Using Time-Trade-Off (TTO) Surveys to Measure Health Utilities Associated With Different Urinary Catheter Innovations

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Introduction

- Intermittent catheterisation (IC) is preferred over indwelling catheters for bladder emptying in people suffering from chronic urinary retention, owing to its numerous medical and social benefits, including fewer urinary tract infections (UTIs), increased independence and ability to enjoy intimacy and sexual activities.
- However, performing IC multiple times per day also brings potential challenges, such as pain/discomfort during insertion of the catheter, increased risk of urinary tract infections (UTIs), stigma related to the process and to carrying around catheters, preparation of the catheter, and in case of multiple-use catheters, efforts involved in storage, cleaning and drying of catheters after each use.
- Additionally, many catheters contain chemical softeners called phthalates, which are suspected to be potentially harmful to human health.
- The negative aspects of IC influence the users’ quality of life and increase the risk that users change to other bladder emptying methods with more complications. Innovations in catheter design and technology have consequently focused on making the IC process easier, more discrete, less painful and an avoidance of potentially harmful phthalates in the catheter material.
- In health economic evaluation such outcome differences are normally measured using generic QoL measures (such as EQ-5D) that can be used to calculate Quality-Adjusted Life Years (QALYs). But these generic measures may not be sensitive to all relevant aspects of QoL affected by intermittent catheters.
- Amongst the alternative methods for eliciting utility values, the valuation of health states (or vignettes) using the Time Trade-Off (TTO) approach is widely used and is well-suited for assessing the impact of specific treatment processes.
- The TTO method determines value by understanding the extent to which people are willing to trade duration of survival.

Using the TTO method, three surveys were conducted with the aim to estimate health state utility values associated with the following intermittent catheter features and aspects:
- Access to a patient support service
- The use of catheters that do not need refrigeration
- The use of phthalate-free catheters
- The use of catheters that are of a compact design
- Access to a patient support service
- The use of catheters that do not need refrigeration
- The use of phthalate-free catheters
- The use of catheters that are of a compact design

In the first survey (UK only) focused on compact catheter design and the availability of a support service for patients, the second considered the avoidance of potentially harmful phthalates in the catheter material (UK only) and the third survey on multiple-use catheters (UK only) (UK only) and the third survey on multiple-use catheters (UK only).

Utility values were obtained from the survey by asking respondents to choose between two different scenarios. Different respondents were assigned to different health states to be described, which were presented in a choice questionnaire.

The utility estimates are calculated automatically using the TTO method.

Discussion and Conclusion

- Standard methods to assess QALYs, such as EQ-5D, focus on certain dimensions of health, such as mobility, sexual activities, pain, discomfort and psychological impact (depression or anxiety) for measuring QALYs. However, there is an increasing recognition that EQ-5D is not always sufficient for identifying specific benefits that innovations in bladder management technologies may provide to the users.

The survey results on the vignettes and methodology using the TTO method to estimate the value of intermittent catheter aspects, which typically falls outside of the health dimensions measured by the EQ-5D.

The results show that survey participants were willing to trade remaining life time for catheter innovations and the provision of a support service, which indicates that these aspects are of value to society. Decision makers should hence consider these aspects when fully understanding the benefits of catheter innovation.

The current results confirm that the TTO vignette method can be a useful alternative when the standard generic methods for assessing QALYs are not sensitive to relevant aspects of IC.

Acknowledgements

This research was supported by funding from Coloplast A/S. We thank the individuals who took part in the web-based surveys and Mark’s Plan Healthcare Communications for editorial services.

Materials and Methods

TTO method

- The TTO method is used for eliciting utility values ranging from 0-1 by asking respondents to trade part of their remaining lifetime for a gain in quality of life related to IC and described in different health state scenarios. A health state, or vignette, is a description of how it is to live with the specific health condition and focusing on some of the characteristics related to the study area.

Participants

- The three surveys were conducted in 2017 in representative populations aged over 18 years from Canada and the UK. All respondents provided demographic (age, gender, employment, household) and socioeconomic characteristics (household income and education) regarding their experience with IC.

Satisfaction

- All statistical analyses were performed using SPSS version 9-4 statistical software.
- Utilities were calculated for each health state.
- Bootstrapping was used to simulate standard errors and confidence intervals (CI) for the mean TTO values.
- The 5% most extreme values were excluded from the base analysis to ensure better reliability in the results.
- A sensitivity analysis was carried out to investigate the consequences of outliers on the utility values.
- The survey and health states were described based on published literature regarding IC and were reviewed by five medical doctors amongst the authors, who all have extensive experience with the use of IC.
- The respondents were first presented with a health state scenario designed as a ‘warm-up’ exercise to familiarise them with the subject and the TTO methodology. (See ‘warm-up’ description in Figure 1 and example of TTO question in Figure 2).

Results

- A total of 484 respondents answered the three TTO surveys.
- Compared to multiple-use catheters, the one-time-use catheter gained incremental values of 0.03 (CI: 0.004-0.029) for Canada and 0.21 (CI: 0.193-0.028) for UK and one-time use catheters with a ready-to-use feature gained incremental values of 0.07 (CI: 0.001-0.029) for both Canada and the UK. The difference was statistically significant for both countries.
- The utility gains were added together the technology readiness-saving use feature gained a utility gain of 0.08 in both countries compared to single-use uncoated catheters and 0.04 (CI: 0.049) for Canada/UK respectively.
- The results show that respondents valued the health state individually and not relative to each other.

References

12. Life Tables for WHO Member States. 2014.