Factors affecting the decision to investigate older adults with potential cancer symptoms: a systematic review

INTRODUCTION
Worldwide the population of those aged >65 years is growing faster than any other age group.1 The burden of cancer falls predominantly on older patients, with half of all new diagnoses occurring in people aged >70 years and incidence rates for all cancers increasing most rapidly in the >75 years age group.1,2 The benefits of asymptomatic cancer screening in older adults are unproven and, in most countries, it is not recommended.3,4 In countries such as the UK, symptomatic presentation to primary care is the most frequent route to a cancer diagnosis in older adults.2

Dignosing cancer at an early stage is important, and associated with improved survival.5 In older adults, these survival benefits are likely to be reduced because of shorter life expectancy. If cancer is diagnosed, older patients who are frail have an increased risk of morbidity and mortality from cancer surgery, and intolerance to chemotheraphy and radiotherapy.6 As a result, the management of older adults with cancer symptoms in primary care is difficult.6,7 Older adults need a balanced approach to the diagnosis and management of cancer symptoms. The imperative to diagnose cancer early in older adults must be balanced against the prognosis of the cancer, the likely success and tolerance of treatment, the presence of comorbidities, and patient preferences. Some older adults favour quality rather than length of life,8,9 are less likely to want investigation for cancer symptoms, and would accept a higher risk of cancer being undiagnosed.10

The aim of this review is to consider the global literature on the association between old age and the diagnostic process for cancer. The objectives were:

• to explore the effect of increasing age on the primary care interval (the time from first presentation to referral) in the diagnosis of cancer;
• to identify the factors that influence the decision to investigate potential cancer symptoms in older adults in primary care, both from a patient and healthcare professional perspective; and
• to understand how the factors identified have an impact on decision making, processes, and outcomes.

METHOD
Protocol
Prior to commencing this review, the study protocol was registered with PROSPERO (https://www.crd.york.ac.uk/prospero/protocol/1987).

Abstract
Background
Older age and frailty increase the risk of morbidity and mortality from cancer surgery and intolerance to chemotheraphy and radiotherapy. The effect of old age on diagnostic intervals is unknown; however, older adults need a balanced approach to the diagnosis and management of cancer symptoms, considering the benefits of early diagnosis, patient preferences, and the likely prognosis of a cancer.

Aim
To examine the association between older age and diagnostic processes for cancer, and the specific factors that affect diagnosis.

Design and setting
A systematic literature review.

Method
Electronic databases were searched for studies of patients aged >65 years presenting with cancer symptoms to primary care considering diagnostic decisions. Studies were analysed using thematic synthesis and according to the Synthesis Without Meta-analysis guidelines.

Results
Data from 54 studies with 230,729 participants were included. The majority of studies suggested an association between increasing age and prolonged diagnostic interval or deferral of a decision to investigate cancer symptoms. Thematic synthesis highlighted three important factors that resulted in uncertainty in decisions involving older adults: presence of frailty, comorbidities, and cognitive impairment. Data suggested patients wished to be involved in decision making, but the presence of cognitive impairment and the need for additional time within a consultation were significant barriers.

Conclusion
This systematic review has highlighted uncertainty in the management of older adults with cancer symptoms. Patients and their families wished to be involved in these decisions. Given the uncertainty regarding optimum management of this group of patients, a shared decision-making approach is important.

Keywords
cancer; decision making; shared; early detection of cancer; frail elderly; primary health care; systematic review.

INTRODUCTION
Worldwide the population of those aged >65 years is growing faster than any other age group.1 The burden of cancer falls predominantly on older patients, with half of all new diagnoses occurring in people aged >70 years and incidence rates for all cancers increasing most rapidly in the >75 years age group.1,2 The benefits of asymptomatic cancer screening in older adults are unproven and, in most countries, it is not recommended.3,4 In countries such as the UK, symptomatic presentation to primary care is the most frequent route to a cancer diagnosis in older adults.2

Dignosing cancer at an early stage is important, and associated with improved survival.5 In older adults, these survival benefits are likely to be reduced because of shorter life expectancy. If cancer is diagnosed, older patients who are frail have an increased risk of morbidity and mortality from cancer surgery, and intolerance to chemotheraphy and radiotherapy.6 As a result, the management of older adults with cancer symptoms in primary care is difficult.6,7 Older adults need a balanced approach to the diagnosis and management of cancer symptoms. The imperative to diagnose cancer early in older adults must be balanced against the prognosis of the cancer, the likely success and tolerance of treatment, the presence of comorbidities, and patient preferences. Some older adults favour quality rather than length of life,8,9 are less likely to want investigation for cancer symptoms, and would accept a higher risk of cancer being undiagnosed.10

The aim of this review is to consider the global literature on the association between old age and the diagnostic process for cancer. The objectives were:

• to explore the effect of increasing age on the primary care interval (the time from first presentation to referral) in the diagnosis of cancer;
• to identify the factors that influence the decision to investigate potential cancer symptoms in older adults in primary care, both from a patient and healthcare professional perspective; and
• to understand how the factors identified have an impact on decision making, processes, and outcomes.

METHOD
Protocol
Prior to commencing this review, the study protocol was registered with PROSPERO (https://www.crd.york.ac.uk/prospero/protocol/1987).

Abstract
Background
Older age and frailty increase the risk of morbidity and mortality from cancer surgery and intolerance to chemotheraphy and radiotherapy. The effect of old age on diagnostic intervals is unknown; however, older adults need a balanced approach to the diagnosis and management of cancer symptoms, considering the benefits of early diagnosis, patient preferences, and the likely prognosis of a cancer.

Aim
To examine the association between older age and diagnostic processes for cancer, and the specific factors that affect diagnosis.

Design and setting
A systematic literature review.

Method
Electronic databases were searched for studies of patients aged >65 years presenting with cancer symptoms to primary care considering diagnostic decisions. Studies were analysed using thematic synthesis and according to the Synthesis Without Meta-analysis guidelines.

Results
Data from 54 studies with 230,729 participants were included. The majority of studies suggested an association between increasing age and prolonged diagnostic interval or deferral of a decision to investigate cancer symptoms. Thematic synthesis highlighted three important factors that resulted in uncertainty in decisions involving older adults: presence of frailty, comorbidities, and cognitive impairment. Data suggested patients wished to be involved in decision making, but the presence of cognitive impairment and the need for additional time within a consultation were significant barriers.

Conclusion
This systematic review has highlighted uncertainty in the management of older adults with cancer symptoms. Patients and their families wished to be involved in these decisions. Given the uncertainty regarding optimum management of this group of patients, a shared decision-making approach is important.

Keywords
cancer; decision making; shared; early detection of cancer; frail elderly; primary health care; systematic review.
There is uncertainty in the management of cancer symptoms in primary care. This is the first review, to the authors’ knowledge, to consider the effect of older age on decision making by patients and GPs when patients present to primary care with cancer symptoms. Multiple factors were found to influence the patient and GP decision to investigate cancer symptoms including the presence of frailty, comorbidities, and cognitive impairment, family and carer involvement, and consultation time. Given the uncertainty, a shared decision-making approach is appropriate, but in routine general practice this may be difficult to achieve, mostly because of a lack of time within the consultation.

There is no universally accepted age threshold for defining old age. The World Health Organization’s definition of ‘older people’ as those aged $\geq 65$ years was adopted in this study.

Any studies (qualitative and quantitative) of patients aged $\geq 65$ years or with a subgroup of patients aged $\geq 65$ years with symptoms and signs that warrant investigation and referral for suspected cancer presenting to primary care before diagnosis were included. Case-control, cohort, and cross-sectional studies were included as well as interview and focus group studies. Editorials, single/clinical case studies, reviews, expert opinion articles, and studies that were published as abstracts were excluded from the review.

On 29 April 2020 electronic databases [Box 1] were searched for published and unpublished studies of cancer-related shared decision making (SDM) for older adults in primary care. See Supplementary Appendix S1 for full search strategies.

Subject headings and free-text words were identified for use in the search concepts by the study authors and based on the search strategy published in a similar review. No limits (for example, language or date of publication) were applied to the search. The searches were peer reviewed by a second information specialist.

Further relevant studies were sought by searching the citations of included studies, and hand searches of conference abstracts (Cancer and Primary Care Research International Network, National Cancer Research Institute, Macmillan Cancer Support, and Cancer Research UK).

All titles and abstracts were independently reviewed by two authors. Any disagreements were resolved through discussion or through adjudication by a third author. Reasons for exclusion were recorded. Data extraction was undertaken using a data extraction template.

The mixed-methods appraisal tool (MMAT) was used to assess the risk of bias for the included studies. The reviewers’ reasons for ratings, including strengths and weaknesses of studies, were recorded independently by two authors before agreeing on a final score.

Meta-analysis was not possible because of the heterogeneity of the included studies. Quantitative studies were therefore analysed using the SWiM (Synthesis Without Meta-analysis) reporting guidelines and checklist. Qualitative studies were analysed using thematic synthesis described by Thomas and Harden. Quotes and supporting information were extracted using a template and imported into NVivo (version 12). Quotes and text were then coded line by line before the development of descriptive and analytic themes that...
enabled comparisons and synthesis between studies. This synthesis was undertaken independently by two reviewers. The ENTREQ guidelines were followed for reporting the synthesis of qualitative research.19 Following the separate analysis of qualitative and quantitative data, the findings were combined by considering the barriers and facilitators to decision making in primary care. This method was based on previous published guidance on integrating qualitative research in systematic reviews.20

RESULTS
The database searches identified 5336 studies. After title and abstract screening and full-text review, 54 articles were included with 230 729 participants (Figure 1). Studies ranged in size from 9 to 109 433 participants. In total, 29 articles included quantitative data,11,21–48 24 provided qualitative data,49–72 and one included both qualitative and quantitative data.26 A variety of study settings and cancer types were included (see Supplementary Tables S1 and S2). Overall, the quality of studies was judged to be high with an average MMAT across the 54 included studies of 4.6/5.

Quantitative study results
The 29 quantitative studies included in this review are summarised in Supplementary Table S1. A variety of cancers were investigated in a number of different countries. The association between increasing age and the investigation and referral of cancer symptoms was not related
### Figure 2. Diagram to show the number of quantitative studies, the association with cancer diagnosis, the cancer investigated, and the quality assessment. Size of circle corresponds to the quality rating judged using MMAT. MMAT = mixed-methods appraisal tool.

| Patient factors | Older age associated with early diagnosis or preference for investigation | Older age associated with later diagnosis or deferral of investigation | No association between older age and diagnosis or decision to investigate |
|-----------------|----------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------|
|                  | Howell, 2018                                                               |          | Arndt, 2003                                                                |
|                  | Mikulin, 1997                                                             | Freida, 1999                                        | Jensen, 2016                                                           |
|                  | Neal, 2005                                                                 | Tate, 2010                                         | Hansen, 2008                                                          |
|                  | Flordelis, 2013                                                           | Garrus, 2009                                        | Alper, 2019                                                           |
|                  | Freiss, 2011                                                               | Prionsa, 2009                                      | Van Poppo, 2011                                                      |
|                  | Prionsa, 2009                                                             | Esteva, 2013                                       | Van Erp, 2019                                                        |
|                  | Adam, 2017                                                                 | Sasano, 2004                                       |                                                                         |
|                  | Meinecha-Schmidt, 2003                                                    | Adam, 2017                                        |                                                                         |
|                  | Serum, 2004                                                                | Baumgath, 2011                                     |                                                                         |
|                  | Wilder, 2017                                                               | Delia, 2011                                        |                                                                         |
|                  | Wilder, 2017                                                               | Delia, 2011                                        |                                                                         |
|                  | Banks, 2014                                                                | McNeal, 2017                                       |                                                                         |
|                  | Sheridan, 2019                                                            | McCullough, 2003                                   |                                                                         |
|                  |                                                                | Hollinghurst, 2016                                 |                                                                         |
|                  |                                                                | Martins, 2019                                      |                                                                         |

#### Qualitative study findings

Twenty-five studies included in the review provided qualitative data on the association with age and the primary care interval (Supplementary Table S2). Thematic synthesis identified the following themes on the decision to investigate or refer cancer symptoms in older adults: the effect of old age on GP and patient decision making; frailty, cognitive impairment, and comorbidities; involving family and carers in decision making; and consultation time. The difficulty of providing adequate time within the primary care consultation for older adults was also highlighted.

### The effect of old age on GP and patient decision making

The included studies suggested the presence of significant variation in how GPs and patients managed cancer symptoms in an ageing population. There was evidence that older adults faced additional barriers to diagnosis, with cancer symptoms sometimes being attributed to the ‘effects of old age’ by both patients and GPs. Data suggested that GPs could make decisions on behalf of patients but this may result in depersonalisation and a loss of autonomy. One study suggested that GPs may apply their own personal values to decision making, which could be at odds with that of the patient. In contrast, there was also evidence of doctors considering quality of life and life expectancy when making decisions rather than age alone, which affected the likelihood of investigation and referral. These findings are summarised in Box 2.

### Frailty, cognitive impairment, and comorbidities

Frailty, comorbidities, and cognitive impairment were highlighted as important themes throughout the qualitative synthesis, and are summarised in Box 3. The study analysis suggested that GPs undertook an assessment of a patient’s overall health or frailty when making decisions about the investigation or referral for cancer symptoms. Older adults deemed factors such as declining investigations and not attending appointments were more common. Three studies found that age was not associated with patients’ preference to proceed with investigations for suspected prostate cancer, patients’ wish for cancer investigations, or attitudes towards a cancer diagnosis.

These results of the quantitative analysis are summarised in Figure 2. The qualitative results below go some way to explaining these findings.

#### Number of cancers

- Any cancer or ≥3 cancers
- Breast cancer
- Colorectal cancer
- Upper gastrointestinal cancer
- Prostate cancer
- Head and neck cancer
- Lung cancer
- Brain cancer
- Ovarian cancer
- Leukaemia
- Myeloma

---

Figure 2. Diagram to show the number of quantitative studies, the association with cancer diagnosis, the cancer investigated, and the quality assessment. Size of circle corresponds to the quality rating judged using MMAT. MMAT = mixed-methods appraisal tool.
Box 2. Themes and illustrative quotes demonstrating the effect of old age on GP and patient decision making

| Theme | Subtheme | Illustrative quotes |
|-------|----------|---------------------|
| Old age alone can affect decision making | Possible cancer symptoms are attributed to the ageing process | A GP stated: “I find that there can be a short delay in management, because we tend to trivialise symptoms that can be attributed to age, fatigue, asthenia, maybe a slight anaemia, things that are relatively trivial. We tend to say it’s just age.”
| | | A patient stated: “It was … a gradual process, which I put down to old age … [and], I’d had a bad back, so I was quite sort of willing to accept that my back hurts a bit.”
| | | Healthcare professionals may make decisions on behalf of older patients
| | | With an elderly patient, certain specialists and general practitioners have a tendency to make the decision on behalf of the patient, which is an important problem.”
| | | The carer recalled that the GP stated: “… for what life shall we save him?” The carer further reported: “… it was like he didn’t want anything to be done, that there was no point in doing anything, and that we should be satisfied with taking the world as we found it.”
| | | Healthcare professionals’ personal values may be at odds with those of the patient and carers
| | | A GP stated: “I have folks [in whom] we’re doing certain tests and things well beyond what generally is recommended but I think for good reason … I have a couple patients in their late 80s and 90s where I tell them: ‘you’re likely to live another decade or two … so we might need to be a little more aggressive …’”
| Old age alone should not delay investigation and referral | A GP stated: “One appointment, one problem”, which may highlight problems with policies such as ‘one appointment, one problem’, which may not suit an older patient demographic.

Involving family and carers in decision making. As a result of advanced age, frailty, or cognitive impairment, there were frequent discussions about the impact of a patient’s family or carers on the decisions made in primary care, especially in patients with cognitive impairment [Box 4]. The studies suggested that, if patients had advanced cognitive impairment, then that patient’s family and carers should be involved in decisions on investigation of cancer symptoms. However, there was concern that the wishes of the family and carers may not support those of the patient. There were also concerns over the level of responsibility that should be managed by relatives.

Consultation time. It was recognised by both patients and GPs that time constraints within the consultation could limit the communication of symptoms by patients. Although a lack of time in the consultation could affect patients of all ages, it was more likely to affect older adults because of the presence of frailty, comorbidities, and cognitive impairment, resulting in more complex consultations.

A study of GPs found that most were aware that time constraints within consultations with older adults limited what could be discussed. Two studies highlighted problems with policies such as ‘one appointment, one problem’, which may not suit an older patient demographic. However, there was evidence that GPs considered the practicalities of older adults attending appointments, with one GP suggesting that older adults may find afternoon appointments easier.

**DISCUSSION**

**Summary**

To the authors’ knowledge, this is the first systematic review to explore the effect of old age on the investigation and referral of cancer in primary care. The majority of studies suggest a possible association between increased age and a prolonged diagnostic interval or deferred cancer investigations. The findings suggest that, for
patients and GPs, deciding how to manage older patients with symptoms that could herald a cancer diagnosis is challenging. As well as an assessment of the patient’s wishes, such decisions often require an assessment of patients’ overall health or frailty, along with a judgement as to whether the harms of investigation or referral would be justified by benefits.

There is significant variation in the findings of the studies included in this review. Some studies found that older adults and those with high levels of frailty or comorbidity had prolonged diagnostic intervals or were not investigated for possible cancer, which were in direct contrast with other studies in the same patient group. This variation may reflect uncertainty and a lack of evidence regarding the management of cancer symptoms in older adults. Judgements undertaken by GPs based on a patient’s age or perceived frailty could result in inconsistency and a high degree of variation in clinical practice. However, the variation

| Theme | Subtheme | Illustrative quotes |
|-------|----------|---------------------|
| Frailty | Healthcare professionals are informally assessing frailty | A GP stated: “I’ve never used any specific scale to assess anyone’s frailty. I don’t know what the evidence is behind that frailty score.” |
| Frailty | Healthcare professionals are less likely to investigate or refer patients they deem to be frail | A GP stated: “We need to consider… the psychological and organic weaknesses that mean, possibly justifiably, that we shouldn’t do as much as we would with a younger person.” |
| Frailty | Assumptions about frailty may prevent investigation | A GP stated: “There may be a degree[of] assumption going on ‘I don’t think Mrs Bloggs is well enough’ and I wonder whether there is a better way…” |
| Cognitive impairment | Healthcare professionals are less likely to investigate or refer older patients they deem to be cognitively impaired | A GP stated: “Well, I don’t push the investigation or anything… For me, it’s really a complete hindrance to send people for investigations to seek out cancerous pathology.” |
| Cognitive impairment | Older patients with cognitive impairment may be distressed by examinations or investigations | An older patient with dementia who had undergone tests for colorectal cancer stated: “That woman who ran around and hurt me. Well, she didn’t know what she was doing. ‘No!’ I kept saying to her. I said ‘It’s not right!’ Two people hit me.” |
| Cognitive impairment | The presence of cognitive impairment can affect communication with healthcare professionals | A 79-year-old with colorectal cancer stated it was his wife who had noticed the patient’s symptoms: “I have Alzheimer’s disease and my wife noticed the change in bowel habits. I had no other signs or symptoms.” |
| Cognitive impairment | Despite cognitive impairment, patients may be fit and investigation could be warranted | A GP stated: “Even if they’re very cognitively impaired, we can still share plenty of things, and often they find that it’s worthwhile to continue to fight.” |
| Comorbidities | Investigation and referral of symptoms possibly owing to cancer were delayed because of comorbidities | The carer of a 78-year-old man recalled how the GP attributed his signs of illness to pain from a knee replacement: “I first visited my doctor about my symptoms… I was not examined. I was told the pain was coming from my back (I had a back problem for years).” |
| Comorbidities | Annual check-ups for comorbidities resulted in opportunities for earlier diagnosis | The cancer was only found on annual chest check for COPD. A patient (aged between 85 and 89 years) with lung cancer stated: “I go six monthly to the nurse in the clinic and I mentioned to her I was spitting blood and she said ‘we make an appointment with the doctor’…” |
impairment taken with the carers, those close to the patient, their carers may be at odds with "A 50-year-old who says to you "If I'm ever in that
The wishes of family and  A GP stated: "If we're referring to patients with advanced cognitive
family …' 56
— they shouldered in taking such a decision.' 63
family or carers? clinical investigations consent process of their relative
[the family] take it; it's normal.' 56
to die", but when they [the family] face that situation
This large systematic review of 54 studies
costs than those without comorbidities. 76
A review on the impact of comorbidity on
cancer outcomes found that patients
decisions of older adults who are frail and
A systematic review on the effect of dementia on
cancer outcomes found that patients
A systematic review on the effect of frailty
cancer outcomes found that patients
A systematic review on the effect of frailty
cancer outcomes found that patients
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
with cancer found that cancer treatment was
A review on the impact of comorbidity on
cancer treatment found similar results.
The review reports that patients with
comorbidity had poorer survival, poorer
quality of life, and higher healthcare
costs than those without comorbidities. 74
A systematic review on the effect of dementia on
cancer outcomes found that patients with dementia and cancer had
A qualitative study on the information needs of patients with
dementia making decisions about cancer
treatment found similar results.
Implications for research and practice

National guidelines on investigation and referral of patients with cancer symptoms do not consider older age or frailty.\(^1,7^9\) However, the question of whether healthcare professionals should treat older adults with cancer symptoms differently remains.\(^7^9\) It is not possible to make appropriate management decisions on the basis of age alone, as many patients remain active and healthy well into advanced age, or may express preferences about investigation and treatment. Even patients who may not be able to tolerate aggressive cancer treatments might still benefit from diagnosis, for example, should they wish to know about prognosis or to access palliative care. This review highlights uncertainty in both patients’ and GPs’ views and decisions surrounding the investigation and referral of older adults with cancer symptoms. In this context of uncertainty, an SDM approach is most appropriate.\(^9^\) This would allow patients, and in some cases their family, to evaluate the pros and cons of diagnostic referral on an individual basis. SDM is key part of the NHS Long Term Plan,\(^8^0\) which advocates personalised care across the whole care system.

Barriers to the use of SDM, however, were apparent in the review. The authors of this current study consider in a primary care consultation that there is insufficient time to fully undertake SDM, with the presence of cognitive impairment, comorbidities, and frailty; complex medical/social circumstances; the need for assessments of capacity; and to involve family members. Significant work has been undertaken to understand the use of SDM and holistic geriatric assessment tools to aid decision making for cancer treatment.\(^8^1\) These barriers might be addressed by further use of pre-diagnostic frailty scoring systems and holistic assessments of older adults, and may benefit from further development of geriatric oncology services expanding into primary care, as has been suggested in work considering frailty and cancer treatment.\(^7^\)
REFERENCES

1. GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet 2020; 396(10258): 1204–1222.

2. Cancer Research UK. Cancer statistics for the UK. https://www.cancerresearchuk.org/health-professional/cancer-statistics-for-the-uk (accessed 22 Oct 2021).

3. NHS Digital. NHS screening. 2021. https://www.nhs.uk/conditions/nhs-screening (accessed 22 Oct 2021).

4. Royce TJ, Hendrix LH, Stokes WA, et al. Cancer screening rates in individuals with different life expectancies. JAMA Intern Med 2014; 174(10): 1558-1565.

5. Din NU, Ukoumunne OC, Rubin G, et al. Age and gender variations in cancer diagnostic intervals in 15 cancers: analysis of data from the UK Clinical Practice Research Datalink. PLoS One 2015; 10(5): e0127717.

6. Neal RO, Thranmanathan P, France B, et al. Is increased time to diagnosis and treatment in symptomatic cancer associated with poorer outcomes? Systematic review. Br J Cancer 2015; 112 Suppl 1:55; doi:892–510.

7. Handforth C, Clegg A, Young C, et al. The prevalence and outcomes of frailty in older patients: a systematic review. Ann Oncol 2015; 26(4): 1091–1101.

8. van de Pol MHJ, Fluit CRMG, Lagro J, et al. Shared decision making with frail older patients: proposed teaching framework and practice recommendations. Gerontol Geriatr Educ 2016; 38(4): 482–495.

9. Jones D, di Martino E, Hallon NL, et al. Investigating cancer symptoms in older people: what are the issues and where is the evidence? Br J Gen Pract 2020; DOI: https://doi.org/10.3399/bjgp20X710789.

10. Shrestha A, Martin C, Burton M, et al. Quality of life versus length of life considerations in cancer patients: a systematic literature review. Psycho-Oncol 2019; 28(7): 1367–1380.

11. Banks J, Holinghurst S, Bigwood L, et al. Preferences for cancer investigation: a vignette-based study of primary-care attendees. Lancet Oncol 2014; 15(2): 232–240.

12. Higgins JPT, Thomas J, Chandler J, et al. eds. Cochrane handbook for systematic reviews of interventions. Hoboken, NJ: John Wiley & Sons, 2019.

13. Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. BMJ 2009; 339(1): b2535.

14. World Health Organization. Proposed working definition of an older person in Africa for the MDS project. Geneva: WHO, 2002.

15. Puts MT, Tappen B, Fitch M, et al. A systematic review of factors influencing older adults’ decision to accept or decline cancer treatment. Cancer Treat Rev 2015; 41(2): 197–215.

16. Hong GN, Gonzalez-Reyes A, Pupey P. Improving the usefulness of a tool for appraising the quality of qualitative, quantitative and mixed methods studies, the Mixed Methods Appraisal Tool (MMAT). J Eval Clin Pract 2018; 24(3): 459–467.

17. Campbell M, McKenzie JE, Soedoen A, et al. Synthesis without meta-analysis (SWIM) in systematic reviews: reporting guideline. BMJ 2020; 368: l6890.

18. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. BMJ Med Res Methods 2008; 8; 45.

19. Tong A, Flemming K, McNenes E, et al. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. BMC Med Res Methods 2012; 12; 181.

20. Thomas J, Harden A, Oakley A, et al. Integrating qualitative research with trials in systematic reviews. BMJ 2006; 332(7544): 1011–1012.

21. Neal RO, Allgar VL. Socio-demographic factors and delays in the diagnosis of six cancers: analyses of data from the ‘National Survey of NHS Patients: Cancer’. Br J Cancer 2005; 92(11): 1971–1975.

22. Mikulin T, Hardcastle JD. Gastric cancer — delay in diagnosis and its causes. Eur J Cancer Clin Oncol 1987; 23(11): 1971–1975.

23. Ferrada JL, Vinolas N, Munoz M, et al. Age: a critical factor in cancer diagnosis and survival. Eur J Cancer Clin Oncol 1987; 23(11): 1971–1975.

24. Friese CR, Abel GA, Magazu LS, et al. Diagnostic delay and complications for older adults with multiple myeloma. Leuk Lymphoma 2009; 50(3): 392–400.

25. Friese CR, Earle CC, Magazu LS, et al. Timeliness and quality of diagnostic care for Medicare recipients with chronic lymphocytic leukemia. Cancer 2011; 117(7): 1470–1477.

26. Howell DA, Smith AG, Jack A, et al. Time-to-diagnosis and symptoms of myeloma, lymphomas and leukaemias: a report from the Haematological Malignancy Research Network. BMC Hematology 2013; 13(1): 9.

27. Tate AR, Nicholson A, Cassell JA. Are GPs under-investigating older patients presenting with symptoms of ovarian cancer? Observational study using General Practice Research Database. Br J Gen Pract 2010; 102(6): 947–951.

28. Allgar VL, Oliver SE, Chen H, et al. Time intervals from first symptom to diagnosis for head and neck cancers: an analysis of linked patient reports and medical records from the UK. Cancer Epidemiol 2019; 59: 37–45.

29. Arndt V, Sturmer T, Stegmaier C, et al. Provider delay among patients with breast cancer in Germany: a population-based study. J Clin Oncol 2003; 21(8): 1440–1444.

30. Esteva M, Leiva A, Ramos M, et al. Factors related with symptom duration until diagnosis and treatment of symptomatic colorectal cancer. BMC Cancer 2013; 13: 87.

31. Hansen RP, Olesen F, Sørensen HT, et al. Socioeconomic patient characteristics predict delay in cancer diagnosis: a Danish cohort study. BMC Health Serv Res 2008; 8: 41.

32. Jensen H, Torring ML, Olesen F, et al. Cancer suspicion in general practice, urgent referral and time to diagnosis: a population-based GP survey and registry study. BMC Cancer 2014; 14: 636.

33. van Erp NF, Helsper CW, Dykhof SM, et al. Potential for reducing time to referral for colorectal cancer patients in primary care. Ann Fam Med 2019; 17(5): 419–427.

34. Van Hout AM, de Wit NJ, Rutten FH, et al. Determinants of patient’s and doctor’s delay in diagnosis and treatment of colorectal cancer. Eur J Gastroenterol Hepatol 2013; 25(11): 1056–1063.

35. Adam R, Garaud R, Raja EA, et al. Do patients’ faces influence General Practitioners’ cancer suspicions? A test of automatic processing of socio-demographic information. PLoS One 2017; 12(11): e0188222.

36. Meinea-Schmidt V, Jorgensen T. ‘Alarm symptoms’ in dyspepsia: how does the general practitioner investigate? Scan J Prim Health Care 2003, 21(4): 224–229.

37. Baughan P, Keatings J, O’Neill B. Urgent suspected cancer referrals from general practice: audit of compliance with guidelines and referral outcomes. Br J Gen Pract 2011; DOI: https://doi.org/10.3399/bjgp11X606591.

38. Sheringham J, Sequeira R, Myles J, et al. Variations in GPs’ decisions to investigate suspected lung cancer: a factorial experiment using multimedia vignettes. BMJ Qual Saf 2017; 26(6): 449–459.

39. Sorum PC, Muleit E, Shim J, et al. Avoidance of anticipated regret: the ordering of prostate-specific antigen tests. Med Decis Making 2004; 24(2): 149–159.

40. Wildiers H, Mauer M, Elseviers M, et al. Cancer events in Belgian nursing home residents: an EORTC prospective cohort study. J Geriatr Oncol 2019; 10(5): 855–860.

41. Delha F, Marien E, Fonck M, et al. Factors influencing general practitioners in the referral of elderly cancer patients. BMC Cancer 2011; 11: 5.

42. Sun Z, Ng C, Hakett G, et al. An investigation of factors that influence general practitioners’ referred computer tomography scans in patients with headache. Int J Clin Pract 2013; 67(7): 682–690.

43. Sheridan R, Oliver SE, Hall G, et al. Patient non-attendance at urgent referral appointments for suspected cancer and its links to cancer diagnosis and one-year mortality: a cohort study of patients referred on the two week wait pathway. Cancer Epidemiol 2019; 63: 101588.

44. McCallery K, Wardle J, Wailer J. Knowledge, attitudes, and behavioral intentions in relation to the early detection of colorectal cancer in the United Kingdom. Prev Med 2003; 36(5): 525–535.

45. Martins T, Ukoumunne OC, Banks J, et al. Ethnic differences in patients’ preferences for prostate cancer investigation: a vignette-based survey in primary care. Br J Gen Pract 2015; DOI: http://doi.org/10.3399/bjgp15X683965.

46. Holinghurst S, Banks J, Bigwood L, et al. Using willingness-to-pay to establish patient preferences for cancer testing in primary care. BMC Med Inform Decis Mak 2016; 16: 105.

47. Hurtad A, Aubin M, Ferrat E, et al. Continuity of care in general practice at patient referral for colorectal cancer patients in primary care. Br J Gen Pract 2015; DOI: http://doi.org/10.3399/bjgp15X683965.

48. Howell DA, Hart RJ, Smith AG, et al. Myeloma: patient accounts of their pathways to diagnosis. PLoS One 2018; 13(4): e0194788.
49. Weller D, Vedsted P, Rubin G, et al. The Aarhus statement: improving design and reporting of studies on early cancer diagnosis. Br J Cancer 2012; 106(7):1262–1270.

50. Allen K, Brown H, Singh K, et al. Advancing care, advancing years: improving cancer treatment and care for an ageing population. London: Cancer Research UK, 2018.

51. Andersen RS, Paarup B, Vedsted P, et al. ‘Containment’ as an analytical framework for understanding patient delay: a qualitative study of cancer patients’ symptom interpretation processes. Soc Sci Med 2010; 71(2):378–385.

52. Bann NS, Campbell NC, Ritchie LD, et al. Striking the right balance in colorectal cancer care — a qualitative study of rural and urban patients. Fam Pract 2002; 19(4):369–374.

53. Birt L, Hall N, Emery J, et al. How can experiences of patients and carers influence the clinical care of large bowel cancer? Eur J Cancer Care 2004; 13(4):318–327.

54. Broughton M, Bailey J, Linney J. How can experiences of patients and carers influence the clinical care of large bowel cancer? Eur J Cancer Care 2004; 13(4):318–327.

55. Caswell G, Seymour J, Crosby V, et al. Lung cancer diagnosed following an emergency admission: exploring patient and carer perspectives on delay in seeking help. Support Care Cancer 2017; 25(7):2259–2266.

56. Chicoulaa B, Balardy L, Stillmunkes A, et al. French general practitioners’ sense of isolation in the management of elderly cancer patients. Fam Pract 2016; 33(5):551–556.

57. Evans REC, Morris M, Sekhon M, et al. Increasing awareness of gynaecological cancer symptoms: a GP perspective. Br J Gen Pract 2014; DOI: https://doi.org/10.3399/bjgp14X680161.

58. Issah F, Maree JE, Mwinituo PP. Expressions of cervical cancer-related signs and symptoms. Eur J Oncol Nurs 2011; 15(1):67–72.

59. Jefferson L, Atkin K, Sheridan R, et al. Non-attendance at urgent referral appointments for suspected cancer: a qualitative study to gain understanding from patients and GPs. Br J Gen Pract 2019; DOI: https://doi.org/10.3399/bjgp19X706625.

60. King-Okeye M, Arber A, Faithfull S. Beliefs that contribute to delays in diagnosis of prostate cancer among Afro-Caribbean men in Trinidad and Tobago. Psycho Oncol 2019; 28(6):1321–1327.

61. Leydon GM, Bynoe-Sutherland J, Coleman MP. The journey towards a cancer diagnosis: the experiences of people with cancer, their family and carers. Eur J Cancer Care 2003; 12(4):317–326.

62. McWilliams L, Swarbrick C, Yorke J, et al. Bridging the divide: the adjustment and decision-making experiences of people with dementia living with a recent diagnosis of cancer and its impact on family carers. Ageing Soc 2018; 40(5):944–965.

63. Mitchell ED, Rubin G, Maclennan U. Understanding diagnosis of lung cancer in primary care: qualitative synthesis of significant audit event reports. Br J Gen Pract 2013; 63(604):e337–e46.

64. Neal RD, Robbie UJ, Lewis M, et al. The complexity and difficulty of diagnosing lung cancer: findings from a national primary-care study in Wales. Prim Health Care Res Dev 2015; 16(5):436–449.

65. Obero DV, Ijeka M, McManus A, et al. Help-seeking experiences of men diagnosed with colorectal cancer: a qualitative study. Eur J Cancer Care 2016; 25(1):27–37.

66. Obura D, Ijeka M, McManus A, et al. Help-seeking experiences of men diagnosed with colorectal cancer: a qualitative study. Eur J Cancer Care 2016; 25(1):27–37.

67. Parsonage RK, Hiscock J, Law RJ, Neal RD. Patient perspectives on delays in diagnosis and treatment of cancer: a qualitative analysis of free-text data. Br J Gen Pract 2017; DOI: https://doi.org/10.3399/bjgp16X688537.

68. Rankin NM, York S, Stone E, et al. Pathways to lung cancer diagnosis: a qualitative study of patients and general practitioners about diagnostic and pretreatment intervals. Ann Am Thorac Soc 2017; 14(5):742–753.

69. Salander P, Bergenhjem AT, Hamberg K, et al. Pathways from symptoms to medical care: a descriptive study of symptom development and obstacles to early diagnosis in brain tumour patients. Fam Pract 1999; 16(3):143–148.

70. Samuelsson KS, Egenvall M, Klarin I, et al. The older patient’s experience of the healthcare chain and information when undergoing colorectal cancer surgery according to the enhanced recovery after surgery concept. J Clin Nurs 2018; 27(7–8):e1580–e1588.

71. Schoenborn NL, Bowman TL, Cayea D, et al. Primary care practitioners’ views on incorporating long-term prognosis in the care of older adults. JAMA Int Med 2016; 176(5):671–678.

72. Tookey S, Renzi C, Waller J, et al. Using the candidacy framework to understand how doctor–patient interactions influence perceived eligibility to seek help for cancer alarm symptoms: a qualitative interview study. BMC Health Serv Res 2018; 18(1):937.

73. van Schalkwyk SL, Maree JE, Wright SC. Cervical cancer: the route from signs and symptoms to treatment in South Africa. J Reprod Health Matters 2008; 16(32):9–17.

74. McCutchan G, Wood F, Smits S, et al. Barriers to cancer symptom presentation among people from low socioeconomic groups: a qualitative study. BMC Public Health 2016; 16(1):1052.

75. Tookey S, Renzi C, Waller J, et al. Using the candidacy framework to understand how doctor–patient interactions influence perceived eligibility to seek help for cancer alarm symptoms: a qualitative interview study. BMC Health Serv Res 2018; 18(1):937.

76. Sarfati D, Koczvara B, Jackson C. The impact of comorbidity on cancer and its treatment. CA Cancer J Clin 2016; 66(4):337–350.

77. Tookey S, Renzi C, Waller J, et al. Using the candidacy framework to understand how doctor–patient interactions influence perceived eligibility to seek help for cancer alarm symptoms: a qualitative interview study. BMC Health Serv Res 2018; 18(1):937.

78. McWilliams L, Farrell C, Grande G, et al. A systematic review of the prevalence of comorbid cancer and dementia and its implications for cancer-related care. Aging Mental Health 2017; 21(10):1254–1271.

79. McWilliams L, Farrell C, Keady J, et al. Cancer-related information needs and treatment decision-making experiences of people with dementia in England: a multiple perspective qualitative study. BMJ Open 2019; 8(6):e020250.

80. National Institute for Health and Care Excellence. Suspected cancer: recognition and referral. NG12. London: NICE, 2021 https://www.nice.org.uk/guidance/ng12 [accessed 4 Nov 2021].

81. NHS England. The NHS Long Term Plan. 2019. https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan [accessed 22 Oct 2021].

82. Soto-Perez-de-Celis E, Li D, Yuan Y, et al. Functional versus chronological age: a qualitative interview study. BMJ Open Respir Res 2014; DOI: https://doi.org/10.3399/bmjor14X60007X.