

**Measuring trade-offs in nephrology : a systematic review of Discrete Choice Experiments and Conjoint Analysis studies**

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**Title:** Measuring trade-offs in Nephrology: A Systematic Review of Discrete Choice Experiments and Conjoint Analysis studies.

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**Contribution of authors:**

Dr MD Clark designed the study, independently reviewed all the primary studies for eligibility and data extraction, produced a first draft of the manuscript including all tables and figures, and revised the subsequent drafts.

Professor A Szczepura independently reviewed several primary studies for eligibility and data extraction, contributed to the writing of the methods and discussion sections and revised all drafts of the manuscript.

Dr A Gumber contributed to the study design and development of the search strategy to ensure inclusion of ethnicity / language group considerations, independently reviewed several primary studies for eligibility and data extraction, and revised all drafts of the manuscript.

Professor K Howard independently reviewed several primary studies for eligibility and data extraction, and commented upon all versions of the draft manuscript and appendices.

Dr D Moro independently reviewed several primary studies for eligibility and data extraction, and commented upon all versions of the draft manuscript and appendices.

Associate Professor RL Morton contributed to the design of the review, undertook independent full-text reviews of primary studies, edited and refined successive drafts of the manuscript.

All authors read and reviewed the final manuscript before submission.

**Abstract:**

**Background:** Discrete Choice Experiment [DCE], Conjoint Analysis [CA], or Adaptive Conjoint Analysis [ACA] methods are increasingly applied to obtain patient, clinician or community preferences in nephrology. This study systematically reviews the above mentioned published choice studies providing an overview of the issues addressed, methods, and findings.

**Methods:** Choice studies relating to nephrology were identified using electronic databases, including Medline, Embase, PsychINFO and Econlit from 1990 to 2015. For inclusion in the review, studies had to primarily relate to kidney disease and include results from statistical (econometric) analyses of respondents' choice or preference. Studies meeting the inclusion criteria were assessed against a range of systematic review criteria, and methods and results summarised.

**Results:** We identified 14 eligible studies from Europe, Australasia, North America, and Asia, reporting preferences for treatment or screening, patient experiences, quality of life, health outcomes and priority setting frameworks. Specific contexts included medical interventions in kidney transplantation and renal cell carcinoma, health policies for organ donation and allocation, dialysis modalities and end-of-life care; using a variety of statistical models. The characteristics of 'time' (i.e. transplant waiting time, dialysis hours, transport time) and 'quality of life' (pre and post-transplant, or pre and post-dialysis) consistently influenced patient and clinician preferences across the choice studies.

**Conclusions:** Discrete choice experiments are increasingly used to obtain information about key preferences in kidney transplantation and dialysis. These study methods provide quantitative information about respondents' trade-offs between conflicting clinical and policy objectives, and can establish how preferences vary among stakeholder groups.

**Keywords:** Conjoint Analysis, Discrete Choice Experiment, Dialysis, Transplantation, Kidney Disease, Preferences.

**Summary sentences:**

Discrete Choice Experiments and Conjoint Analyses are increasingly used to study preferences in nephrology about organ donation and organ allocation decisions, and dialysis modality preferences.

Such choice studies can assess preferences for treatments and policies from a variety of stakeholders including nephrologists, patients, caregivers, and the broader community.

They highlight the trade-offs people make between multiple objectives in transplantation and dialysis care.

## **Introduction:**

Every day in nephrology, clinicians and patients face difficult decisions about treatment options, best practice care, and the 'right' use of resources. Discrete Choice Experiments (DCE), Conjoint Analysis (CA) and Adaptive Conjoint Analysis (ACA) studies systematically quantify preferences for alternatives, and measure the trade-offs people make between the characteristics of each alternative. They are grounded in Lancaster's theory of demand,[1] which assumes demand for goods and services, including health services can be related to demand for individual characteristics of the goods or services. Further theoretical details[2] are provided in the technical appendix (see Appendix A.3).

Systematic reviews of the application of DCE, CA, or ACA literature in healthcare from 1990 to 2012[3] reported rapid growth in the application of such techniques from an average of just over 3 per year between 1990-2000 to 48 per year between 2009-2012. The aims of this study were to review the nephrology DCE, CA, and ACA literature published since 1990; to highlight the key trade-offs patients, clinicians, and other groups make in this context; and undertake a detailed systematic outline of study methodology.

## **Methods**

Using keywords including (Nephrology OR Kidney OR Renal) AND (Discrete Choice OR Conjoint Analysis) in Medline, Embase, PsychINFO and Econlit from 1<sup>st</sup> January 1990 to 31<sup>st</sup> December 2015 we identified studies that used DCE, CA, or ACA methodology, applied to any research question relating to nephrology. Primary studies were included in the systematic review if they contained empirical (statistical or econometric) analyses; study protocols, conference abstracts, reviews and

opinions pieces were excluded. We followed criteria used in two previous reviews for study designs of this type,[3, 4] and further details are within the electronic appendices.

DCE and CA survey studies involve a comparison between 2 or 3 alternatives. The characteristics (known as attributes) of these alternatives are identical, but levels of characteristics change. Figure 1 provides an example of a DCE scenario, and Table 1 displays all of the attribute levels. With both DCE and CA formats, the range of choices faced is pre-determined before choices are made. In contrast, ACA methods use similar choices but are 'adaptive' because scenarios are generated by an adaptive computer programme taking into account previous responses. These approaches (DCE, CA, and ACA) have an advantage over other ranking or rating techniques such as Likert scale because they facilitate a relative quantitative valuation of different characteristics as opposed to trying to value or rank the alternative as a 'whole.'

## **Results**

We identified 14 eligible studies from Europe, Australia, New Zealand, North America, and Asia, that reported preference information for a wide range of stakeholder groups including patients, clinicians /healthcare professionals, caregivers, donors, relatives of deceased donors, and the general community. Studies elicited preferences for medical interventions in kidney transplantation, health policies for organ donation and allocation, dialysis modalities, and end-of-life care. Methodological criteria for each study are listed in Tables S1-S15. We provide information about the country of analysis, and category or categories of primary choice studies (Table 2), as reported in previous systematic reviews of DCE, CA, and ACA literature in healthcare.

### *Transplantation studies*

One CA in the United States among 175 patients,[5] investigated the acceptability of receiving a kidney from a donor at increased risk of blood-borne viral infection (DIRVI). The analysis contained 3 attributes relating to HIV infection risk, donor age, and transplant waiting time. Findings suggested longer waiting time ( $P<0.01$ ), lower donor age ( $P<0.01$ ), lower donor HIV risk, participant being on dialysis ( $P<0.01$ ), and older participant age ( $P=0.04$ ), significantly affected preferences. Overall 42 respondents (24%) would not accept a DIRVI kidney in any scenario; 103 (59%) would accept a DIRVI kidney in some scenarios; and 31 (18%) would accept a DIRVI kidney in all scenarios. Patients were more likely to accept DIRVI kidneys when the waiting time was longer ( $P<0.01$ ); the donor was younger ( $P<0.01$ ); and HIV risk was lower ( $P<0.01$ ). Patients on dialysis ( $P<0.01$ ) and older patients ( $P<0.01$ ) would be more likely to accept DIRVI kidneys.

Another DCE in the UK assessed preferences of 908 patients for 6 kidney transplant allocation criteria.[6] Findings were presented in terms of a marginal rate of substitution (MRS) that is, a trade-off relative to waiting an additional year for a kidney transplant. Results suggested that among patients who were not from ethnic minority group, all attributes were significant. Findings suggested a pronounced preference for prioritising patients with moderate not severe diseases affecting life expectancy (MRS = 15.93), but paradoxically no preference for 'no diseases versus moderate diseases,' affecting life expectancy. Other significant attributes included a 1% improvement in kidney survival (MRS = 1.54); having an extra dependent adult or child (MRS = 1.35); a one-year reduction in recipient age (MRS = 0.16); having no disease other than kidney disease affecting quality of life (MRS = -2.48); and having moderate rather than severe diseases affecting quality of life (MRS = 4.08), as was transplant waiting time (MRS = 1). Those who were not from ethnic minorities would prioritise transplants to patients with a better tissue match to the donor, whereas non-white ethnic mi.



In a later analysis[7] the same DCE was applied to 908 patients, 41 carers, 113 healthcare professionals, and 48 live donors /relatives of deceased donors. Similarly, findings suggested a pronounced preference for prioritising patients with moderate, not severe, diseases affecting life expectancy (MRS = 15.32). A 1% improvement in kidney survival (MRS = 1.41); having an extra dependent adult or child (MRS = 1.43); a one year reduction in recipient age (MRS = 0.16); having no diseases other than kidney disease affecting quality of life (MRS = -2.73); and having moderate rather than severe diseases affecting quality of life (MRS = 4.18) were also valued relative to a 1 year transplant wait. Healthcare professionals' valued prioritising patients with better tissue matches lower than patients but prioritised younger recipients and those with dependents higher. They prioritised those with none versus moderate diseases, affecting life expectancy whereas patients did not, and they prioritised those with moderate rather than severe diseases higher than patients. Assessment of preferences for live donors or relatives of deceased donors, and carers, was limited by small sample sizes.

A DCE assessed community preferences for the allocation of donor organs for transplantation (including kidneys and other organs) in Australia[8] using a sample of 2,051 community respondents. This study had 15 attributes. Findings suggested most of the variables for transplant allocation criteria were significant at the 0.001 level, with the exception of having previous cancer, which was significant at the 1% level ( $p=0.01$ ); recipient sex, and having diabetes which were non-significant ( $p>0.05$ ). Mixed logit analysis suggested that allocation to people aged 5 ( $\beta = 0.662$ ), 15 ( $\beta = 0.562$ ), or 25 ( $\beta = 0.380$ ), was preferred compared to recipients aged 40 ( $\beta = -0.163$ ), whilst allocation to those aged 55 ( $\beta = -0.277$ ), or 70 ( $\beta = -1.164$ ), was less preferred to those aged 40. Those with previous transplant(s) ( $\beta = -0.146$ ), and those who did not follow their doctor's advice ( $\beta = -0.059$ ), were given a lower priority. Those with caring responsibilities ( $\beta = 0.351$ ), or whose family were registered as donors ( $\beta = 0.186$ ), were prioritised more; those with long waiting times were

prioritized ( $\beta = 0.042$ ); those with lower life expectancy without a transplant ( $\beta = -0.87$ ), and higher life expectancy post-transplant ( $\beta = 0.058$ ), were prioritised; those with lower quality of life without a transplant ( $\beta = 0.057$ ), and higher quality of life post-transplant ( $\beta = 0.112$ ), were prioritised. Those with comorbidities such as diabetes and previous cancer ( $\beta = -0.088$ ), and hepatitis and other viral diseases which were being treated ( $\beta = -0.217$ ), were prioritised less. Compared to non-smokers, ex-smokers ( $\beta = -0.265$ ), or current smokers ( $\beta = -0.751$ ), were given lower priority, as were those consuming alcohol occasionally ( $\beta = -0.093$ ) or more than 5 nights a week ( $\beta = -0.350$ ). Obese people ( $\beta = -0.266$ ), compared to non-obese people were also given lower priority.

A second DCE analysis[9] investigated the preferences of 2,005 Australian community respondents for organ donation policy. The impact of 8 policy attributes was assessed. The analysis suggested that the type of donation consent system and availability of family priority for transplants in the future did not influence community preferences. Results were presented in terms of odds ratios (OR), whereby an OR  $>1$  for an attribute suggested that as the level of the attribute increased, policy alternative A was preferred over policy B. Respondents favoured a policy where the donor's family still had some, but not all, involvement in the final donation decision; however a policy where family always has the final say (OR, 0.25; 95% confidence interval [95%CI], 0.21-0.28), or never has the final say (OR, 0.50; 95% CI, 0.44-0.56) was significantly less preferred. Respondents also preferred a policy where the registration process was easy (OR, 1.16; 95%CI, 1.09-1.24), e.g. sending all adults a registration form and reply paid envelope; where reconfirmation of donation intent was less frequent (for example, annual confirmation: OR, 0.88; 95%CI, 0.78-0.98); where there was a direct payment (OR range 1.19-1.32) or reimbursement of funeral expenses (OR range 1.18-1.55); and where there was some formal recognition of donation, for example, a letter to the donor's family (OR, 1.14; 95%CI, 1.04-1.27), or the donor's name placed on a memorial (OR, 1.29; 95%CI, 1.14-1.45).

### *Dialysis studies*

A CA in the US examined the willingness of patients to switch dialysis modality from conventional to more frequent dialysis.[10] The authors established the impact of 4 attributes including life expectancy, quality of life, the annual number of hospitalisations, and transport time. All 4 attributes were significantly associated with a willingness to switch to daily haemodialysis in the hypothesised direction. Findings showed that 44% of respondents receiving conventional haemodialysis 3 times per week would not switch to daily 6 times per week haemodialysis regardless of the health benefits. Of the 56% who said they might switch to this regimen, the majority would only switch for substantive health benefits.

A second dialysis DCE investigated public preferences for the location of dialysis facilities for residents of Greenland.[11] This involved 3 attributes including recruitment of nephrologists, location of patient accommodation, and increase in taxation required for dialysis. All the variables relating to these 3 attributes were significant at the 1% level, and standard deviations were significant for all random parameter logit variables (indicating statistically significant preference heterogeneity - see appendix A.2 for details). A key finding was that hypothetical alternatives involving treatment in Greenland (versus treatment in Denmark) were chosen in nearly two-thirds of cases, implying a 'slight tendency' to favour treatment in Greenland despite increased taxation. Respondents were willing to pay 30 Euro more in increased taxes per person per year to see a permanent nephrologist than a non-permanent (visiting) nephrologist. The provision of accommodation required to undertake dialysis in apartments was valued at 70 Euro, and in hotels at 88 Euro of increased taxation per person per year. The statistically significant model constant, implied an overall preference in favour of dialysis in Greenland (valued at 63 Euros).

A DCE in Australia assessed preferences for dialysis modality among 105 pre-dialysis patients and 73 caregivers.[12] Informed by preliminary research,[13, 14] 3 treatment alternatives for home dialysis, in-centre dialysis and non-dialytic conservative care were created. The alternatives were described by 7 attributes including average survival time, number of visits per week to hospital for dialysis, ability to travel or 'go away' on short trips, hours of dialysis per treatment, time of day the dialysis can be undertaken, provision of a transport service to attend dialysis or doctors' appointments, and whether there was flexibility to change dialysis and times. Findings reported home-based dialysis was chosen 65% of the time and in-centre dialysis 35% of the time. Comparing dialysis versus conservative care, 90% of respondents chose a dialysis option and 10% chose a non-dialysis (conservative care) option. In the main analysis for patients, 2 variables for home-based dialysis (life expectancy [OR, 1.68], travel restrictions [OR, 0.37]) were significant with another 8 variables non-significant. Similarly, 1 attribute for in-centre haemodialysis (longer hours [OR, 2.02]) was significant. Among caregivers, home dialysis was chosen 72% of the time, in-centre dialysis 25% of the time, and conservative care in 3%. Moreover, 3 out of 9 variables relating to home dialysis compared to conservative care (life expectancy [OR, 1.82], dialysis at night [OR, 0.03], and travel restrictions with home dialysis [OR, 0.43]) were significant. Similarly, amongst caregivers when comparing in-centre haemodialysis with conservative care 2 out of 11 variables (dialysis at night time [OR, 0.03] and hours with in-centre dialysis [OR, 2.67]) were significant. All significant variables were in the expected direction.

A second analysis from the same research teams[15] elicited preferences for dialysis versus conservative non-dialytic care in Australia. Findings suggested patients preferred dialysis to conservative care if dialysis increased average life expectancy (OR, 1.84; 95%CI, 1.57-2.15), if they could dialyse during the day or evening rather than during the day only (OR, 8.95; 95% CI, 4.46-17.97), and if subsidised transport was available (OR, 1.55; 95% CI, 1.24-1.95). Patients were less

likely to choose dialysis over conservative care if more hospital visits were required (OR, 0.70; 95% CI, 0.56-0.88), and with more restrictions on travel (OR, 0.47; 95% CI, 0.36-0.61). Patients would forgo 7 months life expectancy to reduce the number of visits to the hospital, and 15 months to increase the ability to travel.

Another DCE[16] looked at the preferences of 159 Australian nephrologists for dialysis in elderly patients with end-stage kidney disease. The DCE included 10 attributes. Findings indicated all patient characteristics (except sex) significantly affected the likelihood of nephrologists recommending dialysis. Nephrologists were more likely to recommend dialysis for patients with preserved cognition (OR, 68.3, 95% CI: 33.4-140.0), lower comorbidity (OR, 2.1, 95% CI: 1.1-4.1), increased life expectancy (OR, 2.8, 95% CI: 2.1-3.7), high current QOL (OR, 2.8, 95% CI: 2.0-3.8), and positive patient and family dialysis inclination (OR, 27.5, 95% CI: 16.2-46.8 and OR, 2.0, 95% CI: 1.3-3.3, respectively). Nephrologists over 65 years were more likely to recommend dialysis than younger nephrologists. Overall, nephrologists would forgo 12 months of patient survival to avoid substantial quality of life decreases associated with dialysis.

An ACA[17] investigated preferences among 305 US nephrologists for blood transfusion in chronic dialysis patients. The analysis incorporated 10 attributes. Findings presented in terms of relative importance of attributes suggested that haemoglobin level (g/dl) accounted for 29% of decision-making, followed by functional status (16%), cardiovascular disease (12%), clinical scenario (9%), ESA status (9%), age (7%), haemoglobin stability over time (6%), kidney transplant eligibility (5%), iron indices (4%), and evidence of occult blood in stool: Fecal Occult Blood Test or Fecal Immunochemical Test positive (3%).

### *Combined dialysis, end-of-life & transplantation*

One Canadian DCE,[18] assessed the preferences of 169 patients, 29 caregivers, and 150 healthcare professionals. Dialysis-related attributes included 'Who provides comprehensive day to day care for patients on dialysis?' and 'How decisions to stop dialysis should be made'. Transplantation attributes included 'How deceased donor kidneys should be allocated for transplantation', and 'How should live kidneys for transplantation be obtained?' Other attributes related to 'end-of-life' issues including 'When should end-of-life care discussions commence?' and 'How much information on prognosis and end-of-life care issues should be routinely provided?' All the attributes were significant, with the exception of some levels for the attribute about who provides comprehensive day-to-day care on dialysis. Regression coefficients suggested that for all respondents early 'end-of-life care' discussions (0.72) were preferred to late (0.00); detailed information on prognosis and end-of-life care was preferred to limited information (0.56 vs 0.00); whereas medical and personal decisions (0.34) as opposed to personal decisions only (0.00) was preferred for decisions about stopping dialysis.

In relation to how deceased donor kidneys should be allocated, the 'best match' approach (0.81) was preferred to 'first come first served' (0.00). With respect to how live kidneys for transplantation should be obtained, receiving an organ from an unknown donor (-0.43), via a paired kidney exchange (-0.80), or buying a kidney (-1.93) were less preferable than receiving a kidney from a family member or close friend (0.00). For the attribute of providing day-to-day dialysis care, the family physician (-0.51) was less preferable than 'family physician and group of kidney specialists' (0.25), whilst the 'advanced nurse practitioner and group of kidney specialists' was non-significant.

### *Renal cancer studies*

A DCE assessed 120 patients, 52 family members, and 272 healthcare professionals' preferences for

targeted renal cell carcinoma therapy in South Korea.[19] The analysis involved 6 attributes. All the attributes were significant at the 1% level for patients and health professionals. Additional months of progression-free survival were positively valued at 7-31% in terms of relative importance; additional months of bone marrow suppression was negatively valued at 18-36%; the increased likelihood of hand-foot skin reaction was negatively valued at 12-23% ; increased likelihood of gastrointestinal perforation was valued at between 4-13%: increased risk of bleeding was valued at between 11-14%; and administration by injection versus orally was valued at 13-22% in terms of relative importance of attributes according to the stakeholder group.

A second DCE assessed benefit-risk preferences for targeted agents in the treatment of renal cell carcinoma in 138 US patients.[20] The respondents faced questions relating to hypothetical renal cell carcinoma profiles. The profiles were defined by attributes including efficacy (progression-free survival [PFS]), when overall survival was constant), tolerability effects (fatigue / tiredness, diarrhoea, hand-foot syndrome, mouth sores) and serious adverse events (liver failure, blood clot). Findings suggested PFS was the most important attribute for patients. The remaining attributes were ranked in decreasing order of importance: fatigue / tiredness, diarrhoea, liver failure, hand-foot syndrome, blood clot, and mouth sores. A key finding was that to increase PFS by 11 months, patients would accept a maximum blood clot risk of 3.1% (95%CI 1.5- 5.3) or liver failure risk of 2.0% (95%CI 1.0- 3.3).

## **Discussion**

The published literature provides important insights about the preferences of key stakeholder groups for treatment of kidney disease. The UK transplantation analyses[6, 7] found that allocation on the basis of waiting time was important. However other criteria including quality of tissue match,

quality of life and life expectancy of recipients, recipient age, and whether recipients had child or adult dependents were also of importance. Had some of these attributes been specified in the Canadian analysis[18] the 'first come first served' allocation criterion may have assumed less importance as other allocation attributes were valued. An Australian analysis relating to community preferences for organ allocation[8] had the advantage that a wide variety of allocation criteria were considered. However, its applicability to kidney transplant allocation preferences was unclear because it considered preferences for allocating organs in general. Separate Australian analysis[9] revealed that the type of donation consent system and availability of family priority for transplants did not influence community preferences, although other factors were important.

A US analysis suggested most patients would consider, or accept a transplant at increased risk of blood-borne viral infection.[5] Another US analysis[10] demonstrated that frequency and timing of dialysis were pertinent and a majority of patients would only switch to 6 sessions from 3 sessions weekly for substantive health benefits. A different analysis[11] demonstrated a clear preference, for localised dialysis provision within Greenland, at the cost of increased annual taxation. An Australian dialysis analyses[12] found that whilst some determinants of dialysis versus conservative dialysis could be established for patients and caregiver respondents, many of the hypothesized determinants of preferences (e.g. attributes) proved non-significant. Another Australian analysis[15] relating to patient preferences for dialysis versus conservative care, concluded patients would forgo 7 months of life expectancy to reduce visits to the hospital, or 15 months to increase the ability to travel. An assessment of Australian Nephrologists' preferences[16] found they would forgo 12 months of patient survival in elderly patients to avoid substantial quality of life decreases associated with dialysis. Another analysis[17] relating to US Nephrologists' preferences highlighted the importance of clinical considerations relating to blood transfusions in dialysis patients.



A South Korean analysis[19] related to targeted renal cell carcinoma therapy, showed results varied considerably between the patient, family, and healthcare professional stakeholder groups. In contrast, a US analysis[20] relating to targeted agents in renal cell carcinoma concluded that to increase progression-free survival by 11 months, patients would accept a 3.1% blood clot risk or 2% liver failure risk.

Looking to the future, several choice studies in nephrology are planned, including patient preferences for kidney transplant monitoring by video-conferencing,[21] preferences for outcomes after kidney transplantation,[22] and patient and family preferences for home versus facility-based dialysis in New Zealand.[23]

### *Conclusions*

This review has evaluated the content and methodology of choice studies in nephrology. These study designs are increasingly used to obtain information about key preferences in kidney transplantation and dialysis. In contrast to other methods they provide quantitative information about respondents' trade-offs between conflicting objectives, and can establish how policy-relevant preferences vary among stakeholder groups.

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**FIGURE 1: Example of a choice set (scenario) in a DCE of nephrologists' preferences for dialysis recommendation in elderly ESKD patients used in the reviewed DCE analysis cited in the reference list by Foote et al 2014.**

	Patient A	Patient B	Neither
Age	90	85	
Gender	Male	Female	
Cognitive state	Normal	Somewhat impaired	
Comorbid burden	CAD, CVD, PVD	CAD, CVD, PVD	
Life expectancy	1 year	1 year	
Quality of life	Medium	Medium	
Change in quality of life	Expected to decrease	Expected to decrease	
Family/close person support	High	Medium	
Patient inclination to dialyse	Undecided	Inclined	
Family/close person inclination to dialyse	Disinclined	Undecided	
Which patient would you <b>prefer</b> to recommend dialysis to?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The attribute levels were allowed to vary across choice sets as set out in table 1.

**Table 1: Characteristics and their levels in the 12 choice sets (scenarios)**

<b>Characteristics</b>	<b>Levels</b>
Patient age	75 85 90
Patient gender	Male Female
Patient cognitive state	Normal Somewhat impaired Greatly impaired
Patient comorbid burden	Diabetes Diabetes/coronary artery disease Diabetes/CVD*/peripheral vascular disease
Patient life expectancy (with dialysis)	1 year 3 years 5 years
Patient QOL (baseline)	Low Medium High
Patient change in QOL (with dialysis)	Expected to decrease Expected to be maintained Expected to improve
Family/close person support	Low Medium High
Patient inclination to dialyse	Inclined Undecided Disinclined
Family/close person inclination for patient to dialyse	Inclined Undecided Disinclined

\*CVD = cerebrovascular disease

**Table 2. Country of analysis and standardised category (or categories)\* of primary choice studies.**

Authors.	Country of analysis	Number of respondents	A. Patient Consumer Experience.	B. Valuing Health Outcomes.	C. Investigating trade-offs health outcomes and patient or consumer experience factors.	D. Estimating utility weights within the QALY framework	E. Job Choices for preferences relating to medical posts or healthcare human resource policy.	F. Developing priority setting frameworks.	G. Health Professionals preferences for treatment or screening options for patients	H. Other
Clark et al (2009)	UK	908 patients.	-	-	✓	-	-	✓	-	-
Clark et al (2012)	UK	908 patients, 41 Carers, 113 Healthcare professionals.	-	-	✓	-	-	✓	✓	-
Davison et al (2010)	Canada	169 patients, 29 Carers.	✓	-	-	-	-	✓	✓	-
Foote et al (2014)	Australia and New Zealand	159 Nephrologists	-	-	-	-	-	-	✓	-
Halpern et al (2004)	USA	126 patients	-	-	✓	-	-	-	-	-
Howard et al (2015a)	Australia	2051 Community respondents	-	-	✓	-	-	✓	-	-
Howard et al (2015b)	Australia	2005 Community respondents	-	-	-	-	-	-	-	✓
Kjaer et al (2012)	Greenland	206 Public preferences	-	-	-	-	-	✓	-	-
Mohamed et al (2011)	USA (+respondents from Australia, Canada, UK)	138 patients	-	-	✓	-	-	-	-	-
Morton et al (2012a)	Australia	105 Patients, 73 Carers	-	-	✓	-	-	-	-	-
Morton et al (2012b)	Australia	105 Patients	-	-	✓	-	-	-	-	-

Park et al (2012)	South Korea	120 Patients, 52 Family members, 272 Healthcare professional	-	-	✓	-	-	-	✓	-
Reese et al (2010)	USA	175 patients	-	-	✓	-	-	✓	-	-
Whitman et al (2013)	USA	305 Nephrologists	-	-	-	-	-	-	✓	-
Total			1	0	9	0	0	6	5	1

A blank cell suggests that the paper does not fulfil this criterion, whereas the symbol ✓ implies that the criterion is met.

\* Standard categories used in prior systematic reviews of DCE studies in the healthcare literature.