

# Overlooking cancer

## Practising cancer diagnostics in the subjunctive mood

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Frumer, Michal (2017). 'Overlooking cancer: Practising cancer diagnostics in the subjunctive mood', *Tidsskrift for Forskning i Sygdom og Samfund*, nr. 27, 65-83

*The paper explores the management of uncertainty, when watching the possible development of signs of lung cancer at a lung cancer outpatient clinic. Based on ethnographic fieldwork at a clinic in Denmark, it is presented how potential signs of lung cancer, termed nodules, on people's lungs call to be managed due to the hope and aspirations of alleviating cancer and cancer related suffering. The paper suggests that the significance of the uncertainties of lung nodules is tried out by watching the nodule with follow-up CT-scans and opposed by focusing on intervention. Approaching the management of uncertainties as in a subjunctive mood, the paper proposes that the physicians try out a possible but indeterminate future of cancer, to contain the prognostic horizon and uncertainties by acting 'as if' cancer will develop. However, in this cautionary managing of cancer doubt and uncertainty, ambiguities are (re-)produced, leaving an interim certainty: This lung nodule is most likely not and may never become cancer.*

## Introduction

According to anthropologist Sharon Kaufman contemporary medicine is practised as *ordinary* medicine. Kaufman suggests that the desirability of disease prevention and symptom control, 'watching, waiting, testing, and treating' (Kaufman 2015: 21), is taken for granted and valued as essential components of good

healthcare. Routine intervention as unremarkable, as well as not acknowledging a line of 'too much', is what Kaufman specifies as *ordinary* medicine. This kind of medicine is influencing us as humans to think that 'the body is infinitely fixable and life is infinitely extendable' (Kaufman 2015: 26). Kaufman furthermore describes the drive of this development in terms of how technologies of risk push our awareness of the risk of disease. It then becomes a moral imperative for patients and physicians alike to act to prevent this risk from developing into a bodily expression of disease:

*"There is more risk to be aware of because technologies enable us to see and understand it as never before and to do so ever earlier in the course of disease [...] The more risk we know about, the more things we can (and therefore must) do to avoid and ameliorate it"* (Kaufman 2015: 35).

Risk as a driver for action or intervention is a central theme of this paper.

As a concept, *risk* has been theorised in different manners in accordance with sociological, cultural or historical approaches. Sociologists have argued that so-called late-modern risks and accompanying uncertainties are qualitatively and quantitatively different from pre-modern risks (Beck 1992; Giddens 1990). These new risks cannot be restricted spatially, temporally or socially, and therefore they cause greater reflexivity and anxiety about the contingencies of life. In opposition, others have argued against this notion and other illusions of modernity or emphasized equivalent functioning of models of misfortune and models of risk (Latour 1994; Douglas and Wildavsky 1982). In *The Taming of Chance* (1990), the philosopher Ian Hacking tracks the genealogy of *risk* and the development in scientific reasoning of what he terms *an erosion of determinism*. Hacking argues that the probabilistic conception of risk evolving with modernization is a radical break in styles of reasoning compared to earlier ways of conceptualizing misfortune. Hacking points to the gradual transformation in the 19<sup>th</sup> century of the understanding of the world as regular, but not causal. Instead of laws of nature that determine an outcome, we have chance and risky arguments based on probability. Probabilities in this sense came to tame the randomness of undesirable events, acknowledging the fundamental indeterminacy and irregularity of a universe of chance, but constructing a basis for acting (cf. Hacking 1990: 10). It is this basis for acting that I wish to explore further in the paper.

The paper has its empirical foundation in lung cancer diagnostics. In Denmark, lung cancer is the second most frequent diagnosis of cancer and the leading cause of cancer related death (Saghir et al. 2015). Smoking is a well-known risk factor,

and the incidence rates of lung cancer have risen sharply during the past sixty years, whereas the five-year survival-rates have remained stable around 5-10% (Jensen, Mainz, and Overgaard 2002). In scientific literature, chances of survival are strongly associated with the possibilities of curable treatments possible in the early stages of the disease (Saghir et al. 2015). As in other cancer settings, this is based on a premise of 'the sooner, the better', as practiced in so-called *early detection*: the earlier a cancer – or a precursor to cancer – is identified, the better the survival odds (Cantor 2007: 2). In Denmark, cancer was reframed as an acute disease in the noughties and urgent referral or fast-track cancer pathways were implemented to ensure early diagnosis. Especially the low survival statistics when comparing Denmark to other Nordic countries was enhanced as an element in this reconfiguration of cancer (Tørring 2014; Probst, Hussain, and Andersen 2012). With cancer on the political agenda, the disease continues to be prioritized financially (Sundheds- og Ældreministeriet 2016) and the push for early detection materialises in a sensitisation of technologies and bodily experiences configuring yet additional potential signs of cancer (Andersen 2017).

The paper analyses the management of uncertainties in practices of lung cancer diagnostics, as acted out when detecting "spots" or potential signs of lung cancer in the CT-images of patients' lungs. The significance of a specific spot, also called *nodule*, is indeterminate: It might develop into cancer, it might be a scar after lung infections, it might just be there for no clear reason, and it might disappear again. In other words, nodules do not pose a biological risk in themselves; Only in association with an uncertain future of potential cancer are they deemed potentially dangerous due to the social configuration of cancer. As a result, uncertainties both originates in prognostic uncertainties inherent in probabilities and uncertainties referring to more personal horizons of cancer-related deaths and social suffering. Consequently, this paper revolves around what I experienced as the main concern for the physicians at a lung cancer outpatient clinic (LUCA) in Aarhus, Denmark in the case of nodules: How to manage what we have seen on the CT-images? Should we follow this nodule to see how it develops or not? The practices of early detection as a practice for managing the uncertainties of lung cancer thus shed light on, but also seem to reproduce, additional uncertainties relating to the deadly potential of lung nodules.

As a result, this paper adds to writings on *subjunctivity* (Whyte 2005) when exploring conditional certainty of a plan for action. In a pragmatic engagement with the world, the subjunctive enables practises seemingly sidestepping nodule uncertainties, while simultaneously exhibiting the ambiguity of nodules and the

continuous process of producing yet more uncertainties. As a concept, the subjunctive has been applied in medical anthropology in the work of Byron Good and Susan Whyte (Good 1994; Whyte 1997; Whyte 2005), but has also served in recent research on witchcraft (Bubandt 2014) and rituals (Seligman et al. 2008). In contrast to a voice of certainty, the subjunctive is the grammatical mood of a verb indicating 'doubt, hope, will and potential' (Whyte 2005: 251). To be acting in a subjunctive mood thereby denotes an experimental 'as if' (Seligman et al. 2008: 7) that enables the possibility of sharing a 'potential space of what could be' (Seligman et al. 2008: 23). Employing the idea of the subjunctive thus recognizes the multiplicity and inherent ambiguity of social and natural life. Before clarifying my analytical position, I will first give a note on methodology.

The paper is based on four months of ethnographic fieldwork at LUCA in the fall of 2015, interactively observing (cf. Wind 2008) physicians and nurses in their daily work practices as part of my thesis-project in anthropology. At LUCA I attended the daily morning-CT conferences where radiologists and physicians assessed the newly described CT-images of patients, the twice-weekly Multi-Disciplinary Team-conferences where more complex cases were assessed, as well as participating in consultations with patients by both physicians and nurses. I conducted semi-structured interviews (Kvale 2002) with four health professionals at LUCA and at least one interview with five follow-up patients in their homes. My patient-informants did not have a face-to-face consultation at LUCA during my fieldwork. I have followed lung nodules through the clinic but also at a Radiological Department, where I spent a day observing CT-scans and attended the CT-scans of three of my patient-informants. This paper primarily focuses on uncertainties of not-really cancer as played out in everyday clinical assessments. The paper hence contributes to an emerging anthropological field of 'cancer before cancer' (Offersten 2016; Manderson 2015) to supplement the extensive focus on the perspectives of oncology or actual cancer patients.

## Subjunctivity in nodule follow-up

Susan Whyte suggests that the contingency of the subjunctive is an aspect of managing uncertainty that situates concerns by evoking possible futures (Whyte 2005: 254). Whyte concentrates on the Nyole setting of Uganda, where she describes how biomedicine is enacted as a distinct mode of managing uncertainty, separated from the subjunctive of ritual practices (Whyte 2005: 252). In divinatory rituals, the possible agents behind the suffering are identified to designate a motive, a cause, and suggest a plan to straighten out a relational dispute (Whyte 1997:

60-83). In contrast to this, Whyte describes biomedical tests and treatments in this rural area as symptomatic since they do not problematize or treat the cause of symptoms.

In this paper, I instead explore subjunctivity in a Global North, biomedical setting. I will thus argue that at the clinic of LUCA the management of lung nodules resonates with the Nyole ritualistic management of uncertainty in terms of subjunctivity. In the case of lung nodules, what a nodule signifies is uncertain and a question of trying out the significance through watching it. As such hope is in both cases, rural Uganda and urban Denmark, gathered around a concern about the future and the uncertainty of the outcome, but not least linked to an uncertainty about aetiology (cf. Whyte 2005: 263), specifically what is the cause of this nodule? Will it be cancerous?

The means at hand, an algorithm recommending follow-up intervals, gives the conditional basis of acting, a plan to be followed, which physicians and patients in everyday clinical practices go along. Concurrently, the physicians concern themselves that their attempts at alleviating suffering might fail. Patients come to the physician with a hope of being told where the lung nodules come from, what is going to happen and where and how it ends (cf. Whyte 2005: 253): Is this cancer or is this not? How will this nodule affect me and the life I am leading? Instead of preaching firm conclusions, the diviner or physician has 'the task of establishing conditional certainties' (Ibid.: 253) by proposing a plan that is deemed reasonable by the patients. The physicians at LUCA simultaneously reassure patients not to worry and still act as if cancer could be present. In this manner, it is the evoking of possible futures coupled with the lack of certainty about the properties of the agent, the lung nodule, which epitomizes the subjunctive mood: This lung nodule is most likely not and may never become cancer.

This sort of managing uncertainty furthermore points towards a pragmatic engagement of the physicians in their clinical practices. I therefore suggest that the practices of nodule follow-up circle around a dialectic of knowing and not-knowing. According to the pragmatism of John Dewey (1960 (1929)), humans fundamentally grapple with the world not as onlookers or spectators, but by acting in practice:

*"If we see that knowing is not the act of an outside spectator but of a participator inside the natural and social scene, then the true object of knowledge resides in the consequences of directed action"* (Dewey 1960 (1929): 196).

Thus, the response of following nodules with CT-scans do not resolve the surrounding ambiguities or uncertainties on the nature of the agent, the nodule. Instead, the practices inspire acting. Importantly, the configuration of nodules, early detection, and the related uncertainties are shaped and changed in this process of engagement (cf. Mol 2002).

To recapitulate, the argument of the paper is that the physicians at LUCA try out a possible but indeterminate future of cancer through the follow-up algorithm by acting 'as if' cancer may develop. These practices at first hand shed light on, but then also reproduce, uncertainties relating to the perhaps deadly potential of nodules.

Before introducing the specific case of Mary, a patient I met at LUCA, I will introduce nodule assessment 'behind the scenes'. I will describe the assessment as it plays out at one of the Radiological Departments of Aarhus University Hospital, when a person is CT-scanned, as well as how it travels through machines, persons and papers to the physicians at LUCA. At LUCA the physicians have consultations with the patients, whose CT-images initiated the flow of events.

## Nodules objectified: CT-images and morning-CTs at LUCA

It 'takes guts' to close a case or keep insisting on a cancer suspicion. This is how some of the physicians at LUCA reflected on the practices of nodule follow-up – but why is it so? The assessment of follow-ups relates to the specialists' concerns about balancing too much and too little intervention, about balancing the search for an early diagnosis with potential harm or worries for patients. Uncertainties abound: Issues of age, level of cancer suspicion, technological restrictions, workload, cases difficult to categorize, the risk of generating scanning-induced cancers and the limited time to settle a trajectory. All these aspects play into the diagnostic assessment performed at morning-CTs and in the clinic. Furthermore, the uncertainties of lung nodules are alleviated through acting upon it. As the physicians reflect, they do not know if this specific nodule develops or not, but they act upon a prospective concern of cancer by following the nodule with continuous CT-scanning. The physicians try to balance cancer suspicion with the possibility of inducing worry or discomfort for the patient. Sometimes the trajectories of the patients follow the regular intervals as this is seen as safer. Safe in this sense rela-

tes to the health of the patients: The 'damage' of a quick CT-scan or two is incomparable to the prospects of lung cancer. But safer also relates to the specialists: The risk of overlooking an aggressive lung cancer is a responsibility and a decision too overwhelming for the individual specialist. As several physicians told worried follow-up patients, "We like to wear both belt and braces", a way of saying that the physicians do not take chances and, as an institution, would rather intervene too much than accepting that a patient would develop an unnoticed cancer. When dying of cancer is essentially what is at stake, mistakes are not tolerated, as one physician reflected: »The procedures of CT-scanning are also sort of a safety-net for our sake, like 'ohh we must not make any mistakes, so we'd better...''.

Through fieldwork I experienced two overall bases for a CT-scan of the lungs, what physicians refer to as *the indication*: 1) The patient had consulted her general practitioner (GP) on a bodily concern, who on the basis of their conversation would refer the patient to the hospital for a CT-scan because of possible signs of lung cancer. 2) The patient had been referred directly from another hospital department; Here the physicians, while examining for something else, for instance when performing a CT-scan focussing on the heart, would have detected possible pathological changes in the lungs. When the patient's lungs have been scanned, a physician specialized in chest radiology, a radiologist, assesses the images. The radiologist writes a short summative description following a template distinguishing several key issues of relevance for deciding a trajectory. The description is written in a passive voice indicating that whoever would assess the images would reach similar findings and conclusions. Like Timmermans and Berg argue (2003), you cannot see the individual and messy steps of interpreting the images. The final description instead leaves the impression of a true description (cf. Timmermans and Berg 2003: 66) that can travel unchanged from the Radiological Department to LUCA.

All new case-descriptions related to the lung cancer fast-track are run through at the daily morning-CT conferences, where a radiologist and a lung specialist from LUCA, one of the senior physicians, attend. Usually, the radiologist prepares the conference beforehand by getting the patients' images on the large screens hanging on the wall. The morning-CT lasts less than 30 minutes with the images of between 15-20 patients and possibly some extras not on the list being run through. The tempo of the conference is up-speed, leaving time only for a brief presentation of the patient-case, where the radiologist mostly indicates the preferred trajectory. In relation to lung nodules, there would be the overall decision on whether to propose a follow-up or not, and in case of a follow-up to settle



on the time interval to the next follow-up based on the international Fleischner-algorithm (DLCG 2014: 12):

### Algorithm for follow-up of solid pulmonary nodules

Nodule size	Low-risk patient (e.g. never-smoking)	Risk patient (e.g. smoker > 40 years <sup>§</sup> )
≤ 4 mm	Follow-up not indicated	CT follow-up at 12 month, if no change then ended
> 4 → 6 mm	CT follow-up at 12 month, if no change then ended	CT follow-up at 6-12 month, if no change then again at 18-24 months
> 6 → < 8 mm	CT follow-up at 6-12 months, if no change then again at 18-24 months	CT follow-up at 3-6 months, if no change then again at 9-12 months and 24 months
≥ 8 mm	CT follow-up at 3, 9 and 24 months (if no change) Or orderly diagnostics with contrast-enhanced CT, PET/CT or biopsy.	Follow-up and/or diagnostics like low-risk patient.
<sup>§</sup> Other risk-indications may e.g. be former malignancy or environmental exposure (e.g. asbestos).		

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The consensus-based algorithm is also a means to limit the time spend on each individual case as the follow-up interval directly follows from the size of the nodule and the risk-status of the patient. As seen in the algorithm, nodules only have visual properties: you cannot biopsy, feel or smell a nodule – only see it in CT-images. Its biological properties are indeterminate. Nodules are thus a product of ever more fine-tuned imaging technologies and the dilemma of cancer in a set



ting of early detection. Nodules would not materialise if this setting was different. This sort of scientific phenomena can be described as *techno-phenomena*, as defined by Allan Young as products of ‘technologies, practices, and preconditioned ways of seeing’ (Young 1995: 10).

At a morning-CT in October 2015, prompted by my description of my fieldwork project, Nicole, the radiologist, tells about her recent study-visit to the US and the lung cancer screening trials they are conducting ‘over there’. She describes how the specialists re-scan participants above the age of 55 every five years if the screening participants have an empty scan without “significant alterations”. Nicole then adds with a smile: “But as a smoker above the age of 55, nobody has an empty scan!” As presented by Nicole, nodules in older smokers are thus in terms of frequency comprehended as normal. A recent Danish trial on symptomatic patients showed that a nodule was identified in 22.7% of the conducted CT-scans (Guldbrandt et al. 2014). This implies normality as that within the statistical norm or average (cf. Hacking 1990: 107-108), regularly occurring, but still treated as potentially pathological and in need of being watched.

At a morning-CT in November the images of patient no. 17 on the list is up on the screen. While Catherine, a senior lung specialist, writes the plan for the patient, Nicole, the radiologist, starts typing the personal identification number of the next patient into the computer. The CT-images of the next patient appear on the screens. This is now patient no. 18:

Nicole: *“Previously pneumonia times two. This also looks like a classic pneumonia”.*

Catherine: *“Well, I’ll take her in for a bronchoscopy – and see if we can find something”.*

Before I have finished scrambling my notes, the next patient is already up on the screen and the radiologist almost done presenting the case:

Nicole: *“Ex-smoker, NB c. pulm. [cancer, pulmonary]. There’s a 5.5 mm [lung nodule]”.*

Catherine, while noting the interval on the description: *“So, follow-up in six months”.*

As represented, the run-through is brief and focused, based on objectified forms of knowledge and mostly reporting what has already been indicated by the radiologist describing the CT images. Still, it is the voice of the subjunctive which provides the basis of acting: “it looks like” pneumonia and we’ll “see if we can find something”. In the case of nodules, the radiologist notes the patient as at risk or not, for instance if the patient is a smoker or ex-smoker with an extensive smoking history. She then notes the size of the nodule as well as the recommended plan sometimes supplemented by the lung specialist voicing the exact follow-up

interval. Immediately, this left me with the impression that the assessment of nodules is a straightforward evaluation: Risk patient + 5.5 mm nodule --> Follow-up in six months. And indeed, many of the assessments of patient-cases follow the standard template. However, behind this template is a case of negotiating various modes of uncertainty, for instance age, but also, as I will show, the size of the nodule, and the patients' smoking history. All of this speaks to establishing a shared level of cancer suspicion. In this sense, an answer to the basic prognostic uncertainty of lung nodules is sidestepped to be reassessed later; or rather the answer for the physicians is to subjunctively try out a specific potential future of cancer or not cancer through the algorithm. To unfold the aspect of subjunctivity, I will now introduce Mary, an elderly woman at the age of 66 years. Through this ethnographic story, I will illustrate how a subjunctive mood counters uncertainties by focusing on action.

## Negotiating the significance of a nodule: The case of Mary

I meet Mary the first time in the form of the CT-images of her lungs at a morning-CT in September 2015. Mary has undergone a scan of her heart and in those images the cardiologists have noticed a small, denser area and measured this nodule-area as being 13 mm. Mary has therefore been referred to LUCA and to a CT-scan of her lungs in order to clarify whether there is a need for further examinations. In this additional scan the nodule is now measured to a size just under one cm and the radiologist adds that "you can't do anything now", meaning that the nodule is too small to be biopsied, but implying an inclination of doing something. The radiologist therefore recommends a follow-up scan in three months as per the algorithm.

Mary has been called for a consultation at LUCA the same day. Before the consultation, the physician Sarah summarizes the basis for the referral of Mary to a medical student, who, besides Sarah and I, will also attend the consultation:

*"The patient has been smoking for a long time. She has undergone a heart-CT on the indication of chest pains, so this nodule is what we call an incidental finding, since originally it was something else she was being examined for."*

Sarah describes to the medical student that the follow-up interval of a small nodule especially depends on whether the patient is a smoker, which Mary is. She then adds: *“She [Mary] has probably been telephoned and told that something has been detected – so she is most likely a bit worried”*.

At the consultation Mary has brought her husband, who sits quietly throughout the session. In the call for the appointment, patients are encouraged to bring relatives for the consultation, and the vast majority of patients bring somebody with them. Sarah, who has not met Mary before, begins the conversation by recounting the basis of Mary’s referral and how her trajectory has been this far, to ensure a common ground for the conversation. At other consultations, the patient herself was encouraged to retell the story.

Sarah: *“As you know, a small spot of about 13 mm was initially detected, and this is why we afterwards scanned the entire lung. Here, we didn’t find anything else than the small spot and we then measured the spot to about 9 mm”*.

Mary interrupts: *“You see, I also have middle lobe syndrome [chronically collapsed lung tissue in the middle lobe] and is attended to by a private specialist – could that have something to do with all this?”*

Sarah: *“No, the middle lobe looks fine. And we’re not worried about this spot either. Many people have this kind of spot. But we would like to follow it and see if it gets smaller, stays as it is or perhaps grows in size”*.

Mary continues presenting her ‘medical history’ and describes a recent lung infection. She also tells about her use of a PEP-flutter device to help her get rid of mucus in her lungs. Sarah asks about Mary’s use of the flutter and advises her to be more diligent with it. Sarah then wraps up the conversation by summarizing what the next step is, namely that *“we would like to see you again in a three months’ time for a follow-up”*. However, Mary is not quite finished with the indeterminate spot on her lung: *“But”* Mary hesitates, *“What can it be?”* Sarah therefore returns to the spot and emphasizes that it *“can be anything”* and that spots like these *“are often seen in smokers a little advanced in years”*. Mary sighs. She is somewhat reassured by the descriptions of nodules in smokers as *normal*, even though normality in this sense does not definitively exclude the potential of cancer. Nevertheless, Mary exclaims: *“What a relief! I have been really nervous!”* On her way out, instead of shaking hands, Mary gives all three of us a hug.

I have chosen this ethnographic snippet of a consultation to illustrate how uncertainties on the properties of the nodules are practiced in collaboration with patients, and how a subjunctive mood counters uncertainties by situating the future through action. Initially, Sarah is focused on describing the characteristics of the nodule, especially the size of the nodule. For Sarah it is important that the nodule is re-measured to be below one cm as this serves as the limit of considering to biopsy. For Mary, the difference between 13 mm and 9 mm remains unexplained, only implying that smaller is better. Furthermore, Sarah describes how the detection of the nodule relates to cancer, in this case that *“we didn't find anything else”* and *“we're not worried”*. Also in morning-CTs, the relation to cancer, termed malignancy, was a central reference point resulting in the often used term of *“non-malignancy-suspicious”* [ikke malignitetssuspekt]. Then, when Mary interrupts with her more broadly related concerns regarding her lungs, Sarah plays along on this shift of attention. As a result, the properties of the spot stay at the side-line. For Sarah, the next important step is the question of what the plan should be, how to act from here. For Mary this leads back to the questions of what this nodule actually is. At the morning-CT the uncertainties of the cancerous potential of the nodule were circumscribed by the fact that the nodule is too small to be biopsied. At the consultation, Sarah furthermore plays down the potential of cancer, but she still maintains the uncertainty of outcome.

For patients like Mary, it is not the prognostic uncertainties of nodules that are at stake: It is not about questioning the basis for the evaluation of nodules or questioning the probabilistic uncertainties of being afflicted by cancer. In scientific literature, these uncertainties do create debate (cf. Hillerdal 2008; Harzheim et al. 2015). Instead, the ambiguous potential of cancer related suffering lurks more or less openly in the shadows. For the physicians at LUCA, such as Sarah, it is the uncertainties of too much or too little which seem most relevant. Together these uncertainties form the basis of what I below describe as a cautionary management that reproduce nodule uncertainties.

## Reproducing and moulding uncertainties of the potential of cancer

In patient consultations, like in the consultation with Mary, I heard various descriptions of nodules such as *“we [the physicians] are not that worried, but we want*

to keep track of it [the nodule] to see that it doesn't develop" and "At your age and as a smoker, we see this in many lungs". I also overheard the nurses when they answered telephone calls from puzzled follow-up patients. In a specific situation, the nurse Michelle described the nodules as "presumably scar-tissue", and "two small spots that we want to keep an eye on" since you "can never be a hundred percent sure" what it is. She then explained that the patient "should expect that we want to follow you for up to two years. If it then remains unchanged, at that point we dare to say that it's nothing".

As illustrated in Michelle's explanations and in Sarah's conversation with Mary, both the practices of managing nodule uncertainties through the algorithm and describing nodules to patients are loaded with conditionality and uncertainties of the potential of cancer. The practices give the simultaneous impression of risk – since we need to watch this and act early in case of cancer – and safety – because the health professionals assure the patient that she is not to worry, nodules are quite ordinary. When I asked specifically, the senior lung physicians reflected on the procedures of managing lung nodules. In an interview, Amy describes it in this manner:

*"I think they [the follow-ups] are demanding in time, and that is both for the Radiological Department and for us [in LUCA]. And then I think, in some way, that it's a bit of a diffuse thing to impose on people that, well there is something which is 8 mm big, so we need to keep an eye on that". Amy pauses in her sentence, "If we could only tell people that we know this won't develop, but we don't dare". Amy pauses a bit and then concludes, "That's why I actually find this a bit difficult".*

As illustrated with Amy, the physicians might feel personally ambivalent about the follow-up regimen, but they cannot see any other way to handle the nodules when keeping within an institutionalised setting of early detection. As such, the physicians need to manage the existential uncertainties of patients fearing cancer and balance this with a setting enrolled in action and a general feeling of nearing the limits in terms of capacity, not least due to demands of efficiency (cf. Andersen and Vedsted 2015). With the focus on early detection of cancer, GPs have been encouraged to refer patients directly to a CT-scan when the GP has a suspicion of lung cancer. This direct-CT pathway was implemented in the area of Aarhus in 2014 (Guldbrandt 2014), and the opportunity tremendously increased the number of performed CT-scans and thus the number of established lung nodules. When interviewing Amy, she reflected on the attitude of trying to limit workload in relation to the criteria of follow-up:

*“Well, personally I would also say, ‘Well then scan me’, if it was me. But I think it is a lot of bother for something which sometimes has been found entirely by accident...We are always happy if we discover that the patient has an older CT-scan where this thing [the nodule] was also present. Then we can close the case right away”.*

If a nodule is present at an earlier CT-scan, then the follow-up interval starts at that point. Is the scan older than two years, then the physicians at LUCA will argue closing the case when considering their degree of cancer suspicion. These sorts of considerations of time and workload are also reflected in several comments from the radiologists and lung specialists at different morning-CTs. Here the specialists negotiate the interpretation of nodule size and belief of cancer to try to limit follow-ups; the smaller the nodule, the longer the interval for a follow-up, with specific tipping-points as seen in the algorithm:

Lung specialist: *“Could we squeeze it [the measurement of the lung nodule] just below 6 mm?”*,

Radiologist: *“I’d rather say that the nodules are less than 4 mm”*,

Lung specialist: *“Could we say six months [instead of three]?”*,

Radiologist: *“All the nodules are calcified, so there isn’t as such a reason to follow him – We don’t have to place everybody in a follow-up regimen”.*

In the above ethnographic excerpts, we furthermore see how the physicians try out the meaning of images through practice in what can be termed a pragmatic engagement with the world. The physicians use tools, theories, and technologies in a dialectic process of knowing and not-knowing, when assessing the potentials of lung nodules. Some of these assessments vary between the different specialists, for instance based on their confidence in the field and their attitude towards overdiagnosis. Deciding a trajectory is furthermore connected to the interplay between the specialists at the specific morning-CT. One particular senior radiologist often alluded to the differences between principles and practice, for instance when mentioning uncertainties in image technology by stating: *“It is not uncommon that PET will light up without a [cancerous] basis for it”*, or by commenting on decisions not strictly adhering to guidelines: *“Has it just become routine to follow-up without knowing what happens in the rest of the body?”* At that morning-CT, the radiologist tried to take the discussion with the lung specialist and the other radiologist

who were present, “If we don’t do this [PET-scan], we might as well choose to overlook this nodule as well – there are more than one way to make mistakes, you know”. But in this case, nobody answered and the conference continued with the next patient-case.

The proposition to *overlook* something is interesting in terms of what *seeing* implies in nodule and cancer diagnostics. A nodule exists because it is technologically manifested through a CT-scan – it does not produce bodily signs in the patients beforehand. On the basis of the algorithm, the radiologists and the lung specialists together *oversee*, that is keep an eye on, the potential development of a nodule. To *overlook* then puts the foundation for the follow-up regimen at stake. Thus, if something is established or made visual via image technologies, the physician needs to act, and the preferred action for nodules is the so-called watchful waiting of follow-ups (Wiener et al. 2015). This implies a strong inclination toward follow-ups, regardless that for instance nodules are comprehended as ordinary for the majority of patients, as was illustrated by the comment of Nicole. In an intermittent lunch break, I interviewed a physician, Jennifer, who clearly articulated the aspect of *seeing*:

*“Well, we find a lot of these small thingies, as you say, that you wouldn’t have been able to see in an ordinary x-ray, but when you’ve seen them, then you have to follow up on it, and you also know that a small percentage of these nodules start to grow, and that it is some sort of precancerous lesion. Ehh, so I think ehh, that we have quite many of these [lung nodules], and we perform many CT-scans on that basis, but, necessarily, it has to be that way now that we have seen it.”*

In other words, the nodule is absent until it is seen. The nodule is a techno-phenomenon in the sense that it is not a pre-existing object with inherent properties but come into being in specific coordinating configurations. It furthermore seems that when trying to control cancer yet earlier expressions of potential cancer risk materialise. In this specific case through the detection of lung nodules but similar examples are found in other types of cancer such as bladder polyps and cell changes of the breasts or cervix (van Rhijn et al. 2009; Mannu et al. 2015; Thomsen et al. 2016). Thus, cancer as an indeterminable threat is reproduced at the molecular level. The fear and threat of cancer is in the case of nodules conflated with the disease (cf. Aronowitz 2009), yet the disease – cancer – and the possible expression of it – the nodule – is bodily absent from daily experiences of patients: the few millimetres big nodule in the lungs of patients does not produce bodily signs that can possibly be recognized.



## Concluding remarks

When cancer disease control is framed through practices and ideals of early detection, uncertainties of cancer risk are produced and reconfigured. At an institutional level, through the logics of probability these uncertainties are managed. At the specific level of physicians in a clinical setting, the response of following nodules with CT-scans develops when trying to balance the prognostic uncertainties of nodules – is this a sign of cancer? – with the prospects of doing too much or too little – either imposing diagnostics on ‘healthy’ patients or overlooking a cancer. Follow-ups do not resolve these uncertainties, for neither the physicians nor the patients; we still do not know whether a specific nodule is cancerous. However, they lay a course of action with the aim of a provisional certainty. I have therefore argued that this precautionary plan of watching nodules is an act in the subjunctive mood establishing conditional certainties: This lung nodule is most likely not and may never become cancer.

Consequently, the management of lung nodules exhibits the uncertainties and heterogeneities of cancer biology in terms of questioning who will be affected and how severe. It is about qualifying degrees of cancer suspicion in a cautionary concern with the future. Thus, approaching the practices of lung nodule diagnostics through inspiration from Whyte and her notion of the subjunctive highlights how the physicians act as if cancer is present with the hope of being able to act ‘in time’ before death is irreversible. Additionally, to include the notion of a pragmatic engagement is a manner of highlighting diagnostic decisions as configured in practices of grappling with uncertainty. Thus, biomedical practises of managing risk and uncertainty ambiguously act out potential scenarios. Consequently, uncertainties are not easily resolvable. They are instead reconfigured and produced in the processes of managing them. The different uncertainties of cancer thus migrate to the molecular level of nodules materialising in yet new formations of cancer risk.

As suggested in the introduction, the ordinary in medicine has become to watch and intervene without being able to see where to draw the line. The practices of lung cancer diagnostics teach us that the physicians at the outpatient clinic interacting with patients every day very much acknowledge the ambiguities and uncertainties of medical practice. However, “doubt is blocked institutionally” (Douglas 2001: 145) through guidelines, regulation, and pressures of efficiency. To deal with contemporary uncertainty instead seems to demand a general acknowledgement of uncertainty as the norm. To do this, practitioners of medicine need a

space to take up the inherent ambiguities of medical diagnostics and treatment in dialogue with patients to be able to suggest that there are other ways to go around these issues.

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