Medical decision making for older patients during multidisciplinary oncology team meetings

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A B S T R A C T

Objectives: Multidisciplinary team meetings aim to facilitate efficient and accurate communication surrounding the complex process of treatment decision making for older patients with cancer. This process is even more complicated for older (≥70 years) patients as the lack of empirical evidence on treatment regimens in patients with age-related problems such as comorbidity and polypharmacy, necessitates a patient-centred approach. This study investigates the decision making process for older patients with cancer during multidisciplinary team meetings and the extent to which geriatric evaluation and geriatric expertise contribute to this process.
Methods: Non-participant observations of 171 cases (≥70 years) during 30 multidisciplinary team meetings in five hospitals and systematically analysed using a medical decision making framework. All cases were in patients with colon or rectal cancer.
Results: First, not all steps from the medical decision making framework were followed. Second, we found limited use of patient-centred information such as (age-related) patient characteristics and patient preferences during the decision making process. Third, a geriatric perspective was largely missing in multidisciplinary team meetings.
Conclusions: This study uncovers gaps in the treatment decision making process for older patients with cancer during multidisciplinary team meetings. In particular individual vulnerabilities and patient wishes are often neglected.

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1. Background

Treatment decision making for older patients with cancer is often complex as many treatment combinations and sequences (e.g., surgery, chemotherapy, radiotherapy) can be considered. Consequently, specialists from different disciplines (e.g., surgeons, oncologists, radiotherapists) are involved [1]. To facilitate efficient communication and decision making for further investigation and treatment, multidisciplinary oncology team meetings (MDTM) have been introduced in many countries [2, 3]. These meetings aim to accurately stage tumors and to make treatment recommendations that are evidence-based, reached by consensus, and patient centered, i.e., based on patient characteristics, such as health status, and preferences [4].

Decision making for older patients with cancer is particularly complex, because evidence-based guidelines that aid decision making in oncology are mostly based on the outcomes of studies in which the most

prevalent group of patients, those ≥70 years, is underrepresented. First, older patients are often excluded from clinical trials, due to multiple age-related problems, such as co-morbidity and decline in overall physical condition [5]. Second, it is unknown how treatment regimens will interact with treatments that patients may receive for other illnesses [6]. Lacking empirical evidence, decision making for older patients particularly asks for acquiring and considering older patients' preferences and age-related problems. The latter can be guided by geriatric evaluation, such as geriatric consultation, Geriatric Screening (GS), or Comprehensive Geriatric Assessment (CGA). GS and CGA consist of validated measures to detect age-related problems in the domains of medical, functional, cognitive, social, nutritional and psychological parameters. Measuring patients' health status by these domains allows to estimate life expectancy, predict toxicity or decrease in quality of life [7, 8]. By detecting geriatric problems, geriatric evaluation can impact treatment decisions for older patients [7, 9]. Different experts in the field [9, 10] advocate the incorporation of geriatric expertise in MDTM to improve decision making for this patient group. Thus, geriatric evaluation and geriatric experts should play a role in the decision making process for older patients during MDTM. However, it is unclear whether and how this is implemented in current practice.

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Most research on the decision making process in MDTM is focused on their impact on the recommendations made and whether these were subsequently implemented. From these studies, it is known that oncological MDTM have several beneficial outcomes, such as more accurate staging and treatment selections [11] resulting in increased survival rates [12, 13]. Few studies explored the decision making process in MDTM by observation, and concluded that characteristics and preferences of patients were rarely discussed [14, 15]. However, these studies did not specifically focus on decision making for older patients. To the best of our knowledge, no research has been conducted focusing on the decision making process for older patients with cancer, let alone on the role of geriatric evaluation or geriatric expertise during MDTM. We therefore investigated (1) how the decision making process for older patients with cancer takes place during MDTM, (2) to what extent geriatric evaluation (e.g., geriatric consultation, GS or CGA) is incorporated in the decision making process for older patients with cancer during MDTM and (3) whether this differs for MDTM with and without the presence of geriatric expertise.

2. Methods

2.1. Study Design

We conducted non-participant observations during MDTM and analysed the field notes using content analysis. This is a suitable method for describing practices and processes in health care settings [16].

2.2. Setting and Subjects

Data was collected in five non-academic hospitals in The Netherlands (in alphabetical order): Atrium Medisch Centrum (now: Zuyderland Ziekenhuis), Heerlen; Diakonessenhuis, Utrecht; ElizabethTweesteden Ziekenhuis, Tilburg; HagaHospital, The Hague; Sint Lucas Andreas Ziekenhuis (now: OLVG West), Amsterdam.

We observed six MDTM in each hospital where at least one older (≥70 years) patient with colon or colorectal cancer was discussed.In total, we observed the decision making process of 171 older patients with colorectal cancer during 30 MDTM. See Table 1 for the distribution and characteristics of the discussed cases.

One MDTM per hospital was attended by two researchers, who independently took field notes of the discussed cases during the MDTM. After the meeting the field notes of the two researchers were compared and showed strong overlap. The other MDTM were observed by the first author. MDTM were held in a room where chairs were either facing screens onto which the electronic medical records (EMR) including scans from imaging techniques were shown or where chairs were positioned in a u-shape, allowing to see the screens as well aseach other. Some hospitals also had a video-connection with other hospitals or with colleagues working from different locations. The MDTM recommendations were documented in the EMR by a pre-assigned physician or nurse. In most sessions, senior physicians were seated in the front row(s), while junior staff sat in the back.

2.3. Ethics Approval and Consent to Participate

The study was approved by the (a) Ethics Committee of the Amsterdam School of Communication Research, University of Amsterdam, the Netherlands (reference number: 2014-CW-80),(b) The Ethical Review Board of the HagaHospital (METC Zuidwest Holland; reference number: 13-062), supplemented by (c) local feasibility statements from the ethics committees of the five participating hospitals (reference number for Diakonessenhuis: 14.0470; Sint Lucas Andreas Ziekenhuis: 14.176; HagaHospital: 13-057; ElizabethTweesteden Hospital: L8144; Atrium Medisch Centrum: 12N120). Prior to data collection, the management of each hospital agreed to our visits at the MDTM. One contact person in every hospital informed the participants of the MDTM and gave oral consent to our visits and data collection. The contact person signed an informed consent form. All participants were informed that the researchers would take a back seat during the observations in order to not disrupt the usual process during the meetings.

2.4. Data Collection

We recorded our observations on a form with pre-structured sections capturing the observer, time and place of the observation, participating individuals (e.g., geriatric expert (e.g., geriatrician, geriatric nurse), surgeon, oncologist, radiotherapist, radiologist, pathologist, nurse, MD), and patient characteristics (i.e., age, gender, diagnosis). The form included a section for the observation of the decision making process and a section for the observation of geriatric evaluation instruments and comments. One form was used per patient that was discussed (see Appendix A for the observation guide). During the MDTM we took brief field notes which we expanded immediately after the meetings had finished. In order to minimize observer bias, observers were blinded to each other's field notes until they were completed.

2.5. Data Analysis

The hand-written field notes were transcribed and imported into MAXQDA software (version 11). First, the first author read the entire set of field notes to gain overview over the data. In the first round of coding we used a pre-structured codebook. With regard to how the decision making process took place, we developed codes following the framework by Fox and colleagues [17], who identified different attributes in the medical decision making process: (1) a situation, in which the case of the patient is introduced, (2) a goal - the aim or desired result of the treatment, (3) candidates – treatment options (4) arguments and commitments – reasons and rules in support of or against candidates. During the first round of coding, we could identify sub codes under these main codes. Next to these attributes of the medical decision making process, we also coded the final recommendation.

With regard to the question to what extent geriatric evaluation is incorporated into MDTM discussions, we developed codes which cover the domains of geriatric evaluation. To do so, we derived the domains and specific measures from the 'Geriatric Navigator', which is a web-based screening tool developed by GeriOnNe ('Geriatrische Oncologie

Table 1
Case characteristics.

	Hospital 1	Hospital 2	Hospital 3	Hospital 4	Hospital 5	Total
n cases	47	16	33	31	44	171
Age M(SD)	77.83(4.75)	77.5(6.26)	76.36(5.19)	77.77(4.92)	77.45(5.39)	77.41(5.15)
Female patient %	68.1	37.5	42.4	48.4	38.6	49.1
Cases discussed in presence of geriatric expertise %	100	0	84.8	64.5	100	55.6
Cases of patients with a new diagnosis%	59.6	50.0	69.7	48.4	52.3	56.7
Colon cancer %	66.0	87.5	66.7	71.0	52.3	65.5
Rectal cancer %	34.0	12.5	33.3	29.0	47.7	34.5

Nederland'), a national multidisciplinary geriatric oncology workgroup. The Geriatric Navigator systematically investigates potential problems in older patients with cancer, and to this end provides a complete overview of domains and measures used in geriatric evaluation (i.e., geriatric consultation, geriatric screening and CGA; see Table 7 for an overview of the observed domains from the Geriatric Navigator).

One researcher (SB) coded the entire set of field notes and the second researcher (JW) coded the field codes of two randomly chosen patients per hospital. Disagreements were resolved through discussion. After the first round of coding, we discussed the codebook and adapted the codebook where necessary and specified sub codes. We then completed our codebook. This codebook was used for the second round of coding, which was done by one researcher (SB). Again a second researcher (JW) coded the data of ten randomly chosen patients per hospital. Disagreements were resolved through discussion and the coding system was once again revised after discussion. During the entire coding process we used memos to clarify codes and keep track of ideas and impressions. In addition, we consulted one of the researchers, a geriatrician (MH), to help with the medical interpretation of the field notes.

Next, we used IBM SPSSStatistics (version 24) to fill in the scores for whether each specific code was used 'once or more' (1) or 'not at all' (0) for each case. We chose to use a dichotomous distribution for the codes as we noticed that the same code was rarely used twice or more within one case, which made it impossible to run analyses for continuous variables. Instead, we used descriptive statistics/crosstabs and Chi^2 analyses to describe whether a code was used for each patient and to compare the two groups (i.e., geriatric expertise was absent or present) for statistical differences. In addition, we used crosstabs and separate Chi^2 analyses to examine whether there were differences in the decision making process for patients with a new diagnosis that have not been treated (from now on: cases discussed prior to treatment) and patients that have received treatment for the same tumour before (from now on: cases discussed during or post-treatment). Results are only reported when differences were found.

3. Results

3.1. Medical Decision Making Process

3.1.1. Situation
In almost all cases (97.7%), the situation of the patient was introduced as a start. The overview of the patients' situation comprised (from most frequently discussed to least frequently discussed) the diagnosis and/or staging of the tumour (91.8%), followed by a discussion of previous treatment to the same tumour (43.3%), symptoms related to the tumour (36.3%), patients' (age-related) characteristics (35.7%) and patient preferences (6.4%).Regarding patients' (age-related) characteristics, general condition in terms of frailty and vitality (19.9%), comorbidity (15.8%), and chronological age (9.9%) were most frequently reviewed. Self-reliance (4.1%), geriatric syndrome (2.9%), social support system (2.9%), psychosocial factors (1.8%), medication use (1.8%), communication aspects (1.2%), and risk of malnutrition (0.6%), were the least frequently discussed age-related patient characteristics. See Table 2 for a complete overview and exemplary quotes.

As expected, some topics concerning the situation of the patient were discussed more often for cases discussed prior to treatment compared to cases discussed during or post-treatment. This was the case for symptoms (discussed in 46.4% of the cases for cases discussed prior to treatment vs. 23.0% for cases discussed during or post-treatment; $\chi^2(1) = 9.961$, $p < .01$), medical history (25.8% vs. 10.8%; $\chi^2(1) = 6.034$, $p < .05$), comorbidity (20.6% vs. 9.5%; $\chi^2(1) = 3.931$, $p < .01$), and social support system (discussed in 5.2% of the cases for cases discussed prior to treatment vs. 0% for cases discussed during or post-treatment; $\chi^2(1) = 3.929$, $p < .05$). Medication use was only mentioned for cases discussed prior to treatment (4.1%) and not for cases discussed during or post-treatment ($\chi^2(1) = 4.003$, $p < .05$).

3.1.2. Goal
In only 4.1% of the cases, the goal of the proposed treatment was clearly mentioned (see Table 3).

3.1.3. Candidates
In more than half of the cases (54.4%) one or more possible treatment candidates were discussed. Surgery was the most frequently mentioned candidate (24%), followed by chemotherapy (14%), a combination of either surgery, chemotherapy and/or radiation (10.5%), and radiotherapy (8.2%). Follow up after treatment (3.5%), further diagnostics (7.6%) or geriatric screening (5.3%), palliative care/ no treatment (2.3%), wait and see (2.3%) were least frequently mentioned (see Table 4). Surgery was mentioned more frequently for cases discussed prior to treatment (30.9%) compared to cases discussed during or post-treatment (14.9%; $\chi^2(1) = 5.942$, $p < .05$).

3.1.4. Arguments and Commitments
In more than half of the cases (55.6%), one or more arguments were used in favour or opposed to proposed candidate treatments. Arguments could be categorized as(1) medical arguments (39.2%), (2) arguments based on patient (age-related) characteristics (33.3%), and (3) arguments based on patients' preferences (4.1%). Medical arguments includedprotocols, guidelines, existing evidence, and practitioners' own experience (32.7%), risks or side effects of treatment candidates (7.6%), or whether patients experienced symptoms that affected their quality of life which would argue for or against a treatment candidate (7.6%). Regarding arguments based on patients' (age-related) characteristics, general condition of the patient in terms of frailty or vitality (18.7%) and chronological age (24%) were most frequently used. Least used arguments referring to patient characteristics were comorbidity (4.1%), geriatric syndrome (2.9%), self-reliance (2.3%), risk of malnutrition (1.2%), social support system (1.2%), psychosocial factors (1.2%), and medication use (0.6%). See Table 5 for more details. General condition was mentioned more frequently for cases discussed prior to treatment (24.7%)compared to cases discussed during or post-treatment (10.8%; $\chi^2(1) = 5.356$, $p < .05$). Arguments considering geriatric syndrome were only mentioned for cases discussed prior to treatment (5.2%) and not at all for cases discussed during or post-treatment ($\chi^2(1) = 3.929$), $p < .05$.

3.1.5. Final Recommendation
In 82.5% of the cases a clear final recommendation was mentioned. Three types of final recommendation could be distinguished. First,a final treatment recommendation was given (52%). Second, further diagnostics or medical consultations were recommended. When this was the case, we found that, a final treatment recommendation was givendepending on the outcome of the diagnostic evaluations or consultations (19.3%), and in other cases, no treatment recommendation was given yet (14.6%). Thirdly,further consultation with the patient was needed because the treatment recommendation was dependent on patient preferences (7.6%). A complete overview and exemplary quotes are provided in Table 6. Some final recommendations were made more often for cases discussed prior to treatment compared to cases discussed during or post-treatment. This was the case for referring to a geriatrician (11.3% vs 1.4%; $\chi^2(1) = 6.419$, $p < .05$) and surgery (26.8% vs 9.5%; $\chi^2(1) = 8.108$, $p < .01$). Follow up was only mentioned as final recommendation for cases discussed during or post-treatment (40.5%; $\chi^2(1) = 32.358$, $p < .001$).

3.1.6. Incorporation of Geriatric Evaluation and Geriatric Expertise
In 35.1% of the cases one or more remarks were made that were congruent with elements of geriatric screening. Most of these remarks concerned the general condition of the patient in terms of frailty or vulnerability (19.9%). Results of measures used to determine the patients' frailty or vulnerability were mentioned for the Karnofsky index in ten cases (5.8%) and the ASA classification score in one case (0.6%). However, most comments were made without mentioning a measure

Table 2
Situation.

Remarks on	Discussed in n cases	(%)	Quotes and examples
Previous treatment same tumour			
Chemotherapy	6	(3.5)	
Radiation	3	(1.8)	
Chemo radiation	11	(6.4)	
Chemo radiation and surgery	3	(1.8)	
Surgery Endoscopic polyp removal	48	(28.1)	
Total	74	(43.3)	
Symptoms	62	(36.3)	• Frequently discussed symptoms were: change in bowel habits, obstruction, anemia, weight loss, rectal bleeding, abdominal pain
Medical history	33	(19.3)	
Patient (age-related) characteristics			
Age (chronological	17	(9.9)	• It is an older patient • it concerns a 89-year old patient
General condition in terms of vitality	23	(13.5)	• Clinically vital • good condition
General condition in terms of frailty	10	(5.8)	• Increased geriatric risk • not that vital
General condition – neutral remarks	1	(0.6)	• Question is asked about the general condition of the patient, but it is unknown
Comorbidity	27	(15.8)	• Frequently discussed comorbidities were diabetes, hypertension, stroke, cardiac problems
Self-reliance	7	(4.1)	• Patient lives on his own • patient can take good care of himself • he is sitting in a wheelchair • if her husband would not be there, she would stay in bed
Geriatric syndrome	5	(2.9)	• He has week cognitive short term functions • otherwise, he is cognitively intact • patient has Alzheimer's disease
Communication	2	(1.2)	• Patient has limited communication abilities • patient has ill hearing and vision
Risk on malnutrition	1	(0.6)	• Patient is fed using a feeding tube
Medication use	3	(1.8)	• Patient uses anticoagulants
Social support/social system	5	(2.9)	• Patient takes care of his demented spouse • the patient has a large social network which she can avail herself of
Psychosocial	3	(1.8)	• Patient felt anxious and upset because of the diagnosis
Total	61	(35.7)	
Tumour staging/diagnosis	157	(91.8)	• Results of scans, tumour staging (tumour stage, lymph nodes, metastases, tumour size, pathological report, tumour location, tumour changes after treatment)
Patient Preferences	11	(6.4)	• Patient want a consult concerning palliative treatment • Patient wants surgery, but he doesn't want a colostomy • She does not want to undergo pain and suffering and prefers quality of life • She chooses quality of life over pain and suffering
TOTAL	167	(97.7)	

(14%). In 15.2% of the cases, remarks were made considering comorbidity, all without mentioning a specific measure. In 7% of the cases remarks were made considering patients' self-reliance, alsowithout mentioning a specific measure. Remarks considering geriatric syndromes patients may have occurred in 7% of the cases. Nospecific measure was mentioned. Few remarks were made addressing the patients' social support system (4.1%), communication (1.2%), risk of malnutrition (1.8%), or medication use (1.8%). The Short Nutritional Assessment Questionnaire (SNAQ), a measure to assess the risk of malnutrition was mentioned once (0.6%). In all other cases, no reference was made to a specific measures.

Table 3
Goal.

Remarks on	Discussed in n cases	(%)	Quotes and examples
Curative intent	3	(1.8)	• The treatment intent is curative
Palliative	4	(2.3)	• It is a metastasized disease, meaning the patient will not qualify for a curative treatment apart from age and vitality
TOTAL	7	(4.1)	

On some points we found significant differences between MDTM with and without geriatric expertise with regard to the incorporation of geriatric evaluation (see Table 7 for a complete overview). Remarks about the general condition of the patient in terms of frailty or vitality and about geriatric syndromes, were made significantly more often in MDTM with geriatric expertise (18.9% and 10.5% respectively), compared to MDTM without geriatric expertise (7.9% ($\chi^2(1) = 4.275$, $p < .05$) and 2,6% ($\chi^2(1) = 4.033$, $p < .05$) respectively). However, comorbidity wassignificantly more often mentioned in MDTM without geriatric expertise (27.6%), compared to MDTM with geriatric expertise (5.3% ($\chi^2(1) = 16.386$, $p < .001$).

4. Discussion

This study aimed to gain insight into the decision making process for older patients with cancer during MDTM, includingthe use of geriatric evaluation and geriatric expertise. Our first main finding is that MDTM members do not run through all steps we deemed relevant for decision making, i.e., introducing the case (situation), presenting possible treatment possibilities (candidates), discussing arguments in favour of and against these possibilities, and deciding for a final treatment recommendation. As previous research has indicated that MDTM members

Table 4
Candidates.

Remarks on	Discussed in n cases	(%)
Follow up	7	(4.1)
Combination of treatments	6	(3.5)
Chemotherapy	18	(10.5)
Radiotherapy	24	(14)
Surgery	14	(8.2)
Geriatrician/geriatric assessment	41	(24)
Further diagnostics	9	(5.3)
Palliative care/no treatment	13	(7.6)
Wait and see	4	(2.3)
Other	7	(4.1)
Total	93	(54.4)

generally lack time to adequately prepare [18], effective communication that follows these basic steps of the decision making process is offutmost importance in order to have every team member on the same page and making well informed treatment decisions.

The most important steps that were left out of the discussion were discussing alternative candidates and arguments and commitments. We also found that not in all cases a final recommendation could be made. Although this is consistent with findings from a literature review reporting that in 27–52% of cases a decision could not be reached during MDTM [18], our findings indicate that in an older population this can be (partly) explained because additional age-related patient characteristics are needed in order to make a final decision.

The foregoing adds up to our second main finding, which is a lack of use of age-related patient characteristics and patient preferences during the decision making process. Previous studies among patient populations comprising all age groups suggested that the consideration of patient-centred information is limited during MDTM [14, 18]. Given the specific problems regarding medical decision making in older patients (i.e., the lack of empirical evidence on treatment regimens in older patients with comorbidity and polypharmacy), one would expect that older patients' preferences and age-related problems would be more prevalently discussed when the decision concerns older patients than we have seen in this study. As a third main finding, we conclude that a geriatric perspective is largely missing in MDTM. Although geriatric evaluation can provide detailed insight into specific age-related problems, remarks congruent with geriatric evaluations were limited to the patients' general condition and the presence of comorbidity. The contribution of geriatric expertise in MDTM also remained limited. We only found significant differences for the discussion of the patients'conditionin terms of frailty or vitality and the discussion of geriatric syndrome when comparing MDTM with and without the presence of an geriatric expert. This lack of an impact of geriatric expertise might be explained by the factthe incorporation of suchexpertise during MDTM is relatively new [6].

Our finding of a suboptimal decision making process for older patients with cancer has some implications for practice and future research. The quality of the decision making process can be improved by considering and communicating all relevant steps of the decision

Table 5
Arguments and commitments.

Remarks on	Discussed in n cases	(%)	Quotes and examples
Medical			
Protocols/guidelines/ literature/evidence/experience	56	(32.7)	• Because of bad experiences with palliative rectal surgery and strikingly spectacular results with palliative radiation, the latter treatment is proposed • It concerned N2, which means surgery • There is a renewed protocol in which it is prescribed to remove a T1 tumour with a laparoscopic surgery, which means an immediate resection is not needed at first hand • Studies do not show survival or gains, which means that chemo can only yield marginal results
Side effects/risks	13	(7.6)	• Surgery is not possible with reference to morbidity • The location of the tumour is tricky because of the high risk of hitting veins
Quality of life/symptoms	13	(7.6)	• Patient suffers from rectal bleeding and urgency, thus: palliative radiation • Patient has no quality of life caused by abdominal cramps and threatening obstruction
Total	67	(39.2)	
Patient characteristics			
Age (chronological)	24	(14)	• Radiation is risky at this age • Taking age into consideration, a small procedure with colostomy is suggested. Where normally, the full procedure where the left colon will be removed would have been suggested • 73 is a bit old
General condition (vitality/frailty)	32	(18.7)	• Patient is not fit enough to undergo a sigmoid resection • It is a highly vital patient • Patient functions reasonably, but he is a rudimentary fragile man
Comorbidity	7	(4.1)	• It concerns a rudimentary vital patient as of his COPD • Patient has no severe comorbidity
Self-reliance	4	(2.3)	• Concerning physical functioning, the patient is self-reliant
Geriatric syndrome	5	(2.9)	• Patient has a low score on cognition • The issue in this patient is light cognitive difficulties and the risk of delirium. Therefore, surgery is suggested as soon as possible
Communication	0	(0)	
Risk of malnutrition	2	(1.2)	• Patient is not the ideal candidate for surgery due to weight loss • Patient lost 8 kg and that will not improve after chemoradiation
Medication use	1	(0.6)	• The question is raised whether the patient receives anticoagulants and this should be checked before deciding for surgery
Social support/social support system	2	(1.2)	• Support system is absent. Patient only has one cousin in Belgium. This could be a problem regarding revalidation • Patient's husband is informal caregiver. There are some problems at home socially
Psychosocial	2	(1.2)	• Patient is anxious about resuming chemo
Total	57	(33.3)	
Patient preferences	7	(4.1)	• Patient does not want general anesthesia • Initially, patient did not want chemotherapy • Patient does not want any fuss
Other	6	(3.5)	
TOTAL	95	(55.6)	

Table 6
Final recommendation.

Remarks on	Discussed in n cases	(%)	Quotes and examples
Further diagnostics/consultations with…			
Further diagnostics			
With treatment recommendation	13	(7.6)	• To have a look at the lesion in the liver, an ultrasound is recommended. If the lesion is not a metastasis, the patient will be referred for surgery
Without treatment recommendation	14	(8.2)	• Discuss again after pathological examination
Total	25	(14.6)	
Radiotherapist			
With treatment recommendation	2	(1.2)	• In addition, an appointment with the radiotherapist will be scheduled to discuss the pros and cons • Discuss short radiation followed by surgery with the patient
Without treatment recommendation	1	(0.6)	• A treatment plan will be made after the PET scan results are known
Total	3	(1.8)	
Oncologist			
With treatment recommendation	6	(3.5)	• Patient needs to come over to discuss chemotherapy • Oncologist will discuss what the patients wants and does not want, after which the patient can be referred for a palliative colostomy or for a laparoscopic surgery • Patient can come by to discuss adjuvant chemotherapy
Without treatment recommendation	5	(2.9)	• Recommendation is to make an appointment with the oncologist to discuss the patient's preferences • It is important to consult an oncologist which can explain the patient about the treatment
Total	11	(6.4)	
Surgeon			
With treatment recommendation	4	(2.3)	• Patient sees the surgeon tomorrow
Without treatment recommendation	1	(0.6)	• First, we will make an appointment with the surgeon
Total	5	(2.9)	
Geriatrician			
With treatment recommendation	8	(4.7)	• Recommendation is to see the geriatrician first and afterwards see a surgeon • If the geriatrician does not see chemo radiation as possibility, the recommendation will be short-term radiation before surgery
Without treatment recommendation	4	(2.3)	• A consultation with a geriatrician will be scheduled
Total	12	(7.0)	
Total	52	(30.4)	
Additional disciplines			
Psychologist	1	(0.6)	• Geriatrician has seen this patient before. Back then, the patient was anxious and upset because of the diagnosis. Geriatrician wonders whether this receives enough attention. According to the nurse they have accompanied the patient to the pulmonologist and if necessary psychological support will be applied for
Nutritionist	1	(0.6)	• The nutritionist will also be involved in the treatment
Physical therapist	1	(0.6)	• Directly after surgery, the patient will see the physical therapist to mobilize the patient with respect to being overweight
Total	3	(1.8)	
Treatment			
Follow up	30	(17.5)	• Recommendation is standard follow up • Recommendation is accurate follow up • Recommendation is standard follow up by age • Recommendation is oncological follow up
Combination	8	(4.7)	• Recommendation is 5 × 5 radiation followed by resection • First, a resection will be performed after which the patient receives chemo radiation
Radiotherapy	4	(2.3)	• Recommendation is to refer to radiotherapist • Now the recommendation is 5 × 5
Chemotherapy	8	(4.7)	• Recommendation is to refer to oncologist for neoadjuvant chemotherapy after which we can restage the tumour and discuss the case again. Reevaluate after three courses of chemotherapy, so after three courses of chemotherapy scheduling the patient on the MDTM agenda again • Patient receives adjuvant chemotherapy • Recommendation is treatment with chemotherapy according to the colorectal pathway and to see how the tumour hold up and discuss again if necessary
Surgery	33	(19.3)	• Recommendation is laparoscopic resection
Palliative care/no treatment	7	(4.1)	• Recommendation is palliative treatement • Recommendation is palliative care
Total	89	(52)	
Consulting patient for their preferences	13	(7.6)	• Recommendation is to listen to the patient's wishes • Recommendation is to discuss the possibilities • First, it needs to be discussed what the patient wants and does not want
Other	3	1.8	• This patient needs to be discussed again next week. However, the high fever shouldn't be related to the tumour. So we have to refer the patient to an internist, because possibly something else is wrong • Recommendation: refer to Breda for a liver resection after which imaging on the longs can be performed • Recommendation is to first consult a liver surgeon instead of trying things we are unfamiliar with and give chemo-therapy. Discuss again after consultation with liver surgeon to assess our own learing
TOTAL	141	82.5	

Table 7

Geriatric evaluation versus geriatric expertise.

	Discussed in n cases (%)			Quotes and examples
	Without geriatric expertise	With geriatric expertise	Total	
General condition (frailty/vitality)				
Karnofsky index	7 (9.2%)	3 (3.2%)	10 (5.8%)	
ASA	1 (1.3%)	0 (0%)	1 (0.6%)	
WHO	0 (0%)	0 (0%)	0 (0%)	
Possum	0 (0%)	0 (0%)	0 (0%)	
GFI	0 (0%)	0 (0%)	0 (0%)	
Remarks without mentioning measures	6 (7.9%)	18 (18.9%)	24 (14%)**	• According to the geriatrician it concerns a vital man • patient is a somewhat frail older woman • patient has a moderate condition.
Total	13 (17.1%)	21 (22.1%)	34 (19.9%)	
Comorbidity				
Charlson comorbidity index	0 (0%)	0 (0%)	0 (0%)	
Remarks without mentioning measures	21(27.6%)	5 (5.3%)	25 (15.2%)***	• Patient has a background with cardiac issues and diabetes type 2 • background with hypertension, diabetes type 2, COPD and kidney dysfunction • Patient has had multiple strokes • it concerns a rudimentary vital man because of COPD
Total	21(27.6%)	5 (5.3%)	25 (15.2%)***	
Self-reliance				
ADL score: Barthel index	0 (0%)	0 (0%)	0 (0%)	
IADL score: Lawson score	0 (0%)	0 (0%)	0 (0%)	
Katz ADL schaal	0 (0%)	0 (0%)	0 (0%)	
Fillenbaum	0 (0%)	0 (0%)	0 (0%)	
Timed up and go	0 (0%)	0 (0%)	0 (0%)	
Remarks without mentioning measures	6 (7.9%)	6 (6.3%)	12 (7.0%)	• Patient has an increased risk to fall • this patient still does everything on her own • this patient can take good care of himself • this patient lives in a nursing home
Total	6 (7.9%)	6 (6.3%)	12 (7.0%)	
Geriatric syndrome				
Delirium Observation Screening Scale (DOS)	0 (0%)	0 (0%)	0 (0%)	
Geriatric Depression Scale (GDS)	0 (0%)	0 (0%)	0 (0%)	
Mini Mental State Examination (MMSE)	0 (0%)	0 (0%)	0 (0%)	
Remarks without mentioning measures	2 (2.6%)	10 (10.5%)	12 (7.0%)*	• Patient scored low on cognition • patient has a weak short term cognitive function, as for the rest he is cognitively intact • patient has been screened by the geriatrician and she has a low score because of a seriously reduced IQ
Total	2 (2.6%)	10 (10.5%)	12 (7.0%)*	
Communication	1 (1.3%)	1 (1.1%)	2 (1.2%)	• Patient has bad vision and hearing • this patient has limited communicative ability
Risk of malnutrition				
SNAQ	1 (1.3%)	0 (0%)	1 (0.6%)	• We need to check the SNAQ measure
MNA	0 (0%)	0 (0%)	0 (0%)	
MUST	0 (0%)	0 (0%)	0 (0%)	
Remarks without mentioning measures	0 (0%)	2 (2.1%)	2 (1.2%)	• Geriatrician ask whether this patient has been seen by a nutritionist, because he has lost 8 kg in weight and this will not improve by chemo radiation. Moreover, this patient is frail because of nutrition • the patient is fed by a feeding tube
Total	1 (1.3%)	2 (2.1%)	3 (1.8%)	
Medication use	1 (1.3%)	2 (2.1%)	3 (1.8%)	• Patient receives anticoagulant medication (Ascal)
Social support				
'Lastmeter'	0 (0%)	0 (0%)	0 (0%)	
Remarks without mentioning measures	3 (3.9%)	4 (4.2%)	7 (4.1%)	• The patient does not have a social support system. The patient relies only on a cousin in Belgium. This could be a problem regarding revalidation • Her husband is informal caregiver. There are some problems at home socially • Patient has a rather large social network which supports her
Total	3 (3.9%)	4 (4.2%)	7 (4.1%)	
TOTAL	28 (36.8%)	32 (33.7%)	60 (35.1%)	

* p < .05.
** p < .01.
*** p < .001.

making process. Although we found that some topics were discussed slightly more frequently for patients with a new diagnosis compared to patients with recurrent disease, for both groups the same steps are left out of the discussion. To help taking these steps, we argue for the use of checklists, as for example being used in aviation. Comparisons have been made between the medical industry and aviation industry as both doctors and pilots work in teams and need to make decisions in complex environments [19, 20]. Both errors in aviation and health care are frequently caused by poor communication [19, 21] and the introduction of simple checklists -as widely being used in aviation- has been shown to improve communication in medical settings, without taking up extra time [21]. Even in MDTM settings, the use of a checklist has been proposed and developed [22]. Although its effectiveness should still be investigated, for now it is suggested and expected that a checklist which emphasizes the decision making process could be a helpful aid to improve patient-centred decision making. According to Lamb and colleagues [22], such a checklist should consist of three main aspects: (1) whether (sufficient) core team members are present, including someone that knows the patient, (2) whether all relevant domains of information on the patient are covered (i.e., case history, co-morbidities, radiological, pathological, psycho-social, patient views and clinical trials), (3) whether different professional groups are involved and (4) whether a decision can be reached and implemented. In addition, on the basis of our results we would suggest a checklist which also covers the steps of the decision making process.

Our second main finding entails the lacking incorporation of (age-related) patient characteristics and patients' preferences during the decision making process. Abovementioned approach using a checklist can aid in discussing these factors. However, as we have found that sometimes this information was not available during MDTM, it seems important to gather information on age-related problems and patient preferences before MDTM discussion, particularly for older patients with cancer. This can be done by more or less comprehensive forms of geriatric evaluation and could take up slightly more time before MDTM, but be more efficient in the long term as some cases which had to be discussed twice, can be reduced to once. Moreover, this would decrease the time a patient is uncertain of a diagnosis and or treatment plan, and can therefore decrease unnecessary anxiety and distress. If a case needs to be discussed for a second time to reach a final recommendation, a patient needs to wait for another week. In line with and in addition to the recommendation by Lamb et al. to use a checklist and to include someone that knows the patient as a MDTM team member, we suggest that geriatric experts such as geriatricians or geriatric nurses can fulfil the role of advocate or someone that knows the patient for older patients perfectly.

This study has some limitations worth considering. First, for privacy reasons, we used field notes, instead of audio- or video recordings. Hence, we may have missed some information. However, our results are in line with studies which have investigated case reports which were written based on the what was discussed during MDTM, suggesting reliability of our method. Second, as we considered observational data only, instead of, for example, interviews with MDTM members, we do not know whether –unless clearly stated otherwise-information was available beforehand yet simply not communicated during the MDTM or whether information was indeed not available for decision making. We only know that information was not used in the decision making process. Third, this study was conducted in hospitals in the Netherlands. Although this study is unique in the sense that we have included five hospitals, where other studies were carried out in one hospital only [12, 14, 23, 24], our results are only representative for the situation in The Netherlands. However, until future studies investigate the decision making process for older patients with cancer in MDTM in other countries, we believe that the results that contribute to existing similar findings in other countries can be useful across many borders. Last, in order to account for differences in the decision making process between cases discussed prior to treatment and cases discussed during or post-treatment on one hand, and for differences in the incorporation

of geriatric evaluation in the decision making process between MDTMs with and without the presence of geriatric expertise on the other hand, we have performed a large number of Chi^2 analyses. This increases the risk of type one error. However, as we found little significant differences we assume the possibility of type one error to be very small.

Regardless of these limitations, this study provides valuable, novel insights into the treatment decision making process for older patients with cancer during MDTM. This study contributes to existing literature by having considered the extent to which geriatric evaluation was incorporated in decision making and whether there were differences in this respect between MDTM with and without geriatric expertise. Most importantly, especially for older patients with cancer, age-related characteristics and patient preferences are often neglected during the decision making process, whereas, considering the complexity of decision making for older patients with cancer in particular, it is highly important to communicate these during the MDTM. Only by taking patients' individual vulnerabilities and wishes into account, care for older patients may become truly patient-centred.

5. Additional Information

5.1. Availability of Data and Material

Data is archived in the data repository of the Amsterdam School of Communication Research (ASCoR), University of Amsterdam, The Netherlands. Any requests and/or questions can be addressed to the corresponding author.

Authors Contributions

SB. Carried out data collection and analyses, drafted and revised manuscript; ES Supervised the project and provided critical feedback on manuscript; MH Provided critical feedback on manuscript. Contributed to the interpretation of medical data and field notes; EL. Provided critical feedback on manuscript; JvW conceived the original idea, retrieved funding, contributed to the analysis and interpretation of the data, supervised the project and provided critical feedback on manuscript.

Appendix A. Observation guide

Hospital code	
Patient number	
Date	

Participating professionals	Present yes/no
Geriatricician	
Geriatric nurse	
Oncologist	
Surgeon	
Radiotherapist	
Pathologist	
Nurse	
MD	
other	

Patient characteristics	
gender	Male/Female
Age	
Diagnosis	
Tumour type	

Decision making process

[space used for field notes]

Comments on geriatric evaluations and geriatric screening instruments

[space used for field notes]

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