

# Where does a diagnosis come from

## *Questions about the local context in diagnostic reasoning*

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*Medical anthropologists have studied a great variety of phenomena in medicine and health care across the globe. However, the field of acute medical conditions have received less attention from social sciences. In medicine, this is the field that provides the key inspiration for studies on clinical decision-making. It is the acute and dangerous diseases that receive the greatest attention and it is the medical specialities dealing with these conditions that receive the highest acclaim within the profession. In the article two cases from departments of internal medicine and surgery are presented that demonstrate that the diagnostic process is not free from influence from the clinical setting and social context more generally, but is rather dependent on it. Doctors are seen to use in their diagnostic work a combination of what is here called a local spectrum of normality, a search for available fast-track action pathways and a locally negotiated hierarchy of different sources of information. The implication of the findings is discussed against prevailing notions of diagnostic reasoning in medicine. The article is a preliminary exploration of issues that warrant more attention in future studies.*

## Sherlock Holmes, hierarchies and clinical decision-making

When I was taught about the process of diagnosis in medical school, my teachers would sometimes refer to it as “the detective work” of being a doctor; sometimes even with a direct reference to Sherlock Holmes as the image of the expert diagnostician. When Arthur Conan Doyle, himself a physician, wrote up his literary consulting detective, he is said to have used one or more doctors from his medical education as inspiration. In this article, I will present two cases of diagnostic work to examine the diagnostic reasoning in clinical practice with particular focus on the role of local context. A short extract from the novel “A Study in Scarlet” may serve as a prologue and help to illustrate the kind of thinking that lies as an ideal type behind much writing and teaching about the diagnostic process. The situation is from shortly after Holmes and Dr. Watson have become acquainted. When they first met, Holmes remarked that Watson had been in Afghanistan, and Watson was surprised how he could know. He believed that Holmes had been told, but Holmes now denied this:

“Nothing of the sort. I *knew* you came from Afghanistan. From long habit the train of thoughts ran so swiftly through my mind that I arrived at the conclusion without being conscious of intermediate steps. There were such steps, however. The train of reasoning ran, ‘Here is a gentleman of a medical type, but with the air of a military man. Clearly an army doctor, then. He has just come from the tropics, for his face is dark, and that is not the natural tint of his skin, for his wrists are fair. He has undergone hardship and sickness, as his haggard face says clearly. His left arm has been injured. He holds it in a stiff and unnatural manner. Where in the tropics could an English army doctor have seen much hardship and got his arm wounded? Clearly in Afghanistan.’”

(Conan Doyle: “A study in scarlet”, 1887)

Throughout the stories of Sherlock Holmes he remains the imminent master of deduction with Dr. Watson as his good-intentioned and empathic, but always intellectually inferior, companion. You recognize more than a little of both Holmes’ thinking and abrupt personality in doctors from popular culture, such as Dr. House - and we marvel at the cognitive acrobatics that produce, out of apparent

chaos, the diagnosis that allow the doctor to save the patient's life (or Holmes to crack the case).

How does this correspond to actual clinical practice? Research on clinical decision-making (CDM) informs us that doctors use a variety of strategies to arrive at a diagnosis: The hypothetico-deductive method where a series of hypotheses are created and tested one by one, used more often by young doctors or when a doctor faces a new kind of problem (Elstein et al., 1978); pattern recognition where the experienced clinician is able to connect the many pieces of information by seeing them as part of a recognizable whole (Schmidt et al., 1990); Schema-induction reasoning where a written guideline for making decisions is followed (Coderre et al., 2003). A long line of other kinds of diagnostic reasoning is described, indicating the complexity of the matter, and Norman in a review of three decades of reasoning even concluded that we still do not understand how the clinician arrives at a diagnosis (Norman, 2005).

A matter of debate is the role of context in diagnostic reasoning. Medical researchers in the field of CDM argue that contextual factors may have a confusing impact on the diagnostic process and should be eliminated if possible (Bates et al., 1997; Durning et al., 2011; Feldman et al., 1997). Ethnographic studies on CDM lean more towards context as the socio-material pattern of relations that allow meaning to emerge from practice (Garro, 1998a; Garro, 1998b; Mol, 2002). However, there is a tendency for medical researchers to focus on patients with acute disease whereas ethnographers have studied CDM regarding chronic illness more.

Album and others have found that students and doctors learn and sustain a social hierarchy of diseases and medical specialties, and that the more acute and dramatic the disease, the higher status it has and the more prestigious is it to be a doctor in the related specialty (Album, 1991; Album and Westin, 2007). The highest status is awarded conditions which

“is situated in an organ positioned in the upper part of the body, preferably the heart; conditions which emerges acutely and dramatically and leads to immediate hospitalization; conditions which are mortal, but possible to cure by heroic action and the use of highly specialized technology, so that the patient after a brief interval is again well, strong, and healthy; conditions which picks its victims randomly, but mostly young to middle-aged men from the higher social levels and makes them unconscious in the first stage and grateful in the last – these conditions will gain the highest prestige”

(my translation) (Album, 1991)

So although the social aspects of disease is recognized widely, it may be that a group of diagnoses – acute and with many of the characteristics found by Album and others – is believed to be free from the disturbing impact of socio-cultural context and remain pure; a question of the clinical information emerging from the patient and the reasoning provided by the mental efforts of the doctor – nothing more.

This social pinnacle of the disease hierarchy is the spectrum of diseases most often referred to by authorities in clinical decision-making. For instance, Kevin Eva in 2004 summarized much of the research in diagnostic reasoning in the article “What Every Teacher Needs to Know about Clinical Reasoning” (Eva, 2004), and starts out the enquiry with the following story (with reference to an article by Cunnington et al from 1997):

A 43-year-old woman is brought to the Emergency Room by her husband at 0200 in the morning because of acute shortness of breath. The dyspnea had occurred suddenly at 1100 pm and had awoken the patient from sleep. She had felt nauseated and vomited a small amount of bile. She complained of retrosternal chest pain that was worse on deep breathing. For several days she had coughed up small amounts of blood. For 4 days she had felt unwell and had had a sore throat and sinus congestion that resolved. She complained of having experienced fever and chills on several occasions in the past few days. The previous night she had woken with chest tightness, but this had settled after a short while. Her past history included bronchitis (Eva, 2004)

We recognize in this story many of the aspects that are, Album argued, typical for a “high status condition”. Eva proceeds in the article to compare the task of the clinician to the task of determining ‘whodunit’ when reading a mystery story, thus closing the circle back to the cases experienced and solved by Holmes and Watson.

A possible hypothesis that emerges from this short extract of viewpoints from the discourse on diagnostic reasoning is that a group of diagnoses exist, which are less polluted by context and is primarily a question of intellectual work done with distinct clinical signs as its prepositions; a process through which all other diagnoses are excluded, and the resulting diagnosis constitute the truest representation of the patient’s condition and the best basis for further management of the condition. Or, as Holmes would put it:

“How often have I said to you (Watson) that when you have eliminated the impossible, whatever remains, *however improbable*, must be the truth?”  
(Conan Doyle “the Sign of Four”, 1890)

In this paper, we will examine two cases from the higher levels of Album’s status hierarchy and from a close-up perspective reflect on the relation between diagnosis and local context. Is it possible to see more clearly what context does to diagnostic reasoning in acute medicine?

## A fieldwork of medical internship

The cases represent events that took place in a fieldwork I did in 2007-2008, in which I wanted to study how young doctors learn to make clinical decisions in the practice of everyday work in hospital departments and in general practice. To understand the practice of diagnostic reasoning was therefore a core theme and something I spent a great deal of time to look for and reflect upon. The article draws from several chapters in the thesis (Risør, 2010), but presents an issue that I could not quite come to grasps with in my analysis back in 2010, when I finished the thesis. In this way, the present article represents a secondary analysis; a return to material collected about eight years ago.

I recruited a total of nine young doctors, fresh out of medical school – four men and five women. They were about to enter the mandatory 18 months of internship; at the time both the final stage of undergraduate education and the necessary stage to pass before entering specialty training. For each doctor this period included six months work in a department of internal medicine, six months in a surgical department and six months in general practice. For some internal medicine came first, for others it was surgery. General practice was always the last part of the internship.

I followed each of the young doctors in everything they did at work (with the exception of bathroom visits) for days at a time. Because the purpose was to study learning over time, I chose to be with them for a few days in the beginning and end of each of the three parts of the internship. After each 2-3 days of observation, I would do an interview with each, in which we would go through some of the patients we saw together and try to analyse how the doctor reasoned about diagnosis and treatment. From this combination of participant observation and individual interviews over time, I would eventually produce an analysis of pat-

terns of reasoning and how these patterns developed over the course of internship (Risør, 2010).

No fieldworker can claim to be neutral, but as a doctor myself and with work experience from most of the departments studied, I found myself a “partial insider” (Abu-Lughod, 1988) with the benefits and limitations given by that position. The most obvious advantages were easy and unquestioned access to participate and the ability to understand much of the reasoning doctors did without them telling me about it. But being unquestioned also meant that I at times forgot that I was a fieldworker and not a clinician and became less reflective, less critical, in my observations and note-taking. It struck me, however, that the distance - created by me being silent instead of asking questions to the patients (as the doctor did) and by having a notebook in my hand instead of a patient record - still produced a perspective sufficiently different from the doctor’s to allow me to glimpse patterns and social dynamics that had been unseen to me as a clinician.

The two cases presented below are from two different hospital departments, one department of internal medicine and one from a surgical department; both from the same regional hospital. The context is the Danish health care system where the service is free for the patients and a strong system of primary care provides the gatekeeping for all services in the system. Hospitals with emergency functions - as the one presented here - have 24-hours intake of patients who usually enter an intermediary or reception ward first before they are transferred to a bed unit in the relevant department. Being on call in the medical and surgical departments is a key part of young doctors training and continue to be a part of their work even as more experienced doctors.

The doctors in the cases are in the first half of their first six-months period of internship. In the text, I have written all the diagnoses discussed in *italics*, and I have added a number of footnotes to explain medical expression that may not be commonly understood. At the time when these actions took place, my analysis of the cases into a coherent model of clinical decision-making was a few years into the future and observations were therefore perhaps less focused on details that I would later find important in decision-making. It shows to some extent in the cases below where the text may sometimes include details that may seem unnecessary and some passages, where a reader may - with every right - find that more information is needed. I have, however, tried to stay true to the fieldnotes and the transcripts to avoid the danger of filling in information from a memory likely to be incomplete eight years after the events.

## The case of Peter and Else

It is late May. Peter has just begun the evening watch at the department of internal medicine in a regional hospital. We have just left the watch-shift meeting and have gone to the medical reception ward. It is 4.30 in the afternoon.

A new patient, Else, has arrived. Her information is given on a sheet in the office of the ward. Peter reads it: 93-year-old woman, *lipothymia*<sup>1</sup>, *low blood pressure, dehydration, collapse of the spinal column*, blood pressure (BP) 120/75, pulse (P) 112, temperature (TP) 36.9, oxygen saturation (SAT) 94%. A nurse says to Peter: 'She is an old woman, rather weakened' and gives Peter a small note with the patient's basic values: BP 100/55, P 108, TP 37.2. Peter looks in the journal. Among other things it says that she is known to have *hypertension*<sup>2</sup> and *atrial fibrillation*<sup>3</sup>. In 2006 she possibly had *embolic lung disease*. She has recently been admitted with suspected *pneumonia*.

Peter goes to the bedroom to see Else. She is lying on her back in the bed - possibly asleep. She does not answer when Peter greets her. She turns and groans occasionally, though. Her daughter and two young men (Else's grandchildren) are standing next to the bed. The daughter tells Peter that Else collapsed in her home when the community home care was with her yesterday and that she was unconscious for a while. She has complained about back pain. She is usually mentally sound. The daughter says:

'They have reduced her painkillers. Even though [name of GP] had said it was okay for her to take the extra tablets.'

She has a long list of medications, including Kodein, Dolol and Pamol. One of the grandsons says: 'She was certainly complaining about her stomach just before'. The daughter says that she is not certain whether Else has been given her medication today. She asks her son to call another daughter who had been with the patient earlier in the day. The patient has a total of five children.

Peter examines Else systematically. She is groaning as he does so. She says that 'my leg is hurting', indicating the left leg with her hand. Peter sees some dry pale red areas on the anterior surface on both crurae<sup>4</sup>, the largest area on the left crus. When he does the rectal exploration he finds a small amount of watery stool in the patient's diaper. There is a little amount of black stool on the finger of the glove after exploration. Peter says that: 'It is somewhat black, this is'. He smells it. The patient turns and groans: 'I just can't do anything'.

Peter leaves the room and goes to find a nurse to ask her about the two different measurements of the patient's blood pressure, one giving a systolic blood pressure of 120 mm Hg, the other one only 100 mm Hg. They find that the first measurement was done at 12.45 and the second just before Peter went to see the patient. Peter asks the nurse to repeat all the basic values. He studies the ECG: 'It shows sinus tachycardia<sup>5</sup>. I ask 'What do you think is the matter with her?' Peter says that:

'*Dehydration* sounds reasonable. She does not have a fever, but she might still have an *infection* that brings her out 'on the edge'. Her stool is black, but not putrid (foul smelling) and I noticed that she takes an iron supplement. So we have to shoot a bit wide. The urine must be stixed<sup>6</sup>, but it is probably contaminated with that diaper and all. So a sample for blood cultures must be taken. X-ray of thorax.'

He looks in the journal again: 'Nobody seems to have asked her if she has any allergies'. He goes to ask the patient, who answers no to his question about allergy. He returns to the office. It is now about 5.35. Peter dictates the entry to the journal. He looks at the ECG again and says to me:

'I cannot see any p-waves, but it does look regular. And the little Japanese<sup>7</sup> says that it is a *sinus tachycardia*. Well, I'd better dictate what I see – no visible p-waves, regular rhythm = 113 – so I haven't really taken any kind of stand about that.'

Peter crosses off the relevant blood tests in the relevant yellow-coloured scheme and fills out the requisition for x-ray of Else's thorax. The second-call physician of internal medicine, Helle, enters the office. She is coming to see another patient. Peter asks her about the ECG. They look at the new ECG and compare it with an old one from a previous admission. Helle says:

'It is regular. It does not look like an AFLI (*atrial fibrillation*). It might be an AFLA (*atrial flutter*), but I think it is a *sinus tachycardia*, even though the p-waves are not exactly... She does have a little depression in V4 to V6... What brought her in here? What kind of medication does she get? (looks at the medicine sheet) She gets a lot for her heart – is she suffering from *cardiac insufficiency*? She does not need to get her medicine just now. We

will have to see in the morning. We will do serum digoxin and coronary markers as well.'

Peter finds the nurse and asks her to call the laboratory to get the extra tests done. The nurse calls the lab. It is 6.10 PM.

The next couple of hours, Peter is busy admitting an old woman with neurological symptoms and possible *apoplexy*. Then he is called to the emergency ward to a young man with an *epileptic seizure*, who is also known to have *diabetes* and is *retarded*, making the process of story taking and the physical examination difficult. Peter returns to the reception ward, where a nurse tells him about two more patients on their way to the hospital.

The nurse informs Peter, that the old woman, Else, has a haemoglobin<sup>8</sup> level of 4.2, which is well below the reference interval. Peter takes this as an indication that she has lost blood and asks the nurse: 'You better order some blood for her then. She should not get more than two bags<sup>9</sup> a day'. He returns to dictating the journal on the last patient and entering the information from the patient's medical sheet in the patient's file in the electronic patient record (EPR).

More patients enter the ward. Peter does his best to keep up. He talks to the patients, he talks to the nurse, he dictates entries to the journals, he adjusts the lists in EPR and he prescribes the necessary tests. At about 11 PM, Helle has been to see Else and tells Peter what she thinks. She says that

'She is getting the blood now, and her AK (anti-coagulant) treatment has been withdrawn<sup>10</sup>. But she is minus R<sup>11</sup> and minus gastroscopy<sup>12</sup>. There is some suspicion of malignancy<sup>13</sup>. The treatment is blood transfusion and conservative treatment.'

I talk to Peter a bit more. He fills out a few forms. It is getting quieter now. There are no patients left for him to see. There will probably be more during the night, though.

## Reflection #1 – A local spectrum of normality

We, more or less, recognize the sequence of data-collection that medical students are taught. Peter interviews the patient and – because she does not say much – proceeds to the physical examination. He then summarized the story and the findings, decided on diagnostic tests and management of the patient. We see through the case how different actors provide new elements of information that may or may not enter the decision-making. We can also see that the simple step-by-step reasoning taught to students and given in the structure of the patient's record is, in practice, less ordered, with several parallel processes and sometimes with loops back to earlier stages to reinterpret and refocus. Any clinician, who has been working in internal medicine will recognize the elements and the general structure in the case.

In this case, the old woman is first suspected of dehydration and possible infection. Questions of possible heart disease also enter the picture. These conditions are all potentially serious and also common in an internal medicine department. Else was found to have a bleeding ulcer, possibly induced by NSAID taken for pain in her back. Retrospectively, the indications of this were there upon admission: There had been a rather quick deterioration of her condition, she was more tired than usually, complained of abdominal pains and her stools were black. Much of this information came from the daughters and the grandsons. However, this did not come to the fore before the haemoglobin count came out. Up till then the possible diagnoses in the journal and in the conversation between doctors and nurses were urinary infection, pneumonia, dehydration, atrial fibrillation, hypotension and others more usually encountered at the department of internal medicine.

This development in the case hints at what we may call “a spectrum of normality” at the department: There are conditions that are common and thus part of the normal everyday practice in this particular setting. They are not common in life outside the hospital, nor are they common in a surgical department. Thus, the pattern is local, although other departments with the same medical specialty are likely to have the same prevalence of these conditions. The conditions have partly overlapping symptoms and signs, so in appearance they are a spectrum more than a number of distinct phenomena. Because they are common here, doctors and nurses working in this setting become conditioned to expect them in new patients and use the spectrum in the interpretation of the patients symptoms, and provide suggestions for action – tests to perform, treatments to instigate.

Note that when I ask Peter about the patient's condition, most of his answer focuses on what should be done rather than what he knows and believes about the patient. There is some indication of possible diagnoses, but his prime objective is to find out what to do. This was a general finding concerning diagnostic information in the fieldwork. It is either standard information that just always has to go into the journal, or it is more specific information aimed at making certain routes of action possible. The diagnostic process is a search to define a problem, but also to define it in such a way that it opens a pathway of action.

What these pathways are will be examined more with the next case. But first note from the extract of the clinical action above, how intensely complex the processing of information to create meaning in clinical practice is: All kinds of information are being written, said, exchanged, compared, and questioned. This is also something we will pay attention to in the next case in which the patient is a woman with suspected gastrointestinal bleeding – as Else had – admitted to a department of abdominal surgery in which this condition is commonly treated. I have reduced the case in length to focus on the diagnoses suspected by the doctors in the case and provide fewer details than I did in Peter & Else.

### *The case of Christine and Milla*

It is a day a few months into the fieldwork. I follow the intern Christine in her work at a surgical department. She already has a good idea of the layouts of the hospital, the general procedures and the spectrum of diseases the patients usually have at this particular department, but many specific procedures remained new to her and she is much aware of this and – she later told me – very alert because she does not want to do anything wrong in her management of the patient or to make a fool of herself.

It is still early in the day, around 10 AM. She receives a call from the emergency ward. A young woman, Milla, has arrived and (on the basis of a history of vomiting of blood) a medical doctor has decided to transfer her to the surgical ward because he suspects that she might have an *upper gastro-intestinal haemorrhage*<sup>14</sup>. When we enter the emergency ward, the medical doctor is sitting at a desk going through a file. The patient is in an examination room with the door closed. Christine goes to see the patient. We enter the room where Milla is lying on a hospital bed in the middle of the room. On the table next to the bed is a small bowl with some blood-coloured fluid in it. She is awake and Christine starts to interview her. She then performs the physical exami-

nation. The interview and the examination is done somewhat quicker than usually as Christine is aware of a potential bleeding that may be dangerous if it continues to long. She is, she tells me later, focusing on finding a quick and relevant series of actions rather than spend to much time collecting data.

Milla has a low blood pressure – 100/60, and Christine suspects a serious and potentially lethal blood loss and plans to transfer the patient to an immediate gastroscopy<sup>15</sup>. She calls the operating nurse to book this procedure. However, in the patient's file – lying on a table to one side of the room – Christine finds additional information that makes her reconsider. At a previous admission to the hospital, Milla had the same blood pressure without any sign of bleeding. A post-it on the front of the journal left there by the nurse state that Milla's temperature is 38.5. Christine reflects that maybe the blood in the bowl is not from vomiting, but from coughing. She re-examines the patient, doing a more thorough stetoscopy and percussion of the lungs and finds a change in the respiratory sound on the left lung – Christine suspect that the patient suffers from *pneumonia* and she cancels the gastroscopy. Instead she fills out a requisition for x-ray of thorax and the nurse calls a porter to transport Milla in her bed to the x-ray department.

Milla and I go up a few floors to the bed unit where Milla will be taken after X-ray. Christine informs the nurse there and dictates the information she has into Milla's journal. After a while she looks up the X-ray for Milla. The X-ray of the lungs seems to be normal and this – combined with the fact that Milla had complained of abdominal pain – leads Christine to suspect that an abdominal condition may after all be the cause. She talks to Casper, one of her more experienced colleagues at the unit, and they go to see Milla together when she returns from X-ray. One of the nurses is there as well. Casper talks briefly to Milla, examines her abdomen and he suggests to Christine that Milla may have *cholecystitis*<sup>16</sup>. This had already been suggested by the nurse who received Milla when she entered the bed unit. However, an hour later the answer to the blood tests are available, and they seem to contradict this: the liver- and gallbladder parameters are normal. CRP and leucocytes are both high. So, apparently it is an infection of some kind, but not in the gallbladder, or can you have that diagnosis even though bilirubin and ALAT are normal? Now, what to believe? Christine is frustrated and feels insufficient – even stupid. The patient still runs a fever and has upper abdominal pain – what could be the matter? Christine starts to suspect a *urinary infection* since this is the only set of abdominal organs that have not been examined yet.

A consultant at the bed unit, a specialist in urology, hears of the suspected urinary infection, which – because of the division of labour at the unit – means that he will be responsible for the patient. He sighs, as – he tells me – he is already overworked and would prefer not to have additional patients to care for. He therefore goes through Milla's data to see if he can find another explanation. He looks in the file, looks at the lab results and looks at the x-ray on the screen. He then informs Christine that Milla seems to have *pneumonia* and thus she is not his responsibility.

At this time it is discovered that the X-ray of the lungs was at first misinterpreted – or rather that the first image was not the correct one, but an older one of the same patient, taken half a year previously. The new – correct – image is showing a whiteness of the left lung, which is compatible with the diagnosis *pneumonia*. Now, suddenly, everything seems to add up: The patient has *pneumonia*, she has a fever due to this, and as a result of nausea and coughing she throws up which makes her develop a painful abdominal cramp. The patient is then transferred to the medical department.

## Reflection #2 – Local hierarchies of information

You probably recognize many of the same features as we saw in Peter & Else: The patient has entered the hospital, been put into bed in a room suited for examination. Initial evaluation and standard measurement of blood pressure and temperature is done by a nurse. The doctor then interviews, examines and prescribes test and treatments. In this case the patient is transferred to a bed unit where a reassessment is done and adjustments made to diagnosis and treatment. In the case of Peter & Else this was instead done in the reception ward rather than in a more specialized bed unit, but the standard process was the same. We also see how more senior doctors are involved after the initial assessments are done.

In Christine & Milla we see a diagnostic process almost opposite to the process in Peter & Else. Else was a woman initially suspected of an infection, possibly pneumonia or urinary tract infection, but eventually found to have upper gastrointestinal haemorrhage. Milla was at first suspected of having a GI bleeding, but eventually found to have pneumonia, with urinary tract infection as one of the intermediary diagnoses. In the case of Else it was the low haemoglobin, which eventually turned the doctors' attention towards a possible bleeding. In Milla's case it was the (second) interpretation of the x-ray, which decided the diagnosis.

From the two cases, we may suggest a hypothetical pattern in the diagnostic process: In both cases, there are diagnoses, which are more easily arrived at. These are diagnoses for conditions most commonly encountered at this particular department and for which there are established local pathways of action available: Gastrointestinal haemorrhage is relatively common in abdominal surgery and the nurses and doctors there know how to manage this condition. The bed unit where Milla goes after x-ray mostly sees patients with diseases of the liver, gall bladder and urinary tract. So here, the diagnosis cholecystitis and urinary tract infection are common. They are part of a local spectrum of normality, as I termed it above.

This spectrum, however, does not in itself explain the suggested diagnoses. Rather, it seems to serve as a sounding board on which to play with the available information. Clearly, in the cases, it is possible to suggest diagnoses from outside the local spectrum of normality, but only if the information is sufficiently strong to convince the key actors. Which may lead us to reflect on what – in these settings – makes information “sufficiently strong”. In Peter & Else we saw that relevant information from the patient’s family members did not fit with the initial diagnosis, but was reconsidered after the lab results came in. In Christine and Milla, the info from the patient record combined with the physical examination was at first enough to step outside the spectrum of normal abdominal diseases. But as the x-ray was (incorrectly) found to be normal, the process moved back into diagnoses from the abdominal region, as we would expect at this department. So some kinds of information seem to have supremacy compared to others. The patient’s voice, the young doctor’s evaluation, the nurse’s assessment, the experienced doctor’s reasoning, the lab results – how are they related, and which kind of information is trusted by the key actors over other kinds?

The cases illustrate how different sources of information may contradict each other and how there is a risk of neglecting the patient’s voice and the young doctor’s reflections in the process of decision-making. This was a recurring theme in the fieldwork, but I will here limit the description to one general finding: Some sources of information were more powerful or had a higher status in clinical practice than others. Written sources would outrank verbal sources. Senior doctors and nurses would often outrank young doctors and patients. There was an informal local hierarchy of information and this helps to explain the diagnostic process in Peter & Else and in Christine & Milla: When a doctor with more experience has made an initial assessment of the patient – as the doctor did with Milla before Christine saw her – it is more difficult for the young doctor to deviate from

this assessment. But when Christine found written evidence that Milla had had a low blood pressure before, it helped her reconsider the case. When Carsten, the more experienced surgeon, suggested cholecystitis this outranked Christines reflections on a possible diagnosis, but when lab results – a written source – came in, they ruled out cholecystitis. It is not a hierarchy carved in stone; it is flexible and adaptable. But it suggests and guides the actors – in this case the young doctors in particular – in the process of sense-making.

### Reflection #3 – Pathways of actions

After telling you about Peter & Else, I briefly reflected that Peter was trying to define problems in ways that allowed for pathways for action. We may tentatively hypothesize from the two cases that the doctors are looking for acute problems to focus on. This makes sense in settings where acute problems are the norm, and indeed the reason hospitals have the reception wards for new patients. But they are also looking for problems that are simple, in the sense that they have a single cause – bleeding, bacteria – and are located to a single organ system – the ventricle, the lungs. For these kinds of problems there are routine procedures to follow, which are efficient. Surgeons know how to handle a bleeding ulcer and internal medicine doctors know how to handle pneumonia and infections. These pathways of actions observed in the cases involve several steps – particular tests and - based on results – particular treatments and management strategies. The pathways also share the common features that they make use of medical technology – intravenous access, biochemical analysis, diagnostic imagery, pharmaceuticals - and they are quickly instigated and allow a rapid progress in the management of the patient. Are these patterns of searching for **Acute Simple** problems for which **Technical Rapid Action** exist a general feature of clinical settings? These pathways – that we could give the acronym *astra* pathways – appear to be non-formalized procedures, which allow efficient management of patients within a particular local spectrum of normality?

Going back to my reflections in the beginning of this article, we may question the assumption that information from the patient's mind and body pass to the physician un-interpreted and is then combined into the most likely diagnosis. Rather, each piece of information is weighted on the scales of the informal hierarchy which exist for different kinds of information; it is combined with other pieces to search for a match with local spectrums of normality, and it is used in a search for

action, preferably through a pathway where an acute and simple problem is taken from the larger whole; a problem for which a locally negotiated series of technical rapid action is available.

## Should we abandon Sherlock Holmes?

The interns know much of what is usually considered knowledge in medicine: Textbook knowledge of diagnoses, symptoms, tests to do, treatments to instigate, and the extensive patho-physiological universe of information of the human body and its diseases. They acquire more of this knowledge in the course of internship, and there is an expectation that this is enough: if the doctor knows enough, she will be able to find the right diagnosis and select the best treatment.

The cases presented challenge this perception. In this article, I have focused on the impact of the spectrum of diagnoses most commonly used in specific locations and how each of these are connected to a pathway of action that is locally available. In addition, a hierarchy of information sources exist that help decide on diagnoses to pursue and pathways to follow.

A relevant critique may be raised against my selection of cases exactly because they are a selection. In some ways it mirrors the selection of information performed in the cases themselves: From a wide spectrum of information sources, I present just two examples and claim a more general relevance that goes beyond the actual cases and the clinical settings in which they took place. I would like to qualify, therefore, what kind of “general relevance” I extract from these cases.

First, the setting for the two cases – the entry of a patient with an acute medical problem into a hospital ward – is the archetypal situation used in the description of diagnostic work, indeed often used as the prototype situation for all clinical decisions. If we accept, as I have argued above, that in these cases the local context, with its *spectrum of normality* and with available *astral pathways*, plays a role in the diagnostic process, we must also accept that this may be the case in other situations in the same type of setting. The patients in the cases do not have, as I am sure most physicians would agree, exotic or unique clinical problems or present these in a mysterious or clouded manner. They are patients and problems that one may encounter in any hospital.

Second, it is no surprise – from an anthropological perspective – that a human being in their interaction with other human beings will be sensitive to the socio-material context in which they find themselves and that the meaning-making in

the interaction will involve - and adapt to - local context. But the developers of theory and tools for clinical decision-making have apparently not had this perspective sufficiently in mind. The anthropological literature on reasoning and rationality from Evans-Pritchard's classical study of the Azande (Evans-Pritchard, 1976), over Winch's rethinking of some of Evans-Pritchard's findings (Winch, 1964) and on to a critique of science as a haven of pure reason by Latour (Latour, 1991) give strong indication that nowhere is human reasoning free from the socio-material context where it takes place. That a field of knowledge – diagnosis of acute disease – in medicine is thought to be context-free or at least see context as a “pollution” of the “pure” diagnostic process is a call for scientific scrutiny and curiosity. The theoretical framework developed by Mary Douglas in “Purity and Danger” (Douglas, 1966) could make a good starting point for such an exploration.

You may get the idea that my selection of cases are examples of the diagnostic process going wrong and that I claim this to be a general statement about hospital departments. This is not the case. I believe, and have many case-stories that support it, that more often than not a local spectrum of normality is a relevant context for interpreting a patient's health care problem, and the astra pathways are effective ways of managing many problems that are indeed both acute and simple. But the power of the local context in the diagnostic process becomes visible in cases where the patient does not fit the spectrum or have a condition that fall outside what the astra pathway is fit to manage.

Interesting questions for future research emerge from this: If local spectrums of normality, astra pathways and local hierarchies of information exist, they must be created and modified over time. How do they develop? And how do they transfer to newcomers like the young doctors? There is indication of organizational dynamics that would be interesting to study more closely, including the issues of power within a health care organization like a hospital and how it may impact the diagnostic process and decisions about therapy and management. Social power and organization should be included in the analysis of clinical decision-making in acute and emergency medicine.

Should we then abandon Sherlock Holmes as the ideal for the master diagnostician? If we look at the extract in the beginning of this article, in which Holmes deduct that Watson has been to Afghanistan, he does this from a position in late nineteenth century London. His thoughts about the medical gentleman, the military and the tropics depend on current knowledge about Britain's activities in Asia at the time and the understanding of London as the centre of an empire to which wounded soldiers may return. Today, with the military activities in Afgha-

nistan, a contemporary Holmes could possibly make the same statement about Watson, but had he made it in the 1920s or the 1960s a number of African countries rather than Afghanistan would have been a better match for his observations. And actually, Conan Doyle let Holmes solve most of his cases in London – thus in a known spectrum of normality. A case like *The Hound of Baskerville* proved difficult to Holmes and was only solved after a prolonged stay in the moor where the crime took place to allow him to adjust his reasoning to a different context. Watson with his sensitivity to context and social relations is a very fit and appropriate companion for Holmes, and his qualities are probably underrated when clinician-teachers try to communicate the intricateness of decision-making to students.

Students and teachers of anthropology are more aware of this, I think. They learn to understand themselves as part of the subject for their observation; in fact they learn that to think of oneself as detached from the field limits both what they can see and how they can understand and analyse what they see. It is interesting to think that just as anthropologists have stayed away from studying the acute emergency medical cases that constitute the crown jewel of medical expertise (as the hierarchy by Album demonstrated), so have medical practitioners not taken into their professionalism the ethnographic fieldwork, the diamond of anthropological methodology, and its potential for daily clinical practice. Maybe an ethnographic gaze would help Peter find Else's ulcer. Maybe it would help Christine to see the local patterns of meaning-making that veiled Milla's pneumonia.

## Notes

<sup>1</sup> fainting

<sup>2</sup> abnormally high blood pressure

<sup>3</sup> a relatively common disorder in the bioelectric impulses in the heart that creates an irregular heart rhythm.

<sup>4</sup> Lower legs

<sup>5</sup> a regular but fast heart rhythm

<sup>6</sup> 'Stixed' refers to the use of a certain stix, which has been chemically treated at certain points to create a specific change of colour indicating the level of protein, sugar, nitrite, blood and leucocytes in the urine. This is usually performed by a nurse, but in most clinical settings, the doctor needs to ask the nurse to do it, thus making it a part of the available actions, the intern may perform.

<sup>7</sup> 'The little Japanese' is a common slang word among doctors. The ECG comes out on paper showing the different leads representing the electric activity of the heart measured from different angles. At the right hand end of the paper there is a short text with a suggestion of a diagnosis based on the computations of the ECG-machine. Some of the machines are from countries in the Far East, and "the little Japanese" is thus a suggestion that the machine is a helper, a little bit human perhaps, giving clues to the doctor. However, the expression "the Japanese is a little jumpy" is also used. It suggests that the diagnoses suggested by the ECG are often too serious as little disturbances in electrical activity are interpreted as significant. Thus, the helper provides clues to diagnosis, but should not necessarily be trusted.

<sup>8</sup> Haemoglobin is a composite protein molecule in the red blood cells. The count is used here as a measurement of blood loss. The normal interval for the test is about 7.0-10.0.

<sup>9</sup> The terms 'bag' and 'portion' is used interchangeably in a Danish clinical context when referring to blood transfusions. The 'bag' is a special plastic container containing half a litre of blood, but may also contain other fluids for intravenous administration, which are also referred to as 'bags'.

<sup>10</sup> The Danish term here is *seponeret*. In the journal text the word 'seponat', abbreviated 'sep' is used, whenever a treatment or procedure is to be terminated. Thus, when using the term as a verb, as it is done here, it refers to the action, which follows the 'sep'-prescription.

<sup>11</sup> 'Minus R' is short for 'no Resuscitation in case of cardiac arrest', indicating that the patient is in such a poor general condition that trying to revive her, if her heart stops beating, is pointless as there is no hope for improving her quality of life or extending her remaining lifespan. It generally indicates that the patient's death is expected to be within the next 1-2 days. In Chapter 16 (p183), I describe a situation where Christine is required to write an entry of 'minus R' in a journal and her reflections on this:

<sup>12</sup> Gastroscopy is the examination of the upper gastrointestinal tract using a fiberoptic scope (see Christine & Milla, p63). In this case the second-call indicates that there is no reason to do a gastroscopy, because the patient is in too poor condition to survive the surgery. That might be the case if an ulcer or indication of a cancer was found. However, sometimes it is possible to stop the bleeding in the course of the gastroscopy and avoid open surgery. We must assume that the second-call has reasons for making a different choice of therapy for Else. The footnotes here simply indicate that beneath and before the use of these short terms 'sep', 'minus

R' and 'minus gastroscopy', an extensive construction of information is going on. The terms may sound simple, but they are not.

<sup>13</sup> Another way to say "suspicion of cancer"

<sup>14</sup> An upper gastro-intestinal haemorrhage is a bleeding from the oesophagus or the stomach.

<sup>15</sup> Gastroscopy is an examination of the upper gastro-intestinal tract with a fiberoptic telescope inserted through the patient's mouth. A visual image from the front of the telescope is produced on a monitor besides the bed. Different kinds of instruments can be inserted through the telescope and a bleeding can often be stopped this way.

<sup>16</sup> Cholecystitis is an infection in the gall bladder often seen in combination with gall bladder stones.

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