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DEVELOPMENT

Heuristics in primary care for recognition of unreported vision loss in older people: a technology development study

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Aim: To evaluate heuristics (rules of thumb) for recognition of undetected vision loss in older patients in primary care. **Background:** Vision loss is associated with ageing, and its prevalence is increasing. Visual impairment has a broad impact on health, functioning and well-being. Unrecognised vision loss remains common, and screening interventions have yet to reduce its prevalence. An alternative approach is to enhance practitioners' skills in recognising undetected vision loss, by having a more detailed picture of those who are likely not to act on vision changes, report symptoms or have eye tests. This paper describes a qualitative technology development study to evaluate heuristics for recognition of undetected vision loss in older patients in primary care. **Method:** Using a previous modelling study, two heuristics in the form of mnemonics were developed to aid pattern recognition and allow general practitioners to identify potential cases of unreported vision loss. These heuristics were then analysed with experts. **Findings:** It was concluded that their implementation in modern general practice was unsuitable and an alternative solution should be sort.

Key words: detect vision loss; general practice; heuristic; primary care; rules of thumb; unreported visual loss

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Background

There is compelling evidence of an unmet need for eye care amongst older people with undetected vision loss. Between 12% and 50% of older people have undetected visual loss, with a higher prevalence amongst women, and the risk increasing rapidly with age (Klein *et al.*, 1991; Wormald *et al.*, 1992; Reidy *et al.*, 1998; Evans and Rowlands, 2004). Much of this undetected visual impairment is reversible (Reidy *et al.*, 1998; Foran *et al.*, 2002; Evans *et al.*, 2004). Reidy *et al.* (1998) found that impaired vision in one or both eyes was potentially remediable in 69% of cases. The common reversible eye disorders are cataracts, corneal opacity, posterior subcapsular opacity, and refractive error. These conditions may be corrected by surgery or spectacles if identified.

Recent studies indicate that vision loss is associated with higher prevalence of chronic health conditions (Crews *et al.*, 2006), premature death (Lee *et al.*, 2002), falls and injuries (Ivers *et al.*, 2000), depression and social isolation (Horowitz 2003; Jones *et al.*, 2009). When combined with chronic health conditions such as diabetes, vision

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loss is associated with overall poorer health among people aged 65 or older (Saadine *et al.*, 2008). Vision loss compromises people's quality of life because it reduces their capacity to read, drive a car, watch television, or keep personal accounts. Often, it isolates older people and keeps them from friends and family. Undetected vision loss can be serious in its impact, which is largely avoidable.

There have been many studies from the United Kingdom, the United States, and Australia that have shown that population screening for unrecognised visual impairment does not lead to significantly improved visual function in the older population (Smeeth *et al.*, 2003; Chou *et al.*, 2009; Swamy *et al.,* 2009). The exact reason for why population screening for visual impairment is not effective is not known. One explanation proposed by Swamy *et al.* (2009) was that members of control groups in intervention studies visit eye care services that are freely available in most of the developed world, making them poor controls and reducing the chance of finding differences between study arms.

Selective eye screening was proposed. A quantitative analysis of a large database of people aged 65 and over recruited through general practice, and a qualitative study of older people's responses to vision loss and eye tests carried out for the Thomas Pocklington Trust, described patient characteristics that are associated with unreported poor vision (Iliffe *et al.*, 2013b; Kharicha *et al.*, 2013). The key findings of the quantitative analysis were: those with undiagnosed visual function loss are more likely to have had only basic education, to be at risk of social isolation, to have depressed mood, to be in need of assistance with one or more basic activities of daily living and instrumental activities of daily living, to have impaired memory, and to describe their health as only fair or poor. This description is potentially useful as a recognisable clinical pattern that can trigger further eye investigations. In addition, two items from the Visual Function Questionnaire (Mangione *et al.*, 2001) used in the quantitative cohort study significantly predicted deterioration in visual function over a period of three years: those reporting difficulty with close vision hobbies and those reporting difficulty with reading newspaper print were more likely to have worse self-reported vision three years later.

The quantitative analysis (Kharicha *et al.*, 2013) did not identify individual health-related or socio-demographic characteristics that predicted failure to have eye checks. The qualitative data, on the other hand, suggested a complex model of decision making based on three axes which are:

1. positive attitudes to preventive care, versus acceptance of change to normal ageing;
2. decisiveness about action, versus avoidance or denial; and
3. trusting professional skills and judgements, versus distrust of commercial motives.

This qualitative data could contribute to pattern recognition for the opportunistic identification of older people at high risk of visual loss.

Using the findings of the quantitative and qualitative studies in a modelling study (Iliffe *et al.*, 2008), we proposed a process as seen in Figure 1 for opportunistic case finding of people with undetected vision loss. This can be divided into two stages. In the first stage, a heuristic in the form of a mnemonic would aid pattern recognition and allow general practitioners to identify potential cases of unreported vision loss. Heuristics are 'rules of thumb' which can be seen as schematic patterns that can be applied in complex situations.

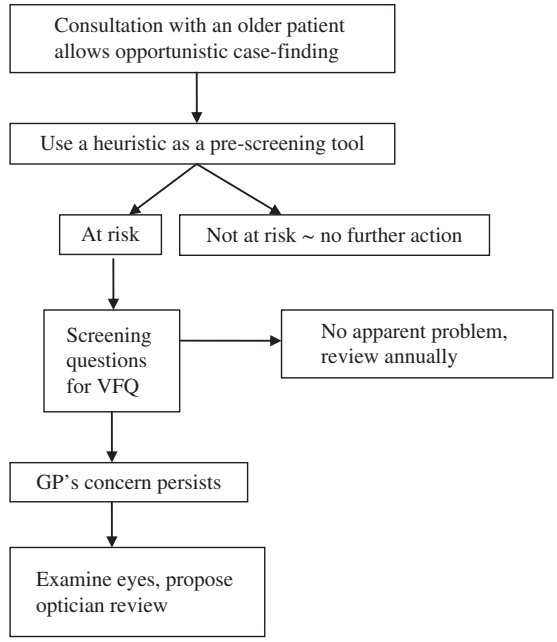

Figure 1 Algorithm for detection of unrecognised visual function loss in older people seen in general practice

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They function as prompts to thinking and action. Heuristics are brief and easy to remember and lead to action. The heuristics that general practitioners use in making clinical decisions shape performance more powerfully than any form of formal training (Anderson *et al.*, 2002), explaining why educational activities can increase knowledge without changing practice (Andre *et al.*, 2002). In the second stage, the two predictive questions would be used as triggers for further evaluation of the patient's eye health and visual function.

This study developed two prototype heuristics that captured some of the important features of those older people who were more likely to have unreported vision loss. The first was 'FOCUS' and the second 'BLINDS':

'FOCUS'

- Frailty; visual impairment is part of frailty, and may predict its development.
- Opportunistic Checks using two questions about close vision work or hobbies, or reading newsprint.
- Unrecognised visual function loss may be tractable, with significant improvement in the quality of life.
- Stoicism and Stigma are barriers to action to improve vision.

'BLINDS'

- Brain – memory loss
- Low income
- Ill-informed – low educational attainment
- Needy – disabilities
- Depressed
- Stoicism and Stigma

This study aimed to evaluate the use of these heuristics in practice, and this report describes their attempted validation and refinement. Figure 2 summarises the derivation of the heuristics. The boxes within the grey area of Figure 2 are the focus of this paper.

Methods

We followed the Wyatt approach (Wyatt and Spiegelhalter, 1990) to test whether the heuristics could improve recognition of unreported vision loss in primary care. The heuristics would be discussed with experts (bench tested), and then field tested in everyday practice. A convenience

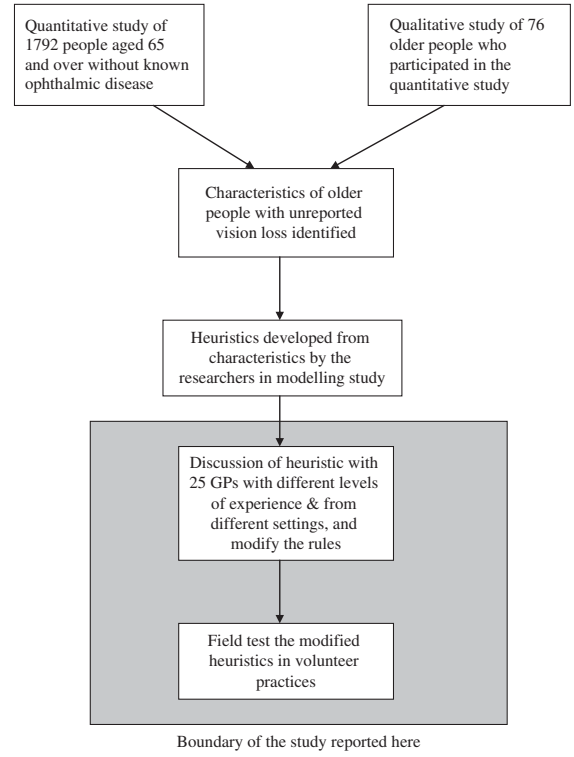

Figure 2 Development of heuristics for identifying older people with unreported vision loss

sample of 25 general practitioners (GPs) was recruited to give a range of views based on varying years of experience in general practice, list size and inner city and suburban experience. All GPs invited agreed to participate. They were invited to discuss the strengths and weaknesses of the heuristics. Practitioners were offered a choice of how to give their views: face-to-face, by email or by telephone; and either on an individual or group basis. The interviews were carried out by two of the authors. They were taped where possible for later reference, or detailed contemporaneous notes were made.

All those who participated in the discussion process were given the information shown in Figure 3 before the interview.

The following questions were asked of the general practitioners:

1. Is the use of a heuristic a feasible approach for primary care practitioners to detect unreported visual impairment in older people?

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2. What are the strengths and weaknesses of the 'FOCUS' and 'BLINDS' heuristics? What alternatives are there?
3. Do you use heuristics for identifying other conditions? If yes, how useful do you find this and why?

Findings

In all, 25 GPs were consulted on their views of the prototype heuristics. Six were academic GPs and included both newly qualified and very experienced practitioners. The number of years worked as a GP, the list size and location of their practices are given in Table 1. Seven face-to-face discussions were held, three group discussions, seven telephone encounters, and two GPs emailed their responses. Four of the GPs had taken specialist courses after qualification. These included a five-day course at a specialist eye hospital and a two day course for GPs in ophthalmology at a teaching hospital. One had received an hour of informal training and the rest relied on their GP basic training.

General practitioners' responses to the questions are summarised below.

Developing a training programme for general practice to help improve the uptake of eye care services among older people.

Despite free NHS eye examinations for those aged 60 and over, a significant proportion of visual impairment in older age remains due to remedial causes.

How do we target this group and persuade them to take up services?

Given that population screening does not lead to improved visual function, is opportunistic case finding in primary care a possible answer?

Earlier research suggests that knowledge in the following 3 areas may be helpful:

- Understanding eye health and the tractability of eye disease in later life
- The reasons why some older people avoid taking actions to improve their vision
- The value of simple questions in finding 'cases' of unrecognised visual impairment.

Risk factors of patients likely to have visual impairment - basic education only; be at risk of social isolation; have depressed mood; be in need of assistance with one or more Basic Activities of Daily Living (BADL), e.g. eating, bathing, dressing and Instrumental Activities of Daily Living (IADL), e.g. cleaning, shopping; have impaired memory; and describe their health as only fair or poor.

For opportunistic case finding we propose a 2 stage process:

- using a heuristic to prompt inclusion of the above items in the discussion with the patient
- undertaking further evaluation of the patient's eye health and visual function

(This process is illustrated in Figure 1.)

Figure 3 The task presented to general practitioners in the 'bench testing' phase

Is the use of a heuristic a feasible approach for primary care practitioners to detect unrecognised visual impairment in older people?

There were differences of opinion on the feasibility of using heuristics in primary care. More recently qualified GPs were more likely to be in favour of heuristics per se as 'they can help you remember to do things' and thought they would be useful for visual impairment as well. The more experienced GPs were less keen and preferred to 'work as a generalist, think for themselves and use professional experience' instead. They thought it was impractical to have a heuristic for every specific condition. It was also felt by some that some characteristics in the heuristics were subjective, and defining them would be time consuming.

All GPs questioned the use of a heuristic for visual impairment in every consultation, mainly due to the lack of time. Consultations with older patients tended to be longer than average and when issues need to be prioritised they were more likely to focus on those that are incentivised as part of the quality and outcomes framework (QOF). They felt the use of the heuristic might be better in consultations about conditions that impact on eyes, like diabetes and hypertension, discussions related to falls, low mood or with carers, or as a part of existing patient checks – for example the housebound check, annual check, new patient check. Several GPs identified the housebound older population as being a group in which implementing a visual impairment heuristic would be particularly difficult, mainly because GPs only have time to deal with acute issues. Other professionals may have more contact with this group that may be particularly needy.

Table 1 Characteristics of practitioners

Years in general practice	1–3 years = 18	4–10 years = 2	>10 years = 5	
List size	0–2K = 4	>2–10K = 8	>10–15 K = 10	Locum = 3
Practice location	Inner London = 4	Suburban London = 15	Suburban out of London = 3	Locum = 3

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GPs asked whether other members of the primary care team might be better placed to use heuristics for visual impairment. Practice nurses may have more time and be able to incorporate these checks into other monitoring, like chronic obstructive pulmonary disease and asthma reviews. Other professionals who were identified as potential users of the heuristics included: district nurses, health visitors for older people, carers, social service staff, day centre staff, care home workers, practice receptionists, health care assistants, falls clinic staff, and occupational therapists.

Two GPs mentioned that they routinely screen older patients for vision loss, which had been an incentivised programme in general practice as part of the 75 and over checks. They did not think the heuristics would be useful to them.

Several GPs acknowledged visual impairment as a topic that gets forgotten in a consultation, and although GPs may advise visiting the optometrist, there is no guarantee that the patient will act on this advice. Most, but not all, reported good local optometry services and working relationships. Some mentioned low standards of local services and pressures from Primary Care Trusts to cut eye related referrals to ophthalmology. One GP wondered whether the Primary Care Trust could commission optometrists to do health promotion related to eye health and carry out home visits.

What are the strengths and weaknesses of the 'FOCUS' and 'BLINDS' heuristics? What alternatives are there?

Several GPs were unclear how they would use the heuristic and needed them explained. Several felt that the characteristics highlighted in the heuristics were not specific enough to vision – they describe all older people seen by practitioners – and did not raise the profile of visual impairment *per se*. There were differences in preferences between the two examples offered. Strengths and weaknesses were identified in both.

The strengths of FOCUS were that it was an easy mnemonic to remember, but the 'U' and 'S' in the acronym needed explaining. The 'U' in FOCUS could raise expectations as not all unrecognised visual function is treatable. BLINDS was easier and probably quicker to complete than FOCUS, was clearer and was more clearly related to visual impairment, but it was perceived as very negative. One doctor commented, 'Apart from blind being quite depressing itself, I think that many people think about blindness as an extreme, and something separate from levels of visual impairment, while its important to get doctors to consider it before people reach that stage'. Another concern was that it would identify many patients, and one GP wanted to know how sensitive and specific it was as a screening tool.

Do you use heuristics for identifying other conditions? If yes, how useful do you find this and why?

There were mixed responses to this question, although most respondents did not use heuristics and struggled to think of examples. One example used by several GPs was the CAGE checklist for hazardous alcohol consumption, which is simple, makes sense, and is relevant to QOF. The ABCD2 algorithm was also mentioned as a risk predictor and guide to treatment after a transient ischaemic attack. This was used because it has a scoring system attached with clear cut offs in terms of the recommended treatment. One GP used mnemonics for depression and found them useful for a quick screen and time-efficient, especially when the condition of interest was unlikely to be the main problem.

Another GP just used heuristics to 'safety-net' – for example, with a patient who had been to a country where malaria is endemic, when the heuristic 'Fever + Any Symptom = Malaria until proven otherwise' would be useful. 'I don't generally find them too useful as every patient has a different collection of symptoms, and they seem very simplistic (therefore good for safety-netting)'.

Discussion

This paper has identified that there is a high prevalence of reversible eye disease among the older population. Population screening has not found to be effective in reducing this prevalence (Smeeth and Iliffe, 1998). This paper aimed to evaluate the use of a heuristic in general practice for identifying patients with reversible eye disease.

Heuristics are used throughout clinical medicine for decision making. Elstein (Elstein, 1999) defined heuristics as the mental shortcuts commonly used

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in decision making that can lead to faulty reasoning or conclusions. He suggested evidence-based medicine and decision analysis could be used to overcome this problem. McDonald (1996) pointed out that the use of heuristics is variable. He suggested that more uniform use of explicit and better heuristics could lead to less practice variation and more efficient medical care.

Our study has shown that heuristics should also be practical to use within a clinical scenario. All GPs felt that it would be a challenge to use the heuristic for case-finding during a 10 minute consultation. Andre *et al.* (2003) found that heuristics were used in general practice consultations for rapid assessment of whether a patient needed to be seen in hospital or in primary care. Therefore, the use of a heuristic must take into account the time constraints of modern general practice, but has a role in certain clinical scenarios.

The heuristics used in our study were thought to be confusing and difficult to remember. McDonald (1996) suggested that one should use heuristics, then criticise, improve and standardise them. It is possible that our one-off discussions were insufficient to evaluate our heuristics. Testing their use in day-to-day general practice might have led to a different conclusion. However, this study also pointed out that implementation without incentives will be difficult as the consultation in general practice already has many aspects to cover.

This study found that one way to improve the use of the heuristic is to use it in a target population such as housebound patients, where reversible eye disease is more likely to be present. At present, in primary care in England, target populations at risk of dementia are being screened with a heuristic, General Practitioner assessment of Cognition.

Another method would be to redesign the heuristic so that it is easier to implement in general practice. One possibility is that a shorter heuristic could be used with 'at risk' patients (Iliffe *et al.*, 2013a). This will be investigated in a future study.

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