stranger when the most difficult, sensitive and personal aspects of the story are being played out. Bad care does not die with the patient; it lives on in the memories of those deeply affected by the death, often across several generations in a family, altering their view of the future they want for themselves, reinforcing fears and fuelling anger with a service perceived as having let them down.

All patients who are dying need to have a GP lead in care at home, with clear care plans and instructions about 'what to do if …'; respite care — both planned and acute — must be potentially available; specialist palliative care advice must be easily accessible at all times. District nursing out-of-hours is probably the most important factor in maintaining patients at home — in some areas additional out-of-hours support from community hospice services has increased the proportion of deaths at home.[10] While generic nursing skills should include competence in palliative care, there will always be complex clinical problems for which district nurses do not have the training, time or experience to cope adequately on their own and they need additional help. One answer would be for specialist nurses in a district to come together in a pooled out-of-hours rota to provide advice, additional input and education of the generic nurses across a whole population, covering home, hospital and nursing home beds. After all, when someone is dying, the specialist knowledge needed is applicable wherever they are — pain, distress, constipation do not vary from home to hospital; children and relatives need help to understand what is happening and particularly distraught family members need support around the deathbed, wherever that bed is.

The End of Life Care initiatives may help, but cannot substitute for personalised care.[11] I have never known a GP's personal number be abused by the family of a dying patient, but I have seen the comfort provided from just having that phone number available. For we must all think of what we would want and 'do as we would be done by'.

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Counting the cost of fast access: using discrete choice experiments to elicit preferences in general practice

In publicly provided healthcare systems, when limited resources are coupled with unlimited demand, decisions have to be made about the efficient allocation of scarce resources. This raises questions of how services should be provided (for example, should breast cancer patients be prescribed Trastuzumab®? Should there be an increased role for pharmacists in prescribing?) through to the optimal provision and financing of health care (for example, how can we encourage doctors to provide out-of-hours care or work in remote and rural areas?). Trade-offs inevitably have to be made. A technique gaining popularity in health economics to identify trade-offs is the discrete choice experiment approach,[1] used by Longo *et al*[2] in this Journal to consider patients' preferences for shared decision-making. Within general practice the technique has been used to elicit patient and community preferences,[2–6] as well as to explore GP preferences for job characteristics.[7–9]

Discrete choice experiments are based on the assumptions that interventions, services or policies can be described by characteristics, and that value depends on the levels of these characteristics. Responders are presented with a number of choices that involve different levels of attributes. For each choice they are asked which option they would choose. Making choices involves trade-offs between attribute levels. Responses are analysed using regression techniques and from this it is possible to estimate the relative importance of attributes, as well as the trade-offs between attributes; for example, how much longer individuals are willing to wait for a consultation with their preferred doctor. If a price proxy is included as a characteristic then willingness to pay, a monetary measure of benefit, can be estimated,[1] that is, willingness to pay to see a doctor. The paper by Longo *et al*[2] describes the stages involved in conducting a discrete choice experiment. For further information see Ryan and Gerard.[1]

Longo *et al*[2] use the approach to look at the relative importance of attributes of shared decision-making. While this is a useful output, one of the favoured outputs of the technique by economists is estimation of trade-offs between attributes. In economics something is only of value if we are willing to give something up for it. Thus, the value of one attribute can be defined in terms of the

opportunity cost of another. To estimate such trade-offs, a continuous characteristic, such as time or money, must be included. Discrete choice experiments then offer real world answers when resources are scarce and we have to count the opportunity cost of any change.

To illustrate estimation of trade-offs we focus on two published studies. The first by Gerard *et al*[5] elicited patient preferences for out-of-hours care and the second by Gosden[7] used the approach to elicit GP preferences for job characteristics. Supplementary Table 1 shows extracts of the results. Regression coefficients indicate the relative importance of a unit change in each characteristic, the sign on the coefficients indicates whether the characteristic has a positive or negative effect on choice and the ratio of coefficients shows how much of one attribute responders are willing to give up to have more of another.

Consider the results of Gerard *et al*[5] for out-of-hours care. The positive coefficients for both nurse and doctor giving advice imply both are preferred to a paramedic, with a doctor also being preferred to a nurse (as indicated by the higher coefficient). The negative coefficient for waiting time implies a preference for shorter waiting times. While responders prefer shorter waiting times they also prefer to see a doctor, and were willing to wait up to 2 hours and 18 minutes (0.690/0.005) to receive advice from a doctor rather than a paramedic.

Gosden *et al*[7] use the technique for estimating monetary values. An increase in income and having opportunities to develop specialist interests makes a job more attractive (positive coefficient), while working in high deprivation areas reduces attractiveness (negative coefficient). Responders would give up £2270 (0.68/0.003) of annual income in return for opportunities to develop outside interests and require an additional £5000 per annum (-1.51/0.003) to work with a population with high levels of deprivation. This study also estimates trade-offs in terms of working hours and list size.

While the approach is potentially useful for estimating trade-offs, there are a number of issues practitioners should consider.[1] Determining characteristics and levels is crucial to the conduct of a good study. An implicit assumption of the approach is that individuals consider all characteristics and levels, and trade across them, thus allowing trade-offs between characteristics to be estimated. This assumption may be violated as the number of attributes and levels becomes large, and research is needed in this area.[1] When conducting a discrete choice experiment, consideration should be given to the number of attributes a responder can be expected to consider and trade-off.

The attributes and levels determine the total number of scenarios (full factorial). Many applications give rise to more scenarios than can be presented to responders. For example, a study with four characteristics at five levels results in 625 possible scenarios (estimated as 5^4). Here a sub-set of scenarios (fractional factorial) is chosen using experimental design theory. This sub-sample should not be chosen at random, as this could result in correlations between characteristics and prevent the effect of each characteristic being determined in the analysis. The starting point is often to define a reduced set of scenarios from experimental design catalogues or computer software (fractional factorial).[1] These profiles are used to create choices. In moving from the fractional factorial to creating choices Longo *et al*[2] selected one scenario as a 'constant comparator' and paired all other scenarios with this. Alternative methods of creating choice sets are presented by Louviere *et al.*[10] Given the crucial role of the experimental design in developing a discrete choice experiment and obtaining meaningful results, the importance of authors providing sufficient information on the experimental design component of the study is becoming increasingly recognised.[1]

Regarding the validity of the method, work has shown that responders are consistent and internally valid.[1] With regard to external validity, for example whether responders behave the same way in the 'real world' as stated in the hypothetical situation, results indicate that researchers can be optimistic[1] although evidence is limited.

In conclusion, discrete choice experiments are a characteristic-based measure of value. The real advantage of the technique is the explicit consideration of opportunity cost. We know that individuals want the best of everything, but in a world of limited resources trade-offs have to be made. Wenseng *et al*,[11] in a systematic review of the literature on patient priorities for general practice care, found that while patients value rapid access, they give higher priority to seeing a doctor they know, can talk to and trust. Such trade-offs are not always recognised by government. For example, government policy currently gives priority to fast access,[12] taking no account of the implied trade-offs. Such a policy may not maximise benefits from limited resources. For efficient decision making we need to know how patients and the public trade fast access with other aspects of care, which they may be forgoing in government attempts to ensure all patients see their doctor within 48 hours. Discrete choice experiments would be useful here.

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Supplementary information
Additional information is available online at http://www.rcgp.org.uk/journal/supp/index.asp

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