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Patient and general practitioner views of tools to delay diagnostic imaging for musculoskeletal pain: a qualitative study

Running head: Tools to delay diagnostic imaging

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Abstract

OBJECTIVE: Delayed prescribing is a promising strategy to manage patient requests for unnecessary tests and treatments. The purpose of this study was to explore general practitioner (GP) and patient views of three communication tools (an Overdiagnosis Leaflet, a Dialogue Sheet, and a 'Wait-and-see' Note) to support delayed prescribing of diagnostic imaging.

DESIGN: Qualitative study

SETTING: Primary and emergency care in Sydney, Australia

PARTICIPANTS: 16 GPs and 14 patients with recent episode of musculoskeletal pain

OUTCOMES: Views of tools to delay diagnostic imaging for musculoskeletal pain. Data were collected using a combination of focus groups and individual interviews.

ANALYSIS: Two researchers independently performed a thematic analysis, and the author team reviewed and refined the analysis.

RESULTS: GP participants responded positively to an Overdiagnosis Leaflet. The Dialogue Sheet and 'Wait-and-see' Note raised several concerns about patient pushback, adding to time pressure, and being overwhelmed with hard-to-find paper resources. GPs preferred to communicate verbally the reasons to delay an imaging test. For patients, the reactions to the tools were more positive. Patients valued written information and a signed agreement to delay the test. However, patients expressed that a strong desire for diagnostic imaging would be likely override any effect of written advice to delay the test. The term "false alarm" to describe overdiagnosis was poorly understood by patients.

CONCLUSIONS: GPs and patients agreed that a leaflet about overdiagnosis could support a delayed prescribing approach to musculoskeletal imaging. A Dialogue Sheet and 'Wait-and-see' Note were acceptable to patients but not GPs.

Key words: diagnostic radiology, quality in healthcare, rehabilitation medicine, back pain, internal medicine

Strengths and limitations of this study

- We sampled people involved in the decision to have diagnostic imaging for musculoskeletal pain in emergency and primary care.
- Our data collection methods allowed us to capture natural conversations in the focus groups, and explore emergent themes in depth in the interviews.
- GPs included in this study were attending a professional education event and may have had more positive views of tools to delay imaging than the wider population of GPs.

Introduction

Guidelines for musculoskeletal pain recommend that clinicians reserve diagnostic imaging tests for patients who have clinical features of serious pathology.(1) Yet on average general practitioners (GP) refer around one quarter of their patients with low back pain for imaging.(2) 82% of GPs surveyed would refer a patient with shoulder pain and suspected rotator cuff tendinopathy for an ultrasound at the first presentation.(3) In most cases these tests will not bring patients any benefit.(4) Instead, overuse of musculoskeletal imaging has negative consequences for the patient, the clinician, and health systems.(5)

A number of factors related to the patient-clinician interaction could drive overuse of imaging for musculoskeletal pain. A review of 17 qualitative studies identified 'perceived pressure from patients' as a key driver of guideline discordant imaging reported by doctors.(6) Indeed, around 50% of patients with low back pain believe imaging is necessary.(7) Also, many clinicians worry about medicolegal liability if they do not provide the test, and feel they lack tools to discuss the need for imaging with their patient.(8)

Tools that promote watchful waiting as an evidence-based alternative to imaging could be effective at reducing overuse. For example, information leaflets to support delayed prescribing, that is, where a GP provides a script but instructs the patient to wait and see if symptoms resolve, can reduce use of antibiotics.(9) One trial in the 1980s found this approach reduced imaging low back pain.(10) There is evidence that written delayed prescribing tools are acceptable to patients considering antibiotics and some screening tests.(11, 12) However, it is unclear how GPs and patients might react to tools for symptomatic conditions where imaging overuse is problematic.

The aim of this study was to gather GP and patient views on three newly developed communication tools (an Overdiagnosis Leaflet, a Dialogue Sheet, and a 'Wait-and-see' Note) to support delayed prescribing of musculoskeletal imaging.

Methods

Study Design and Participants

We conducted a qualitative study with 4 focus groups and 8 individual interviews to explore how GPs and patients understood and responded to the communication tools. We have prepared this report to adhere to the COREQ checklist.(13) Additional methodological details are provide in a COREQ table in Appendix 1.

GPs who were practising in Australia were eligible to participate. For the GP participants we recruited a sample of GPs who were attending a continuing professional development event on 30 July 2019. For the patient participants we recruited men and women who had sought care for low back pain between March and June 2019. We identified a consecutive list of adult patients who presented with 'non-serious' low back pain to the Emergency Department of Liverpool Hospital, Sydney.

Data Collection

Focus groups

Each group comprised five to seven people. Sessions had the following format: baseline questionnaire, introduction of study and facilitators, warm-up discussion, presentation of the tools (Powerpoint slides plus paper versions), guided discussion of each tool (Box 1).

Interviews

After the focus groups DO and JC conducted additional individual interviews with four GPs and CK conducted additional interviews with four patients. We stopped recruiting patients for interviews when no new themes emerged (data saturation).(14) Recruitment of GP participants for interviews was limited by resources and not necessarily by data saturation.

Communication tools and discussion content

Table 1 describes the rationale and content of the three communication tools. Complete versions of the tools are included in Appendix 2. The focus groups and interviews followed a similar discussion format (Box 1). Each started with a short warm-up discussion of the role of diagnostic imaging in low back pain. Participants were then presented with the three tools, in turn, for discussion.

Data Analysis

We performed a thematic analysis to identify main themes as well as divergent views.(15). Three authors (AT, SS and CK) independently reviewed all transcripts. We developed a library of codes in an iterative process, decided on a coding framework, and applied this framework to the data. We used a 'constant comparison' approach, which involves continually looking for similarities, differences, and other patterns within and across transcripts.(16)

Patient and public involvement

We piloted the tools with consumers (n= 4) and clinicians (n=4) to optimise content prior to enrolling participants.

Results

Sixteen GPs and 14 patients participated in the study. Table 2 shows the characteristics of participants. The majority of GP participants were female and had more than 20 years in practice. Patient participants were mostly born outside of Australia, middle-aged, and around half had a university education. All patient participants had had an imaging test in the past. Below we summarise the key findings with selected quotes. Additional supporting quotes (numbered in text as Q1, Q2, Q3 and so on) are provided in Appendix 3.

1. GP views

Overall GP reactions

GPs had mixed reactions to the tools (Box 2). Some GPs felt the communication tools could have a role in helping to manage difficult consultations:

> "I guess if you had a really stroppy patient you didn't know and didn't think you'd get any follow up with, perhaps there could be a role." (GP focus group)

However, most GPs reacted negatively to the Dialogue Sheet and Wait-and-see Note, and none of them reported they would use these in practice. They found the concept of written

prompts and co-signing an agreement with their patient, to be an insult to their clinical skill and autonomy:

> "No, no, I'd never use [*the dialogue sheet*] in a pink fit." (GP focus group)

GPs felt paper-based tools in general were impractical, easily forgotten, and preferred verbal reassurance (Q1).

GP reactions to the Overdiagnosis Leaflet: important content that would be useful in digital format, but may induce patient anxiety

GP participants responded most positively to the design and content of the Overdiagnosis Leaflet. They valued the condition-specific information such as clinical features for lumbar imaging and self-management advice (Q2). Some felt the language of the leaflet was too emphatic and could discourage necessary imaging:

> "I mean [*the overdiagnosis leaflet*] would scare them off having a scan and maybe it might scare some of the 1% who do need to have it." (GP focus group)

GP participants expressed a strong preference for easily accessible, web- or electronic medical record-based fact sheets for use with their patients (Q3).

GP reactions to the Dialogue Sheet: redundant for experienced GPs, would add to time pressure

Most GP participants felt the dialogue sheet would be superfluous, and preferred to communicate the same messages verbally:

> "So, as I said, that's the sort of thing I would be telling the patient as we went, and maybe summarising at the end, but I would do that in a verbal fashion. I wouldn't be filling in a form like this." (GP focus group)

Some were concerned the tools would just add to time pressure within the consultation (Q4). Most GP participants did not want to sign the Dialogue Sheet and felt that patients would be opposed to signing it as well:

> "It doesn't need a contract, we're not giving morphine out." (GP focus group)

GP reactions to the Wait-and-see Note: could help validate concerns, but impractical

One doctor noted that the language of the Wait-and-see Note could help validate a patient's experience:

> "I guess what the writer was trying to get across was: 'I acknowledge that you have real symptoms.' I think that's better, the patient wants me to know that they really have pain." (GP focus group)

A key barrier to use of the note was practicality. Participants felt verbal communication of similar messages would be more efficient (Q5).

Workforce issues and concerns about patient pushback (all tools):

Some GP participants felt the communication tools were more useful for less experienced doctors or other professions (Q6):

> " This [*overdiagnosis leaflet*] is a document that absolutely needs to go into a lower than primary care level, at a community level." (GP focus group)

GPs felt the Dialogue Sheet and Wait-and-see Note would be patronising to patients (Q7):

> "*[If I were to use it with my patients]* They'd probably think I've gone mad." (Female GP, infrequent requester of imaging)

1. Patient views

Overall patient reactions

Patients had generally positive reactions to all three tools (Box 2). In contrast to GP responses, patients valued paper-based, written information and the perceived accountability that a co-signed agreement section on the Dialogue Sheet and Wait-and-see Note would provide:

> "I hate it when they don't keep their word to see you again. So this one, when they sign on it, they have to see you." (Patient focus group)

For some, the perceived benefit of locating the source of low back pain, and ruling out serious pathology, outweighed any advice to delay an imaging test (Q8).Others regarded the tools with suspicion (Q9).

Patient reactions to the Overdiagnosis Leaflet: informative but alarming, prompts desire to discuss harms of imaging with GP

Most patient participants found the Overdiagnosis Leaflet clear, informative, and credible (Q10). Some patients felt the Overdiagnosis Leaflet would encourage them to ask their doctor questions about their care (Q11). Other patient participants were reluctant to challenge the perceived authority of their doctor:

> " I just don't know if *[my GP]* would be comfortable hearing that from a patient." (Male patient)

There was concern among patient participants that the Overdiagnosis Leaflet would discourage imaging for those who did needed it (Q12). One patient participant reacted angrily to the concept that some scans might be unnecessary (Q13).

Patient reactions to the Dialogue Sheet: could improve recall of the consultation and provide evidence of GP commitment

In contrast to the Overdiagnosis Leaflet, which provoked some concerns, the Dialogue Sheet had potential to be reassuring (Q14). Patients had mixed reactions to the concept of co-signing an agreement to not have an imaging test; some felt it would be and odd process (Q15) where others appreciated the clinician's commitment (Q16).

Patient reactions to the Wait-and-see Note: uses dismissive terminology and would be easy to ignore

Some patient participants found the concept of the Wait-and-see Note dismissive (Q17). One patient participant, who was an allied health professional, felt patients might ignore the note:

> "I think, personally, people, if they've got the referral there, I think they would just ignore that [*message to*] wait-and-see." (Female patient)

Patient understanding and interpretation of content (all tools): take care with language to describe overdiagnosis and related harms

There was some suspicion among patient participants about the veracity of the data on the magnitude of overdiagnosis in the Leaflet (Q18). One patient participant understood the link between overdiagnosis and unnecessary surgery, but felt the odds of this happening were not concerning:

> "…so only one will have surgery and they don't need it. So 1 out 100? *[Facilitator: Yeah, not that bad do you reckon?].* Well yeah not that bad." (Patient focus group)

The term "false alarm" was a poorly understood concept. Some patient participants felt the term indicated that their problem was imaginary (Q19).

Discussion

Summary

The GPs and patients we interviewed had divergent views on the value of three different communication tools to support delayed prescribing of musculoskeletal imaging. While almost all GPs rejected a tool with an example dialogue and discussion points, patients desired this process. Some patients appreciated the concept of co-signing an agreement to delay imaging, while others did not. The GPs we interviewed universally rejected this co-signing approach. There was variation in what patients and GPs considered to be a 'harm' from having imaging.

Strengths and limitations

We conducted this study at a time when advanced imaging rates are increasing.(5) Understanding how both GPs and patients might use communication tools will help inform strategies to reduce this problem. We used a combination of focus groups and interviews, and sampled people involved in the decision to have diagnostic imaging in emergency and primary care. This allowed us to capture natural conversations in the groups, and explore emergent themes in depth in the interviews.

We were restricted to recruiting mainly from a GP professional development network, with a small number of additional participants recruited through an additional study. This group may have had more positive views than expected in the wider population of GPs. Though our data suggest they were highly sceptical of the materials and divergent from patients. Similarly, although all of the patients we included had seen a GP for their low back pain, they had also attended the Emergency Department of a public hospital for their low back

pain. This diverse group of patients may be different to those who typically attend a GP as their first or only contact with the health system. The patient participants in this study might also represent a group who take musculoskeletal pain very seriously and be more critical of tools to delay or deter imaging.

Comparison with existing literature

Our findings are consistent with research showing that attempts to reduce or delay tests can arouse suspicion about financial arrangements, government oversight, and motives to cut costs.(17) This phenomenon also occurs in women considering breast cancer screening.(18) Our study confirms that mistrust among patients could extend to communicating about delayed musculoskeletal imaging, overdiagnosis, and the option of watchful waiting.

The patients we interviewed reacted with surprise to the nature and magnitude of imaging overdiagnosis. Many of the patient participants struggled to think of harms of diagnostic imaging, other than exposure to radiation. This finding supports evidence on patient perceptions of overused screening tests e.g. the perception that the benefits of early detection tend to outweigh the harms of unnecessary tests.(19) Our findings on how GPs describe harms from overdiagnosis suggest that they may also hold this view.

Implications for future research and practice

This study provides insights into the complexity of communicating about unnecessary imaging to patients and GPs. Based on these findings there may be several ways to enhance acceptability and uptake of delayed prescribing approaches. First, the language relating to

the necessity of diagnostic imaging tests should be cautious rather than emphatic. Patients may interpret harms differently; tools that describe risk of 'harms' would benefit from also providing clear examples of overdiagnosis. Second, tools should be in digital format for GPs but readily printed for patients who prefer paper-based information. Finally, a Dialogue Sheet with or without a co-sign agreement section requires further testing before implementing this kind of tool in clinical practice.

Conclusions

An information leaflet that explains the problem of overdiagnosis could support a delayed prescribing approach to musculoskeletal imaging. A Dialogue Sheet and Wait-and-see Note to help discuss a delayed imaging were acceptable to patients but not GPs.

Author Contributions

Study concept and design: All authors
Acquisition, analysis, or interpretation of data: All authors
Drafting of the manuscript: Traeger
Critical revision of the manuscript for important intellectual content: All authors
Analysis: All authors
Obtained funding: McCaffery, Traeger
Administrative, technical, or material support: none
Study supervision: Traeger

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Data sharing statement: No additional data are available.

Ethics: Study procedures were approved by the University of Sydney HREC (ref: 2019/591), the Southwest Sydney Local Health District HREC (ref: 2019/ETH00281), and the Bond University HREC (ref: LA03323).

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Table 1. Description and intended use of tools to support delayed prescribing of musculoskeletal imaging

	Overdiagnosis Leaflet	**Dialogue Sheet**	**Wait-and-see Note**
Why Rationale	Goal: 1. promote watchful waiting for people with low back pain 2. raise awareness of non-essential or 'low-value' lumbar imaging tests	Goal: 1. promote watchful waiting for people with musculoskeletal pain 2. support doctor-patient communication and joint decision-making 3. Provide actions for patients to take to address their pain, as alternatives to imaging.	Goal: 1. promote watchful waiting for people with musculoskeletal pain 2. support doctor-patient communication and joint decision-making
What Materials and content	6-panel A4 folded leaflet Designed by advertising company and researchers Key messages - Unnecessary lumbar scans can cause harm - There are alternatives to imaging - Speak to your doctor Behavioural prompts - Framing of harms from overdiagnosis - Appeal to authority (quote from orthopaedic surgeon)	1-page A5 sheet Designed by the Commonwealth Department of Health and researchers Key messages - In your case I think imaging is unnecessary - I recommend we delay decision to have a scan - There are other actions you can take to address your pain Behavioural prompts - Present no imaging as the default - Co-signature (patient and doctor) commitment to delay	2-sided A6 note Designed the Commonwealth Department of Health and researchers Key message - The referral is a backup; only to be used under specific circumstances (tailored to the patient) Behavioural prompts - Present no imaging as the default - Co-signature (patient and doctor) commitment to delay
Tailoring to the individual	None	Space to describe symptoms, things to look out for, name and date, customisable reasons to delay, recommended actions to manage pain and assist recovery	Review date, things to look out for

Box 1: Focus group and interview topic guide

All participants

- Participants take turns to read the tools and 'think aloud' as they read the content.
- Which elements of the tools did you like? Why?
- Which elements of the tools did you not like? Why?
- Do you have any suggestions for improvement?

For GP participants

- Are any of these tools something that you would use? What would improve usability?

For patient participants

- Did you gain any new information about imaging from these tools? If your doctor went through these tools with you, how would you feel? What would improve usability?

Table 2. Participant characteristics (n=30)

Characteristics	Number of participants	
	Patients (n=14)	**GPs (n=16)**
Age		
20-39	5	2
40-59	7	5
60-79	2	9
Sex		
Female	9	12
Male	5	4
Born outside of Australia		
Yes	11	-
No	3	-
University education		
Yes	6	-
No	8	-
Had an imaging test for back pain in the past	14	-
Believe everyone with low back pain should have a scan	11	0
Years practicing as a GP		
1-9	-	2
10-19	-	1
20+	-	13
Self-reported imaging request rate		
<10%	-	6
~25%	-	7
~50%	-	2
>75%	-	1
Had an interest in management of musculoskeletal conditions	-	8

Box 2. Summary of GP and patient views on communication tools to support delayed prescribing of musculoskeletal imaging

GP views

Reaction to Overdiagnosis Leaflet

- *Useful, visually appealing information*
- *May increase anxiety and discourage necessary care*
- *Digitise tools, communicate using other media in waiting room*

Reaction to Dialogue Sheet

- *Preference for verbal communication*
- *Could add to time pressure*
- *Reluctance to sign*

Reaction to Wait-and-see Note

- *Validating messages*
- *Preference for verbal communication*

Workforce issues (all tools)

- *Experienced GPs don't need these tools*

Concerns about patient pushback (all tools)

- *Tools could undermine patient-clinician relationship*
- *Patient's (mis)interpretation of 'harms'*

Patient views

Reaction to Overdiagnosis Leaflet

- *Authoritative, informative, reassuring, encourages discussion*
- *Desire for less emphatic language*
- *May increase anxiety, cause anger, and discourage necessary care*

Reaction to Dialogue Sheet

- *Appreciated as a take-home tool/memory aid*
- *Co-signed agreement could have mixed response*

Reaction to Wait-and-see Note

- *Uses dismissive terminology (e.g. "wait")*
- *Easily ignored*

Understanding and interpretation of content (all tools)

- *Understood concept of overdiagnosis but were sceptical of its magnitude*
- *Desire for clear definition of 'harm'*
- *Struggled with terminology for false positives*

Appendix 1 - COREQ checklist

The Consolidated Criteria for Reporting Qualitative Studies (COREQ): 32-item checklist
(Table developed from Tong et al., 2007)

No. Item	Guide questions/description	Notes
Domain 1: Research team and reflexivity		
The research team AT, physiotherapist, PhD; SS, PhD student; JC, anthropologist, PhD; PV, behavioural scientist; ET, senior physiotherapist; CK, qualitative research assistant; LO behavioural scientist		
Personal Characteristics		
1. Inter viewer/facilitator	Which author/s conducted the interview or focus group?	The focus groups were facilitated by AT, SS, JC, PV, AND CK. The interviews were facilitated by CK, JC and DO
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	AT: PhD, SS: MPH, JC: PhD, CK: GCert (qualitative health research), DO: PhD
3. Occupation	What was their occupation at the time of the study?	AT, physiotherapist and research fellow; SS, PhD student; JC, behavioural insights unit, PhD; PV, behavioural insights unit; ET, senior physiotherapist; CK, qualitative research assistant; LO behavioural insights unit; DO research fellow
4. Gender	Was the researcher male or female?	The focus group facilitators were male (x1) and female (x3). The interviewers (CK, JC, DO) were female
5. Experience and training	What experience or training did the researcher(s) have?	AT, JC, and CK had experience with qualitative methods including facilitating focus groups and interviews
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	The research team did not have any contact with participants prior to organising the time for the interview. Researchers had no professional or ongoing relationship with the participants.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for	Participants were informed that the researchers were interested in exploring the use of diagnostic

	doing the research	imaging for musucloskeletal pain. The study was introduced to participants as an initiative to better understand the use of imaging for musculoskeletal pain.
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Participants were informed that researchers were interested in improving communication between doctors and patients about imaging.
Domain 2: Study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	We based our framework analysis on phenomenological orientation. Phenomenological methodology focuses on individual experience arising from the data, so was therefore appropriate to explore reactions to the tools.
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	We used a convenience sampling to select participants. For the GP participants we recruited a sample of GPs who were attending a continuing professional development event on 30 July 2019. We recruited an additional 7 GP participants from a separate study. That study's aim was to explore GP perceptions of audit and feedback letters focused on diagnostic imaging for musculoskeletal conditions. After the interview about the audit and feedback letter intervention, GPs were invited to take the three tools away with them to use in their practice, for a period of 3 weeks. Because they were participating in a separate study, the four GPs who participated in individual interviews were aware of a broader program of work to reduce unnecessary care by the Commonwealth Department of Health.

		For the patient participants we recruited men and women attending a hospital emergency department for low back pain between March and June 2019.
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Patient participants were approached using text messages from the hospital clinician and research team, giving the participant an opportunity to opt in to the study. GP participants were approached at a continuing education event on low back pain.
12. Sample size	How many participants were in the study?	There were 30 participants in the study.
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Of the 40 patients who were invited and eligible, 10 agreed to participate in a focus group, and 4 in an individual phone interview. Of the 23 GPs attending the event who were invited and eligible, 12 agreed to participate.
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	We held the sessions with GPs at the Institute for Musculoskeletal Health, a clinical research institute at the University of Sydney. We held the sessions with patients at a conference facility attached to Liverpool Hospital in Sydney. Interviews were conducted over the phone. GP participants were paid $200 to reimburse for lost clinic time. Patient participants were paid $50 to reimburse for their time and travel expenses, and were provided with lunch.

15. Presence of non-participants	Was anyone else present besides the participants and researchers?	ET attended one of the patient focus groups. No other non-participants were present in the focus groups or interviews
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	We conducted four focus groups, two with GPs held on 30 July 2019, and two with patients held on 23 August 2019. See Table 2 for participant characteristics
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Interviews and focus groups were semi-structured and followed the topic guide in Box 1. The interview guide was not pilot tested.
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	No repeat interviews were carried out
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	We audio recorded all focus group discussions and interviews. The recordings were transcribed verbatim.
20. Field notes	Were field notes made during and/or after the interview or focus group?	Facilitators made field notes throughout the interviews identified salient themes. After the focus groups, moderators involved in the sessions (AT, CK, PV, JC, SS, ET) independently documented their observations and emerging key themes. They then discussed these initial themes as a team.
21. Duration	What was the duration of the interviews or focus group?	The focus group sessions lasted 60 to 90 minutes and had at least two facilitators from the author team. The interview sessions lasted 20 to 40min.
22. Data saturation	Was data saturation discussed?	Preliminary analysis suggested thematic consistency among patient participants; recruitment took place until saturation reached in individual interviews (determined by CK).

23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Transcripts were not returned to participants for comment and/or correction
Domain 3: Analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Two authors coded the entire dataset (AT, CK) and a third (SS) reviewed the transcripts and coding
25. Description of the coding tree	Did authors provide a description of the coding tree?	A refined version of the coding tree is provided in Box 2
26. Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. The research team met to discuss emerging themes throughout the analysis, and interpretation of the data. Key themes that the team agreed on were used to develop an initial coding framework for the data. These discussions also led to refinement of the discussion guide for the individual interviews.
27. Software	What software, if applicable, was used to manage the data?	Microsoft Word was used for Framework analysis
28. Participant checking	Did participants provide feedback on the findings?	Participants did not provide feedback on the overall findings
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? E.g. participant number	Participant quotes presented in main text to illustrate themes. Quotes from individual interviews are identified with age and sex (patients) and years of experience (GPs)
30. Data and findings consistent	Was there consistency between the data presented and the findings?	We included key quotes that reflect our main findings
31. Clarity of major themes	Were major themes clearly presented in the findings?	Major themes are presented clearly under subheadings
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Diverse cases and minor subthemes are discussed after each major theme is described.

Appendix 2 - Tools

Figure S1. Overdiagnosis Leaflet

Figure S2. Dialogue Sheet

Dear: _____

Based on my review today _____*(date)*
I'm not referring you straight for imaging for your

_____ pain, because:

☐ I have checked you and imaging won't change the treatment that you need today

☐ Your symptoms should improve over the next _____ days/weeks

☐ Findings from imaging can often be unimportant or not significant and cause anxiety and lead to tests that won't help you

What you can do:

☐ Use over the counter medicines for pain relief _____ *(list medicines)*

☐ Heat/ice for pain relief *(circle one)*

☐ Gradually return to your normal activities

☐ Other _____

If your pain persists I'd like to review you in _____ weeks
but come back sooner if you are concerned or if the pain changes

I am happy with this plan: ☐ Yes ☐ No *(patient to tick)*

Signed: _____ (doctor)

Signed: _____ (patient)

Figure S3. Wait-and-see Note

We have agreed to wait _____ weeks before having the test.
If you have not improved by then, I suggest you have the test and make an appointment with me to discuss the results.

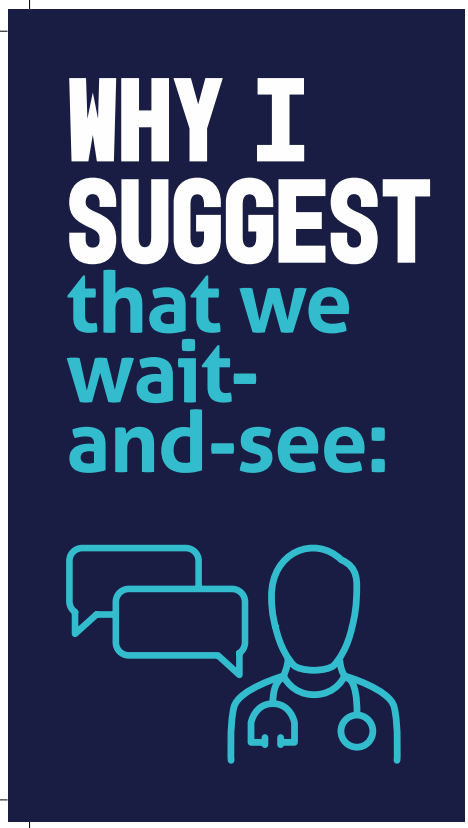
Signed: _____
(doctor)

I am happy with this plan

☐ Yes ☐ No

Signed: _____
(patient)

Why have I asked you to wait? See over for details.



- Musculoskeletal pain can improve rapidly. For example, around 50% of people who experience an episode of back pain recover within 2 weeks.
- There are harms associated with unnecessary imaging.
- I have assessed you and although I don't believe imaging is needed, I can see that you are still concerned.

Contact me earlier if you experience any of the following:

_____

_____

_____

Appendix 3 - Supporting quotes

Q1 "Would I use [*the dialogue sheet and note*]? Probably not. I, probably again, I would document [*instruction to delay*] in the notes. I do document this sort of thing in the notes" (Female GP, infrequent requester of imaging)

Q2 "It's got great statements, it's got statistics, it's a beautiful document. Not sure about the colours, but the document is great." (GP focus group)

Q3 "Young people don't like paper any more. So if you can send it to them so they can have it on their phone [*that would be better than paper*]." (GP focus group)

Q4 "So, if the patient is going to have to sit down and read this, and try to understand it, and then sign it, it's just going to lengthen things out. It's just not going to be feasible." (GP focus group)

Q5 "You just tell them verbally most people will get better but, if you're not, then you can go and have this." (GP focus group)

Q6 "I think this could be good for a junior doctor, registrar who are not empowered as opposed to more experienced GPs with their loyal patient base." (GP focus group)

Q7 "These pieces of paper are the opposite [*to patient centered care*], these are all giving me, the doctor, the power. And the patient is the person who's below me doing what I have told them." (GP focus group)

Q8 "I want to know what's happening inside me and the best way to know is to have an MRI scan. That's what we've been taught for many years that's what the doctors have said to us. Maybe the new generation can have a different view on it, but from my perspective, I think if I'm feeling neck pain or shoulders I would have my ultrasound. I want to know what's happening inside." (Male patient)

Q9 “I’m just now thinking maybe the doctors, the government, whatever, want all the people with the back pain not to do the scans any more, why?” (Patient focus group)

Q10 “I’m assuming the quote comes from Professor at the bottom of the page. So yeah I think it’s a fairly accurate statement, easy to understand, good advice. I guess it’s clarified that he’s an orthopaedic surgeon so that adds some weight to the comment.” (Male patient)

Q11 “I like it. ‘What if I don’t have a scan?’ I find that a really interesting question because yeah, I suppose it just allows more communication by asking that question…. it opens up that communication path again.” (Female patient)

Q12 “it potentially causes alarm for people who are going to require a scan.” (Male patient)

Q13 “Telling me that a scan is not going to find something is a waste of my time. Not a waste of my time, but I’m angry as soon as I see it. I'm pissed off at that.” (Patient focus group)

Q14 “If as a patient I had this on a referral I think it would give me a little bit more guidance. It would still make me feel like something is happening and validating my actual concerns or pain.” (Female patient)

Q15 “I don’t think signing it really adds any value to it, it just seems a bit strange. It’s like you’re entering into a contract. It just seems a bit unusual to have to sign the document.” (Male patient)

Q16 “… if he says he reviews us in two weeks, and he’s signed it as well, if you come and he cancels it, it’s on him. So it’s peace of mind.” (Patient focus group participant)

Q17 “Wait for what? I’m in pain, I’m suffering. Why wait four weeks *[to find out]* what’s going to happen? If he’s going to tell me ‘ok take the tablets maybe the pain is going to go or not’ I would feel like [*he doesn’t*] care.” (Patient focus group participant)

Q18 “Is it real data we’re looking at?” (Patient focus group)

Q19 “…reading the narrative of that just tells me that perhaps I’m playing it up a bit in my head.” (Male patient)

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Patient and general practitioner views of tools to delay diagnostic imaging for low back pain: a qualitative study

Running head: Tools to delay diagnostic imaging

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Abstract

OBJECTIVE: Delayed prescribing is a promising strategy to manage patient requests for unnecessary tests and treatments. The purpose of this study was to explore general practitioner (GP) and patient views of three communication tools (an Overdiagnosis Leaflet, a Dialogue Sheet, and a 'Wait-and-see' Note) to support delayed prescribing of diagnostic imaging.

DESIGN: Qualitative study

SETTING: Primary and emergency care in Sydney, Australia

PARTICIPANTS: 16 GPs and 14 patients with recent episode of low back pain

OUTCOMES: Views of tools to delay diagnostic imaging for low back pain. Data were collected using a combination of focus groups and individual interviews.

ANALYSIS: Two researchers independently performed a thematic analysis, and the author team reviewed and refined the analysis.

RESULTS: GP participants responded positively to an Overdiagnosis Leaflet. The Dialogue Sheet and 'Wait-and-see' Note raised several concerns about patient pushback, adding to time pressure, and being overwhelmed with hard-to-find paper resources. GPs preferred to communicate verbally the reasons to delay an imaging test. For patients, the reactions to the tools were more positive. Patients valued written information and a signed agreement to delay the test. However, patients expressed that a strong desire for diagnostic imaging would be likely override any effect of written advice to delay the test. The term "false alarm" to describe overdiagnosis was poorly understood by patients.

CONCLUSIONS: GPs and patients agreed that a leaflet about overdiagnosis could support a delayed prescribing approach to imaging for low back pain. A Dialogue Sheet and 'Wait-and-see' Note were acceptable to patients but not GPs.

Key words: diagnostic radiology, quality in healthcare, rehabilitation medicine, back pain, internal medicine

Strengths and limitations of this study

- We sampled people involved in the decision to have diagnostic imaging for low back pain in emergency and primary care.
- Our data collection methods allowed us to capture natural conversations in the focus groups, and explore emergent themes in depth in the interviews.
- GPs included in this study were attending a professional education event and may have had more positive views of tools to delay imaging than the wider population of GPs.

Introduction

Guidelines for low back pain recommend that clinicians reserve diagnostic imaging tests for patients who have clinical features of serious pathology.(1) Yet on average general practitioners (GP) refer around one quarter of their patients with low back pain for imaging.(2) In most cases these tests will not bring patients any benefit.(3) Instead, overuse of imaging has negative consequences for the patient, the clinician, and health systems.(4)

A number of factors related to the patient-clinician interaction could drive overuse of imaging for low back pain. A review of 17 qualitative studies identified 'perceived pressure from patients' as a key driver of guideline discordant imaging reported by doctors.(5) Indeed, around 50% of patients with low back pain believe imaging is necessary.(6) Also, many clinicians worry about medicolegal liability if they do not provide the test, and feel they lack tools to discuss the need for imaging with their patient.(7)

Tools that promote watchful waiting as an evidence-based alternative to imaging could be effective at reducing overuse. For example, information leaflets to support delayed prescribing, that is, where a GP provides a script but instructs the patient to wait and see if symptoms resolve, can reduce use of antibiotics.(8) One trial in the 1980s found this approach reduced imaging low back pain.(9) There is evidence that written delayed prescribing tools are acceptable to patients considering antibiotics and some screening tests.(10, 11) However, it is unclear how GPs and patients might react to tools for symptomatic conditions where imaging overuse is problematic.

In 2019 the Australian Government Department of Health developed a resource pack to support GPs to reduce unnecessary imaging for musculoskeletal pain, with a key focus on low back pain. The pack included three newly developed communication tools. One was developed by the lead author in collaboration with an advertising agency (Overdiagnosis Leaflet). The remaining two tools (a Dialogue Sheet, and a 'Wait-and-see' Note) were developed by the Behavioural Economics and Research Team at the Australian Government Department of Health and with input from researchers and clinicians within the Wiser Healthcare Research Collaboration. The goal of the tools was to encourage discussions between patient and clinician about the need for imaging and support a delayed prescribing approach to reduce unnecessary requests.

The aim of this study was to gather GP and patient views on the three newly developed communication tools to support delayed prescribing of imaging for low back pain.

Methods

Study Design and Participants

We conducted a qualitative study with 4 focus groups and 8 individual interviews to explore how GPs and patients understood and responded to the communication tools. We have prepared this report to adhere to the COREQ checklist (Appendix 1).(12)

We used convenience sampling to select participants. We aimed to conduct a minimum of two focus groups of at least 5 participants for each participant type. We planned additional "mop-up" individual interviews which took place until saturation was reached. GPs who

were practising in Australia were eligible to participate. For the GP participants we recruited a sample of GPs who were attending a continuing professional development event on 30 July 2019. Of the 23 GPs attending the event who were invited and eligible, 12 agreed to participate. We recruited an additional 7 GP participants from a separate study. That study's aim was to explore GP perceptions of audit and feedback letters focused on diagnostic imaging for musculoskeletal conditions. After the interview about the audit and feedback letter intervention, GPs were invited to take the three tools away with them to use in their practice, for a period of 3 weeks. Because they were participating in a separate study, the four GPs who participated in individual interviews were aware of a broader program of work to reduce unnecessary care by the Commonwealth Department of Health.

For the patient participants we recruited men and women who had sought care for low back pain between March and June 2019. We identified a consecutive list of adult patients who presented with 'non-serious' low back pain to the Emergency Department of Liverpool Hospital, Sydney. Patient participants were approached using text messages from the hospital clinician and research team. Of the 40 patients who were invited and eligible, 10 agreed to participate in a focus group, and 4 in an individual phone interview.

Data Collection

The research team comprised a physiotherapist and research fellow (AT); a PhD student with background in sociology (SS); two research fellows from the Behavioural Economics and Research Team, Australian Government (JC, PV); a senior physiotherapist (ET); a qualitative research assistant (CK); a GP and research fellow (LO); a senior research fellow

(DO); and an expert in qualitative research and professor of public health (KM). The focus groups were facilitated by AT, SS, JC, PV, and CK. The interviews were facilitated by CK, JC and DO. The focus group facilitators were male (x1) and female (x3). The interviewers (CK, JC, DO) were female. AT, JC, and CK had experience with qualitative methods including facilitating focus groups and interviews.

Researchers had no professional or ongoing relationship with the participants. Participants were informed that the researchers were interested in exploring the use of diagnostic imaging for musculoskeletal pain. The study was introduced to participants as an initiative to better understand the use of, and communication about, imaging for low back pain. Prior to beginning the sessions participants completed a written demographic questionnaire so that we could describe the sample. We asked all participants whether they agreed with the following statement: *"Everyone who gets low back pain should have an imaging test (x-Ray, CT, MRI)."* Patients were asked an additional question about their history of imaging for low back pain. GPs were asked additional questions regarding years practicing, their self-reported imaging rate, and their interest in musculoskeletal conditions.

We audio recorded all focus group discussions and interviews. The recordings were transcribed verbatim. Transcripts were not returned to participants for comment or correction. Facilitators made field notes throughout the interviews identified salient themes. After the focus groups, facilitators involved in the sessions (AT, CK, PV, JC, SS, ET) independently documented their observations and emerging key themes. They then discussed these initial themes as a team.

Focus groups

Because this project worked to a strict deadline imposed by our Department of Health collaborators, we chose to conduct focus groups primarily to capture the views of several participants in a short time frame.

Each group comprised five to seven people. Sessions had the following format: demographic questionnaire, introduction of study and facilitators, warm-up discussion, presentation of the tools (Powerpoint slides plus paper versions), guided discussion of each tool (Box 1). We held the sessions with GPs at the Institute for Musculoskeletal Health, a clinical research institute at the University of Sydney on 30 July 2019. We held the sessions with patients at a conference facility attached to Liverpool Hospital in Sydney on 23 August 2019. ET attended one of the patient focus groups. The focus group sessions lasted 60 to 90 minutes and had at least two facilitators from the author team.

Interviews

After the focus groups DO and JC conducted additional individual interviews with four GPs and CK conducted additional interviews with four patients. Interviews were conducted over the phone. We used these additional "mop-up" interviews to further explore salient themes that emerged in the focus groups. We stopped recruiting patients for interviews when no new themes emerged (data saturation).(13) Recruitment of GP participants for interviews was limited by resources and not necessarily by data saturation. The interview sessions lasted 20 to 40min. No repeat interviews were carried out.

Communication tools and discussion content

Table 1 describes the rationale and content of the three communication tools. We selected these three tools because they were being used in a broader program of work to reduce unnecessary diagnostic imaging by the Commonwealth Department of Health. Complete versions of the tools are included in Appendix 2. The focus groups and interviews followed a similar discussion format (Box 1). The interview guide was not pilot tested. Each started with a short warm-up discussion of the role of diagnostic imaging in low back pain. Participants were then presented with the three tools, in turn, for discussion.

Data Analysis

We performed a thematic analysis to identify main themes as well as divergent views.(14). We based our framework analysis on a phenomenological orientation. That is, we focused on individual experiences and reactions arising from the data. We started by analysing the focus groups first. Two authors coded the data from the focus groups (AT, CK) using Microsoft Word and a third (SS) reviewed the transcripts and coding. The research team met to discuss themes emerging from the focus groups, and interpretation of the data. Key themes that the team agreed on were used to develop an initial coding framework for the data. These discussions of findings from the focus groups also led to refinement of the discussion guide for the individual interviews. We developed a library of codes in an iterative process, decided on a coding framework, and applied this framework to the entire dataset. A refined version of the coding tree is provided in Box 2. We used a 'constant comparison' approach, which involves continually looking for similarities, differences, and

other patterns within and across transcripts.(15) Participants did not provide feedback on the overall findings.

Patient and public involvement

We informally piloted the tools with consumers (n= 4) and clinicians (n=4) to optimise content prior to enrolling participants. We asked them to provide feedback on the readability, content, and usefulness of the tools and made minor edits to produce the versions evaluated in this study.

Results

Sixteen GPs and 14 patients participated in the study. Table 2 shows the characteristics of participants.

Twelve GP participants were female and 13 had more than 20 years in practice. None of the GP participants agreed with the statement: *"Everyone who gets low back pain should have an imaging test (x-Ray, CT, MRI)."* 13 GP participants reported requesting imaging in fewer than one quarter of their consultations for musculoskeletal imaging, and 8 had an interest in musculoskeletal conditions

Eleven patient participants were born outside of Australia, 12 were between 20 and 60 years of age, and 6 had a university education or higher. All patient participants had had an imaging test in the past and 11 believed everyone with low back pain should have imaging.

Below we summarise the key findings with selected quotes. During the analysis the author team agreed that the clearest format to present the results was to present views of the two groups of participants separately. Additional supporting quotes (numbered in text as Q1, Q2, Q3 and so on) are provided in Appendix 3.

1. GP views

Overall GP reactions

GPs had mixed reactions to the tools (Box 2). Some GPs felt the communication tools could have a role in helping to manage difficult consultations:

> "I guess if you had a really stroppy patient you didn't know and didn't think you'd get any follow up with, perhaps there could be a role." (GP focus group)

However, most GPs reacted negatively to the Dialogue Sheet and Wait-and-see Note, and none of them reported they would use these in practice. They found the concept of written prompts and co-signing an agreement with their patient, to be an insult to their clinical skill and autonomy:

> "No, no, I'd never use [*the dialogue sheet*] in a pink fit." (GP focus group)

GPs felt paper-based tools in general were impractical, easily forgotten, and preferred verbal reassurance:

> "Would I use [*the dialogue sheet and note*]? Probably not. I, probably again, I would document [*instruction to delay*] in the notes. I do document this sort of thing in the notes" (Female GP, 20+ years of experience)

GP reactions to the Overdiagnosis Leaflet: important content that would be useful in digital format, but may induce patient anxiety

GP participants responded most positively to the design and content of the Overdiagnosis Leaflet. They valued the condition-specific information such as clinical features for lumbar imaging and self-management advice (Q1). Some felt the language of the leaflet was too emphatic and could discourage necessary imaging:

> "I mean [*the overdiagnosis leaflet*] would scare them off having a scan and maybe it might scare some of the 1% who do need to have it." (GP focus group)

GP participants expressed a strong preference for easily accessible, web- or electronic medical record-based fact sheets for use with their patients (Q2).

GP reactions to the Dialogue Sheet: redundant for experienced GPs, would add to time pressure

Most GP participants felt the dialogue sheet would be superfluous, and preferred to communicate the same messages verbally:

"So, as I said, that's the sort of thing I would be telling the patient as we went, and maybe summarising at the end, but I would do that in a verbal fashion. I wouldn't be filling in a form like this." (GP focus group)

Some were concerned the tools would just add to time pressure within the consultation:

"So, if the patient is going to have to sit down and read this, and try to understand it, and then sign it, it's just going to lengthen things out. It's just not going to be feasible." (GP focus group)

Most GP participants did not want to sign the Dialogue Sheet and felt that patients would be opposed to signing it as well:

"It doesn't need a contract, we're not giving morphine out." (GP focus group)

GP reactions to the Wait-and-see Note: could help validate concerns, but impractical

One doctor noted that the language of the Wait-and-see Note could help validate a patient's experience:

> "I guess what the writer was trying to get across was: 'I acknowledge that you have real symptoms.' I think that's better, the patient wants me to know that they really have pain." (GP focus group)

A key barrier to use of the note was practicality. Participants felt verbal communication of similar messages would be more efficient (Q3).

Workforce issues and concerns about patient pushback (all tools):

Some GP participants felt the communication tools were more useful for less experienced doctors or in the community more broadly(Q4):

> "This [*overdiagnosis leaflet*] is a document that absolutely needs to go *[beyond]* primary care level, at a community level." (GP focus group)

GPs felt the Dialogue Sheet and Wait-and-see Note would be patronising to patients or could compromise the clinician-patient relationship:

> "These pieces of paper are the opposite [*to patient centered care*], these are all giving me, the doctor, the power. And the patient is the person who's below me doing what I have told them." (GP focus group)

> "*[If I were to use it with my patients]* They'd probably think I've gone mad." (Female GP, 20+ years of experience)

1. Patient views

Overall patient reactions

Patients had generally positive reactions to all three tools (Box 2). In contrast to GP responses, patients valued paper-based, written information and the perceived accountability that a co-signed agreement section on the Dialogue Sheet and Wait-and-see Note would provide:

> "I hate it when they don't keep their word to see you again. So this one, when they sign on it, they have to see you." (Patient focus group)

For some, the perceived benefit of locating the source of low back pain, and ruling out serious pathology, outweighed any advice to delay an imaging test (Q5). Others regarded the tools with suspicion:

> "I'm just now thinking maybe the doctors, the government, whatever, want all the people with the back pain not to do the scans any more, why?" (Patient focus group)

Patient reactions to the Overdiagnosis Leaflet: informative but alarming, prompts desire to discuss harms of imaging with GP

Most patient participants found the Overdiagnosis Leaflet clear, informative, and credible:

> "I'm assuming the quote comes from Professor Ian Harris at the bottom of the page. So yeah I think it's a fairly accurate statement, easy to understand, good advice. I guess it's clarified that he's an orthopaedic surgeon so that adds some weight to the comment." (Male patient, 40-59 years old)

Some patients felt the Overdiagnosis Leaflet would encourage them to ask their doctor questions about their care (Q6). Other patient participants were reluctant to challenge the perceived authority of their doctor:

> " I just don't know if *[my GP]* would be comfortable hearing that from a patient." (Male patient, 20-39 years old)

There was concern among patient participants that the Overdiagnosis Leaflet would discourage imaging for those who did needed it (Q7). One patient participant reacted angrily to the concept that some scans might be unnecessary:

> "Telling me that a scan is not going to find something is a waste of my time. Not a waste of my time, but I'm angry as soon as I see it. I'm pissed off at that." (Patient focus group)

Patient reactions to the Dialogue Sheet: could improve recall of the consultation and provide evidence of GP commitment

In contrast to the Overdiagnosis Leaflet, which provoked some concerns, the Dialogue Sheet had potential to be reassuring. Patients had mixed reactions to the concept of co-signing an agreement to not have an imaging test; some felt it would be and odd process (Q8) where others appreciated the clinician's commitment:.

> "… if he says he reviews us in two weeks, and he's signed it as well, if you come and he cancels it, it's on him. So it's peace of mind." (Patient focus group participant)

Patient reactions to the Wait-and-see Note: uses dismissive terminology and would be easy to ignore

Some patient participants found the concept of the Wait-and-see Note dismissive. One patient participant, who was an allied health professional, felt patients might ignore the note:

> "I think, personally, people, if they've got the referral there, I think they would just ignore that [*message to*] wait-and-see." (Female patient, 40-59 years old)

Patient understanding and interpretation of content (all tools): take care with language to describe overdiagnosis and related harms

There was some suspicion among patient participants about the veracity of the data on the magnitude of overdiagnosis in the Leaflet (Q9). One patient participant understood the link between overdiagnosis and unnecessary surgery, but felt the odds of this happening were not concerning:

"…so only one will have surgery and they don't need it. So 1 out 100? *[Facilitator: Yeah, not that bad do you reckon?].* Well yeah not that bad." (Patient focus group)

The term "false alarm" was a poorly understood concept. Some patient participants felt the term indicated that their problem was imaginary (Q10).

Discussion

Summary

The GPs and patients we interviewed had divergent views on the value of three different communication tools to support delayed prescribing of imaging for low back pain. While almost all GPs rejected a tool with an example dialogue and discussion points, patients desired this process. Some patients appreciated the concept of co-signing an agreement to delay imaging, while others did not. The GPs we interviewed universally rejected this co-signing approach. There was variation in what patients and GPs considered to be a 'harm' from having imaging.

Strengths and limitations

We conducted this study at a time when advanced imaging rates are increasing.(4) Understanding how both GPs and patients might use communication tools will help inform strategies to reduce this problem. We used a combination of focus groups and interviews, and sampled people involved in the decision to have diagnostic imaging in emergency and primary care. This allowed us to capture natural conversations in the groups, and explore emergent themes in depth in the interviews.

We were restricted to recruiting mainly from a GP professional development network, with a small number of additional participants recruited through an additional study. This group may have had more positive views than expected in the wider population of GPs. Though our data suggest they were highly sceptical of the materials and divergent from patients. Similarly, although all of the patients we included had seen a GP for their low back pain, they had also attended the Emergency Department of a public hospital for their low back

pain. This diverse group of patients may be different to those who typically attend a GP as their first or only contact with the health system. The patient participants in this study might also represent a group who take low back pain very seriously and be more critical of tools to delay or deter imaging.

Comparison with existing literature

Our findings are consistent with research showing that attempts to reduce or delay tests can arouse suspicion about financial arrangements, government oversight, and motives to cut costs.(16) This phenomenon also occurs in women considering breast cancer screening.(17) Our study confirms that mistrust among patients could extend to communicating about delayed imaging, overdiagnosis, and the option of watchful waiting.

We are aware of one other study that evaluated reactions to a communication tool to support GPs to reduce unnecessary imaging of low back pain. Jenkins et al. examined GP and consumer reactions to a booklet about lumbar imaging.(18) Similar to our findings, some GPs preferred digital format whereas consumers appreciated a glossy hard copy to take home to discuss with their family. Consumers valued detailed, written, individualised information and reassurance. Our findings suggest that patients may also desire tools that provide them with a sense that the GP has taken them seriously. The co-signed section in the Dialogue Sheet and Wait-and-See appeared to achieve this, yet GPs had reservations about using it.

Trials of patient-mediated interventions to reduce imaging rates have had limited success and suggest challenges to uptake.(19) For example Schectman et al found no effect of

patient education tools on imaging rates in their trial including 120 GPs, but only one third of GPs reported using the tools in the trial.(20) Given the divergent and sometimes strong views expressed in this study, ongoing evaluation of communication tools to meet the needs of end-users appears essential.

The patients we interviewed reacted with surprise to the nature and magnitude of imaging overdiagnosis. Many of the patient participants struggled to think of harms of diagnostic imaging, other than exposure to radiation. This finding supports evidence on patient perceptions of overused screening tests e.g. the perception that the benefits of early detection tend to outweigh the harms of unnecessary tests.(21) Our findings on how GPs describe harms from overdiagnosis suggest that they may also hold this view.

Implications for future research and practice

This study provides insights into the complexity of communicating about unnecessary imaging to patients and GPs. Based on these findings there may be several ways to enhance acceptability and uptake of delayed prescribing approaches. First, the language relating to the necessity of diagnostic imaging tests should be cautious rather than emphatic. Patients may interpret harms differently; tools that describe risk of 'harms' would benefit from also providing clear examples of overdiagnosis. Second, tools should be in digital format for GPs but readily printed for patients who prefer paper-based information. Finally, a Dialogue Sheet with or without a co-sign agreement section requires further testing before implementing this kind of tool in clinical practice. Together our findings suggest that information leaflet that explains the problem of overdiagnosis could support a delayed

prescribing approach to imaging for low back pain. A Dialogue Sheet and Wait-and-see Note to help discuss a delayed imaging may be acceptable to patients but not GPs.

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Table 1. Description and intended use of tools to support delayed prescribing of musculoskeletal imaging

	Overdiagnosis Leaflet	**Dialogue Sheet**	**Wait-and-see Note**
Why Rationale	Goal: 1. promote watchful waiting for people with low back pain 2. raise awareness of non-essential or 'low-value' lumbar imaging tests	Goal: 1. promote watchful waiting for people with musculoskeletal pain (including low back pain) 2. support doctor-patient communication and joint decision-making 3. Provide actions for patients to take to address their pain, as alternatives to imaging.	Goal: 1. promote watchful waiting for people with musculoskeletal pain (including low back pain) 2. support doctor-patient communication and joint decision-making
What Materials and content	6-panel A4 folded leaflet Designed by advertising company and researchers Key messages - Unnecessary lumbar scans can cause harm - There are alternatives to imaging - Speak to your doctor Behavioural prompts - Framing of harms from overdiagnosis - Appeal to authority (quote from orthopaedic surgeon)	1-page A5 sheet Designed by the Commonwealth Department of Health and researchers Key messages - In your case I think imaging is unnecessary - I recommend we delay decision to have a scan - There are other actions you can take to address your pain Behavioural prompts - Present no imaging as the default - Co-signature (patient and doctor) commitment to delay	2-sided A6 note Designed the Commonwealth Department of Health and researchers Key message - The referral is a backup; only to be used under specific circumstances (tailored to the patient) Behavioural prompts - Present no imaging as the default - Co-signature (patient and doctor) commitment to delay
Tailoring to the individual	None	Space to describe symptoms, things to look out for, name and date, customisable reasons to delay, recommended actions to manage pain and assist recovery	Review date, things to look out for

Box 1: Focus group and interview topic guide

All participants

- Participants take turns to read the tools and 'think aloud' as they read the content.
- Which elements of the tools did you like? Why?
- Which elements of the tools did you not like? Why?
- Do you have any suggestions for improvement?

For GP participants

- Are any of these tools something that you would use? What would improve usability?

For patient participants

- Did you gain any new information about imaging from these tools? If your doctor went through these tools with you, how would you feel? What would improve usability?

Table 2. Participant characteristics (n=30)

Characteristics	Number of participants	
	Patients (n=14)	**GPs (n=16)**
Age		
20-39	5	2
40-59	7	5
60-79	2	9
Sex		
Female	9	12
Male	5	4
Born outside of Australia		
Yes	11	-
No	3	-
University education		
Yes	6	-
No	8	-
Had an imaging test for back pain in the past	14	-
Believe everyone with low back pain should have a scan	11	0
Years practicing as a GP		
1-9	-	2
10-19	-	1
20+	-	13
Self-reported imaging request rate		
<10%	-	6
~25%	-	7
~50%	-	2
>75%	-	1
Had an interest in management of musculoskeletal conditions	-	8

Box 2. Summary of GP and patient views on communication tools to support delayed prescribing of imaging for low back pain

GP views

Reaction to Overdiagnosis Leaflet

- *Useful, visually appealing information*
- *May increase anxiety and discourage necessary care*
- *Digitise tools, communicate using other media in waiting room*

Reaction to Dialogue Sheet

- *Preference for verbal communication*
- *Could add to time pressure*
- *Reluctance to sign*

Reaction to Wait-and-see Note

- *Validating messages*
- *Preference for verbal communication*

Workforce issues (all tools)

- *Experienced GPs don't need these tools*

Concerns about patient pushback (all tools)

- *Tools could undermine patient-clinician relationship*
- *Patient's (mis)interpretation of 'harms'*

Patient views

Reaction to Overdiagnosis Leaflet

- *Authoritative, informative, reassuring, encourages discussion*
- *Desire for less emphatic language*
- *May increase anxiety, cause anger, and discourage necessary care*

Reaction to Dialogue Sheet

- *Appreciated as a take-home tool/memory aid*
- *Co-signed agreement could have mixed response*

Reaction to Wait-and-see Note

- *Uses dismissive terminology (e.g. "wait")*
- *Easily ignored*

Understanding and interpretation of content (all tools)

- *Understood concept of overdiagnosis but were sceptical of its magnitude*
- *Desire for clear definition of 'harm'*
- *Struggled with terminology for false positives*

Appendix 1 - COREQ checklist

The Consolidated Criteria for Reporting Qualitative Studies (COREQ): 32-item checklist
(Table developed from Tong et al., 2007)

No. Item	Guide questions/description	Page Number
Domain 1: Research team and reflexivity		
The research team		6
Personal Characteristics		
1. Inter viewer/facilitator	Which author/s conducted the interview or focus group?	7
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	1
3. Occupation	What was their occupation at the time of the study?	6
4. Gender	Was the researcher male or female?	7
5. Experience and training	What experience or training did the researcher(s) have?	7
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	7
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	7
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	7
Domain 2: Study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	9
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	5
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	6
12. Sample size	How many participants were in the study?	6,10
13. Non-participation	How many people refused to participate or dropped out? Reasons?	6
Setting		

14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	8
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	10
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	9
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	8
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	7
20. Field notes	Were field notes made during and/or after the interview or focus group?	7
21. Duration	What was the duration of the interviews or focus group?	8
22. Data saturation	Was data saturation discussed?	5,8
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	7
Domain 3: Analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	9
25. Description of the coding tree	Did authors provide a description of the coding tree?	9
26. Derivation of themes	Were themes identified in advance or derived from the data?	9
27. Software	What software, if applicable, was used to manage the data?	9
28. Participant checking	Did participants provide feedback on the findings?	9
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? E.g. participant number	10-18
30. Data and findings consistent	Was there consistency between the data presented and the findings?	10-18
31. Clarity of major themes	Were major themes clearly presented in the findings?	10-18
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	10-18

Appendix 2 - Tools

Figure S1. Overdiagnosis Leaflet

Figure S2. Dialogue Sheet

Dear: _____

Based on my review today _____*(date)*
I'm not referring you straight for imaging for your

_____ pain, because:

☐ I have checked you and imaging won't change the treatment that you need today

☐ Your symptoms should improve over the next _____ days/weeks

☐ Findings from imaging can often be unimportant or not significant and cause anxiety and lead to tests that won't help you

What you can do:

☐ Use over the counter medicines for pain relief _____
(list medicines)

☐ Heat/ice for pain relief *(circle one)*

☐ Gradually return to your normal activities

☐ Other _____

If your pain persists I'd like to review you in _____ weeks
but come back sooner if you are concerned or if the pain changes

I am happy with this plan: ☐ Yes ☐ No *(patient to tick)*

Signed: _____ (doctor)

Signed: _____ (patient)

Figure S3. Wait-and-see Note

We have agreed to wait _____ weeks before having the test.
If you have not improved by then, I suggest you have the test and make an appointment with me to discuss the results.

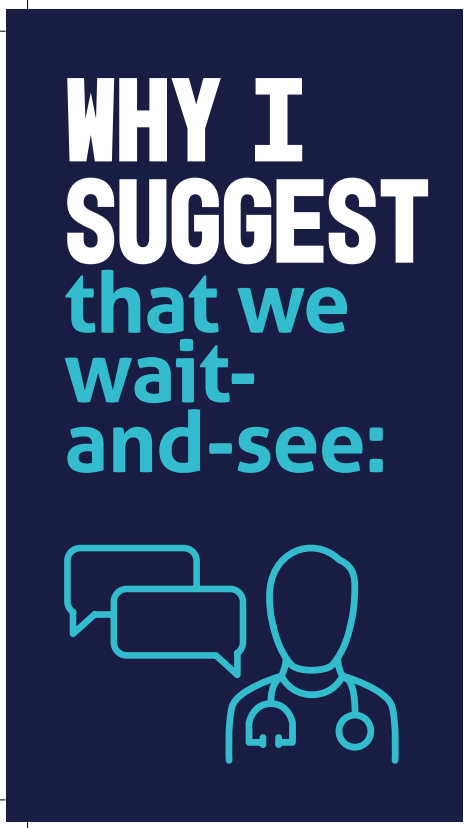
Signed: _____
(doctor)

I am happy with this plan

☐ Yes ☐ No

Signed: _____
(patient)

Why have I asked you to wait? See over for details.



- Musculoskeletal pain can improve rapidly. For example, around 50% of people who experience an episode of back pain recover within 2 weeks.
- There are harms associated with unnecessary imaging.
- I have assessed you and although I don't believe imaging is needed, I can see that you are still concerned.

Contact me earlier if you experience any of the following:

_____

_____

_____

Appendix 3 – Additional supporting quotes

Q1 “It’s got great statements, it’s got statistics, it’s a beautiful document. Not sure about the colours, but the document is great.” (GP focus group)

Q2 “Young people don’t like paper any more. So if you can send it to them so they can have it on their phone [*that would be better than paper*].” (GP focus group)

Q3 “You just tell them verbally most people will get better but, if you’re not, then you can go and have this.” (GP focus group)

Q4 “I think this could be good for a junior doctor, registrar who are not empowered as opposed to more experienced GPs with their loyal patient base.” (GP focus group)

Q5 “I want to know what’s happening inside me and the best way to know is to have an MRI scan. That’s what we’ve been taught for many years that’s what the doctors have said to us. Maybe the new generation can have a different view on it, but from my perspective, I think I would have my ultrasound. I want to know what’s happening inside.” (Male patient, 20-39 years old)

Q6 “I like it. ‘What if I don’t have a scan?’ I find that a really interesting question because yeah, I suppose it just allows more communication by asking that question…. it opens up that communication path again.” (Female patient, 40-59 years old)

Q7 “it potentially causes alarm for people who are going to require a scan.” (Male patient, 40-59 years old)

Q8 “I don’t think signing it really adds any value to it, it just seems a bit strange. It’s like you’re entering into a contract. It just seems a bit unusual to have to sign the document.” (Male patient, 40-59 years old)

Q9“Is it real data we’re looking at?” (Patient focus group)

Q10“…reading the narrative of that just tells me that perhaps I’m playing it up a bit in my head.” (Male patient, 40-59 years old)

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Patient and general practitioner views of tools to delay diagnostic imaging for low back pain: a qualitative study

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Patient and general practitioner views of tools to delay diagnostic imaging for low back pain: a qualitative study

Running head: Tools to delay diagnostic imaging

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Abstract

OBJECTIVE: Delayed prescribing is a promising strategy to manage patient requests for unnecessary tests and treatments. The purpose of this study was to explore general practitioner (GP) and patient views of three communication tools (an Overdiagnosis Leaflet, a Dialogue Sheet, and a 'Wait-and-see' Note) to support delayed prescribing of diagnostic imaging.

DESIGN: Qualitative study

SETTING: Primary and emergency care in Sydney, Australia

PARTICIPANTS: 16 GPs and 14 patients with recent episode of low back pain

OUTCOMES: Views of tools to delay diagnostic imaging for low back pain. Data were collected using a combination of focus groups and individual interviews.

ANALYSIS: Two researchers independently performed a thematic analysis, and the author team reviewed and refined the analysis.

RESULTS: GP participants responded positively to an Overdiagnosis Leaflet. The Dialogue Sheet and 'Wait-and-see' Note raised several concerns about patient pushback, adding to time pressure, and being overwhelmed with hard-to-find paper resources. GPs preferred to communicate verbally the reasons to delay an imaging test. For patients, the reactions to the tools were more positive. Patients valued written information and a signed agreement to delay the test. However, patients expressed that a strong desire for diagnostic imaging would be likely override any effect of written advice to delay the test. The term "false alarm" to describe overdiagnosis was poorly understood by patients.

CONCLUSIONS: GPs and patients agreed that a leaflet about overdiagnosis could support a delayed prescribing approach to imaging for low back pain. A Dialogue Sheet and 'Wait-and-see' Note were acceptable to patients but not GPs.

Key words: diagnostic radiology, quality in healthcare, rehabilitation medicine, back pain, internal medicine

Strengths and limitations of this study

- Understanding how both GPs and patients might use communication tools will help inform strategies to reduce overuse of diagnostic imaging.
- Our data collection methods allowed us to capture natural conversations in the focus groups, and explore emergent themes in depth in the interviews.
- GPs included in this study were attending a professional education event and may have had more positive views of tools to delay imaging than the wider population of GPs.

Introduction

Guidelines for low back pain recommend that clinicians reserve diagnostic imaging tests for patients who have clinical features of serious pathology.(1) Yet on average general practitioners (GP) refer around one quarter of their patients with low back pain for imaging.(2) In most cases these tests will not bring patients any benefit.(3) Instead, overuse of imaging has negative consequences for the patient, the clinician, and health systems.(4)

A number of factors related to the patient-clinician interaction could drive overuse of imaging for low back pain. A review of 17 qualitative studies identified 'perceived pressure from patients' as a key driver of guideline discordant imaging reported by doctors.(5) Indeed, around 50% of patients with low back pain believe imaging is necessary.(6) Also, many clinicians worry about medicolegal liability if they do not provide the test, and feel they lack tools to discuss the need for imaging with their patient.(7)

Tools that promote watchful waiting as an evidence-based alternative to imaging could be effective at reducing overuse. For example, information leaflets to support delayed prescribing, that is, where a GP provides a script but instructs the patient to wait and see if symptoms resolve, can reduce use of antibiotics.(8) One trial in the 1980s found this approach reduced imaging low back pain.(9) There is evidence that written delayed prescribing tools are acceptable to patients considering antibiotics and some screening tests.(10, 11) However, it is unclear how GPs and patients might react to tools for symptomatic conditions where imaging overuse is problematic.

In 2019 the Australian Commonwealth Government Department of Health developed a resource pack to support GPs as part of a broader program of work to reduce unnecessary diagnostic imaging for musculoskeletal pain. The pack included three newly developed communication tools. One was developed by the lead author in collaboration with an advertising agency (Overdiagnosis Leaflet). The remaining two tools (a Dialogue Sheet, and a 'Wait-and-see' Note) were developed by the Behavioural Economics and Research Team at the Australian Government Department of Health and with input from researchers and clinicians within the Wiser Healthcare Research Collaboration. The goal of the tools was to encourage discussions between patient and clinician about the need for imaging and support a delayed prescribing approach to reduce unnecessary requests. Before deciding whether they would distribute the tools to GPs, the Department of Health commissioned a qualitative evaluation, which we describe here.

The aim of this study was to gather GP and patient views on the three newly developed communication tools to support delayed prescribing of imaging for low back pain.

Methods

Study Design and Participants

We conducted a qualitative study with 4 focus groups and 8 individual interviews to explore how GPs and patients understood and responded to the communication tools. We have prepared this report to adhere to the COREQ checklist (Appendix 1).(12)

We used convenience sampling to select participants. We aimed to conduct a minimum of two focus groups of at least 5 participants for each participant type. We planned additional "mop-up" individual interviews which took place until saturation was reached. GPs who were practising in Australia were eligible to participate. For the GP participants we recruited a sample of GPs who were attending a continuing professional development event on 30 July 2019. Of the 23 GPs attending the event who were invited and eligible, 12 agreed to participate in a focus group. We recruited an additional 4 GP participants to participate in individual interviews, from a separate study. That study's aim was to explore GP perceptions of audit and feedback letters focused on diagnostic imaging for musculoskeletal conditions. After the interview about the audit and feedback letter intervention, GPs were invited to take the three tools away with them to use in their practice, for a period of 3 weeks (GPs in the focus groups were not given this opportunity). Because they were participating in a separate study, the four GPs who participated in individual interviews were aware of a broader program of work to reduce unnecessary care by the Commonwealth Department of Health.

For the patient participants we recruited men and women who had sought care for low back pain between March and June 2019. We identified a consecutive list of adult patients who presented with 'non-serious' low back pain to the Emergency Department of Liverpool Hospital, Sydney. Patient participants were approached using text messages from the hospital clinician and research team. Of the 40 patients who were invited and eligible, 10 agreed to participate in a focus group, and 4 in an individual phone interview.

Data Collection

The research team comprised a physiotherapist and research fellow (AT); a PhD student with background in sociology (SS); two research fellows from the Behavioural Economics and Research Team, Australian Government (JC, PV); a senior physiotherapist (ET); a qualitative research assistant (CK); a GP and research fellow (LO); a senior research fellow (DO); and an expert in qualitative research and professor of public health (KM). The focus groups were facilitated by AT, SS, JC, PV, and CK. The interviews were facilitated by CK, JC and DO. The focus group facilitators were male (x1) and female (x3). The interviewers (CK, JC, DO) were female. AT, JC, and CK had experience with qualitative methods including facilitating focus groups and interviews.

Researchers had no professional or ongoing relationship with the participants. Participants were informed that the researchers were interested in exploring the use of diagnostic imaging for musculoskeletal pain. The study was introduced to participants as an initiative to better understand the use of, and communication about, imaging for low back pain. Prior to beginning the sessions participants completed a written demographic questionnaire so that we could describe the sample. We asked all participants whether they agreed with the following statement: *"Everyone who gets low back pain should have an imaging test (x-Ray, CT, MRI)."* Patients were asked an additional question about their history of imaging for low back pain. GPs were asked additional questions regarding years practicing, their self-reported imaging rate, and their interest in musculoskeletal conditions.

We audio recorded all focus group discussions and interviews. The recordings were transcribed verbatim. Transcripts were not returned to participants for comment or

correction. Facilitators made field notes throughout the interviews identified salient themes. After the focus groups, facilitators involved in the sessions (AT, CK, PV, JC, SS, ET) independently documented their observations and emerging key themes. They then discussed these initial themes as a team.

Focus groups

Each group comprised five to seven people. Sessions had the following format: demographic questionnaire, introduction of study and facilitators, warm-up discussion, presentation of the tools (Powerpoint slides plus paper versions), guided discussion of each tool (Box 1). We held the sessions with GPs at the Institute for Musculoskeletal Health, a clinical research institute at the University of Sydney on 30 July 2019. We held the sessions with patients at a conference facility attached to Liverpool Hospital in Sydney on 23 August 2019. ET attended one of the patient focus groups. The focus group sessions lasted 60 to 90 minutes and had at least two facilitators from the author team.

Interviews

After the focus groups DO and JC conducted additional individual interviews with four GPs and CK conducted additional interviews with four patients. Interviews were conducted over the phone. We used these additional "mop-up" interviews to further explore salient themes that emerged in the focus groups. We stopped recruiting patients for interviews when no new themes emerged (data saturation).(13) Recruitment of GP participants for interviews was limited by resources and not necessarily by data saturation. The interview sessions lasted 20 to 40min. No repeat interviews were carried out.

Communication tools and discussion content

Table 1 describes the rationale and content of the three communication tools. We selected these three tools because they were being used in a broader program of work to reduce unnecessary diagnostic imaging by the Commonwealth Department of Health. Complete versions of the tools are included in Appendix 2. The focus groups and interviews followed a similar discussion format (Box 1). The interview guide was not pilot tested. Each started with a short warm-up discussion of the role of diagnostic imaging in low back pain. Participants were then presented with the three tools, in turn, for discussion.

Data Analysis

Because this project worked to a strict deadline imposed by our Department of Health collaborators, we chose to conduct focus groups primarily to capture the views of several participants in a short time frame.

We performed a thematic analysis to identify main themes as well as divergent views.(14). Our thematic approach focused on individual experiences and reactions arising from the data and across case comparisons. We started by analysing the focus groups first. Two authors coded the data from the focus groups (AT, CK) using Microsoft Word and a third (SS) reviewed the transcripts and coding. The research team met to discuss themes emerging from the focus groups, and interpretation of the data. Key themes that the team agreed on were used to develop an initial coding framework for the data. These discussions of findings from the focus groups also led to refinement of the discussion guide for the individual

interviews. We developed a library of codes in an iterative process, decided on a coding framework, and applied this framework to the entire dataset. A refined version of the coding tree is provided in Box 2. We used a 'constant comparison' approach, which involves continually looking for similarities, differences, and other patterns within and across transcripts.(15) Participants did not provide feedback on the overall findings.

Patient and public involvement

Patients and the public were not involved in the design or conduct of this study.

Results

Sixteen GPs and 14 patients participated in the study. Table 2 shows the characteristics of participants.

Twelve GP participants were female and 13 had more than 20 years in practice. None of the GP participants agreed with the statement: *"Everyone who gets low back pain should have an imaging test (x-Ray, CT, MRI)."* 13 GP participants reported requesting imaging in fewer than one quarter of their consultations for musculoskeletal imaging, and 8 had an interest in musculoskeletal conditions

Eleven patient participants were born outside of Australia, 12 were between 20 and 60 years of age, and 6 had a university education or higher. All patient participants had had an imaging test in the past and 11 believed everyone with low back pain should have imaging.

Below we summarise the key findings with selected quotes. During the analysis the author team agreed that the clearest format to present the results was to present views of the two groups of participants separately. Additional supporting quotes (numbered in text as Q1, Q2, Q3 and so on) are provided in Appendix 3.

1. GP views

Overall GP reactions

GPs had mixed reactions to the tools (Box 2). Some GPs felt the communication tools could have a role in helping to manage difficult consultations:

> "I guess if you had a really stroppy patient you didn't know and didn't think you'd get any follow up with, perhaps there could be a role." (GP focus group)

However, most GPs reacted negatively to the Dialogue Sheet and Wait-and-see Note, and none of them reported they would use these in practice. They found the concept of written prompts and co-signing an agreement with their patient, to be an insult to their clinical skill and autonomy:

> "No, no, I'd never use [*the dialogue sheet*] in a pink fit." (GP focus group)

GPs felt paper-based tools in general were impractical, easily forgotten, and preferred verbal reassurance:

> "Would I use [*the dialogue sheet and note*]? Probably not. I, probably again, I would document [*instruction to delay*] in the notes. I do document this sort of thing in the notes" (Female GP, 20+ years of experience)

GP reactions to the Overdiagnosis Leaflet: important content that would be useful in digital format, but may induce patient anxiety

GP participants responded most positively to the design and content of the Overdiagnosis Leaflet. They valued the condition-specific information such as clinical features for lumbar imaging and self-management advice (Q1). Some felt the language of the leaflet was too emphatic and could discourage necessary imaging:

> "I mean [*the overdiagnosis leaflet*] would scare them off having a scan and maybe it might scare some of the 1% who do need to have it." (GP focus group)

GP participants expressed a strong preference for easily accessible, web- or electronic medical record-based fact sheets for use with their patients (Q2).

GP reactions to the Dialogue Sheet: redundant for experienced GPs, would add to time pressure

Most GP participants felt the dialogue sheet would be superfluous, and preferred to communicate the same messages verbally:

"So, as I said, that's the sort of thing I would be telling the patient as we went, and maybe summarising at the end, but I would do that in a verbal fashion. I wouldn't be filling in a form like this." (GP focus group)

Some were concerned the tools would just add to time pressure within the consultation:

"So, if the patient is going to have to sit down and read this, and try to understand it, and then sign it, it's just going to lengthen things out. It's just not going to be feasible." (GP focus group)

Most GP participants did not want to sign the Dialogue Sheet and felt that patients would be opposed to signing it as well:

"It doesn't need a contract, we're not giving morphine out." (GP focus group)

GP reactions to the Wait-and-see Note: could help validate concerns, but impractical

One doctor noted that the language of the Wait-and-see Note could help validate a patient's experience:

> "I guess what the writer was trying to get across was: 'I acknowledge that you have real symptoms.' I think that's better, the patient wants me to know that they really have pain." (GP focus group)

A key barrier to use of the note was practicality. Participants felt verbal communication of similar messages would be more efficient (Q3).

Workforce issues and concerns about patient pushback (all tools):

Some GP participants felt the communication tools were more useful for less experienced doctors or in the community more broadly(Q4):

> "This [*overdiagnosis leaflet*] is a document that absolutely needs to go *[beyond]* primary care level, at a community level." (GP focus group)

GPs felt the Dialogue Sheet and Wait-and-see Note would be patronising to patients or could compromise the clinician-patient relationship:

> "These pieces of paper are the opposite [*to patient centered care*], these are all giving me, the doctor, the power. And the patient is the person who's below me doing what I have told them." (GP focus group)

> "*[If I were to use it with my patients]* They'd probably think I've gone mad." (Female GP, 20+ years of experience)

1. Patient views

Overall patient reactions

Patients had generally positive reactions to all three tools (Box 2). In contrast to GP responses, patients valued paper-based, written information and the perceived accountability that a co-signed agreement section on the Dialogue Sheet and Wait-and-see Note would provide:

> "I hate it when they don't keep their word to see you again. So this one, when they sign on it, they have to see you." (Patient focus group)

For some, the perceived benefit of locating the source of low back pain, and ruling out serious pathology, outweighed any advice to delay an imaging test (Q5). Others regarded the tools with suspicion:

> "I'm just now thinking maybe the doctors, the government, whatever, want all the people with the back pain not to do the scans any more, why?" (Patient focus group)

Patient reactions to the Overdiagnosis Leaflet: informative but alarming, prompts desire to discuss harms of imaging with GP

Most patient participants found the Overdiagnosis Leaflet clear, informative, and credible:

> "I'm assuming the quote comes from Professor Ian Harris at the bottom of the page. So yeah I think it's a fairly accurate statement, easy to understand, good advice. I guess it's clarified that he's an orthopaedic surgeon so that adds some weight to the comment." (Male patient, 40-59 years old)

Some patients felt the Overdiagnosis Leaflet would encourage them to ask their doctor questions about their care (Q6). Other patient participants were reluctant to challenge the perceived authority of their doctor:

> " I just don't know if *[my GP]* would be comfortable hearing that from a patient." (Male patient, 20-39 years old)

There was concern among patient participants that the Overdiagnosis Leaflet would discourage imaging for those who did needed it (Q7). One patient participant reacted angrily to the concept that some scans might be unnecessary:

> "Telling me that a scan is not going to find something is a waste of my time. Not a waste of my time, but I'm angry as soon as I see it. I'm pissed off at that." (Patient focus group)

Patient reactions to the Dialogue Sheet: could improve recall of the consultation and provide evidence of GP commitment

In contrast to the Overdiagnosis Leaflet, which provoked some concerns, the Dialogue Sheet had potential to be reassuring. Patients had mixed reactions to the concept of co-signing an agreement to not have an imaging test; some felt it would be and odd process (Q8) where others appreciated the clinician's commitment:.

> "… if he says he reviews us in two weeks, and he's signed it as well, if you come and he cancels it, it's on him. So it's peace of mind." (Patient focus group participant)

Patient reactions to the Wait-and-see Note: uses dismissive terminology and would be easy to ignore

Some patient participants found the concept of the Wait-and-see Note dismissive. One patient participant, who was an allied health professional, felt patients might ignore the note:

> "I think, personally, people, if they've got the referral there, I think they would just ignore that [*message to*] wait-and-see." (Female patient, 40-59 years old)

Patient understanding and interpretation of content (all tools): take care with language to describe overdiagnosis and related harms

There was some suspicion among patient participants about the veracity of the data on the magnitude of overdiagnosis in the Leaflet (Q9). One patient participant understood the link between overdiagnosis and unnecessary surgery, but felt the odds of this happening were not concerning:

"…so only one will have surgery and they don't need it. So 1 out 100? *[Facilitator: Yeah, not that bad do you reckon?].* Well yeah not that bad." (Patient focus group)

The term "false alarm" was a poorly understood concept. Some patient participants felt the term indicated that their problem was imaginary (Q10).

Discussion

Summary

The GPs and patients we interviewed had divergent views on the value of three different communication tools to support delayed prescribing of imaging for low back pain. While almost all GPs rejected a tool with an example dialogue and discussion points, patients desired this process. Some patients appreciated the concept of co-signing an agreement to delay imaging, while others did not. The GPs we interviewed universally rejected this co-signing approach. There was variation in what patients and GPs considered to be a 'harm' from having imaging.

Strengths and limitations

We conducted this study at a time when advanced imaging rates are increasing.(4) Understanding how both GPs and patients might use communication tools will help inform strategies to reduce this problem. We used a combination of focus groups and interviews, and sampled people involved in the decision to have diagnostic imaging in emergency and primary care. This allowed us to capture natural conversations in the groups, and explore emergent themes in depth in the interviews.

We were restricted to recruiting mainly from a GP professional development network, with a small number of additional participants recruited through an additional study. This group may have had more positive views than expected in the wider population of GPs. Though our data suggest they were highly sceptical of the materials and divergent from patients. Unfortunately, none of the 4 GPs who offered to take the tools away could reflect on use of the tools in practice, either because they did not see an appropriate patient in the 3-week

period, or because they forgot. This means that the views expressed here are restricted to hypothetical, rather than experiential, use of these tools. Although all of the patients we included had seen a GP for their low back pain, they had also attended the Emergency Department of a public hospital for their low back pain. This diverse group of patients may be different to those who typically attend a GP as their first or only contact with the health system. The patient participants in this study might also represent a group who take low back pain very seriously and be more critical of tools to delay or deter imaging.

Comparison with existing literature

Our findings are consistent with research showing that attempts to reduce or delay tests can arouse suspicion about financial arrangements, government oversight, and motives to cut costs.(16) This phenomenon also occurs in women considering breast cancer screening.(17) Our study confirms that mistrust among patients could extend to communicating about delayed imaging, overdiagnosis, and the option of watchful waiting.

We are aware of one other study that evaluated reactions to a communication tool to support GPs to reduce unnecessary imaging of low back pain. Jenkins et al. examined GP and health consumer (community members with a history of low back pain) reactions to a booklet about lumbar imaging.(18) Similar to our findings, some GPs preferred digital format whereas health consumers appreciated a glossy hard copy to take home to discuss with their family. Health consumers valued detailed, written, individualised information and reassurance. Our findings suggest that patients may also desire tools that provide them with a sense that the GP has taken them seriously. The co-signed section in the Dialogue Sheet and Wait-and-See appeared to achieve this, yet GPs had reservations about using it.

Trials of patient-mediated interventions to reduce imaging rates have had limited success and suggest challenges to uptake.(19) For example Schectman et al found no effect of patient education tools on imaging rates in their trial including 120 GPs, but only one third of GPs reported using the tools in the trial.(20) Given the divergent and sometimes strong views expressed in this study, ongoing evaluation of communication tools to meet the needs of end-users appears essential.

The patients we interviewed reacted with surprise to the nature and magnitude of imaging overdiagnosis. Many of the patient participants struggled to think of harms of diagnostic imaging, other than exposure to radiation. This finding supports evidence on patient perceptions of overused screening tests e.g. the perception that the benefits of early detection tend to outweigh the harms of unnecessary tests.(21) Our findings on how GPs describe harms from overdiagnosis suggest that they may also hold this view.

Implications for future research and practice

This study provides insights into the complexity of communicating about unnecessary imaging to patients and GPs. Based on these findings there may be several ways to enhance acceptability and uptake of delayed prescribing approaches. First, the language relating to the necessity of diagnostic imaging tests should be cautious rather than emphatic. Patients may interpret harms differently; tools that describe risk of 'harms' would benefit from also providing clear examples of overdiagnosis. Second, tools should be in digital format for GPs but readily printed for patients who prefer paper-based information. We may not have reached saturation on the key ways a GP might integrate communication tools into their

workflow. Future research on how best to integrate delayed prescribing tools into workflow (e.g. via access to leaflets, printed tear-off sheets, web- or app-based tool, electronic medical record-based tools) would be informative for initiatives to reduce overuse. Finally, a Dialogue Sheet with or without a co-sign agreement section requires further testing before implementing this kind of tool in clinical practice. Together our findings suggest that information leaflet that explains the problem of overdiagnosis could support a delayed prescribing approach to imaging for low back pain. A Dialogue Sheet and Wait-and-see Note to help discuss a delayed imaging may be acceptable to patients but not GPs.

Author Contributions

Study concept and design: Traeger, Checketts, Tcharkhedian, O'Connor, Klinner, Sharma Vyas, Albarqouni, McCaffery

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Study supervision: Traeger

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Table 1. Description and intended use of tools to support delayed prescribing of musculoskeletal imaging

	Overdiagnosis Leaflet	**Dialogue Sheet**	**Wait-and-see Note**
Why Rationale	Goal: 1. promote watchful waiting for people with low back pain 2. raise awareness of non-essential or 'low-value' lumbar imaging tests	Goal: 1. promote watchful waiting for people with musculoskeletal pain (including low back pain) 2. support doctor-patient communication and joint decision-making 3. Provide actions for patients to take to address their pain, as alternatives to imaging.	Goal: 1. promote watchful waiting for people with musculoskeletal pain (including low back pain) 2. support doctor-patient communication and joint decision-making
What Materials and content	6-panel A4 folded leaflet Designed by advertising company and researchers Key messages - Unnecessary lumbar scans can cause harm - There are alternatives to imaging - Speak to your doctor Behavioural prompts - Framing of harms from overdiagnosis - Appeal to authority (quote from orthopaedic surgeon)	1-page A5 sheet Designed by the Commonwealth Department of Health and researchers Key messages - In your case I think imaging is unnecessary - I recommend we delay decision to have a scan - There are other actions you can take to address your pain Behavioural prompts - Present no imaging as the default - Co-signature (patient and doctor) commitment to delay	2-sided A6 note Designed the Commonwealth Department of Health and researchers Key message - The referral is a backup; only to be used under specific circumstances (tailored to the patient) Behavioural prompts - Present no imaging as the default - Co-signature (patient and doctor) commitment to delay
Tailoring to the individual	None	Space to describe symptoms, things to look out for, name and date, customisable reasons to delay, recommended actions to manage pain and assist recovery	Review date, things to look out for

Box 1: Focus group and interview topic guide

All participants

- Participants take turns to read the tools and 'think aloud' as they read the content.
- Which elements of the tools did you like? Why?
- Which elements of the tools did you not like? Why?
- Do you have any suggestions for improvement?

For GP participants

- Are any of these tools something that you would use? What would improve usability?

For patient participants

- Did you gain any new information about imaging from these tools? If your doctor went through these tools with you, how would you feel? What would improve usability?

Table 2. Participant characteristics (n=30)

Characteristics	Number of participants	
	Patients (n=14)	**GPs (n=16)**
Age		
20-39	5	2
40-59	7	5
60-79	2	9
Sex		
Female	9	12
Male	5	4
Born outside of Australia		
Yes	11	-
No	3	-
University education		
Yes	6	-
No	8	-
Had an imaging test for back pain in the past	14	-
Believe everyone with low back pain should have a scan	11	0
Years practicing as a GP		
1-9	-	2
10-19	-	1
20+	-	13
Self-reported imaging request rate		
<10%	-	6
~25%	-	7
~50%	-	2
>75%	-	1
Had an interest in management of musculoskeletal conditions	-	8

Box 2. Summary of GP and patient views on communication tools to support delayed prescribing of imaging for low back pain

GP views

Reaction to Overdiagnosis Leaflet

- *Useful, visually appealing information*
- *May increase anxiety and discourage necessary care*
- *Digitise tools, communicate using other media in waiting room*

Reaction to Dialogue Sheet

- *Preference for verbal communication*
- *Could add to time pressure*
- *Reluctance to sign*

Reaction to Wait-and-see Note

- *Validating messages*
- *Preference for verbal communication*

Workforce issues (all tools)

- *Experienced GPs don't need these tools*

Concerns about patient pushback (all tools)

- *Tools could undermine patient-clinician relationship*
- *Patient's (mis)interpretation of 'harms'*

Patient views

Reaction to Overdiagnosis Leaflet

- *Authoritative, informative, reassuring, encourages discussion*
- *Desire for less emphatic language*
- *May increase anxiety, cause anger, and discourage necessary care*

Reaction to Dialogue Sheet

- *Appreciated as a take-home tool/memory aid*
- *Co-signed agreement could have mixed response*

Reaction to Wait-and-see Note

- *Uses dismissive terminology (e.g. "wait")*
- *Easily ignored*

Understanding and interpretation of content (all tools)

- *Understood concept of overdiagnosis but were sceptical of its magnitude*
- *Desire for clear definition of 'harm'*
- *Struggled with terminology for false positives*

Appendix 1 - COREQ checklist

The Consolidated Criteria for Reporting Qualitative Studies (COREQ): 32-item checklist
(Table developed from Tong et al., 2007)

No. Item	Guide questions/description	Page Number
Domain 1: Research team and reflexivity		
The research team		6
Personal Characteristics		
1. Inter viewer/facilitator	Which author/s conducted the interview or focus group?	7
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	1
3. Occupation	What was their occupation at the time of the study?	6
4. Gender	Was the researcher male or female?	7
5. Experience and training	What experience or training did the researcher(s) have?	7
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	7
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	7
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	7
Domain 2: Study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	9
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	5
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	6
12. Sample size	How many participants were in the study?	6,10
13. Non-participation	How many people refused to participate or dropped out? Reasons?	6
Setting		

14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	8
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	10
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	9
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	8
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	7
20. Field notes	Were field notes made during and/or after the interview or focus group?	7
21. Duration	What was the duration of the interviews or focus group?	8
22. Data saturation	Was data saturation discussed?	5,8
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	7
Domain 3: Analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	9
25. Description of the coding tree	Did authors provide a description of the coding tree?	9
26. Derivation of themes	Were themes identified in advance or derived from the data?	9
27. Software	What software, if applicable, was used to manage the data?	9
28. Participant checking	Did participants provide feedback on the findings?	9
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? E.g. participant number	10-18
30. Data and findings consistent	Was there consistency between the data presented and the findings?	10-18
31. Clarity of major themes	Were major themes clearly presented in the findings?	10-18
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	10-18

Appendix 2 - Tools

Figure S1. Overdiagnosis Leaflet

Figure S2. Dialogue Sheet

Dear: _____

Based on my review today _____ *(date)*
I'm not referring you straight for imaging for your

_____ pain, because:

☐ I have checked you and imaging won't change the treatment that you need today

☐ Your symptoms should improve over the next _____ days/weeks

☐ Findings from imaging can often be unimportant or not significant and cause anxiety and lead to tests that won't help you

What you can do:

☐ Use over the counter medicines for pain relief _____ *(list medicines)*

☐ Heat/ice for pain relief *(circle one)*

☐ Gradually return to your normal activities

☐ Other _____

If your pain persists I'd like to review you in _____ weeks
but come back sooner if you are concerned or if the pain changes

I am happy with this plan: ☐ Yes ☐ No *(patient to tick)*

Signed: _____ (doctor)

Signed: _____ (patient)

Figure S3. Wait-and-see Note

We have agreed to wait _____ weeks before having the test.
If you have not improved by then, I suggest you have the test and make an appointment with me to discuss the results.

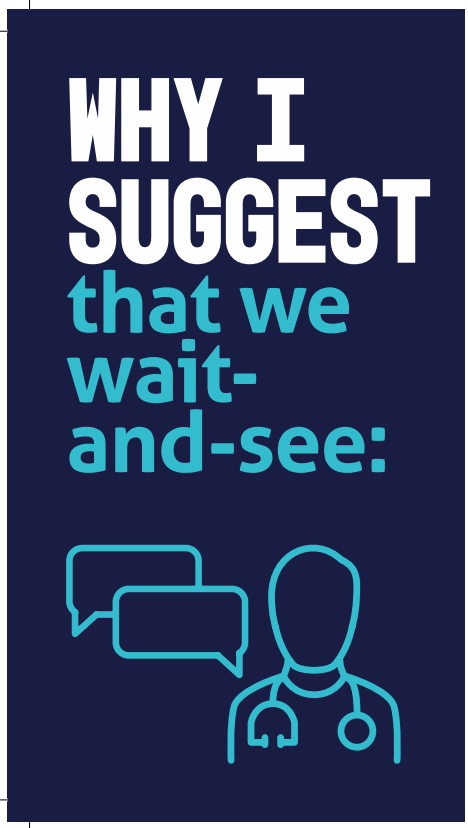
Signed: _____
(doctor)

I am happy with this plan

☐ Yes ☐ No

Signed: _____
(patient)

Why have I asked you to wait? See over for details.



- Musculoskeletal pain can improve rapidly. For example, around 50% of people who experience an episode of back pain recover within 2 weeks.
- There are harms associated with unnecessary imaging.
- I have assessed you and although I don't believe imaging is needed, I can see that you are still concerned.

Contact me earlier if you experience any of the following:

_____

_____

_____

Appendix 3 – Additional supporting quotes

Q1 “It’s got great statements, it’s got statistics, it’s a beautiful document. Not sure about the colours, but the document is great.” (GP focus group)

Q2 “Young people don’t like paper any more. So if you can send it to them so they can have it on their phone [*that would be better than paper*].” (GP focus group)

Q3 “You just tell them verbally most people will get better but, if you’re not, then you can go and have this.” (GP focus group)

Q4 “I think this could be good for a junior doctor, registrar who are not empowered as opposed to more experienced GPs with their loyal patient base.” (GP focus group)

Q5 “I want to know what’s happening inside me and the best way to know is to have an MRI scan. That’s what we’ve been taught for many years that’s what the doctors have said to us. Maybe the new generation can have a different view on it, but from my perspective, I think I would have my ultrasound. I want to know what’s happening inside.” (Male patient, 20-39 years old)

Q6 “I like it. ‘What if I don’t have a scan?’ I find that a really interesting question because yeah, I suppose it just allows more communication by asking that question…. it opens up that communication path again.” (Female patient, 40-59 years old)

Q7 “it potentially causes alarm for people who are going to require a scan.” (Male patient, 40-59 years old)

Q8 “I don’t think signing it really adds any value to it, it just seems a bit strange. It’s like you’re entering into a contract. It just seems a bit unusual to have to sign the document.” (Male patient, 40-59 years old)

Q9“Is it real data we’re looking at?” (Patient focus group)

Q10“…reading the narrative of that just tells me that perhaps I’m playing it up a bit in my head.” (Male patient, 40-59 years old)