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Coping with the CKD epidemic: the promise of multidisciplinary team-based care

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Introduction

It is well known that late referral to a nephrologist is associated with many adverse outcomes [1–4], and indeed has been the subject of a recent review in this journal [5]. Some of the more important negative outcomes include more rapid onset of end-stage renal disease (ESRD), progression of co-morbid conditions such as anaemia and cardiovascular disease, suboptimal vascular access at initiation of dialysis, increased use of centre-based haemodialysis (HD), increased hospital utilization, increased cost and worse survival. The literature has many examples of sub-optimal chronic kidney disease (CKD) care provided by primary care physicians prior to referral, and also shows clearly that care provided by nephrologists is

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better [6,7]. There is a consensus within the renal community that early referral is desirable [5,8–10].M

Multidisciplinary team-based CKD care

There is much less consensus about how to provide CKD care if early referral is achieved. Multidisciplinary team-based care (MDC) is not a new idea and in fact was advocated by the NIH consensus group in the early 1990s [9]. Until now, it has been studied in a limited way, and with inconsistent results [11–14]. In this issue of the journal, Curtis and colleagues report that in an Italian and a Canadian setting, MDC was superior in several respects to standard care provided by a nephrologist [15]. Most impressively, they have documented an important survival advantage after initiation of dialysis. Recently, Goldstein and colleagues from Toronto, Canada have demonstrated a similar survival advantage with MDC [16].

There are probably two main barriers to more widespread utilization of the MDC model of care. First, some nephrologists do not accept that this model of care is any better than their usual approach. It appears that this attitude applies to those nephrologists whose patients form the control groups of the Curtis and Goldstein studies [15,16]. These new data prove conclusively that such thinking is regressive and should be abandoned. Secondly, many jurisdictions do not provide adequate funding to support the infrastructure, space and salaries of an MDC team, making it either unavailable or incomplete. Nonetheless, it seems likely that MDC team care will eventually be shown to be cost effective through several improvements in outcomes, including delaying the onset of ESRD, increasing the use of arteriovenous (AV) fistulae, increasing the choice of less expensive home-based dialysis modalities, decreasing the catastrophic onset of ESRD with its attendant heavy utilization of in-patient resources, and perhaps through decreasing hospitalization rates after dialysis is started. Nonetheless, the field of economic analysis of CKD care is still in its infancy [17,18]. Hopefully, the evidence within the Curtis and Goldstein papers will be helpful in creating the conditions that will lead to more clinical and economic research in this area and promote expansion of the MDC concept.

Another reason to encourage expanding the MDC approach is that it provides important opportunities for the diagnosis and treatment of the widely predicted epidemic of newly referred CKD patients [19] without overloading the limited resources of current nephrologists, and without massively expanding the pool. In this regard, models of shared care with family physicians, internists, endocrinologists and others must be developed. Similarly, models of MDC care that do not require every patient to see a nephrologist at every visit, perhaps using care maps, algorithms and nurse practitioners or other nephrologist extenders, must be considered and evaluated.

Defining late referral

One area where more research is required is in defining more precisely where the distinction should be made between a late referral and an early one. Both Curtis and Goldstein used 3 months prior to ESRD in order to exclude late referred patients [15,16]. However, it seems probable that 6 months would be even better than 3 months, and 1 year might be ideal.

There are important reasons why this distinction is important. Closer examination of the care delivered by the MDC reveals that while it is better than standard care, it is still not optimal. For example, Goldstein reports that 52.4% of MDC patients started HD using temporary vascular access [16]. However, according to NKF KDOQI vascular access guidelines, central catheters should be used <10% of the time in prevalent patients [20]. Similarly, the haemoglobin level on starting HD in the Italian/Canadian cohort was only 102 g/l (15), a level below that recommended by current guidelines [21,22]. Both fistula and anaemia outcomes are undoubtedly influenced by how long a patient receives nephrological care. For example, the process of referral to a surgeon for AV fistula, waiting for surgery and time to maturation can take many months, and a 20% primary fistula failure rate means many patients will need two cycles before a fistula is mature. Therefore, 6 or 8 months or even more might be the ideal point where MDC care should begin. Similarly, partial correction of anaemia to haemoglobin target levels of 110 120 g/l with iron and an erythropoietin-stimulating protein is a process that is recommended to occur slowly over several months [22]. It is tempting to predict that patients followed for 1 year in an MDC will have higher haemoglobin levels and more AV fistulae than patients who were followed for only 3–4 months.

An alternative explanation for suboptimal CKD care outcomes even with MDC is that there are important processes of care deficiencies in the models that have been described so far. Exactly which elements of multidisciplinary CKD care are most important in this regard is not known, but could be assessed through empirical research. If this is shown to be the correct explanation, then efforts to improve MDC further should be encouraged.

Adjusted performance indicators

Another reason why the definition of late referral needs to be characterized more accurately is that units might want to track certain performance indicators as a continuous quality improvement activity. Again, let us look at AV fistula use as an example. The NKF KDOQI guidelines suggest that 50% of all incident HD patients should have an AV fistula *in situ* at initiation of dialysis [20]. The crude AV fistula rate reported by Goldstein is 45.2% [16]. At first glance, it would seem that his team is very close to the target.

However, the crude 45.2% rate reported excludes patients referred <3 months prior to ESRD, and so it could be argued that for this particular cohort of patients referred early, the appropriate target should be 60% and not 50%. It could be argued further that the rate should be broken down even further, so that for patients referred <1 month prior to ESRD, the appropriate target should be 0%, for 1–3 months 10%, for 3–6 months 40%, for 7–9 months 60%, and for those >10 months 90%.

Note that these targets are arbitrary and are used only to illustrate a sliding scale concept as applied to performance measures, and to stimulate discussion. This sliding scale target based on time spent in CKD care before dialysis might seem unnecessarily complicated but appears to be essential. Just as one must adjust statistically for demographic differences in a prospective cohort analysis, similarly, CKD outcomes deserve an analogous approach. Using such a sliding scale could allow a standard care nephrologist to compare his or her practice more accurately with an MDC, or to compare one model of MDC with another, while allowing for adjustments based on when patients are referred and how long patients are followed.

Summary

In summary, Curtis and colleagues have made an important contribution to the CKD literature [15]. They confirm a recent report that MDC confers a substantial survival benefit after dialysis begins [16]. The challenge for the nephrology community now is to use these data to advocate for broadly available access to this model of care for CKD patients. Although survival is the ultimate outcome measure, the nephrology community must still anticipate resistance to the MDC model, especially in these fiscally challenging times. However, thanks to these studies, the path is now much clearer. The gaps in hard data, especially in the area of economic aspects of MDC care, are easy to identify. Efforts to fill these gaps with excellent research should become a priority. The reward will most certainly be outstanding care and better outcomes for future CKD and dialysis patients.

Conflict of interest statement. None declared.

[See related article by Curtis *et al*. (this issue, pp. 147–154)]

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