


# Exploring wait time variations in a prostate cancer patient pathway—A qualitative study

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## Abstract

Norwegian health authorities emphasise that all citizens should have equal access to healthcare and implement cancer patient pathways (CPPs) to ensure medical care for all patients within the same time frame and to avoid unwanted variation. Statistics regarding prostate cancer indicate longer wait times for patients from a local hospital compared to patients from a university hospital. This study describes which health system-related factors influence variations in wait times. Eighteen healthcare workers participated in qualitative individual interviews conducted using a semi-structured interview guide. Transcripts were analysed by systematic text condensation, which is a cross-case method for the thematic analysis of qualitative data. The analysis unveiled four categories describing possible health system-related factors causing variation in times spent on diagnostics for patients in the local hospital and in university hospital, respectively: (a) *capacity and competence*, (b) *logistics and efficiency*, (c) *need for highly specialised investigations*, and (d) *need for extra consultations*. Centralisation of surgical treatment necessitated the transfer of patients, with extra steps indicated in the CPP for patients transferring from the local hospital to the university hospital for surgery. The local hospital seemed to lack capacity more frequently than the

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university hospital. Possible factors explaining variations in wait time between the two hospitals concern both internal conditions at the hospitals in organising CPPs and the implications of transferring patients between hospitals. Differences in hospitals' capacity can cause variations in wait time. The extra steps involved in transferring patients between hospitals can lead to additional time spent in CPP.

#### KEYWORDS

cancer, cancer patient pathways, hospital, prostate cancer, wait times

#### Highlights

- Centralisation of surgical treatment necessitated the transfer of patients
- The extra steps involved in transferring patients between hospitals can lead to additional time spent in cancer patient pathway
- It can be a demanding exercise to comply with the authorities' requirements for specific wait times and simultaneously centralise treatment
- Politicians and health authorities should have these implications of contradictory quality indicators in mind when designing patient pathways

## 1 | INTRODUCTION

In Norway, health authorities have a goal of equal access to and offer health services for all citizens, regardless of diagnosis, gender, place of residence, personal finances, ethnic background, and individual life situations.<sup>1</sup> To achieve this goal, authorities have implemented several different measures. For cancer patients, the health authorities introduced cancer patient pathways (CPP) in 2015<sup>2</sup> to increase the quality of cancer care through better interaction between professionals about the patients, reducing unnecessary wait times and other risk factors.<sup>3</sup> There have been implemented guidelines for 28 types of cancers so far.<sup>4</sup> CPP commences when a hospital receives a referral with a reasonable suspicion of cancer.<sup>5</sup> The CPP includes investigation, initial treatment, follow-up, and possible treatment of relapse (recurrence and metastases).<sup>5</sup>

Prostate cancer is one of the most commonly diagnosed cancers in men<sup>6</sup> and wait time has become an important issue for both clinical reasons and the psychological implications on patients.<sup>7</sup> Regarding prostate CPP, specialist healthcare has 66 calendar days from the day referral is received to the start of treatment,<sup>8</sup> as illustrated in Figure 1. The health authorities require that 70% of all patients who follow CPP complete the steps within the defined deadlines,<sup>8</sup> and one of the national quality indicators measures the portion of CPPs that complete the steps within the defined deadlines in CPP.<sup>9</sup>

Furthermore, centralisation of treatment is a measure to provide better quality and avoid unwanted variation by specialising diagnostics and treatment to fewer providers. Consequently, patients must travel farther to

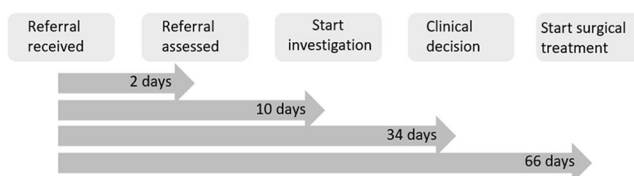


FIGURE 1 Illustration of cancer patient pathway (CPP) with steps and defined deadlines

receive treatment. However, centralisation also entails that all will have access to treatment of the best quality.<sup>3</sup> The report 'Cancer Surgery in Norway' sets minimum requirements for hospitals that will perform cancer surgery to maintain quality.<sup>10</sup> The report requirements include the volume of surgeries at the hospital, the volume of surgeries for the individual surgeon, and the number of surgeons with specialisation. Centralisation of cancer treatment requires good collaboration between the hospitals involved. Hospitals have gradually integrated themselves into a more collaborative arrangement rather than individual entities, and organising and operating these collaborations is challenging.<sup>11</sup> Successful collaborations require, among others, trust and commitment.<sup>11</sup> Good cooperation, motivation, and goodwill across borders are required to make multidisciplinary processes work in practice.<sup>12</sup>

As described earlier, authorities aim to ensure that patients with cancer receive treatment within the defined wait times. Another point at issue is the variation in wait times between different hospitals. Variation in wait times is not a desired result, and it can consequently jeopardise the ambitions of equal access to care for all Norwegian citizens. Numerous studies have examined geographical variations in terms of survival, access to health care, choice of treatment, and wait time. A Swedish study found large variations in wait times for cancer patients between counties,<sup>13</sup> and a study from Poland noted that the distance between the place of residence of patients and the oncological centre was related to wait time prolongation.<sup>14</sup> A snapshot of national health care delivery for localised pca showed substantial interprovincial variation across Canada regarding treatment wait times, especially for radical prostatectomy.<sup>15</sup> An article from Norway states that cancer survival varies by place of residence, but it remains uncertain whether this reflects differences in tumour, patient and treatment characteristics, or regional differences in the quality of delivered health care.<sup>16</sup>

Based on experience in a university hospital comprising high-volume cancer treatment and a small hospital with fewer patients, we detected variations in compliance with the target times in the prostate CPP. The main question addressed by this study is as follows: What factors influence variations in wait times for patients with prostate cancer between a university hospital and a local hospital?

## 2 | METHODS

### 2.1 | The study

Initially, the study was conducted as a master's project in 2019.<sup>17</sup> This study investigated the transition of patients with prostate cancer between two hospitals, and aimed to explore how professionals handled transfer of patients between a local hospital and a university hospital within the prostate CPP.<sup>17</sup> This was a cross-sectional qualitative and explorative study. The interviews conducted in the study resulted in substantial material. All five authors of this article collaborated in re-analysing parts of the material to gain insight into which factors influence variations in wait times for prostate CPP between a local and a university hospital.

## 2.2 | Setting

The hospitals included in the study are public providers, funded and owned by the state, and they are organised as two health trusts in the same county. One of the health trusts is a university hospital located in the largest city in the county, which we refer to as 'the university hospital'. The other health trust comprised two local hospitals located in small cities, and we refer to this as 'the local hospital'. The patients live between 30 min and 5 hours from the university hospital.

General practitioners send referral to specialised care in hospitals for further investigation when suspecting prostate cancer. The Norwegian health care system is founded on the principles of universal access, decentralisation and free choice of provider. This means that the patients choose if they want the referral sent to the local hospital or the university hospital. The patients mostly choose their local hospital.

Both the university hospital and the local hospital perform prostate cancer diagnostics. Only the university hospital provides the main surgical treatment, Robotic Assisted Radical Prostatectomy, and radiotherapy, and patients from the local hospital who need such treatment are transferred to the university hospital. The local hospital can offer Transurethral resection of the prostate and medical treatment, and provides follow-up of patients after surgery. Telemedicine is used to a limited extent in the follow-up of patients, and it is used a bit more for facilitating meetings between professionals from the local hospital and the university hospital.

Table 1 shows the percentage of patients who started surgical treatment in accordance with the defined deadline. The basis for the statistics is the hospitals' patient administration system. Within the indicated 3 years, the table shows that an average of 16% of the patients from the local hospital started surgical treatment at the recommended time, while for patients from the university hospital, an average of 60% started surgical treatment at the recommended time.

## 2.3 | Participants

Eighteen participants took part in our study. They all worked with patients with prostate cancer, either in the local hospital or at the university hospital, and represented different groups of professionals to reflect diversity in terms of professions and locations. Table 2 provides an overview of the informants.

**TABLE 1** Compliance with deadline regarding starting surgical treatment (66 working days) in prostate cancer patient pathway (CPP) for a university hospital and local hospital

Year	University hospital	Local hospital
2016	69% (n = 131)	15% (n = 26)
2017	55% (n = 118)	14% (n = 35)
2018	51% (n = 75)	20% (n = 20)
Total average for 2016–2018	60% (n = 324)	16% (n = 81)

**TABLE 2** Characteristics of study participants (the majority had more than one role)

Total participants	University hospital	Local hospital	Management	Physician	Nurse	Radiograph	Administrative staff/coordinator
N = 18	11	7	7	7	6	2	5

## 2.4 | Data collection

Semi-structured interviews were conducted during February and March of 2019. We developed an interview guide with overall themes concerning CPP, management, collaboration, and culture. The interviewers presented data from the monitoring system during the interviews. The purpose was to obtain participants' thoughts about the transition of patients between the two hospitals as well as their thoughts on differences in wait times. The interviews lasted between half an hour and 1 h. All interviews were audio-recorded with the participants' consent and subsequently transcribed verbatim.

## 2.5 | Ethical considerations

The study was approved by the Data Protection Official for Research in Norway (NSD) (project no: 510385). Further, the two participating hospitals gave their ethical approval. The researchers contacted participants through a personal e-mail with an invitation to participate, along with information about the study and a consent form. The researchers met the participants in person at the time and place of their convenience. Before commencing, the interviewer specified that the participant could withdraw at any time. The interviewees were also informed that the content of the interview would not be traceable back to the participant. Informed consent was obtained from all the individuals who participated in the study.

## 2.6 | Data analysis

The method of analysis was systematic text condensation, which is a pragmatic method for thematic cross-case analysis of qualitative data.<sup>18</sup> The analysis was conducted in four steps.<sup>18,19</sup> The two researchers who conducted the study collaborated on everything from planning, conducting interviews, analysis, to discussion.<sup>18</sup>

Initially, the researchers read parts of the material to get an overall impression and identify preliminary themes. In step two, they coded from the preliminary themes by identifying meaningful units. During this time, the names and features of the code groups developed from the preliminary themes evolved in the first step of the analysis. In the third step, subgroups were established. The researchers condensed the contents of each subgroup and identified illustrative quotations. In the last step, they summarised the significance of those condensed from each code group and created result categories.

All five authors of this article read the empirical data from step three in the analysis process, which are code groups and subgroups with condensed text. Based on the developed categories, relevant text and quotes from empirical data materialised in step two was linked.

## 3 | RESULTS

Our findings indicate that there was good cooperation between the two hospitals regarding the prostate CPP. Professionals involved in the prostate CPP in the two hospitals knew each other and trusted each other. The physicians generally expressed that when they had inquiries, they experienced quick response, good dialogue, and supportive and uncomplicated communication.

*'They [the physicians at the university hospital] have a supportive attitude when I talk to them on the phone, and when I get feedback about issues, I get them fast... it would not have worked without this attitude... for me it would not have worked.'* (Participant 18, Local Hospital)

The statements about good dialogue between the two hospitals mainly applied to the physicians. The picture appeared somewhat different for the administrative staff. They pointed out that there was no need for cooperation regarding the admission of patients. They explained this by the fact that they had shared medical records and, therefore, did not need to communicate across the hospitals.

As described above, the interviews unveiled good cooperation when needed and trustful relationships between the professionals in the two hospitals regarding CPP. Still, patients from the local hospital had prolonged wait time. The participants expressed little contentment with prolonged time for patients from the local hospital compared with patients from the university hospital. However, several pointed out that prostate cancer often developed slowly, arguing that a 2–3 months time frame had no effect on the outcome. Nevertheless, participants saw the point of predictability and rapid diagnostics for the patients, and acknowledged time as important to them:

'For prostate cancer... it is not as important as in some other more vicious, fast-growing tumours. Regardless of this, for the patient, cancer is cancer'. (Participant 13, Local Hospital)

With these findings as a background, we proceeded to investigate why there were variations in wait times for the prostate CPP between the two hospitals. In the analysis, we identified four categories describing possible factors causing variations in the times spent on diagnostics for patients in the local hospital compared to patients from the university hospital. These four categories are: (a) *capacity and competence*, (b) *logistics and efficiency*, (c) *the need for highly specialised investigations*, and (d) *the need for extra consultations*.

### 3.1 | Capacity and competence

According to the participants, a lack of capacity led to prolonged wait times for patients with prostate cancer. Lack of capacity seemed most pronounced at the local hospital, and several participants emphasised that the local hospital had too few urologists and specialised radiologists compared to its needs. The participants from the university hospital acknowledged this as well:

*'It is [prostate cancer] a major illness being investigated at the local hospital, but then I know: There are few urologists and it is a large group of patients [...]'. (Participant 3, University Hospital)*

The interviews revealed that both hospitals had challenges with MRI capacity, but this was most evident at the local hospital. The local hospital tried to compensate for the lack of resources for interpreting images by using external companies to do those tasks. However, hospital staff questioned the competence of the external companies:

'Prostate MRI is not an easy procedure, and there are special MRI physicians who have to do these procedures, and regarding this, we have not been good enough. Images are being sent to private clinics for assessment, and we are, in fact, unsure of the competence of these private clinics. We still do not feel completely safe. We occasionally send questions to the university hospital. Is this correct?' (Participant 13, Local Hospital)

Although the local hospital mostly experienced a lack of MRI capacity, the university hospital had some challenges as well:

'So, I think organising a CPP is pretty easy, but when you're involved in 28 CPPs, then it is more difficult. It is a concurrency conflict, and it is a challenge to get all the CPPs planned into a system that fits

them all. ... It is complicated for us to be in so many CPPs because we have bottlenecks in so many places.' (Participant 6, University Hospital)

As described above, participants discussed capacity in terms of enough resources for MRI, biopsy, consultations at outpatient clinic, and surgery. Additionally, they mentioned a lack of resources for performing jobs related to registration, coordination, and other administrative routines.

### 3.2 | Logistics and efficiency

The university hospital seemed more efficient in terms of logistics and organising consultations than the local hospital. Several of the participants referred to the university hospital's efficient way of organising the steps at the beginning of the CPP. They explained that the patients initially in the CPP had three consultations lined up and were assigned dates and times for all three consultations in the same appointment notice.

The local hospital wanted to achieve the same structure with appointments lined up for MRI, biopsy, and urologist, but had not yet succeeded. The local hospital experienced CPP to be more random and fragmented. Implementing these three appointments came to be challenging because they lacked capacity, as presented in the previous section.

*'[...] Lately, we have overcome an obstacle in the outpatient clinic, so we now have much better capacity there, and we have tried to achieve a similar system as... [the university hospital], where patients are informed about appointment for MRI, biopsy date, histology date altogether, and there is a short time between when the samples are taken and the results are received, and decision of further treatment are made. We have not achieved this yet, partly due to MRI capacity and partly because we have so many [patients] waiting for a consultation at the outpatient clinic that we have not achieved it. But I wish we could manage this.'* (Participant 12, Local Hospital)

### 3.3 | Need for highly specialised investigations

The participants highlighted that the type of biopsy the local hospital used could lead to extra steps in the CPP. They explained this by highlighting that some of the patients from the local hospital had a biopsy and received a negative answer, and for some of these patients, the physicians still had a strong suspicion of cancer based on the results from the MRI. To be sure, these patients had to go to the university hospital to obtain an MRI-ultrasound fusion biopsy. One participant explained that the local hospital did not have the equipment to perform MRI-ultrasound fusion biopsies, and asked rhetorically, *'[...] and is this right?'* (Participant 3, University Hospital). For patients who needed an extra biopsy, the participants explained that this resulted in an extra step and possibly a longer time.

The majority of the participants stated that MRI-ultrasound fusion biopsy was the preferred choice. One participant argued that this method led to fewer biopsies and, therefore, the capacity for more patients:

*'[...] The risk of sepsis and complications with prostate biopsy has been reduced because they need to take fewer biopsies and we have released time for even more patients. So, this is a win for all, and there will be better treatment for the patients. This is most important.'* (Participant 5, University Hospital)

Some of the participants expressed the need for specialised skills to perform biopsies. One participant said that they had decided that not every physician should perform prostate biopsies:

*'[...] because there were so many [physicians] who did not get it right, and they [the patients] had to have a new biopsy. This led to more consultations at the outpatient clinic [...], and we saw the number of extra biopsies went down after we decided not let everyone take [biopsies] ...there were attending physicians and physicians who were better trained, who are allowed to take the biopsies'. (Participant 10, University Hospital)*

The quote above illustrates how the university hospital tried to minimise the use of scarce resources when it came to performing biopsies.

### 3.4 | Need for additional consultations

The findings indicate that there were more steps for patients in the prostate CPP who transferred from the local hospital to the university hospital compared to patients who only followed the CPP at the university hospital. One participant explained the reason for the extra steps in this way:

*'I have not really experienced any bottlenecks between the two hospitals, only that there are some extra steps in transition to the university hospital, which those who live in the catchment area of the university hospital do not have. It is a consequence of centralisation really'. (Participant 18, Local Hospital)*

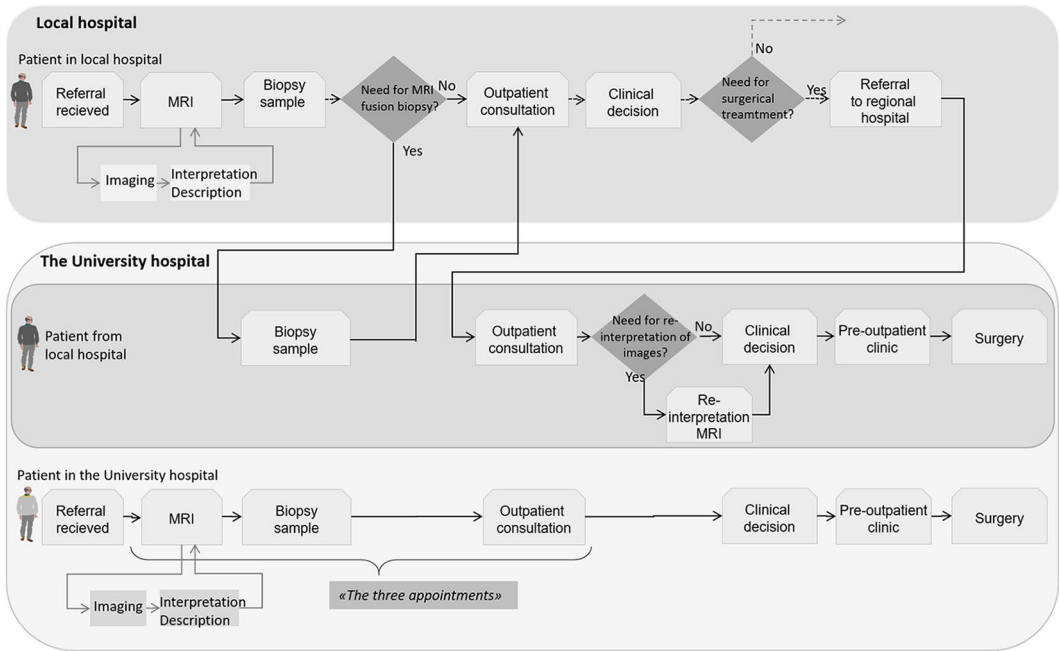
Several participants explained that transferring patients between hospitals caused a few extra days because the patients who transferred from the local hospital had a new consultation at the outpatient clinic at the university hospital. Patients from the local hospital need to have an outpatient assessment with the operating physician at the university hospital before surgery. Patients who underwent CPP only at the university hospital did not need such an extra consultation.

Although not all participants agreed that there was a need for re-examination when patients were transferred from the local hospital to the university hospital, several of them said that the 'new' physicians had to check and examine the work done by the other hospital. They thought this was both understandable and necessary.

*'It is only natural when they are the ones to do the surgery; they cannot blindly trust my assessments. In a way, it is duplicating work, but it is absolutely necessary'. (Participant 12, Local Hospital)*

Participants thought that the university hospital was mainly satisfied with the MRI images taken at the local hospital, and they said there was rarely a need for new MRI images. However, most of them expressed it was relatively common that the MRI images had to be re-interpreted at the university hospital before clinical decision. They explained that the university hospital often ordered a demonstration of images taken at the local hospital. The reason for re-interpretation of MRI images was that surgeons preferred to operate based on interpretation from someone they knew. A participant said: *'... that's just the way it is, they shall, after all, do something with another person's body'. (Participant 6, University Hospital)*





**FIGURE 2** Flowchart showing cancer patient pathway (CPP) for patients from the local and the university hospital, respectively [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

### 3.5 | Flowchart illustrating cancer patient pathway in the studied hospitals

To illustrate our findings, we developed a figure that illustrates the differences between the two hospitals regarding CPP. Figure 2 illustrates the steps for patients in prostate CPP from the local hospital and the university hospital, respectively. The flowchart was prepared based on information from the study participants, and it focuses on patients who need surgical treatment.

The flowchart illustrates the logistics for CPP in the local hospital and the university hospital, and, as elaborated in this section, it shows 'the three appointments' the university hospital had developed. It also highlights that patients in the local hospital had to go to the university hospital for biopsy samples if they needed an MRI fusion biopsy. Further, it illustrates the re-interpretation of images and the extra outpatient consultation for patients in the local hospital who needed surgery at the university hospital.

## 4 | DISCUSSION

The objective of this article was to obtain insight into possible factors influencing variation in wait times for prostate CPP between a local hospital and a university hospital.

According to the findings in our study, unsurprisingly, the probability of meeting the target times was influenced by whether there were enough employees with the right skills to be able to perform investigations, MRIs, and diagnostics, as well as administrative tasks such as coding and coordination. Lacking capacity seemed to be more frequent at the local hospital than at the university hospital. This can indicate that the mentioned inequality in capacity may be a causative factor leading to different wait times between the two hospitals. This finding is consistent with the conclusion from a study from Canada, which found that most interprovincial variation in treatment wait times seemed related to differences in systemic-and process-related factors, for example, the number of urologists, availability to

and triaging of hospital resources.<sup>15</sup> A qualitative study that explored the perspectives of healthcare professionals on implementing CPPs highlighted lack of resources as an explanation for prolonged wait time.<sup>20</sup> A common perception among respondents in this study turned out to be that even though professionals made strong efforts to achieve the target times in one part of the system, the lack of resources, competence, or initiative in another part of the system hindered the processes and created bottlenecks in the system.<sup>20</sup> Yet another study found connections between wait times and lack of resources and capacity, and stated that hospital staff were torn between meeting the target times and a lack of resources and capacity.<sup>21</sup> This corresponds with our findings. Lastly, we refer to Kreindler, who stated that successful wait reduction entails ensuring that sufficient capacity exists, and applying sustained intervention to ensure that this capacity is well used.<sup>22</sup>

Our study indicates that the centralisation of hospital services affects wait time, as we found that transferring patients from one hospital to another led to some extra steps in the patient's pathway. Those extra steps could be the re-interpretation of MRI images and an extra outpatient consultation with the operating physician. We also found that one reason for the need to transfer patients between the local hospital and the university hospital could be the lack of equipment such as an MRI-ultrasound fusion device at the local hospital. Findings identified that patients had to go to the university hospital to have such an examination performed. Our findings are in line with other studies that have stated that transferring patients between hospitals have consequences. De Regge et al. stated that transfers between hospitals possibly will increase the length of the pathway and create complex pathways,<sup>11</sup> and Robertson et al. posited that the ongoing centralisation of cancer care in Sweden would most likely affect access to cancer care and wait times.<sup>13</sup> Our findings are also in congruent with a study conducted by Bardell et al.<sup>23</sup> They identified several independent predictors of increased wait time, and they said some of these are not surprising, such as requiring transfer to another hospital for surgery.<sup>23</sup>

An evaluation report describing challenges with transitions of patients between Danish hospitals indicated technical difficulties, such as the transmission of information, and the challenges concerned the division of tasks and professional disagreement,<sup>12</sup> which is in contrast to our findings. The two hospitals in our study had the same medical record system, and the transmission of information did not seem to be a problem. According to the Danish evaluation report, there could be disagreement about when to transfer a patient from one hospital to another for further investigation or treatment, how examinations should be performed, or different views on quality and perceived differences in competence regarding examinations to be performed.<sup>12</sup> Our study suggests the opposite, as the participants seemed to agree on the delegation of tasks and followed the standardised approach that came with CPP.

The Danish report indicated that repetition or re-description of preclinical examinations occurred in some cases, but in other cases it did not occur at all.<sup>12</sup> One explanation for repetition was because the treating physician who received a patient from another hospital, needed to feel as confident as possible about the diagnosis, type, stage, etc.<sup>12</sup> This is in line with our study, as participants explained the need for surgeons to check previous examinations as a precaution.

In the last 20 years, cancer surgery in Norway has been concentrated in fewer hospitals, which is a contributing factor to better results and increased survival.<sup>3</sup> In our study, transfers of patients to the university hospital partly appeared because treatment for prostate cancer had been centralised to the university hospital. This illustrates an interesting dilemma: healthcare must meet requirements for wait times, while centralising entails longer wait time for surgery. On the one hand, transfers between hospitals likely increase the length of the pathway and create complex pathways. On the other hand, centralisation presumably increases the quality of treatment. Healthcare organisations at one level may be capable of following the time-bound requirements in a pathway but are paradoxically dependent on other healthcare providers outside their own setting.<sup>20</sup> The functionality of the CPPs becomes less coherent and uniform when it depends on one or few single units/organisations.<sup>20</sup>

It can be a demanding exercise to comply with the authorities' requirements for specific wait times and simultaneously centralise treatment. We argue that politicians and health authorities should have these implications of contradictory quality indicators in mind when designing patient pathways. Health authorities must find equitable wait times. Wait times are not the only priority issue in health care, and wait time reduction must be balanced with

other worthwhile goals,<sup>22</sup> such as travel times and other local conditions.<sup>3</sup> Furthermore, authorities must find the right volume regarding when to recommend centralisation of surgeries. Centralisation can be a chance to improve results through regional collaboration for complex and challenging surgical pathologies, as concluded in one study of pancreatic surgery.<sup>24</sup> On the other hand, you have to be sure that centralisation has a potential benefit. A study examined whether there was a potential benefit from further centralisation of pancreatic surgery, and concluded that centralisation beyond medium volume would probably not improve the 90-day mortality or failure-to-rescue rates after pancreatoduodenectomy.<sup>25</sup>

Our study indicates that there is a scarcity of resources and an uneven distribution of competence between the university hospital and the local hospital. We argue that there may be a potential for better resource utilisation by strengthening the management and coordination of CPP with a regional focus. This can improve the functionality of CPPs that involve more than one hospital. More regional focus can ensure that patients in the region have equal access to the same medical treatment and better distribution and utilisation of resources.

Changes in wait times can be useful for describing trends in wait times, but caution must be exercised when attempting to draw conclusions about quality of care and delivery of services.<sup>23</sup> Still, we have to keep in mind that the effect on the individual patient who is waiting for treatment for a life-threatening illness remains simple: fear and anxiety about the procedure persists, and the perception that survival chances will decrease with increased wait time is nearly universal.<sup>13,23</sup>

## 5 | CONCLUSIONS

We found that there were extra steps in the CPP for patients transferring from the local hospital to the university hospital for prostate cancer surgery. Those extra steps indicate that additional time will be spent in the CPP. Hospitals' capacity was another factor possibly causing variation in wait times. Our findings imply that a lack of hospital internal capacity can lead to suboptimal logistics and consequently longer wait lists, and that lacking capacity seemed to be more frequent at the local hospital than at the university hospital.

There seem to be challenges in merging defined deadlines for wait time on the one hand, and centralisation to ensure quality of treatment on the other. We argue that politicians and health authorities should have these implications of contradictory quality indicators in mind when designing patient pathways.

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### CONFLICT OF INTEREST

The authors declare no conflicts of interest.

### AUTHOR CONTRIBUTIONS

A. G. Valbekmo and L. Mo designed the study and collected data. A. G. Valbekmo had the main responsibility of conducting the analysis and interpretation of data for this article and was a major contributor in the writing of the manuscript. L. Melby was involved in revising the manuscript critically for important intellectual content and supervised A. G. Valbekmo throughout the writing. L. Mo, G. Gjørund, E. Håland and L. Melby contributed to the analysis and in finalising the manuscript. All authors read and approved the final manuscript and agreed to be accountable for all aspects of the work to ensure that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

## ETHICS STATEMENT

Ethical approval for this study was granted by the Data Protection Official for Research in Norway (NSDs) (project no: 510385). Further, the two participating hospitals gave their ethical approval. Participants provided informed consent.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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