

# **Managing uncertainty: A qualitative study of GPs' views on the diagnosis and immediate management of Transient Ischaemic Attack and the potential of a diagnostic tool.**

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## **KEY MESSAGES**

- GPs find diagnosis of TIA challenging in the absence of 'classical' symptoms
- Referrals are used to manage uncertainty and seek reassurance
- GPs would value a diagnostic tool to supplement clinical judgement

## **Abstract**

### **Background**

Most patients with Transient Ischaemic Attack (TIA) present to their general practitioner (GP). Early identification and treatment reduces the risk of subsequent stroke and consequent disability and mortality.

### **Aim**

To explore GPs views on the diagnosis and immediate management of suspected TIA, and the potential utility of a diagnostic tool.

### **Design and setting**

Qualitative interview study based in Leicestershire UK. A purposive sample of 10 GPs participated in 30 minute semi-structured telephone interviews. Data were analysed thematically.

### **Results**

GPs reported that TIA was more likely to be suspected when patients were more obvious candidates for TIA based on their history, characteristics, and symptom presentation. Referrals were in part a strategy to manage risk under conditions of uncertainty, and to seek reassurance. GPs valued using a TIA risk stratification tool but felt this did not inform their diagnostic decision-making. A diagnostic tool for TIA in primary care was seen to have potential to improve the decision-making process about diagnosis and management, and enhance GP confidence, particularly in ruling out TIAs. GPs saw benefits of using hard thresholds, but remained concerned about missing TIAs and saw a tool as an adjunct to clinical judgement.

### **Conclusions**

GPs weigh up the likelihood of TIA in the context of assessments of candidacy, and diverse, often vague, symptoms. A diagnostic tool could support GPs in this process and help reduce reliance on

referrals to TIA clinics for reassurance, provided the tool was designed to support decision-making in cases of less 'typical' presentations.

Key words: TIA, qualitative study, general practitioners, primary care, diagnostic tool.

## Introduction

Transient ischemic attacks (TIAs) are defined as temporary episodes of focal brain dysfunction of presumed vascular aetiology, lasting less than 24 hours, with no evidence of cerebral infarction <sup>1</sup>. Over 46,000 people living in the UK experience a TIA each year, and this significantly increases their risk of stroke <sup>2</sup>. General practitioners (GPs) are the first contact for most people who experience symptom(s) of a TIA <sup>3</sup>. The GP therefore plays a central role in ensuring a timely and accurate diagnosis, either in primary care, or from an appropriate specialist as a consequence of a GP referral <sup>4</sup>.

Current UK guidelines (updated in 2017) state that patients with acute neurological symptoms that resolve completely within 24 hours, (i.e. suspected TIA) should be given aspirin 300 mg immediately and assessed urgently within 24 hours by a specialist physician in a neurovascular clinic or an acute stroke unit. Patients with suspected TIA should have a full diagnostic assessment urgently without further risk stratification <sup>5</sup>.

The low achievement of these targets is in part due to the lack of capacity for clinics to assess the high number of referrals, over half of which are not diagnosed as TIA or a stroke <sup>6</sup>.

Many quantitative studies focusing on the diagnosis and management of TIA in primary care have been identified from a systematic review conducted in 2016 <sup>7</sup>. The results from the review indicated deficiencies in GP knowledge and clinical practice <sup>8-13</sup>. GPs tended to over-interpret non-specific symptoms when considering a TIA diagnosis <sup>11</sup>. Half of referrals to secondary care clinics were not diagnosed as TIA <sup>14,15</sup>, but there was also evidence of under-referral and under-use of effective medication <sup>8,11,15-18</sup>. Additionally, GPs may refer some patients to exclude rather than confirm a final diagnosis. The high number of patients referred to TIA clinic who turn out not to have suffered a TIA or stroke <sup>19</sup>, coupled with evidence that some TIAs are missed or undertreated <sup>14,15</sup>, highlights the possible value of education and a decision support tool for GPs in diagnosing and managing suspected TIA.

The diagnosis of TIA in primary care is not always entirely straightforward. It is a complex process, relying on an interpretation of a history given by the patient or a bystander <sup>20</sup>. Typically, there are no persisting neurological deficits at the time of presentation for TIA, and diagnostic research in TIA suffers from a lack of gold standard for diagnosis <sup>1</sup>. The ABCD2 score has been developed as a risk stratification tool, to enable GPs and TIA clinics to prioritise referrals, and is used to manage TIA patients once the decision to refer has been decided by GPs; rather than a diagnostic tool used to assist with the diagnosis of the condition <sup>21</sup>. UK guidance update in 2017 excludes risk stratification using this tool <sup>5</sup>.

The only published diagnostic tool for TIA (at the time of the systematic review) was the Dawson score, <sup>22</sup> developed in the context of secondary care. This tool has the potential to be utilised to reduce the number of non-cerebrovascular referrals to a fast track TIA service, by aiding GPs with the

diagnosis of suspected TIA patients. The potential utility of a diagnostic score in primary care, and how it could best be used to support decision-making, has not been explored.

The aim of this qualitative study is to provide insight into GPs' views on the difficulties of diagnosing and managing TIAs in primary care, factors influencing their decision to refer to a specialist TIA clinic, and their views on the utility and practicalities of a TIA diagnostic tool in the primary care setting.

## **Method**

The study is reported using the consolidated criteria for reporting qualitative research (COREQ) checklist <sup>23</sup>.

### ***Recruitment***

GPs were recruited via invitation emails sent through practice managers of GP practices in East Leicestershire and Rutland CCG, West Leicestershire CCG, Leicester City CCG, and directly to the board of GPs in Leicestershire. The principal investigator was a stroke consultant and had no professional relationship with any of the GPs. GPs were made aware that the researcher was a PhD student and not a clinician. This encouraged GPs to be open with how they really felt in regards to the questions being asked. No additional interviewer information or characteristics were given. We also used a purposive sampling approach. Recruitment continued until theoretical saturation was reached in the analysis and no new themes emerged <sup>24</sup>. None of the agreed GPs refused to participate or withdrew from the study. It was not possible to check findings with the participants, or to get feedback from participants about findings.

### ***Interviews***

The interview topic guide for the semi-structured interviews was developed by reviewing other research in the area, and was piloted with two GPs to generate the final topic guide (Supplementary file S1). The questions were centered on experiences and views of diagnosis and management of TIA in primary care, and the use of a TIA diagnostic tool. Interviews were conducted by telephone, with a duration around 30 minutes. The interviews were conducted (PB) during June 2017 and August 2017. Participants consented to the interviews being conducted and recorded, and to anonymous quotations being used. All Interviews were conducted by only the same researcher (PB) from the researcher's workplace; (University of Leicester offices). Recordings were transcribed verbatim, and anonymised.

## **Analysis**

Interviews were analysed using a thematic analysis approach (TA) <sup>25</sup>. TA was performed through the process of coding in five phases (familiarization, generation of codes, searching for themes, reviewing themes and defining themes) <sup>25</sup>. NVivo (version 11) was used to organise and code the transcripts to facilitate the analysis and comparison of relationships between codes <sup>26</sup>, supplemented by the use of diagramming and narrative summaries. Analysis was led by PB with support from CT, an experienced qualitative researcher. PB read the transcripts, undertook open coding. PB and CT discussed open codes and identified thematic areas. PB conducted mind maps and wrote narrative summaries (Supplementary file S2).

## **Results**

Interviews were conducted with ten GPs; four were female. Participating GPs were relatively experienced, with the majority having 6-11 years' experience of working in primary care. Additionally, some GPs were from the same practices (See Table 1).

We report our findings under three broad thematic areas, with sub themes: criteria for suspecting a TIA; making a referral decision (managing uncertainty, disposing and gaming the system); attitudes towards a diagnostic tool for TIA in primary care (a role of a diagnostic tool in primary care, setting thresholds for levels of referral). Quotes from interviews are presented in Table 2, and referred to in the text by number (e.g. 1.a).

### **1. Suspecting a TIA, diagnosis and presenting symptoms**

The majority of GPs recognised that stroke and TIA were managed differently, and that distinguishing between the two, as well as prompt referral, were essential. GPs also argued for the importance of diagnosing TIAs as an opportunity for stroke prevention.

Despite this recognition of the importance of TIA, GPs found it difficult to answer how many patients annually they saw for whom a TIA was a possible diagnosis, with very widely varying estimates of numbers. (2, 4-5, 10, 12-24, and 25-50). GPs suggested that the numbers of suspected TIA encountered depended on various factors, i.e. whether the GP was part time or full time GP, the size of practice and the population of the practice.

When asked for a definition of a TIA, a key criterion for suspecting TIA as opposed to stroke, was that the symptoms of a TIA resolved within 24 hours. This criterion provided a sense of diagnostic confidence, while criteria related to clinical signs and symptoms were often less clear cut. GPs accounts of diagnosing TIA on the basis of clinical indicators were characterised by a theme of uncertainty. GPs were more confident in making a diagnosis of TIA in the presence of what they referred to as 'classical symptoms' e.g. leg, arm, face weakness, speech abnormalities and vision impairment (1.a.). Some GPs reported uncertainty even with these classical symptoms, when they had a number of previous experiences in which these symptoms had turned out to be the result of a different cause (1.b.). The key problem, however, with diagnosing TIA was that the symptoms patients presented with were often vague, non-classical, and potentially attributable to a range of different underlying conditions (1.c.). This difficulty was compounded in GPs' views by the fact that patients could sometimes struggle to articulate their symptoms and histories in a way that would have allowed a GP to associate them with the clinical definitions of a TIA, particularly if the patient had language difficulties with English language (1.d.). In cases where patients had pre-existing neurological conditions, or had experienced previous strokes, GPs found it difficult to assess whether or not a new event had occurred (1.e.).

When GPs saw patients with pre-existing risk factors such as diabetes, hypertension and obesity, their suspicion of TIA was significantly higher. GPs reported increased uncertainty, and potentially a higher threshold for suspecting a TIA, when patients were not typical TIA candidates, in particular, those of a younger age group <sup>27</sup> (1.f.).

The challenge for GPs in diagnosing a TIA was, therefore, about working with levels of uncertainty due to the lack of clarity and specificity of the presenting symptoms, weighed up against judgements about the likelihood that a patient was a candidate for TIA based on their history and characteristics.

## **2. Making a referral decision**

### ***a. Managing uncertainty***

GPs reported distinct purposes of referral depending on their level of certainty about the TIA diagnosis. If the GP had a high level of suspicion that the patient had a TIA, they wanted confirmation of the diagnosis, through the investigations and specialist opinion, which TIA clinics delivered. In

these cases, the GPs recognised the referral to the TIA clinic would also then enable these patients to get speedy access to the treatment they needed. If a GP suspected a TIA was a possibility but were uncertain, they saw referral as a way of reducing uncertainty (2.a.a.). Seeking certainty was important in terms of ruling in a TIA, as GPs were reluctant to start treatment before the diagnosis had been confirmed (2.a.b.). But perhaps more importantly, a referral was seen as a way for GPs to exclude TIA as a diagnosis (2.a.c.), enabling them to manage the fear of missing a diagnosis. GPs described anxiety about overlooking a TIA even if they judged this to be an unlikely diagnosis, and reported a sense of personal and professional duty towards their patient to avoid missing a TIA diagnosis due to the consequences a TIA can have on the patient (2.a.d.)

It was evident from GP accounts that they were conscious of the balance between over- and under-referring. For GPs, the risks of missing a TIA were greater than their concern about over-referral, and false positives were seen as a price they were willing to accept, to avoid missing TIAs. GPs suggested that the desire to use testing for reassurance was common across medicine (2.a.e.), not just in relation to TIA clinics, and that this general tendency was a factor in explaining the high number of referrals to TIA clinics

### ***b. Disposal and gaming the system***

GPs valued being able to get patients seen by the TIA clinic, which provided ease of access and speedy appointments with a short wait time. The fact that the clinics were accessible and offered quick appointments was a 'double edged sword'. GPs suggested that TIA clinic referrals could potentially be exploited as a way of 'disposing' <sup>28</sup> of patients with uncertain symptoms by moving them on to another service, and as a way of gaining access to quick investigations, even if TIA was seen as unlikely (2.b.a.). This 'gaming technique' was described by one of the GPs as *"one of the dark secrets of general practice"* (GP 7).

## **3. Attitudes towards a diagnostic tool for TIA in primary care**

### ***a. A role for a diagnostic tool in primary care***

GPs routinely used the ABCD2 score which is a risk stratification tool (including age, blood pressure, clinical features, duration of TIA and diabetes). The ABCD2 score is not a diagnostic tool, rather it is a

score developed to enable TIA clinics to prioritise referrals, and can be used by GPs to decide the *urgency* of the referral once the decision to refer had been made, rather than as part of the decision-making process around *whether or not* to refer. A diagnostic tool would primarily focus on aiding GPs with the diagnosis of TIA which is the first step when patients present in practice. Most GPs thought that a validated TIA diagnostic tool for primary care would have value in justifying their diagnosing, suspecting, or ruling out a TIA, providing objective evidence to back up this judgement, and making them feel more confident about their management decisions (3.a.a.). An objective diagnostic tool was seen as having the potential to reduce uncertainty by increasing diagnostic accuracy, and therefore reducing inappropriate referrals. GPs felt a diagnostic tool would have particular value in confirming their judgement that a patient is low risk, and legitimising decisions not to follow a TIA pathway (3.a.b.).

### ***b. Setting thresholds for levels of referral***

A diagnostic tool could potentially be designed to be used with objective cut-off points for referral, based on a diagnostic score of 'likelihood' for TIA (e.g. presented as percentage likelihood). The choice of cut-off points has implications for the numbers of false positives and negatives of a TIA, so there are important implications of setting lower or higher thresholds.

When GPs were asked about appropriate thresholds (percentage likelihood of TIA) as a cut-off point to recommend *definitely* referring a patient, there was significant variation in their responses, with suggested figures including: 5-10%, 20-50%, 1 in 3. When GPs were asked what threshold they would find useful as a guide as to when *not to refer*, some were happy to suggest a threshold and most suggested "10% or less".

Providing hard, objective thresholds for referral was seen as having some potential benefits, by: taking some of the responsibility for making the decision away from the GP, legitimising referral decisions, and providing some protection from legal challenge if problems arose due to an undiagnosed TIA. Overall, GPs felt that a tool would give them more confidence in ruling out TIAs, but still felt that tool results would need to be used in conjunction with clinical judgement, and felt that they would maintain a low threshold for referral. Central to this belief was the fundamental difficulty posed by the often non-classical and vague presentation of symptoms: GPs felt they would be happier not to refer if they were reasonably confident in an alternative diagnosis (3.b.a.), but where there was



significant uncertainty or ambiguity about the patients' presenting symptoms they might still decide to refer a patient with low likelihood score (3.b.b.).

## Discussion

### *Summary*

This study of GP views of diagnosing and making referral decisions for TIA identified that a consistent theme throughout the results was GPs' uncertainty around diagnosis and management. This arose from the often vague and ambiguous symptoms that patients presented with, which could potentially be suggestive of TIA and varying patient history and characteristics. Referrals were in part a strategy to manage this uncertainty (either to confirm or refute a diagnosis) along with an approach to seeking reassurance and to protect GPs from the risk of missing a TIA. GPs' felt that a diagnostic tool, would reduce uncertainty by supplementing GPs' clinical judgement as part of the decision-making process. A diagnostic tool was seen as having the potential to provide objective evidence to defend their decision and back up their judgement. Although GPs were aware of the importance of diagnosing and managing suspected TIA patients, the majority found it extremely difficult to specify suitable thresholds for referrals, and felt that their willingness to abide to thresholds would depend on the level of ambiguity around a patient's symptoms.

This study examining GPs' views on a diagnostic tool for TIA in primary care addresses a new area of research which has not been explored in-depth before; there are currently no validated diagnostic tools for TIA in primary care, and there has been little qualitative research into the diagnosis and management of TIA by GPs. Therefore, the study adds to the existing evidence base on the diagnosis of TIA and management which mostly comes from the context of secondary care <sup>29,30</sup>. The study is limited in that the sample included only 10 GPs, and sampling was limited to GPs working in the Leicestershire area, but these interviews generated rich and extensive data on views and attitudes. GPs were self-selected, so they may have been more likely to have an interest in TIA. Participating GPs were also fairly experienced (See Table 1); we were not able to recruit more newly qualified GPs, who may have different views and attitudes. However, despite this, data saturation had been reached from the obtained sample.

The findings of this study support previous research in the field of the diagnosis and management of TIAs in primary care <sup>7</sup>. The results suggested GPs' tendency to over-refer on the side of caution, partly

driven by a defensive medicine approach- this is a fundamental feature of medical practice <sup>31</sup>. Defensive medicine is defined as departing from normal medical practice as a safeguard from litigation <sup>32</sup>. This may include, performing unnecessary diagnostic tests and invasive procedure, prescribing unnecessary treatment and needless hospitalisation. The literature raises concerns on how healthcare professionals can get drawn into practicing in ways that are dominated by a desire to protect themselves rather than necessarily in the best interests of their patient <sup>32</sup>. As of 2017, guidance in the UK now excludes risk stratification using the ABCD2 score <sup>5</sup> however, the results from GPs stressed the need for a tool to aid with diagnosis and initial management. A diagnostic tool therefore, has the potential to provide objective evidence to justify a decision, thus offering some protection for GPs in instances where they choose not to refer patients for further treatment to TIA clinics. The value of a tool to aid GPs has been supported in this study. More generally, Einhorn <sup>33</sup> suggested that clinical risk scores/models are better than clinical judgement alone. One of the challenges for GPs is assessing, on the basis of their pre-existing characteristics, and their presenting symptoms, whether the patients are a likely candidate for TIA diagnosis <sup>27</sup>. There's often significant ambiguity about this, meaning it can be easy to miss a TIA. A diagnostic tool such as the Dawson score could help GPs in making decisions under conditions of uncertainty, provided the tool is designed to reflect the reality of the ways that patients present and that GPs make sense of symptoms and weigh up risk factors. Conversely, there is a risk that a diagnostic tool focusing GPs on the classical symptoms may in fact provide false reassurance in cases where symptoms of TIA are non-classical.

This study highlighted another factor in over-referral to TIA clinics: the permeability and accessibility that was a feature of TIA clinics meant they were open to exploitation by GPs as a means of disposing of suspected TIA patients or accessing speedy investigations inappropriately. A diagnostic score could help with avoiding overuse on this basis if it was required as part of the referral process, with flexibility for GPs to make a case for referrals of low-scoring patients.

### ***Implications for research and practice***

This study has identified that a diagnostic tool such as the Dawson score may have the potential to strengthen the diagnostic and referral process, by helping to reduce the uncertainty GPs feel with their decision-making process, and enabling better clinical decisions around the referral and management of TIA. GPs could see the benefit of using a diagnostic tool, with the potential for a tool

to support more appropriate use of TIA clinics and potentially a reduction in the number of referrals, but understanding how a tool would function in the context of making sense of symptoms where there is significant ambiguity is critical to avoid unintended negative outcomes.

## **Declaration**

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Conflict of interest: none.

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**Table 1.** Characteristics of 10 primary care GPs within Leicestershire; data collection period: June 2017- August 2017; Semi-structured telephone interviews.

GP	Gender	Years in practice	Size of practice (Approx.)	Practice location
1	Male	6	6,000	Rutland (East Leicestershire and Rutland CCG)
2	Male	11	10,000	Wigston (East Leicestershire and Rutland CCG)
3	Male	2	3,500	Leicester city
4	Male	3	6,000	Enderby (East Leicestershire and Rutland CCG)
5	Male	11	3,500	Leicester city
6	Female	11	3,500	Leicester city
7	Male	11	7,000	Leicester city
8	Female	11	7,000	Leicester city
9	Female	7	7,000	Leicester city
10	Female	11	9,000	Leicester city

**Table 2:** Illustrative quotes from semi-structured telephone interviews with GPs in three particular areas; diagnosis, management and views on diagnostic tools in a primary care setting.

<b>1. Suspecting a TIA, diagnosis and presenting symptoms</b>
<p><i>"I think the more supportive of the TIA would be just transient facial sort weakness or the sort of classical, curtain across the eye, any sort of transient weakness of the arm or leg, associated with tingling. So, I think, classical symptoms are those, more helpful in making the diagnosis"</i> [1.a. GP 6]</p> <p><i>I've had people with sensory symptoms i.e. they've had tingling and numbness in their right arm, right leg and headache. I have referred them to a TIA clinic on many occasions and the diagnosis comes back as migraine, and they've never had a migraine before"</i> [1.b. GP 2]</p> <p><i>"Vague can be perhaps just feeling dizzy. And we get a lot of patients where they just come in and say they just felt a bit dizzy, a bit light headed. And so then it's – you know, that can be quite challenging, because there can be so many different causes for that"</i> [1.c. GP 6]</p> <p><i>"Patients don't say 'oh I've got weakness in my arm and leg, my face dropped and my speech went a bit slurred for half an hour and it came back' they don't say that they say 'I felt funny in my arm or leg' or they have sensory symptoms of tingling and numbness in the right side of their body or left side of their body, [...] they feel strange in themselves or they've got a headache. [Also] diagnosing a patient as suspected TIA is difficult in patients who has language difficulties- say people who English is not their first language"</i> [1.d. GP 2]</p>



*It's very difficult sometimes just to say that looks like a neurological event that's causing it and not something else masking it" [1.e. GP 4]*

*"Younger patient present with more of a diagnostic dilemma, because it's less likely for that group of patients to have TIA" [1.f. GP 3]*

## **2. Making a referral decision**

*"It's that initial deciding, could this be a TIA, you know how sure am I? How sure am I that it's not a TIA? That's where the difficulty is. I guess its initially deciding that you're worried about a TIA or maybe even more difficult is "ok I don't think it is but how certain am I that it's not?" [2.a.a. GP 1]*

*If I'm unsure if it's a TIA and I would like some assurance on the diagnostic possibility of this then I tend to hold back from prescription" [2.a.b. GP 4]*

*"When you're referring to a TIA clinic this will be obviously specialists who are seeing TIAs constantly, one after another. So, in order to select somebody who is not a TIA at that time or is less likely to warrant a diagnosis of TIA would be, obviously easier made actually in a TIA clinic than it would be in General Practice. That combined with the availability of investigations which obviously leads to an exclusion of the TIA" [2.a.c. GP 5]*

*"Understanding that people who are referring in to the TIA clinic potentially are under a degree of pressure themselves and that they may have some anxieties themselves about missing something important like a TIA which, you know people get a lot of teaching on TIA and so that perhaps increases their level of anxiety and sort of changes their index of suspicion" [2.a.d. GP 7]*

*"There is definitely an element of reassurance, because from our point of view in general practice, because we're seeing the patients actually, again we don't really want to miss the opportunity to actually take some preventative action for a patient with a TIA because the next time we might see them could be when they've actually had a stroke, which potentially we could have done something to prevent that" [2.a.e. GP 5]*

*"The TIA clinic is so accessible, it becomes an easy place to send people who have that kind of softer symptoms that aren't classic TIA. It's a way of getting for example an MRI scan of the head or some investigations done quicker than you could get them done through a medical or neurological outpatient clinic. [Also], if you've got someone whose symptoms could potentially but deep down we know not really be likely to be a TIA, then you know that if you refer them to the TIA clinic then they'll get a decent work up and even if the diagnosis that's reached isn't TIA, you know that they'll have*

some investigations and you know at least the ball will be rolling for the patient in terms of working out what's going on" [2.b.a. GP 7]

### **3. Attitudes towards a diagnostic tool for TIA in primary care**

*"So sometimes if our diagnosis of a TIA is solidified with an evidence based tool like a score which is known to increase the diagnostic predictability of a TIA then you can diagnose with a degree of certainty as opposed to ambiguity. Ultimately it's the clinical decision but something like that could be used to help solidify and consolidate that decision to use it"* [3.a.a. GP 3]

*"Yeah, I think with non-referrals there probably would be some benefit in that actually because I expect if you, again, I think it's like everything else that we do, you have to look at the medical/legal aspect of it as well. So if there's a scoring system, because again, the safety element of referring patients or not referring patients, if you had a score and you've gone through an assessment, it probably does give you that"* [3.a.b. GP 5]

*"If someone said to me a patients got a ten percent chance risk of a TIA then I think they should be investigated. That's one in ten chance and that's significant in my opinion [Also], the less than ten percent chance of a TIA is not sufficient for me not to investigate further, just because of the morbidity and mortality risk increases with positive diagnosis of TIA and you could under-diagnose TIA"* [3.b.a. GP 3]

*"If there is a risk but its low and actually you've got your other diagnosis that you think is more likely then again you might come to a different decision about whether to refer or not. Whereas if it's the only thing you think that's happening but the score is [similarly] low then yeah you might be more likely to refer because you haven't got another idea of what is going on"* [3.b.b. GP 9]