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**Title page**

**Safety-netting in routine primary care consultations: an observational study**

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## **Abstract**

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**Background:** Safety-netting advice is information shared with a patient or their carer, designed to help them identify the need to seek further medical help if their condition fails to improve, changes or if they have concerns about their health.

**Aim:** To assess when and how safety-netting advice is delivered in routine GP consultations.

**Design and setting:** 318 adult recorded GP consultations, UK.

**Method:** A safety-netting coding tool was applied to all consultations. Logistic regressions for the presence or absence of safety-netting advice was compared between patient, clinician and problem variables.

**Results:** 390 episodes of safety-netting advice were observed in 205/318 (64.5%) consultations for 257/555 (46.3%) problems. Most advice was initiated by the GP (94.9%) and delivered in the treatment planning (52.1%) or closing (31.5%) consultation phases. Specific advice was delivered in almost half (47.2%) of episodes. Safety-netting advice was more likely to be present for problems that were acute (odds ratio [OR] 2.18, 95% confidence interval [CI] = 1.30-3.64), assessed first in the consultation (OR 2.94, CI = 1.85-4.68) or assessed by GPs less than 50 years old (OR 2.56, CI = 1.45-4.51). Safety-netting advice was documented for only 109/242 (45.0%) problems.

**Conclusion:** GPs appear to commonly give safety-netting advice, but the contingencies or actions required on the patient's part may not always be specific or documented. The likelihood of safety-netting advice being delivered may vary according to characteristics of the problem or the GP. How to assess safety-netting outcomes in terms of patient benefits / harms warrants further exploration.

### **How this fits in**

- Many studies of safety-netting to date have relied upon retrospective data collected in clinician and patient interviews / questionnaires or review of medical records.
- Prior research has reported that GPs provide safety-netting advice 'intuitively' in some circumstances, but it is not known exactly how and to what extent safety-netting advice occurs in routine adult consultations.
- This is the first observational study of when and how GPs give safety-netting advice in routine consultations in the UK and what factors are associated with frequency of safety-netting advice.
- This study confirms findings from prior qualitative research that safety-netting advice is often not specific and not documented in the medical notes.

### **Keywords (MeSH headings)**

- Health Communication
- Video Recording
- Primary care
- Patient safety

## **Introduction**

Safety-netting is a diagnostic strategy, utilised to manage clinical uncertainty, highlight 'red-flags', and help monitor patients until their symptoms are explained.<sup>1, 2</sup> This broad term has been used to describe not only advice given during healthcare encounters, but also system and administration factors.<sup>1, 3, 4</sup> In this study we assessed the communication of 'safety-netting advice', defined as "*information shared with a patient or their carer designed to help them identify the need to seek further medical help if their condition fails to improve, changes or if they have concerns about their health*",<sup>5</sup> which was adapted from Roland and colleagues definition.<sup>6</sup>

Recommendations to incorporate safety-netting into everyday clinical practice are widespread.<sup>3, 7</sup> Safety-netting is a key element of the RCGP curriculum, features in multiple consultation models and clinical guidelines, and is recognised as forming part of 'best-practice' in primary care.<sup>3, 8-14</sup> Conversely, a lack of safety-netting has been implicated in contributing towards harm to patients and GPs have been criticised for its omission.<sup>15, 16</sup>

A consensus study indicates clinicians agree safety-netting should be employed in high risk clinical situations such as when the diagnosis is uncertain, the diagnosis carries a known risk of serious complications, or the individual patient poses certain characteristics that puts them at an increased risk of illness or complications.<sup>2</sup> Patients presenting to primary care may be regarded to have an inherently high rate of both risk and uncertainty as they often present early in the disease process, there is a low background prevalence of most diseases, and most GPs practice without immediate diagnostic investigations such as x-rays and point of care blood tests. Neighbour first described a safety-netting checkpoint as one way of handling uncertainty.<sup>12</sup> Recent research suggests safety-netting is still valued by GPs when managing diagnostic uncertainty,<sup>17</sup> but both doctors and patients have questioned the utility of generic or vague safety-netting advice.<sup>2, 18</sup>

Many research studies on safety-netting have relied on retrospective data collected in GP and patient interviews, survey data and review of medical records.<sup>1-3, 19-23</sup> Qualitative research suggests that despite a lack of training in safety-netting

methods, for acutely ill children, GPs do it 'intuitively'.<sup>19, 20</sup> Yet it is unclear to what extent safety-netting is utilised in everyday clinical practice in adult consultations, which type of problems warrant safety-netting and what other factors contribute towards a GPs decision to safety-net or not.<sup>24</sup>

The aim of this explorative study was to describe when and how GPs deliver safety-netting advice in routine primary care consultations, the extent to which they document this advice in the medical notes and to explore patient, GP and problem factors associated with the presence or absence of safety-netting advice.

## **Methods**

### **Participants and data**

This study was a secondary analysis of an existing primary care consultations archive. Full details of data collection have been reported elsewhere.<sup>25, 26</sup> In short, the archive contains recordings and verbatim transcripts of unselected adult primary care consultations in areas of high and low deprivation in the West of England collected between 2014-15 with permissions in place for reuse. Linked data includes patient and GP characteristics, pre and post visit questionnaires and electronic medical records.

### **Problems raised in the consultations**

All problems (defined as the answer to the question "*what is wrong?*") raised in the consultations had previously been coded using the International Classification of Primary Care, second edition (ICPC-2).<sup>27, 28</sup> One coder (PE) rechecked all the problem types for each consultation used in this project. Problems were coded under their diagnostic category where available, for example a patient presenting with undifferentiated chest pain that was diagnosed to be musculoskeletal in origin would be coded under the ICPC-2 category of 'Musculoskeletal L'. Where the diagnosis was 'A97 No disease' or 'A85 Adverse effect medical agent' then the problems were coded by the category of their presenting complaint. Problems were ordered chronologically according to the GP assessment of each problem.

## **Screening and application of coding tool**

Full details of the development and inter-rater reliability of the coding tool are described elsewhere.<sup>5</sup> Briefly, percentage agreement and Cohen's kappa scores for the presence or absence of safety-netting advice per consultation and per problem were 100% ( $\kappa$  1.0) and 89% ( $\kappa$  0.77) respectively. The mean agreement score for the application of the tool was 88% ( $\kappa$  0.66).<sup>5</sup>

One coder (PE) screened all the consultations in the archive and counted the number of times safety-netting advice was delivered as well as which problems the advice applied to. Every consultation recording was viewed at least twice alongside the verbatim transcript. All problem codes and verbatim safety-netting advice were entered into the coding tool for full analysis. Additional codes capturing the wider context, for example, the presence or absence of follow-up, were assessed in all problems and not just those where safety-netting advice was present. Safety-netting advice was considered as contingent in nature and therefore distinguished from follow-up which was defined as an unconditional future review, referral or investigation of a problem.<sup>5</sup>

## **Software and statistical analysis**

Coding was undertaken using a Microsoft Excel spreadsheet that was imported into Stata (version 15.1) for data cleaning and statistical analysis. Descriptive statistics for when and how safety-netting was delivered by consultation, problem and for each discrete episode of safety-netting advice were calculated. Logistic regressions were used to generate Odds Ratios (OR) for the frequency of safety-netting advice associated with different patient, clinician or problem variants in both an unadjusted and adjusted model. In the adjusted model, we used multilevel mixed-effects modelling to adjust for all variables in Table 5 as covariates and for clusters within GP and patient. This adjusts for associations between variables (e.g. if acute problems are more likely to be assessed first by the GP), all problems seen by the same GP and multiple problems raised by the same patient. 95% confidence intervals (CI) with a significance level of 0.05 were calculated. Unless stated otherwise, OR are reported from the adjusted model. Patient problems with missing data were excluded from the adjusted models. All odds ratios reported for IMD quintiles use the least deprived quintile as the reference group.

## **Results**

### **Participants characteristics**

The demographic information for the 318 patients who were included in this study are presented in Table 1. Almost two thirds (64.5%) were female and most were of a white ethnic group (87.1%). In just under half of the consultations (47.5%) GPs assessed more than one problem. Of the 318 consultations 300 were video, 17 were audio only and one consultation the research team only had permission to use the transcript. Consultations were recorded with 23 GPs (13 female, 12 male, all white ethnic group) working in 12 practices.

### **Safety-netting advice and follow-up frequencies**

Safety-netting advice was present in 205/318 (64.5%) consultations but only 257/555 (46.3%) problems. However, most problems (468/555, 84.3%) had either some form of safety-netting advice or follow-up. For the 298 problems where no safety-netting advice was present, there was evidence of planned follow-up in 211 (70.8%) cases. The different types of planned follow-up are listed in the supplementary Table S1. Safety-netting advice varied by type of problem discussed (Table 2), being most common for neurological problems (16/27, 59.3%) and least common for urological disorders (4/21, 19.0%). On an individual GP basis (n=23), safety-netting advice per problem assessed ranged from a minimum of 18.2% to a maximum of 89.5% with a mean average of 46.9%.

### **Safety-netting contextual codes**

Diagnostic uncertainty was communicated for 256/555 (46.1%) of problems discussed, whereas the expected time course of the problem was communicated in only 127/555 (22.9%) of cases (Table S1). We also recorded if the doctor issued any other contingency plans that did not meet our definition of safety-netting advice such as contingent self-care, for example, "*if the rash comes back just use this cream again*" (Table S1).

### **Content of safety-netting advice**

There were 390 episodes of safety-netting advice observed across all consultations (Table 3). Most episodes were initiated by the GP (94.9%) and delivered in the treatment planning (52.1%) and closing phases of the consultation (31.5%). Over



half (52.8%) of episodes were classified as generic, but notable, during treatment planning, there was a higher percentage of specific (56.2%), rather than generic advice (43.8%), whereas the advice delivered in closing was more commonly generic (73.2%) rather than specific (26.8%).

In most cases, GPs advised patients to return back to their primary care team (90.5%) but a timescale of when to seek medical help was not often specified (77.7%). Rarely, a fixed period was given [GP: *If the symptoms are persisting and you are no better you do need to come back and see me, I'll say two weeks*] (16.7%) or the patients were informed to take immediate action (5.6%) [GP: *"If you're sitting there thinking, 'I'm really bad,' don't think, 'I'll wait till tomorrow' I am telling you now you need to call somebody straight away"*].

After the safety-netting advice had been delivered patients most commonly responded with a simple acknowledgment e.g. *"Mmhm"*, *"Yeah"*, or clear acceptance e.g. *"Okay"* (69.5%). However, in 9.5% there were signs of resistance / misalignment where patients chose to reject the advice / questioned the GP further. [GP: *"Any problems, then you know where we are."* Patient: *"Don't say things like that"*]. It was equally rare (9.6%) that patients asked any questions about the safety-netting advice.

### **Mode of communication**

Safety-netting advice was most commonly communicated verbally (249/257 problems, 96.9%). Eight problems were identified as having both verbal and written safety-netting advice. There were nine problems where GPs gave patients a written information leaflet that may have contained safety-netting advice, but we were unable to ascertain the exact contents of the leaflet and the GP did not vocalise that the leaflet contained safety-netting advice.

### **Documentation**

Where safety-netting advice was given for a problem and medical records were available (242/257), there was evidence in the medical notes that the patient had been given safety-netting advice in only 109/242 (45.0%) of cases. Documentation

rates of any follow-up plans verbalised in the consultation for each problem were higher at 295/354 (83.3%).

### **Symptoms or conditions**

The most common conditions or symptoms (e.g. if “x” happens then...) highlighted in the safety-netting advice for all problems are listed in Table 4. The most common verbalised category was a new specific symptom or condition (197/692) which applied to 87 problems, indicating that doctors often listed multiple symptoms for patients to look out for when assessing one problem. The most common category per problem was if the current illness or symptoms persisted. There were 179 verbalised conditions in the persisting category, which applied to 106 problems indicating that doctors often repeated the need for the patient to seek help if their symptoms persisted for the same problem. There were 49 incidents where the doctors vocalised if the patient had any “*problems*” or “*issues*” to seek medical help. This applied to 54 medical problems, as its generic nature covers multiple types of problems assessed in the same consultation. The mean average number of symptoms / conditions per discrete safety-netting advice episode was 1.77 (692/390) with a range of 1-10.

### **Patient, GP and problem factors associated with safety-netting advice**

Acute problems, including “acute on chronic” problems, (for example, acute shortness of breath attributed to COPD) were more likely to be given safety-netting advice than chronic problems, for example, a general review of COPD (OR 2.18  $p=0.003$ ) in both adjusted and unadjusted model (Table 5). Problems assessed by the GP first were more likely to be given safety-netting advice compared to problems assessed later in the consultation (OR 2.94  $p<0.001$ ). To ensure this association was not driven purely by consultations where only one problem was discussed we repeated the analysis including only problems from consultations where multiple problems were assessed and still found strong evidence of an association (OR 2.40  $p=0.001$ ). There was weak evidence of some form of follow-up being associated with less safety-netting advice (OR 0.63  $p=0.059$ ).

Frequency of safety-netting advice was not significantly higher for problems presented by older patients (aged 65 and over OR 1.21  $p=0.50$ ; age of 75 and over

OR 1.29 p=0.52). In the unadjusted models it appeared as if problems raised by patients who were not of a white ethnicity (OR 1.88 p=0.027) or those raised by patients from the most deprived IMD quintile (OR 0.58 p=0.016) were associated with an altered frequency safety-netting advice, however, these associations were not maintained in the adjusted model (OR 1.44 p=0.41, OR 0.90 p=0.77 respectively).

As a logistic regression for the presence or absence of safety-netting advice using GPs age as a continuous variable showed an association for younger GPs to have increased odds of giving safety-netting advice we categorised GPs into two groups, 50 years of age and older or younger than 50. Problems assessed by GPs younger than 50 years of age were more likely to have safety-netting advice (OR 2.56 p=0.001) compared to problems assessed by GPs 50 years and over.

## **Discussion**

### **Summary**

Safety-netting advice was present in just under two thirds of consultations but applied to just under half of all problems assessed during these consultations. Acute problems, problems assessed first by the GP, and problems assessed by GPs younger than 50 years old were more likely to be issued safety-netting advice. Most safety-netting advice was initiated by the GP. Specific advice was commonly delivered during the treatment planning phase whereas generic advice tended to be delivered during the closing phase. The most common eventuality patients were told to look out for per problem was if their current symptoms persisted. Patients were rarely given written advice and when safety-netting advice had been given, for just over half of problems there was no documentation in the medical notes.

### **Strengths and limitations**

This is the first observational study to assess when and how GPs give safety-netting advice in routine consultations with adult patients in the UK; and to assess what type of problem, patient and GP factors are associated with safety-netting advice. Each consultation was viewed at least twice alongside a verbatim transcript to ensure coding accuracy and systematic methods were utilised to check for missing codes. We utilised a coding tool that was specifically designed to assess safety-netting

advice in primary care, generated from the published literature and systematic observations of real-life consultations to generate codes with substantial levels of inter-rater reliability.<sup>5</sup> However, apart from the inter-rater reliability testing, all coding was completed by only one coder.

While the act of recording itself may change the communication between participants,<sup>29</sup> a review by Themessl-Huber and colleagues concluded that there was little evidence that audio or video recording significantly affects practitioner or patient behaviour.<sup>30</sup> Indeed, patients often forget during the consultation that they are being recorded.<sup>31</sup> Furthermore, this is a secondary analysis of a dataset and although the participants were aware their consultations may be used in future research projects, they were not specifically aware that how they gave safety-netting advice was going to be evaluated making it more likely our results represent the true day-to-day practice of individuals involved in the One in a Million study.

This study involved 23 GPs in one region of England recorded between 2014-15, so the results are unlikely to be generalisable to all UK GPs, who may be working with different patient populations and under very different circumstances. There was a lack of ethnic diversity in our dataset with all GPs and most patients (87%) reporting being of a white ethnicity. The effects of variations in training, cultural and social norms are likely to influence safety netting behaviours in different geographical areas and warrant further exploration.

Furthermore, when generic advice was given at the end of the consultation where multiple problems were discussed, for example, *“any problems let me know”*, then all problems within the consultation were coded as have been given safety-netting advice. Giving the benefit of the doubt here may have over-estimated the prevalence of safety-netting advice but in most cases it not possible to ascertain if the doctor was referring to the final problem that was discussed or all problems during the consultation.

This study identified that chronic problems were less likely to be given safety-netting advice. However, a limitation of the dataset is that it is not possible to tell if the patient had previously been given safety-netting advice in another consultation for

the same problem. Likewise, follow-up plans for chronic problems may have already been arranged that were not discussed in the recorded consultation and some conditions patients are automatically invited to attend for an annual review such as asthma and COPD therefore our study may underestimate the amount of follow-up for each problem.

We used robust statistical analysis to adjust for co-variants and clustering when exploring GP, patient and problem factors associated with the frequency of safety-netting advice. The importance of adjusting is demonstrated by the unadjusted association between non-white ethnicity and higher frequency of safety-netting advice ( $p=0.027$ ), evidence for which becomes very weak ( $p=0.41$ ) in the adjusted model.

### **Comparison with existing literature**

Overall, rates of safety-netting advice in our study were comparable to one other primary care study that reported on 'safety-netting' whilst assessing the extent of patient recall of the content of face-to-face and telephone consultations.<sup>32</sup>

There was weak evidence ( $p=0.059$ ) that where some form of follow-up was discussed, problems had less safety-netting advice. This may indicate that some doctors are not discriminating between safety-netting advice and follow-up planning, and recent research has suggested classifying them on the same spectrum.<sup>1, 3</sup> However, there were 162/555 problems (29.1%) that had both safety-netting advice and follow-up, indicating GPs in our study recognised the need for both 'conditioned follow-ups'<sup>33</sup> - referred to in this paper as safety-netting advice - and unconditional review or investigation of patients (planned follow-up).

Consultation models usually indicate that safety-netting should be delivered towards the end of the consultation, which was consistent with our results and one other study in Danish primary care.<sup>12, 13, 33</sup> Similarly, our finding that generic advice is more commonly given when closing the consultation is consistent with anecdotal evidence from clinicians.<sup>2</sup> Currently, the benefits of generic advice, for example, "*any problems let me know*", when patients already have the right to contact their GP about any issues are unknown and require further evaluation. However, parents of sick children have reported that they often consider safety-netting advice too vague to be useful.<sup>18</sup>

The low rates of documentation of safety-netting in the medical record observed in our study are consistent with a previous qualitative study report.<sup>20</sup> Consequently, other research studies such as audits of safety-netting practices from medical records may underestimate the true incidence of safety-netting in primary care.<sup>34</sup>

### **Implications for research and/or practice**

Intervention studies comparing enhanced safety-netting communication practices with usual care may be the best route to evaluate effectiveness. A more in-depth analysis of safety-netting communication practices and patient responses would provide further evidence for the design of such communication-based interventions and for intervention training. Any such studies would preferably be set in a more controlled context where you would expect to see safety-netting activity such as those with low risk but not no risk of cancer.<sup>35</sup>

It is unclear from our study if outcomes differed between patients who were given safety-netting advice and those that were not. Future observational studies may benefit from longer term follow-up of patients presenting with a less diverse array of medical problems to be powered to evaluate whether safety-netting advice alters patient outcomes.

Even within the small sample of 23 GPs in this study, there was a wide variation in clinical practice (rates of safety-netting advice per problem ranged between 18.2% and 89.5%). This may raise questions about doctors' training in safety-netting methods. However, if GPs are going to be held to clinical standards that they 'should' give safety-netting advice for certain conditions, further guidance is required in exactly what type of advice and information ought to be shared with patients, when and how. Furthermore, the low documentation rates indicate that GPs may be putting themselves at unwarranted medico-legal risk. Automated documentation systems may help alleviate some of this risk in a time pressured environment. Increasing the ease of access to written patient information leaflets that include specific safety-netting advice may also help to increase both the amount of written and specific advice issued to patients. Finally, a consensus amongst clinicians, researchers and patients of what exactly constitutes effective safety-netting is

required alongside a robust evaluation if safety-netting is to be considered part of evidence-based medicine and an accountable standard.

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### **Ethical approval**

NHS ethical approval was obtained for this study from the London Brent Ethics Committee (16/LO/1739) and access to the One in a Million Primary Care Consultation Archive was approved by the University of Bristol Data Access Committee.

### **Competing interests**

None declared.

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## **References**

1. Nicholson BD, Goyder CR, Bankhead CR, et al. Responsibility for follow-up during the diagnostic process in primary care: a secondary analysis of International Cancer Benchmarking Partnership data. *Br J Gen Pract.* 2018;68(670):e323-e32.
2. Almond S, Mant D, Thompson M. Diagnostic safety-netting. *Br J Gen Pract.* 2009;59(568):872-4.
3. Jones D, Dunn L, Watt I, Macleod U. Safety netting for primary care: evidence from a literature review. *Br J Gen Pract.* 2019;69(678):e70.
4. Nicholson BD, Mant D, Bankhead C. Can safety-netting improve cancer detection in patients with vague symptoms? *BMJ.* 2016;355.
5. Edwards PJ, Ridd MJ, Sanderson E, Barnes RK. Development of a tool for coding safety-netting behaviours in primary care consultations *Br J Gen Pract (UNDER REVISION).* 2019.
6. Roland D, Jones C, Neill S, et al. Safety netting in healthcare settings: what it means, and for whom? *Arch Dis Child Educ Pract Ed.* 2014;99(2):48-53.
7. Edwards PJ, Seddon JO, Barnes RK. Time for guidelines on safety netting? *BMJ.* 2016;355.
8. Royal College of General Practitioners. The RCGP Curriculum: Professional & Clinical Modules. 2016. Available from: <http://www.rcgp.org.uk/-/media/Files/GP-training-and-exams/Curriculum-2012/RCGP-Curriculum-modules.aspx> (accessed 25/07/2018)
9. National Collaborating Centre for Women's and Children's Health. Feverish Illness in Children: Assessment and Initial Management in Children Younger Than 5 Years. London: RCOG; 2013.
10. National institute for Health and Care Excellence. Meningitis (bacterial) and meningococcal septicaemia in children and young people [QS 19]. London. NICE; 2012. Available from: <https://www.nice.org.uk/guidance/gs19> (accessed 17/03/19)
11. National Institute for Health and Care Excellence. Sepsis: Recognition, Assessment and Early Management. London: NICE; 2016.
12. Neighbour R. The Inner Consultation. How to develop an effective and intuitive consulting style. 2nd ed. Oxford: Radcliffe Publishing; 2004.
13. Silverman J, Kurtz S, Draper J. Skills for communicating with patients. 3rd ed. Oxford: Radcliffe; 2013.
14. Mitchell ED, Rubin G, Macleod U. Understanding diagnosis of lung cancer in primary care: qualitative synthesis of significant event audit reports. *Br J Gen Pract.* 2013;63(606):e37.
15. Parliamentary and Health Service Ombudsman. An avoidable death of a three-year-old child from sepsis. London: Parliamentary and Health Service Ombudsman; 2014.
16. Rees P, Edwards A, Powell C, et al. Patient Safety Incidents Involving Sick Children in Primary Care in England and Wales: A Mixed Methods Analysis. *PLoS Med.* 2017;14(1):e1002217.
17. Goyder CR, Jones CHD, Heneghan CJ, Thompson MJ. Missed opportunities for diagnosis: lessons learned from diagnostic errors in primary care. *Br J Gen Pract.* 2015;65(641):e838.
18. Cabral C, Ingram J, Hay AD, Horwood J. "They just say everything's a virus"—Parent's judgment of the credibility of clinician communication in primary care consultations for respiratory tract infections in children: A qualitative study. *Patient Educ Couns.* 2014;95(2):248-53.



19. Bertheloot K, Deraeve P, Vermandere M, et al. How do general practitioners use 'safety netting' in acutely ill children? *Eur J Gen Pract.* 2016;22(1):3-8.
20. Jones CH, Neill S, Lakhanpaul M, et al. The safety netting behaviour of first contact clinicians: a qualitative study. *BMC Fam Pract.* 2013;14:140.
21. Jones CH, Neill S, Lakhanpaul M, et al. Information needs of parents for acute childhood illness: determining 'what, how, where and when' of safety netting using a qualitative exploration with parents and clinicians. *BMJ Open.* 2014;4(1):e003874.
22. Maguire S, Ranmal R, Komulainen S, et al. Which urgent care services do febrile children use and why? *Arch Dis Child.* 2011;96(9):810.
23. Evans J, Ziebland S, MacArtney JI, et al. GPs' understanding and practice of safety netting for potential cancer presentations: a qualitative study in primary care. *Br J Gen Pract.* 2018;68(672):e505-e11.
24. Buntinx F, Mant D, Van den Bruel A, et al. Dealing with low-incidence serious diseases in general practice. *Br J Gen Pract.* 2011;61(582):43-6.
25. Jepson M, Salisbury C, Ridd MJ, et al. The 'One in a Million' study: creating a database of UK primary care consultations. *Br J Gen Pract.* 2017;67(658):e345.
26. Barnes RK. One in a Million: A study of primary care consultations. 2017. Available from: <https://doi.org/10.5523/bris.l3sq4s0w66ln1x20sye7s47wv> (accessed 17/03/19)
27. Procter S, Stewart K, Reeves D, et al. Complex consultations in primary care: a tool for assessing the range of health problems and issues addressed in general practice consultations. *BMC Fam Pract.* 2014;15(1):105.
28. WONCA International Classification Committee. *International Classification of Primary Care, ICPC-2.* Oxford University Press, Oxford. 1998.
29. Labov W. *Sociolinguistic Patterns.* Philadelphia: University of Pennsylvania Press; 1972.
30. Themessl-Huber M, Humphris G, Dowell J, et al. Audio-visual recording of patient–GP consultations for research purposes: A literature review on recruiting rates and strategies. *Patient Educ Couns.* 2008;71(2):157-68.
31. Martin E, Martin PML. The reactions of patients to a video camera in the consulting room. *J R Coll Gen Pract.* 1984;34(268):607-10.
32. McKinstry B, Watson P, Elton RA, et al. Comparison of the accuracy of patients' recall of the content of telephone and face-to-face consultations: an exploratory study. *Postgrad Med J.* 2011;87(1028):394.
33. Beck Nielsen S. "If you don't get better, you may come back here": proposing conditioned follow-ups to the doctor's office. *Text & Talk.* 2018;38(2):217.
34. Swann R, McPhail S, Witt J, et al. Diagnosing cancer in primary care: results from the National Cancer Diagnosis Audit. *Br J Gen Pract.* 2017.
35. National Collaborating Centre for Cancer. *Suspected Cancer: Recognition and Referral.* London: NICE; 2015.

## Tables and figures

**Table 1. Patient characteristics (n=318)**

	<b>n</b>	<b>%</b>
<b>Patient sex</b>		
Male	116	36.5
Female	202	64.5
<b>Patient age</b>		
18-34	86	27.0
35-49	56	17.6
50-64	78	24.5
>65	85	26.7
Not reported	13	4.1
<b>Patient ethnic group</b>		
White	277	87.1
Other	33	10.4
Not reported	8	2.5
<b>Number of problems per patient</b>		
1	167	52.5
2	89	28.0
3	47	14.8
≥4	15	4.7
<b>IMD Quintile</b>		
1 <sup>st</sup> (least deprived)	101	31.8
2 <sup>nd</sup>	52	16.4
3 <sup>rd</sup>	34	10.7
4 <sup>th</sup>	50	15.7
5 <sup>th</sup> (most deprived)	80	25.2
Not reported	1	0.3
IMD = Index of Multiple Deprivation		

**Table 2. Safety-netting and follow-up frequency by types of problem raised (n=555)**

<b>Problem Type (ICPC-2)</b>	<b>No of problems</b>	<b>Follow-up present (%)</b>	<b>Safety-netting advice present (%)</b>	<b>Safety-netting advice and / or follow-up present (%)</b>
Neurological (N)	27	77.8	59.3	88.9
Digestive (D)	61	57.4	57.4	77.0
Ear (H)	14	42.9	57.1	85.7
Skin (S)	51	51.0	52.9	78.4
Cardiovascular (K)	46	67.4	52.2	84.8
Musculoskeletal (L)	96	69.8	50.0	87.5
Female Genital (X)	25	68.0	48.0	92.0
Respiratory (R)	51	49.0	45.1	78.4
Blood, Blood Forming Organs and Immune Mechanism (B)	9	88.9	44.4	100
Male Genital (Y)	9	55.6	44.4	77.8
Eye (F)	7	71.4	42.9	100
Psychological (P)	67	88.1	40.3	92.5
Pregnancy, Childbearing, Family Planning (W)	16	50.0	37.5	62.5
Endocrine/Metabolic and Nutritional (T)	32	81.3	31.3	84.4
General & Unspecified (A) / Process codes (-)	23	65.2	26.1	73.9
Urological (U)	21	90.5	19.0	95.2
<b>Total</b>	<b>555</b>	<b>67.2</b>	<b>46.3</b>	<b>84.3</b>
ICPC-2 = International Classification of Primary Care, 2nd edition. <sup>28</sup>				

**Table 3. Content of safety-netting advice across all episodes (n=390)**

Question	Codes	Frequency	Percent
Applicable to problem, treatment/management or both	Problem	270	69.2
	Treatment / management	38	9.7
	Both	82	21.0
Stage of Consultation	Establishing reason for consultation	1	0.3
	Gathering information	24	6.2
	Delivering diagnosis	36	9.2
	Treatment planning	203	52.1
	Closing	123	31.5
	Unclear	3	0.8
Initiation	Patient	20	5.1
	Clinician	370	94.9
Format	Conditional + course of action	378	96.9
	Conditional warning only	12	3.1
Strength of endorsement	Weaker (can, could)	67	17.2
	Neutral	262	67.2
	Stronger (must, should, etc)	61	15.6
Number of conditionals / symptoms to look out for (e.g. worsening pain, symptoms persist, new weakness)	Implicit conditional*	5	1.3
	1	234	60.0
	2	77	18.7
	3	36	9.2
	4	18	4.6
	5+	20	5.1
Generic or specific advice	Specific (cough up blood, chest pain...)	184	47.2
	Generic (problems, issues, concerns, worse)	206	52.8
Action advised	No Action (conditional warning only)	12	3.1
	Contact other in hours medical service	12	3.1
	Return to practice	244	62.6
	Return to same GP	109	27.9
	Contact OOH service	6	1.5
	Contact emergency services	7	1.8
Focus of action	No action (conditional warning only)	12	3.1
	Patient (" <u>you</u> come back")	163	41.8
	Clinician (" <u>I</u> will have another look at it")	146	37.4
	Both (" <u>you</u> come back, and <u>I</u> will have another look at it")	69	17.7
Timescale of action	Not specified	303	77.7
	Named / fixed time ("2 weeks")	65	16.7
	Immediate ("go straight to A&E")	22	5.6
Patient response at the end of the safety-netting advice	No response**	40	10.3
	Resists / misaligns	37	9.5
	Nods only	42	10.8
	Acknowledgement / acceptance	271	69.5

See the codebook for further explanation and examples of all codes. \*Example: "So three months if not before" \*\*6 cases of no response and audio only so unable to determine if the patient was nodding. OOH = out of hours.

**Table 4. Safety-netting advice conditions / symptoms to look out for**

Category	Frequency verbalised in all consultations	Frequency per problem (n = 555)	
	n	n	%
<b>New specific symptom or condition</b> <i>"Skin starts to break down", "cough up any blood", "indigestion pains"</i>	197	87	15.7
<b>Current illness / symptoms persist</b> <i>"If you feel it's no better in a fortnight come back and see me."</i>	179	106	19.1
<b>Current illness / symptoms worsen</b> <i>"If you feel by all means that things have got worse [...] let us know and we'll see her sooner"</i>	74	50	9.0
<b>Other non-specific condition</b> develop new "symptoms", "want to come back", "not tolerating it", "getting fed up", "questions"	64	54	9.7
<b>Any "problems" / "issues"</b> <i>"any problems in the meanwhile give me a shout."</i>	49	54	9.7
<b>Return of previous symptoms</b> <i>"come back, please, if you have any return of your symptoms."</i>	41	27	4.9
<b>Need</b> <i>"I'll see you in two months or sooner if need be."</i>	23	23	4.1
<b>Concerned / worried / struggling</b> <i>"if you're worried, about any of that, come back to me"</i>	18	18	3.2
<b>Current condition changes</b> <i>"if anything has changed in the interim, we'll see you again"</i>	17	14	2.5
<b>Change in 'wellness'</b> <i>"If you're feeling unwell, then leave me a message and I'll ring you back"</i>	9	8	1.4
<b>Have not heard about a referral / appointment</b> <i>"You should hear within the next couple of weeks. If you haven't heard anything, you can let us know and we can chase that up for you." (2 week wait skin cancer referral)</i>	9	7	1.3
<b>Starts to limit function</b> <i>"if it becomes [...] so painful you can't walk, come back."</i>	7	7	1.3
<b>Implicit conditional</b> <i>"So, three months, if not before"</i>	5	9	1.6
<b>All symptoms / conditions</b>	692	257	46.3

**Table 5. Problem, patient and GP variants as predictors of safety-netting advice**

Codes from observing consultation / linked data	Options	Safety-netting advice present	Unadjusted model	Adjusted model
Is this problem acute, acute on chronic or chronic?	Acute / AoC Chronic	182/342 (53.2%) 75/213 (35.2%)	OR 2.09 p < 0.001 CI 1.47 - 2.98	OR 2.18 p = 0.003 CI 1.30 - 3.64
Is this the first presentation with this medical problem to a healthcare professional?	First presentation Not first presentation Unclear (excluded)	61/114 (53.5%) 188/417 (45.1%) 8/24 (33.3%)	OR 1.40 p = 0.11 CI 0.93 - 2.12	OR 1.08 p = 0.80 CI 0.61 - 1.91
Is the problem the first assessed in the consultation or after the first?	First / only After the first	181/318 (56.9%) 76/237 (32.1%)	OR 2.80 p < 0.001 CI 1.97 - 3.98	OR 2.94 p < 0.001 CI 1.85 - 4.68
Is there evidence for any follow-up for this problem?	Follow-up present No evidence of follow-up	162/373 (43.4%) 95/182 (52.2%)	OR 0.70 p = 0.052 CI 0.49-1.00	OR 0.63 p = 0.059 CI 0.38 - 1.02
What was the age of the doctor who assessed this problem?	<=49 years old >=50 years old	185/354 (52.3%) 72/201 (35.8%)	OR 1.96 p < 0.001 CI 1.37 - 2.80	OR 2.56 p = 0.001 CI 1.45 - 4.51
Is this problem assessed in an elderly patient?	>=65 years old 18-64 years old Unreported (excluded)	65/148 (43.9%) 173/386 (44.8%) 19/21 (90.5%)	OR 0.96 p = 0.85 CI 0.66 - 1.41	OR 1.21 p = 0.50 CI 0.69 - 2.12
What is the sex of the patient presenting with this problem?	Female Male	157/343 (45.8%) 100/212 (47.2%)	OR 0.95 p = 0.75 CI 0.67 - 1.33	OR 0.83 p = 0.46 CI 0.50 - 1.36
What is the ethnicity of the patient presenting with this problem?	Other White Unreported (excluded)	34/57 (59.7%) 213/484 (44.0%) 10/14 (71.4)	OR 1.88 p = 0.027 CI 1.08-3.29	OR 1.44 p = 0.41 CI 0.60 - 3.44
What is the IMD quintile of the patient presenting with this problem?	1 <sup>st</sup> (least deprived) 2 <sup>nd</sup> 3 <sup>rd</sup> 4 <sup>th</sup> 5 <sup>th</sup> (most deprived) Unreported (excluded)	87/159 (54.7%) 38/88 (43.2%) 28/53 (52.8%) 37/94 (39.4%) 66/160 (42.3%) 1/1 (100%)	OR 1.00 (ref) OR 0.63 p = 0.08 OR 0.93 p = 0.81 OR 0.54 p = 0.02 OR 0.58 p = 0.02	OR 1.00 (ref) OR 0.75 p = 0.44 OR 0.97 p = 0.95 OR 0.59 p = 0.16 OR 0.90 p = 0.77

Odd ratios (OR) and 95% confidence intervals (CI) generated from logistic regression of variants associated with the presence or absence of safety-netting advice for problems raised in the archive. Adjusted p values exclude problems with unreported data, n = 505 problems. Multi-level modelling adjusts for all variables in table and for within clustering by GP and patient (all problems seen by same GP and problems from the same patient). AoC = Acute on Chronic, IMD = Index of Multiple Deprivation, ref = reference.

## Supplementary Tables

**Supplementary Table S1. Safety-netting contextual codes (n = 555)**

Question	Codes	Frequency per Problem	
		Frequency	Percent
<b>Diagnostic uncertainty</b>	No uncertainty discussed	270	48.6
	Uncertainty discussed	256	46.1
	N/A e.g. contraception	29	5.2
<b>Time course of illness</b>	No time course discussed	399	71.9
	Time course of problem discussed	127	22.9
	N/A e.g. contraception	29	5.2
<b>Type of follow-up</b>	No follow-up	182	32.8
	Investigation only	42	7.6
	Practice	54	9.7
	Same GP	124	22.3
	Other*	79	14.2
	Multiple (primary care and other)	74	13.3
<b>Other contingent management plan</b>	None	385	69.4
	Delayed prescription	5	0.9
	Contingent self-care	60	10.8
	Contingent on investigation result / second opinion	41	7.4
	Changes mind about treatment already offered	18	3.2
	Contingent admin / other	27	4.9
	Multiple of the above contingent plans	19	3.4
* Secondary care, other healthcare providers outside of the GP practice N/A = not applicable			