated critical elements for sustained operational success in improving outcomes.<sup>4</sup> To achieve certification, an interdisciplinary clinic must possess the characteristics listed in [Table 1](#).

All these clinics were conceptualized as vehicles of improved and more efficient care that produced higher levels of quality than had been previously demonstrated. The clinics would embody multiple components considered essential to enhanced care delivery. In interdisciplinary fashion (nee multidisciplinary), these components could more rapidly respond to changes in patient conditions and provide corrective measures. The components of the CKD clinic could include a social worker, pharmacist, an advanced practitioner (AP), renal nutritionist, and nephrologist, with the patient at the nexus of care. A psychologist, physiotherapist, and chiroprapist could also fill valuable roles but likely on an as-needed basis ([Fig 1](#)). Implemented and executed successfully, all combinations would improve wellness in CKD patients. Care would be primarily provided by an AP, in lockstep with a nephrologist-

collaborator.<sup>5,6</sup> Utilization of APs in CKD clinics would liberate nephrologists to engage in other time-intensive functions, which is much needed given the ongoing workforce issues in US nephrology.<sup>7</sup> In addition, APs could provide a welcome and smoother transition toward end-stage kidney disease care for individuals, with or without pre-existent CKD, who had become dialysis-dependent from acute kidney injury during hospitalization. Notably, unplanned dialysis starts are associated with significantly decreased 1-, 2-, and 3-year survival rates.<sup>3</sup> Furthermore, the KDIGO 2012 guidelines state that interdisciplinary care includes discussions regarding kidney transplantation and vascular access surgery and those involving ethical, psychological, and social care.<sup>8</sup> Interdisciplinary CKD clinics are heterogeneous as they have been built with whichever resources the founders can justify to their business administrations. To date, no absolutely, correct combination of these components has been realized, except that the patient must constitute the center of mass of his or her care.

In addition, the interdisciplinary clinic should provide valuable education for its constituents. In fact, group education would be hospitably encouraged in this enriched milieu. Moreover, by regulation, group education is billable for qualified patient populations.<sup>9</sup> Variations on a theme exist here, with some clinics offering an intense single educational forum for patient and family and others offering multiple visits.<sup>10</sup> Such visits have been correlated with improvements in psychological and physical health.<sup>11,12</sup> Chronic disease self-management has been highly successful in the diabetic population and although less widely publicized, disease management in CKD also. Self-management theory is predicated on the concept that health professionals should address problems deemed significant to the disease-bearer.<sup>13,14</sup> The corollary is that health care providers must engage in patients' treatment decisions. This concept was tested in a Taiwanese CKD clinic in a randomized, controlled study of 54 participants.<sup>15</sup> Self-management support yielded positive

**Table 1. Critical Elements for an Interdisciplinary CKD Clinic**

Element	Implementation Tool
Standard method of delivering or facilitating coordinated care from diagnosis to management, based on the National Kidney Foundation's KDOQI evidence-based clinical practice guidelines	Algorithms and protocols
Secure timely system for information sharing across settings and among providers with patient rights and privacy safeguarded	Secure databases Electronic health record Computer information technology
Comprehensive performance improvement program that used outcome data to continually enhance existing treatment plans and clinical practices	Continuous quality improvement processes
Clinical practices that enabled tailored treatment plans and interventions and supported participant self-management activities.	Group patient education meetings Patient education classes and coaching Interdisciplinary team meetings

Adapted from The Joint Commission.<sup>4</sup>

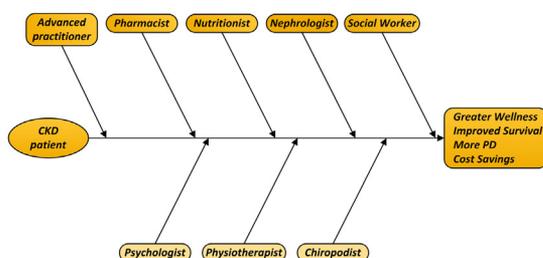
benefits in terms of reduced hospitalization and higher estimated glomerular filtration rate (eGFR) in the self-management group. Furthermore, in another, separate Taiwanese study of 537 patients,<sup>16</sup> dedicated education for CKD patients was associated with a 6-fold reduction in mortality (1.7% vs 10.1%) for those who received dedicated CKD education. This group also experienced a nearly 30% reduction in those who required kidney replacement therapy (13.9% vs 43%). A mortality reduction from earlier CKD clinic-based intervention has also been demonstrated by other groups.<sup>6,10,17</sup>

CKD clinics would enhance patient access, in the hope of "capturing CKD," because many individuals with more advanced CKD have escaped detection and landed, perhaps roughly, into the dialysis suite, with the attendant risks associated with hemodialysis catheters and a lost opportunity for the initiation of home-based therapies such as peritoneal dialysis. With CKD affecting a larger proportion of the US population than could be provided care by the conventional model of nephrology care, greater patient access appears rational. However, the recent USPTF recommendation that espouses a "no CKD screening" philosophy<sup>18</sup> runs in counterposition to data that clearly demonstrate how poorly we are actually screening this vulnerable population,<sup>19,20</sup> with a 34% lifetime risk of developing CKD stage 3B.<sup>21</sup> Note that the health of CKD population is overall unhealthy: 31% of CKD pa-

tients are diabetic, with the proportion increasing to 45% by CKD stage 4, and 27% of CKD stage 4 patients have heart failure, not counting the unknown proportion with diastolic dysfunction and preserved left ventricular function. Furthermore, CKD stage 4 patients will incur strokes or develop coronary artery disease at rates of 30% and 37%, respectively.<sup>5,22</sup>

Compounding the matter was that there was no established "number needed to treat"<sup>23</sup> to avert a complication for the vulnerable CKD population or a defined number of quality of life-years gained by having patients cared for in a CKD clinic. With respect to life-years gained, a CKD clinic is the ideal place where discussions regarding end-of-life care and the "no dialysis" option should occur, sidestepping the morbidity and early mortality on dialysis for those individuals who were ill-prepared to withstand the rigors of kidney replacement therapy.<sup>24</sup> Namely, there is a high mortality risk within a relatively brief interval after the commencement of dialysis—a worldwide phenomenon. Having a discussion of the risk and benefits of long-term dialysis with a distraught family when a patient is critically ill or uremic is even more difficult.

Recently, the outcomes of the Multifactorial Approach and Superior Treatment Efficacy in Renal Patients with the Aid of Nurse Practitioners (MASTERPLAN) study were published.<sup>5</sup> Previously, this program, designed and implemented in the Netherlands in 2005, documented equally efficacious care by APs and physicians at an interim analysis. However, at a later analysis, with a mean follow-up of nearly 6 years, the results favored care by an AP-driven model care versus a conventional physician care model. There were improved kidney end points in patients with a mean eGFR of 35 mL/min/1.73 m<sup>2</sup>, and the rate of eGFR decline was significantly less in the AP group. Other benefits included cost savings, although the study was not planned as a cost-benefit analysis. Lastly, cardiovascular events were not reduced by the interventional group. In a separate, prospective, 3-year cohort study from Taiwan involving 1056 CKD subjects with eGFRs less than 60 mL/min/1.73 m<sup>2</sup>, superior outcomes accrued only from the interdisciplinary CKD clinic.<sup>25</sup> The decline of eGFR in CKD stages 4 and 5 was lower (−5.1 vs −7.1 mL/min, *P* = .01); hospitalizations were reduced by an astounding 40%; and overall mortality was reduced by 51%. Not surprisingly though, there



**Figure 1.** Proposed model for an idealized interdisciplinary CKD clinic. The CKD patient may encounter any or all the health care personnel shown on the path to wellness. Personnel above the horizontal arrow represent permanent members of the clinic. Personnel below the arrow are available to assist in patient care on an as-needed basis. Abbreviation: PD, peritoneal dialysis.

was an increase of participant initiation of kidney replacement therapy of 68% as the patients survived longer. Notably, in the Canadian Prevention of Renal and Cardiovascular Endpoints Trial (CAN-Prevent),<sup>26,27</sup> nursing-coordinated care did not result in a superior outcome for eGFR decline, but the patient population differed from the MASTERPLAN subjects, and there was a shorter follow-up period, obscuring direct comparisons.

If well run, the CKD clinic makes money through savings, albeit with health care delivery of greater quality. That CKD clinics reduce health care costs has been known since 1997 when the results of the Vancouver and Toronto prospective nonrandomized cohorts were published.<sup>1</sup> Even then, positive outcomes were actualized by these predialysis programs. The Vancouver cohort, which did implement CKD clinics, had reduced resource utilization and fewer urgent dialysis starts and hospitalizations, and patients received more outpatient education. The Toronto cohort, which had not yet initiated interdisciplinary CKD clinics, experienced a greater number of access constructions, but there was no difference in urgent hemodialysis starts, attributable to regional resource constraints. Cost savings were possibly underestimated at just \$4000 per patient, and the study authors humbly concluded that objective data were requisite to the justification of resource-intensive programs. However, in a more recent financial analysis, the savings by institution of a CKD clinic were calculated at nearly \$1 million by delaying end-stage kidney disease and the initiation of dialysis in 5 of every 125 patients enrolled in the clinic<sup>28</sup>—this is a more than an adequate surrogate for NTT; it is a number that you do not need to treat. Finally, patients with “sudden” hemodialysis dependence from AKI may find a home in an interdisciplinary CKD clinic.<sup>29</sup> A significant proportion of these individuals will not recover kidney function to the point of independence from kidney replacement therapy, destined to become end-stage kidney disease patients. Within this imperfect circumstance, there is a perfect opportunity: the implementation of an in-hospital based, pre-discharge program can foster the acceptance of a greater proportion of home-based dialytic therapies.<sup>30</sup>

In conclusion, the debate is over as to whether a CKD clinic should or should not exist. The matter is resolved. Certainly, less financial loss will obviously be beneficial to those who are interested in controlling overall health care costs. Interdisciplinary CKD clinics must become standards within health care systems.<sup>28</sup> These clinics are essentially self-contained accountable care organizations, which enjoin different health care component parts of care for the patient and ensure that all of the “parts work well together.” Successful implementation requires cultural modification, too, and the nephrologist must acknowledge that he/she is no longer at the center of care.<sup>2,31</sup> The clinic personnel must accept a more homogeneously deployed form of care, which removes variation and improves time management. The patient must accept that self-management is a personal responsibility with positive outcomes; however, the patient should be assisted in this process through greater resources and follow-up. Thoughtful education and educational mate-

rials can drive modality choice and result in more patients beginning with peritoneal dialysis.<sup>31,32</sup> CKD clinics have definite purpose and structure, but there is plasticity. One size does fit all, and that is the one that fits—all equally acceptable within the construct and constraints of one's own environment.

*Absorb what is useful, discard what is not, add what is uniquely your own.*

—BL

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