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## Doing diagnosis: Whether and how clinicians use a diagnostic tool of uncertain clinical utility

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## ABSTRACT

Diagnosis is fundamental to the practice of medicine and mastery of it is central to the process of both becoming and practicing as a doctor. We focus on diagnosis as a process, in particular from the perspective of clinicians performing it. We explore how UK clinicians exercise discretion about whether and how to use a diagnostic tool (invasive urodynamic tests – IUT) for which there is, currently, no clear, high-quality evidence. Interviews were conducted with a purposive sample of 18 clinicians who had previously completed a survey on their use of IUT. Analysis was based on the constant comparative method. Participants tended to be polarised in their view of IUT. While many regarded it as a valuable diagnostic tool that they used frequently and thought was important, others reported using it only infrequently, and some were sceptical of its value in the diagnostic process even if they commonly used it. In addition to the anticipated clinical functions (e.g. adding to understanding of the condition, helping determine best treatment) there were additional, more social, functions that IUT could serve, including fitting in with local practice and helping to defend against possible future litigation. We discern two distinct approaches to the practice of diagnosis: one approach means 'leaving no stone unturned' and seeking all available evidence, proven or otherwise; while a second means using clinical judgement to say 'enough is enough' and thereby avoid exposing patients to possibly unnecessary tests and potentially wasting scarce healthcare resources.

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## 1. Introduction

The activity of diagnosis is central to the practice of medicine, but has, to date, not received the focused sociological attention which many have argued it warrants (Blaxter, 1978; Brown, 1995). This is beginning to be remedied with an emergent sociology of diagnosis, which seeks to explore the activity and its outcomes as a prism through which many issues are played out (Jutel and Nettleton, 2011). It is argued that diagnosis serves many functions for patients, clinicians and wider society (Jutel, 2009; Jutel and Nettleton, 2011), and can be understood both as a category and a process (Blaxter, 1978).

The focus of this paper is upon diagnosis as a process, in particular from the perspective of the clinicians performing it. Diagnosis serves

a number of functions, including determining the most appropriate treatment and likely prognosis (Jutel, 2009; Jutel and Nettleton, 2011), and mastery of it is central to the process of both becoming and practicing as a doctor (Atkinson, 1995; Brown, 1995). The role of the diagnostician has long had, and continues to have, a central position (Freidson, 1970; Jutel and Nettleton, 2011).

The diagnostic process is not something that happens in a vacuum; there is a variety of factors which may impinge upon it (Brown et al., 2011; Jutel and Nettleton, 2011). The use of increasingly sophisticated diagnostic tools and technologies is one such factor, and is a key focus of this paper. The use of diagnostic tools may function as a way of helping to resolve uncertainty about a set of symptoms or possible illness – by helping to 'make sure' and seek to organize the symptoms into something understandable and manageable (Brown, 1995). However, although diagnostic instruments serve in some senses to objectify aspects of diagnosis, they do not exist independently of those that use them and are not necessarily neutral arbiters of signs and symptoms (Schubert, 2011). Rather, the ways in which these tools are approached and used, and how the results produced are interpreted and made sense

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of in light of other available information, can be a complex process, such that diagnosing has been argued to represent a form of 'situated action' (Suchman, 2007) influenced as much by social context as by technical necessity (Howell, 1995; Schubert, 2011). Saunders' (2008) ethnographic work on the computed tomographic (CT) scanner, for example, explores how CT images are made into diagnostic evidence and the functions they serve for clinicians going about their work. Importantly, Saunders argues that the images generated through CT scanning do not represent knowledge or evidence in and of themselves, but rather the complex of practices known as 'reading' is required in order to form and shape them into diagnostic evidence. It is likely, therefore, that different clinicians will do the work of diagnosis in different ways.

Evidence-based medicine (Sackett et al., 1985) has been proposed as a solution to the problem of practice variation. The idea underpinning evidence-based medicine is that providing clinicians with the best available evidence on specific clinical questions will ensure they are best-placed to deliver optimal care. Indeed organisations such as the National Institute for Health and Care Excellence (NICE) in the UK now spell out in step-by-step fashion how to diagnose and treat patients with a range of conditions. However, while in principle evidence-based medicine may represent an effective way to tackle clinically unwarranted variations in practice, in reality there are many practical barriers to achieving this. One significant obstacle is that in a great many cases there is insufficient, high-quality evidence upon which to make strong recommendations about practice (Timmermans and Oh, 2010; Lambert, 2006). Therefore, while many have voiced fears about the potential for evidence-based medicine to undermine clinical autonomy, discretion and professional judgement – resulting in the rise of so-called 'cookbook medicine' (Harrison, 2002) – there are, in reality, still numerous examples in which it has not yet been possible to discern any 'right' course of action. In these cases, clinicians are still very much operating in what Freidson has characterised as the "zone of discretion" (Freidson, 1994, p.42).

Sociological analysis of the professions in general and of the medical profession in particular, has long paid attention to the exercise of autonomy (Freidson, 1970) or discretion (Evetts, 2002) as a key element characterising the work of professionals. In this paper we focus on how individual clinicians working in the UK exercise their discretion about whether and how they will use a particular diagnostic tool (invasive urodynamic tests – IUT) for which there is, currently, no clear, high-quality evidence to either support or discourage its use in at least some clinical situations. We use this example as a means through which to explore how individual clinicians go about the process of diagnosis and, in particular, to draw out what it means for them to perform the diagnostic process well.

## 2. Invasive urodynamic tests as a diagnostic tool of uncertain utility

This paper is concerned with the use of IUT in the diagnosis of urinary incontinence (UI). UI, whilst rarely life-threatening, may seriously influence the physical, psychological, and social wellbeing of affected individuals. Prevalence figures for UI range from 5% to 69% in women 15 years and older, with most studies reporting prevalence in the range 25–45% (Milsom et al., 2013). More severe UI is reported in 4–7% of women under the age of 65, and around 5 million women over 20 years of age may be affected in England and Wales (McGrother et al., 2004).

Several methods are used in the assessment of UI in order to evaluate function of the lower urinary tract and guide decisions about the most appropriate way to manage the condition. These include non-invasive tests (such as free urine flow rate and post-

void residual volume), but some kinds of testing do require catheterisation (such as conventional cystometry or videourodynamics) and are therefore regarded as invasive.

Despite its relatively widespread use, the appropriate position of IUT in the diagnostic pathway is not currently clear. The UK National Institute for Health and Care Excellence (National Collaborating Centre for Women's & Children's Health, 2006; National Collaborating Centre for Women's & Children's Health, 2013), the UK National Institute for Health Research Health Technology Assessment programme (NIHR-HTA) (Martin et al., 2006), the Cochrane Collaboration (Clement et al., 2013), and the International Consultations on Incontinence (Griffiths et al., 2005; Rosier et al., 2013) have all undertaken systematic reviews on the subject and all emphasize the lack of high quality primary research confirming clinical utility.

In terms of the advice given to those working in this area in the UK, the current guidance from NICE on UI in women suggests that IUT is not required prior to conservative treatments, and that, whilst it may be needed in more complex clinical scenarios, there is no evidence to support its use prior to surgery where the diagnosis of stress UI (SUI) is likely based on clinical assessment alone (National Collaborating Centre for Women's & Children's Health, 2013).

Even if there were proven clinical utility to the investigations, the decision to use them in any particular situation would need to weigh the benefit in outcome against the associated risks. While serious morbidity associated with IUT is rare, anxiety and embarrassment on the part of those experiencing it is common (Shaw et al., 2000) and over a quarter experience pain during investigation (Gorton and Stanton, 1999). In addition, up to 20% of women with sterile urine prior to investigation may develop bacteriological evidence of urinary tract infection subsequently (Powell et al., 1981; Sabanathan et al., 1985; Bombieri et al., 1999; Okorochoa et al., 2002). There is also a financial burden to both patient and health services from the investigations; the annual savings from more conservative use of IUT prior to surgery for SUI have been estimated at £3.4 million (Murdoch et al., 2011).

Considerable variation in the use of IUT across the UK has been reported and there has been uncertainty over its reproducibility, accuracy, and standardisation (Rosier et al., 2013). Since the publication of the NICE report on UI in women (National Collaborating Centre for Women's & Children's Health, 2006; National Collaborating Centre for Women's & Children's Health, 2013), a survey has shown a high level of disagreement with the NICE guidance (Basu et al., 2009), and others have questioned the safety of the recommendations (Agur et al., 2009).

The aim of this paper is to explore whether and how clinicians working in this area use IUT in their diagnostic practice around UI, and what place they accord it within that process. In doing so, we draw insights about what doing diagnosis means to clinicians, and in particular what it means to them to perform the diagnostic process well.

## 3. Methods

The INVESTIGATE-I study was a mixed methods feasibility study including a pragmatic multicentre 'rehearsal' pilot RCT of IUT before surgical treatment for UI in women funded under the UK NIHR-HTA (Murdoch et al., 2011). This study included a national survey of clinicians' views on, and use of, IUT, followed by interviews with a purposively sampled subset of clinicians responding to the survey (Hilton et al., 2012). The survey found that all respondents reported having access to IUT facilities for their patients, with 89% reporting arranging IUT in most patients with SUI or stress predominant mixed UI (this group representing 65–85% of urinary incontinence

in women (Hannestad et al., 2000), and being the target population for the INVESTIGATE studies (Murdoch et al., 2011)). As part of the survey, surgeons were presented with a series of clinical scenarios of varying symptom complexity (and one might assume therefore varying levels of justification for IUT). For each of the clinical scenarios, only 1–6% of respondents were undecided about the value of IUT – most reported highly polarised opinions either in favour of or against the use of IUT. Even in the ‘simplest’ scenario of pure stress UI that is clinically demonstrable (and so would fit with the kind of circumstance in which NICE suggests there is no evidence to support the use of IUT), two thirds thought IUT necessary to a greater or lesser extent, with over a third of these thinking it essential. There were no obvious differences in practice by main speciality or level of specialisation (Hilton et al., 2012).

This paper focuses specifically on the interview study following the survey of clinicians outlined above. The interviews aimed to explore in more detail clinicians’ views on, and use of, IUT including their perspectives on a future randomised controlled trial in this area (not reported here, see (Hilton et al., 2012)). A purposive subsample was drawn from those respondents who completed the survey and indicated they were willing to take part in an interview. The purposive sampling strategy employed aimed to ensure a diverse group of clinicians was interviewed, including: those who did/did not routinely use IUT; those with different approaches to when IUT was needed (i.e. in which types of clinical scenario); those with different perspectives on the planned RCT (i.e. whether they believed this to be an important area for research); and those who would/would not be willing to randomise their patients in a future RCT.

Interviews continued until a point of saturation was reached, by which we mean that no new material was emerging from the interviews. In total, 18 interviews were completed with the following participants, all of whom worked in hospital settings: 6 subspecialists in urogynaecology (gynaecologists); 6 obstetricians and gynaecologists with an interest in urogynaecology; 2 subspecialists in female urology (urologists); and 4 urologists with an interest in female urology. All interviews were conducted by telephone by an experienced, non-clinical, qualitative researcher (see acknowledgements) using a topic guide based initially on the survey and developed through discussion within the INVESTIGATE-I project team. Participants were asked about: their current approach to the use of IUT, and what factors influenced this; what guided their decision-making about whether or not IUT is needed in any particular case; when IUT was used, how it fitted with other available information and the contribution it made; whether an RCT of IUT for UI was important; and why they would or would not be willing to enrol their patients in such an RCT. The topic guide ensured all areas of interest were covered, but was used flexibly with the aim of allowing interviews to flow as freely and naturally as possible and to allow participants to discuss issues that were important to them. The interviewer prompted as appropriate to ensure that all views were fully explained, and the meaning of participants’ responses clear. All interviews were audio-recorded and transcribed verbatim.

Analysis was based on the constant comparative method (Glaser and Strauss, 1967). Transcripts were read three to four times and open codes initially applied line-by-line to the data to represent the meaning or significance of each sentence or group of sentences. Generation of the open codes proceeded sequentially, with no attempt at this stage to impose any framework on the data. The open codes were then incrementally grouped into organizing categories or themes. These categories were modified and checked constantly as further open codes were incorporated as analysis proceeded. When categories had been created to express all of the open codes, explicit specifications were written for each of the

categories to assist in determining under what circumstances data should be assigned to any given category. The categories and their specifications (the coding scheme) were then programmed into NVivo qualitative software. The coding scheme was then used to process the dataset systematically by assigning each section of text to a category, according to the category specifications.

For research governance purposes, the interview study was reviewed (as part of the wider INVESTIGATE-I study) by Newcastle & North Tyneside 1 Research Ethics Committee and given a favourable opinion (Ref 10/H0906/76).

#### 4. Findings

As would be expected from both the overall clinician survey results and the purposive sampling strategy employed during the recruitment process, participants tended to be polarised in their view of IUT. While many regarded it as a valuable diagnostic tool that they used frequently and thought was important, there were others who reported using it only infrequently, and some were sceptical of its value in the diagnostic process even though they commonly used it. In this section we describe these positions and explore the underlying reasons and rationales participants had for adopting them.

##### 4.1. IUT as a valuable diagnostic tool

The clinicians we interviewed who reported commonly using IUT and who regarded it as a valuable diagnostic tool offered two broad explanations for why they held this view: the perceived value of IUT to the diagnostic process; and feeling a duty to patients to present them with as much information as possible.

##### 4.1.1. IUT as a valuable step in the diagnostic process

Many of the participants who reported using IUT regularly appeared genuinely to believe that it was valuable in terms of adding to the overall clinical picture for each particular patient. As explained earlier, in addition to using IUT, there are several non-invasive tests that can be used for patients with UI and a detailed patient history should also be taken. A small number of participants believed that IUT was by far the most important element of this range of available tools, so much so that not performing this kind of testing could almost be seen as negligence.

*I have been doing urodynamics now on all of my patients for the last eight years so I will have done over 4000 and I am constantly humbled by the fact that the symptoms they have just reported don't match the findings in urodynamics to the extent that I don't think it is actually possible to predict the cause of the patient's continence problems clinically, I mean on history and examination. I would go as far as to say that anyone doing that is almost negligent because they simply do not know what is wrong with the patient until they have done urodynamics. (Participant 13)*

The example above highlights very clearly the value that this particular clinician places on the results of IUT, and the primacy s/he accords to these in comparison with the patient's reported symptoms or other, non-invasive, diagnostic tools available. As discussed above, diagnostic instruments can be seen in some ways as objectifying aspects of diagnosis. This would seem to be the case here as this participant clearly frames the results of IUT as revealing the ‘truth’ about a patient's continence problems. S/he reports being ‘humbled’ by the technology in terms of how often it produces findings that do not match with the information available through taking a patient's history and performing a clinical examination. There is apparently no possibility here of the IUT results being

misleading or incorrect: they are simply unquestionable, and looked on as axiomatic, self-evident truth. In this way, then, the use of IUT is vital if one is to avoid being deceived or misled by other, less reliable, sources of information (including the patient themselves).

In contrast to the clear primacy accorded to the results of IUT in the case above, a more common position was for the results of IUT to be framed as having the potential to add incrementally to a building picture assembled from several sources of information. In this case, the results of IUT are regarded as more likely to be confirmatory rather than revelatory, but are nonetheless useful for this.

*I think it may add value or it may help to diagnose and assess their condition. (Participant 01)*

*Well it helps with someone who has a history of stress incontinence and you have not been able to demonstrate it. Then you want to try and quantify the leakage and urodynamic testing can help you do that sometimes. (Participant 05)*

In both of these scenarios, then, the participants see clear additional benefits that the use of IUT can offer as they navigate the process of diagnosing patients' continence problems. No matter whether they regard IUT as having the potential to necessitate a radical re-think of what might be causing the patient's problem or as offering only more modest and largely confirmatory information or detail, the additional information IUT can offer is perceived as beneficial and helpful to them as clinicians.

The fact that many of these patients would then be offered a surgical solution to their continence problem is perhaps important here, and several participants very clearly framed future surgery as further underpinning the need to be as sure as they possibly could be about the diagnosis. Here, the use of IUT, even if it reveals little or no new information, is an important stage in the diagnostic process prior to an essentially irreversible therapeutic intervention.

*The surgery is very much last resort and as a last resort then we do urodynamics just to make sure there is nothing else hiding. (Participant 19)*

*With surgery, once you do it you can't undo it. Invasive tests [are] unpleasant, there's dignity issues, there is, you know, all kind of things associated with the [risk of] infection, I know....But it is a small price to pay compared to an incorrectly chosen operation. (Participant 07)*

The second extract above touches on the interesting issue of how patients may experience IUT, and the potential for complications such as infection. It is apparent that this group of clinicians tends to regard the possible drawbacks of IUT as 'a small price to pay' for the potential benefits it can offer. Research on patients' views and experiences of IUT would suggest they regard it as rather more problematic (Gorton and Stanton, 1999; Shaw et al., 2000).

#### 4.1.2. The use of IUT as fulfilling a duty to patients

As well as the use of IUT providing information that was of help to clinicians in the diagnostic process, several participants also discussed having a duty to compile all the possible information for discussion with patients as they considered treatment options. Again, the apparent objective nature of the results from IUT came up here.

*It gives some objective information that helps in counselling patients [...] it gives you reasonable scientific evidence to sit with the*

*patient and say "that is what you have got, that is what we are going to do, and that is the outcome". (Participant 14)*

*Yes, I think the patients feel a degree of confidence from the fact that you can say you have done this test and it has shown this, this and this, so we can offer you an operation. (Participant 08)*

The participant cited earlier, who talked very strongly about IUT as having the ability to undermine the potentially misleading information available from other sources, also raised the idea of having a duty to patients to present them with all the available information. Even in cases where all IUT did was offer confirmation and reassurance, this was nevertheless an important function and something that was owed to patients.

*I think it is unfair [...] to withhold such a simple test even if all it does at the end of the day is reassure that there is nothing else wrong. I think they need to know that and then they are empowered better to make a more appropriate decision. (Participant 13)*

Interestingly again here we have IUT framed as 'such a simple test' that it would be unfair to withhold from patients rather than, for example, something that patients might find problematic and would be glad to be spared.

#### 4.2. Non-clinical benefits of IUT

In addition to the benefits many participants cited in terms of clinical information and patient counselling, there were some instances in which the use of IUT was framed as fulfilling other, more social, functions. These were most commonly identified when participants who did not necessarily perceive any clinical benefit from using IUT explained why they had nevertheless adopted it as their current routine practice and reported it as such in the survey.

In the two extracts below, participants explain how working as part of a clinical team has led them to routinely use IUT as a way of complying with local practices, despite the fact that neither individual regards the information gained to be particularly helpful.

*I mean at the end of the day you're probably going to offer them [surgery type] anyway, irrespective of what comes out of the urodynamics [...] we would often pool patients on a waiting list for [surgery type], so if I, say, put a patient directly onto a waiting list for [surgery type] and they've not had urodynamics, and my colleague ends up doing that [surgery], well then obviously that creates difficulty because [s/he's] not happy with that. So it just seems simpler for [me] to keep the party line. (Participant 09)*

*It [his/her practice] is going by what the vast majority of my colleagues do so it is to stay in line with what they are doing although I accept what NICE says and also the lack of evidence which shows that, or evidence which shows that urodynamics does not necessarily predict outcome. (Participant 05)*

Here, the use of IUT is motivated more by a desire to fit in with 'how things are done around here' than by any perception of clinical utility. This is perhaps not surprising as Greer (1988) has argued that medical practice, like other social activities, is grounded in local associations, social structures and norms of behaviour. In particular, Greer has focused on how local judgements of utility influence both why particular tests or procedures come to be adopted in some communities but not in others, and how these are subsequently used.

A further way in which some participants talked about their routine use of IUT was as a way of protecting themselves from any



potential future medico-legal claims that might be made against them. The results that could be gained from undertaking IUT, while perhaps not of any direct clinical use, could serve as a useful 'line in the sand' and objectively set down the patient's condition before any surgery was undertaken. In this way, then, the use of IUT becomes something of a 'defensive practice' undertaken as much (if not more) for legal rather than clinical reasons (Annandale, 1989; Summerton, 1995).

*One of the arguments for doing urodynamics on everyone is of course the medical legal argument [...] because you medically legally have a line in the sand of demonstrating that prior to operating they had or had not got condition A so in other words if they develop a new symptom after the operation, you can say "aha, that is new because urodynamics before the operation did not show it". (Participant 03)*

#### 4.3. IUT as a diagnostic tool of limited value

The clinicians we interviewed who reported only rarely using IUT as a diagnostic tool in this context offered a range of explanations for this. Three interlinked categories emerged from our analysis: the perceived lack of evidence to support use of IUT; a firmly held belief that IUT had little or nothing to contribute to the diagnostic process in these cases; and concerns about the potential costs of IUT. In contrast to the section above, in which participants' use of IUT did not always match their perception of its value (i.e. some used it despite not seeing clear clinical benefit), the participants that we focus on here were clear that they did not use IUT routinely because they did not regard it as sufficiently valuable.

A key issue discussed by participants who did not routinely use IUT was the lack of evidence that they should be doing so. In an apparent aim to practice evidence-based medicine, these clinicians avoided using a test for which they did not see a sound evidence base.

*It [his/her current practice] is based on the NICE guidance which suggests you don't have to do it in every woman. (Participant 03)*

*Patients who have got pure stress incontinence and do not complain of any overactive bladder symptoms and in whom you can demonstrate stress urinary incontinence on physical examination, I don't think that urodynamics has a great deal to add to that picture and I think there is reasonable evidence and the guidelines will support it as well that they don't need urodynamics in order to make a decision for surgery. (Participant 16)*

In contrast to those clinicians discussed above who drew on evidence accrued through their own clinical practice to make the case for using IUT, this group focused much more at the level of research evidence and clear guidelines from professional organisations. In the absence of any of these to support the use of IUT in this context, these clinicians adopted the position that IUT was something that should not be used.

In stark contrast to those participants discussed above who regarded IUT as an important, and even crucial, part of the diagnostic pathway, participants who only rarely used it in what they saw as being straightforward cases framed it as something that had little or nothing to offer in this context and should be reserved only for more complex cases.

*It is not the most important thing. You know if you could only do one test it would not be urodynamics, it would probably be something very simple like a frequency volume chart actually and*

*examining the patient and taking a decent history is by far the most important aspect. (Participant 16)*

While some clinicians reported valuing IUT even if all it did was confirm the findings from other, non-invasive, tests and available information, this group appeared to perceive little benefit from this kind of confirmatory evidence and preferred to focus their attention on 'simpler' sources of evidence such as taking a good patient history.

Rather than seeing the use of IUT as something that was worth doing even if it contributed relatively little, participants who used it less frequently focused much more on the potential costs associated with IUT than did others. While those who used it more commonly were aware of some of the potential costs, for example in terms of infection risk, the examples below demonstrate that participants who used IUT less frequently assessed the likely cost/benefit ratio rather differently.

*[IUT results are] as likely, if not more likely, to add complexity to a straightforward case, it's going to cost the patient and the health service money, it could cause delay, it could cause distress and discomfort and infection so, all in all, I think there's more cons than pros. (Participant 01)*

*I just saw a woman in clinic yesterday who I have taken down that pathway [undertaken IUT in] and have mucked her around for two years [by using non-surgical treatment approaches] and we finally decided to operate and had I not done the urodynamics, I may well have operated two years ago. (Participant 18)*

This final extract highlights very clearly that, in this clinician's view at least, it is possible to have too much information and over-complicate what might otherwise be a relatively straightforward diagnosis and subsequent treatment decision. In contrast to the earlier participant who framed the evidence that could be gained from undertaking IUT as the 'truth' that could trump all other sources of evidence, here it is IUT itself which is viewed as the potential 'red-herring' that can distort the diagnostic process and potentially delay the receipt of effective treatment.

## 5. Discussion

In this paper we have explored how clinicians exercise discretion about whether and how they use a diagnostic tool (IUT) for which there is, currently, no clear, high-quality evidence to either support or discourage its use. We have shown that clinicians tend to be polarised in their view of IUT; while many regard it as a valuable diagnostic tool that they use frequently and think is important, others report using it only infrequently, and some are sceptical of its value to the diagnostic process even if they commonly use it. In addition to the anticipated clinical benefits (e.g. adding to understanding of the condition, helping determine best treatment) there were additional functions IUT usefully served, including enabling clinicians to fit in with local practice and customs and helping defend themselves should questions be asked about their practice. Those clinicians not routinely using IUT did not perceive these benefits and instead focused on the lack of evidence and possible costs associated with IUT.

From participants' explanations of their positions on IUT, we were able to discern two distinct approaches to the practice of diagnosis and what it means to perform the diagnostic process well. How participants approached 'doing diagnosis' importantly influenced whether and how they employed IUT in their clinical practice. The first of these approaches can be thought of as 'leaving

no stone unturned' and seeking all the available evidence. It is clear that many participants believed the clinical functions served by IUT to be important because the results could potentially lead to a (sometimes radical) re-evaluation of the diagnosis and/or the most appropriate treatment option. Even if the results from IUT were at the level of confirmation rather than revelation, the act of 'making sure' was still seen as valuable by many. Value here was seen to come in two forms: for them as clinicians in terms of their decision-making and as information that they could present to their patients – working in partnership with patients and sharing responsibility for decision-making with them is often discussed by doctors themselves as key components of delivering good care (Lupton, 1997).

The second approach to diagnosis we discerned involved clinicians using their clinical judgement in order to avoid exposing patients to what they thought were probably unnecessary tests that carried a risk of harm and likely wasted scarce healthcare resources. In contrast to those adopting a 'leave no stone unturned approach', clinicians in this group seemed to more explicitly weigh up the likely benefits of IUT against the possible costs and, perceiving IUT to be unlikely to produce anything very different to the information they had already gathered from other sources, be much less inclined to use it unless a case was very complex or unusual. This approach can perhaps be best characterised as 'saying enough is enough'.

Given that there is currently no clear, high-quality evidence either way on the utility of IUT in these kinds of UI cases, and that all participants we interviewed had access to IUT, it is perhaps not surprising that most adopted a 'leave no stone unturned' approach to the practice of diagnosis. The growth of the 'audit society' (Power, 1997) is argued to have led to the development of regulatory cultures and new forms of bureaucracy within medicine which prioritise codified knowledge (Harrison, 2002; Flynn, 2004) such that being a doctor relies more on the production and use of encoded and formal knowledge rather than more tacit knowledge acquired through experience and a 'feel for the game'. Previous research has shown that doctors are increasingly aware of the potential for complaints from patients and the risk of litigation, and that this means their practice is often more cautious and defensive (Nettleton et al., 2008). In this case, that clinicians feel less able to trust their clinical judgement and instead 'play safe' by checking their diagnoses with further tests.

These wider contextual factors underpinning IUT use suggest that, even if evidence is produced to show more definitively that IUT should not be used routinely (this would be the bigger change given that IUT is more commonly used than not), clinicians' practice may not change easily. A recent study of hospital-based clinicians showed that the social context in which antibiotic prescribing occurred was fundamental to shaping the 'sub-optimal' practice that was taking place. Here, the best practice guidelines and control strategies that sought to achieve a more judicious approach to prescribing in order to mitigate the future threat of antibiotic resistance largely failed to change clinicians' behaviour which was instead geared towards achieving short-term goals such as the protection of individual patients, maintenance of one's professional reputation, and concordance with peer practice (Broom et al., 2014). While our interviews did not explicitly ask clinicians whether they would be likely to change their current practice if evidence subsequently showed it to be inappropriate (it is questionable whether such hypothetical questions would have produced responses of much validity in any case), the vigour with which many participants defended their approach to IUT would suggest that at least some would not be readily prepared to do so.

Within debates about evidence-based medicine more broadly, there are, following on from the long-voiced fears about its

potential to undermine clinical autonomy, discretion and professional judgement (Harrison, 2002), calls for a re-think of the movement and a re-focussing on providing useful evidence that, importantly, can be combined with contextual factors and professional expertise in order to deliver high quality care (Greenhalgh et al., 2014). 'Real' evidence-based medicine, Greenhalgh et al. argue, should have the care of individual patients as its top priority – meaning that *inter alia* clinicians, working in partnership with patients, should be freer to make decisions about whether and how to investigate a patient that may not fit with what 'best evidence' would seem to suggest should happen.

We have already explained that, while serious morbidity associated with IUT is rare, anxiety and embarrassment are common, over a quarter of patients experience pain during investigation, and there is a risk of infection. An interesting point to note is that, despite many participants talking about the importance of gathering all the available information in order to present the patient with as full a picture as possible in order to facilitate discussion about treatment options, the idea of discussing with the patient whether or not she wishes to have IUT as part of the diagnostic process did not feature in clinicians' accounts, although we acknowledge that we did not ask directly about this.

### 5.1. Strengths and limitations

This qualitative study provides further, detailed understanding of the results obtained through our earlier survey of clinicians' views on IUT. Our purposive sampling strategy ensured we included a diverse range of participants which reflected the full range of views expressed by those completing the survey. There are, however, limitations to our approach. Our sample was self-selecting because participants first had to complete the survey and second indicate that they were willing to be approached for interview. It is possible that those who did so may have different views on IUT to those that did not, although the range of views expressed both in the survey and in these interviews suggests this is unlikely. A further limitation is that an interview study such as this relies on participants' own accounts of their practice and the rationale(s) offered for this. While we would not wish to suggest that participants may have been untruthful in their accounts of what they do and why, it is possible that they may have framed their actions in particular ways during the interviews. An ethnographic approach, such as that adopted by Saunders' (2008) work on CT scanning, would have permitted a more in depth of analysis of how clinicians work in practice. Such an approach could also further explore whether and how the possibility of using IUT as part of the diagnostic process is discussed with patients.

## 6. Conclusion

In the absence of any current, high quality evidence to either support or discourage its use, clinicians adopt different approaches to whether or not they use IUT in the diagnostic process for UI. In explaining and accounting for their practice, clinicians offer two distinct versions of what it means to perform the diagnostic process professionally: 'leaving no stone unturned' or using clinical judgement to employ IUT more strategically based on an assessment of the likely costs and benefits in each case.

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