Lay understanding of common medical terminology in oncology

Arwen H. Pieterse1*, Nienke A. Jager2, Ellen M.A. Smets3 and Inge Henselmans3
1Department of Medical Decision Making, Leiden University Medical Centre, Leiden, the Netherlands
2Department of Social and Behavioural Sciences, University of Amsterdam, Amsterdam, the Netherlands
3Department of Medical Psychology, Academic Medical Centre/University of Amsterdam, Amsterdam, the Netherlands

*Correspondence to: Department of Medical Decision Making, Leiden University Medical Centre, PO Box 9600, 2300 RC Leiden, the Netherlands. E-mail: a.h.pieterse@lumc.nl

Abstract

Objective: The purpose of this study was to replicate and extend an earlier study carried out in the UK of lay understanding of cancer-related terms in a Dutch sample, by (i) examining understanding of common terms relating to diagnosis, prognosis, and treatment and (ii) experimentally exploring the effect of medical jargon versus plain language use on individuals' perceived efficacy in interacting with oncologists, participating in medical decision making, and interpersonal trust.

Methods: One hundred ninety-four lay people completed a questionnaire assessing (i) understanding, confidence in understanding, and worry after reading 10 scenarios presenting cancer-related terms and (ii) perceived communication efficacy, decision-making efficacy, and trust following a vignette portraying an oncologist using either jargon or plain language.

Results: On average, participants understood a majority (6.8 ± 1.6) of cancer-related terms, yet only 2.2% understood all 10 terms correctly. Compared with incorrect understanding, correct understanding was generally related to higher confidence in understanding and to worry levels that better matched the scenarios. Language complexity did not significantly affect measures of perceived efficacy or trust. Overall confidence in understanding was significantly related to measures of perceived efficacy (p < 0.01).

Conclusion: Similar to the earlier UK study these results suggest that lay people’s understanding of commonly-used terms in oncology is suboptimal. Moreover, confidence in understanding was related to perceived efficacy in participating in the consultation. Oncologists should attempt to correct patient misunderstanding to alleviate unnecessary worry and potentially facilitate patient participation.

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Introduction

Cancer patients often do not correctly understand their diagnosis, prognosis, or treatment options [e.g., 2,3]. Such misunderstanding might be inherent to the complexity of the information and the emotional nature of cancer consultations. Yet, it may also result from the language clinicians use, including euphemisms, vague words [4], and medical jargon [5]. Chapman et al. [1] examined lay understanding of cancer-related terms oncologists use when discussing cancer diagnosis and prognosis with their patients and found understanding to be suboptimal and variable.

Patients’ limited understanding might hamper effective doctor–patient communication [6,7] in various ways. First, the use of jargon, such as technical terms or ambiguous language, might lower patients’ efficacy in actively interacting with the oncologist [8] and in participating in decision making [9]. For example, it has been shown that patients’ general understanding of health information, that is, their health literacy, is positively related to patients’ participation during the consultation [7,10]. Limited participation in the consultation and in decision making have been reported to be related to negative outcomes, such as receiving less information [11] and having a lower quality of life [12,13]. Moreover, it has been shown that patients with low levels of perceived self-efficacy were less satisfied with the consultation [14]. Second, the use of unclear and incomplete communication may cause patients to have less trust in their oncologist [15]. A recent review demonstrated that low levels of trust complicate communication and decision making and negatively affect patient outcomes, such as psychological well-being [16].

The current study first aims to replicate and extend the descriptive study of Chapman et al. [1] in a large Dutch sample, examining lay people’s understanding of terms relating to diagnosis, treatment, and prognosis, as well as statistics [17]. Second, we aimed to explore experimentally the effect of language use (jargon vs plain) on lay people’s perceived efficacy in interacting with the oncologist, in participating in medical decision making, and trust. Third, we aimed to investigate whether a possible influence of language on outcomes would be moderated by individuals’ confidence in their understanding of cancer-related terms.

Methods

Participants

As we aimed to include a sample representative of the Dutch population, visitors of the Department of Civil Affairs in a district office of Amsterdam, the Netherlands, were approached (7–20 April 2010). Participants were eligible if they had a good command of the Dutch language and had not studied/were not studying medicine. Approximately...
one-third of those approached declined participation, most often because of insufficient time or disinterest.

Procedure

Eligible individuals were invited to participate and were briefly informed about the study’s purpose and procedure. After oral consent was obtained, the participants were seated and asked to complete a questionnaire. The researcher alternately distributed the jargon versus plain language versions of the questionnaire. Care was taken to ensure that the participants did not search for information while completing the questionnaire. The institutional ethical board approved the study.

Materials

Background characteristics

The participants were asked to indicate whether they thought their knowledge about cancer was higher than average, because of having experience with cancer (i) in their personal life (yes/no), or (ii) through their education or work (yes/no). Moreover, the participants reported their age, gender, and educational level. Educational level was categorized into low (elementary/low-level vocational; <9 years of education), intermediate (intermediate level vocational; 10–14 years), high (high level vocational/academic; >15 years).

Understanding

The questionnaire asked the participants to imagine they were cancer patients. To assess understanding, 10 short scenarios were presented that depicted an oncologist using technical or potentially ambiguous language, that is, euphemisms, modifiers, or prognostic, diagnostic or probability terms relating to diagnosis, prognosis, or treatment (Table 1). Five scenarios were derived from Chapman et al. [1], two from Sutherland et al. [17], and three were based on a purposeful sample of videotaped first consultations between Dutch radiation oncologists and patients with various types and stages of cancer [18]. These consultations were recorded as part of an unrelated observational study and served as inspiration for the development of three additional scenarios matching Dutch practice. The resulting scenarios were checked for veracity by two surgical and one radiation oncologist. The participants were asked to indicate what they thought the oncologist was saying using an open-ended (three scenarios) or multiple-choice (seven scenarios) response format. To replicate the study of Chapman et al. as closely as possible, we adopted the response formats they used for the items derived from their study. Closed-ended scenarios other than those from Sutherland et al. included a ‘don’t know’ response option. The participants were further asked to indicate for each scenario their confidence in the correctness of their understanding (1 = not confident at all, 2 = not confident, 3 = little confident, 4 = confident, and 5 = very confident) and how worrisome they considered the scenario (1 = not worrisome at all, 2 = not worrisome, 3 = a little worrisome, 4 = worrisome, and 5 = very worrisome).

Table 1. Correctness of understanding of cancer-related terms, confidence in understanding and worry

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Cancer-related term</th>
<th>News</th>
<th>Correct understanding</th>
<th>Incorrect understanding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>N (%)</td>
<td>SD</td>
</tr>
<tr>
<td>Scenario 1</td>
<td>Seedlings (C) (O)</td>
<td>Bad</td>
<td>151 (78.2)</td>
<td>4.5 (0.7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.5 (0.8)</td>
<td>42 (21.8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>4.0 (1.1)</strong></td>
<td>4.5 (0.9)</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>Beige (C) (O)</td>
<td>Good</td>
<td>128 (66.3)</td>
<td>4.2 (0.8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.7 (1.0)</td>
<td>65 (33.7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>4.0 (1.1)</strong></td>
<td>2.9 (1.0)</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>Spots (C) (O)</td>
<td>Bad</td>
<td>65 (34.2)</td>
<td>3.1 (1.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.3 (0.8)</td>
<td>125 (65.8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>3.5 (1.2)</strong></td>
<td><strong>3.4 (0.9)</strong></td>
</tr>
<tr>
<td>Scenario 4</td>
<td>Positive (C)</td>
<td>Bad</td>
<td>120 (62.8)</td>
<td>3.2 (1.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.4 (0.8)</td>
<td>71 (37.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>3.7 (2.1)</strong></td>
<td><strong>3.4 (0.9)</strong></td>
</tr>
<tr>
<td>Scenario 5</td>
<td>Remission (C)</td>
<td>Good</td>
<td>55 (28.4)</td>
<td>3.1 (1.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.8 (1.0)</td>
<td>139 (71.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>1.8 (1.1)</strong></td>
<td><strong>3.2 (1.0)</strong></td>
</tr>
<tr>
<td>Scenario 6</td>
<td>Under control</td>
<td>Neutral</td>
<td>163 (84.0)</td>
<td>3.7 (1.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.7 (0.9)</td>
<td>31 (16.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>2.3 (1.1)</strong></td>
<td><strong>3.4 (1.1)</strong></td>
</tr>
<tr>
<td>Scenario 7</td>
<td>Small margins</td>
<td>Neutral</td>
<td>167 (87.0)</td>
<td>3.7 (0.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.6 (1.1)</td>
<td>25 (13.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>1.7 (0.9)</strong></td>
<td><strong>3.4 (1.1)</strong></td>
</tr>
<tr>
<td>Scenario 8</td>
<td>Intensive treatment</td>
<td>Bad</td>
<td>147 (77.4)</td>
<td>3.5 (1.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.7 (0.7)</td>
<td>43 (22.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>2.9 (1.2)</strong></td>
<td><strong>3.9 (1.0)</strong></td>
</tr>
<tr>
<td>Scenario 9</td>
<td>Itchy, red skin</td>
<td>Good</td>
<td>161 (83.0)</td>
<td>4.2 (0.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.4 (1.0)</td>
<td>33 (17.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>3.6 (1.0)</strong></td>
<td><strong>2.9 (1.1)</strong></td>
</tr>
<tr>
<td>Scenario 10</td>
<td>Response to</td>
<td>Bad</td>
<td>157 (80.9)</td>
<td>3.8 (1.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.3 (0.9)</td>
<td>37 (19.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>3.3 (1.3)</strong></td>
<td><strong>4.1 (1.0)</strong></td>
</tr>
</tbody>
</table>

Sample sizes range between 190 and 194 due to occasional missing data.

(C) Scenario adopted from Chapman et al. [1]; (S) Scenario adopted from Sutherland et al. [17]; (O) Open-ended question about understanding.

*Whether the scenario was aimed to imply good, neutral or bad news.

**Scenario 6 read as follows: “On the basis of a series of examinations your doctor concludes that the cancer has spread to another part of the body. Your doctor proposes a treatment and tells you: ‘With this treatment we know that we have a high probability to keep the illness under control for a longer period of time.’”

What do you believe the doctor is telling you?

Thanks to this treatment: (A) You will probably experience no or few symptoms of your cancer for a longer period; (B) You will probably be free of cancer for a longer period; (C) I do not know.

*Scenario 7 read as follows: “On the basis of a series of examinations your doctor concludes that the cancer has spread to another part of the body. Your doctor proposes a treatment and tells you: ‘To spare healthy tissue as much as possible, we will keep the margins as small as possible.’”

What do you believe the doctor is telling you?

(A) The treatment will be aimed as much as possible only at the tumor; (B) The treatment will be carried out in as short a period as possible; (C) The treatment will be carried out as soon as possible; (D) I do not know.

*Scenario 8 read as follows: “Your doctor discusses the treatment options with you and tells you: ‘We want first to make sure that the cancer has not spread. If that is the case, you see, it is not worth it to give you an intensive treatment and to burden you with it.’”

What do you believe the doctor is telling you?

(A) When the cancer has spread, then no treatment can cure you anymore; (B) When the cancer has spread, then a less intensive treatment can work as well; (C) When the cancer has spread, then an intensive treatment is not worth the money; (D) I do not know.

*p < 0.05.

**p < 0.01.

***p < 0.001.
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3 = a little worrisome, 4 = worrisome, and 5 = very worrisome), as additional indicators of understanding.

Experimental manipulation
To experimentally explore the effect of language, the participants were presented with one of two vignettes (Appendix A). Again, these were developed using content and terminology derived from the sample of videotaped first consultations with radiation oncologists. The vignettes portrayed an oncologist who was providing information on treatment options either in jargon or plain language. As a manipulation check, the participants were asked to indicate whether they considered the language used to be difficult (1 = totally disagree, 2 = disagree; 3 = neither disagree nor agree; 4 = agree; 5 = totally agree).

Outcome measures
The participants’ perceived efficacy in interacting with the oncologist was measured using the five-item Perceived Efficacy in Patient-Doctor Interactions scale [19]. The participants were asked to indicate how confident they were that they, for example, would be able to get their questions answered by the presented doctor, or would be able to make the most out of the visit. Internal consistency was high (α = .83). Higher total scores (range, 5–25) indicate higher perceived efficacy. The participants’ perceived self-efficacy in participating in decision-making was assessed using the five-item Decision Making Participation Self-efficacy scale [DEPS, 20]. The DEPS assesses patients’ confidence in engaging in activities related to decision-making, for example, confidence in telling the doctor what treatment option they prefer. Internal consistency was high (α = .83). Higher total scores (range, 5–25) indicate higher perceived self-efficacy. The participants’ trust in the oncologist was assessed with two items from the Wake Forest Physician Trust Scale [21,22]: ‘You have no worries about putting your life in this doctor’s hands,’ and ‘You completely trust this doctor.’ Internal consistency was high (α = .86). Higher total scores (range, 2–10) indicate higher overall trust.

Coding of open-ended responses
Coding guidelines were created for the open-ended questions. Responses should clearly reflect understanding, should not simply paraphrase scenarios and had to be specific to be considered correct. In all scenarios, responses were categorized into ‘correct’ or ‘incorrect.’ ‘I don’t know’ responses were considered incorrect. Consensus on the coding was reached among three independent coders (NJ, IH, AP).

Analysis
Associations between background characteristics and the number of correctly understood scenarios were examined by means of t-tests and Pearson correlations. Moreover, we examined whether the two experimental groups differed on background characteristics. For the first aim, levels of confidence in understanding and worry were compared per scenario for participants who did versus those who did not understand the scenario correctly, using Mann–Whitney U-tests. Missing data were not imputed. For the second aim, an independent t-test was performed to determine whether the manipulation (jargon vs plain) had been successful, that is, whether the participants perceived medical jargon as more difficult than plain language. A multivariate analysis of variance was conducted to assess the main effect of language complexity on the three outcome variables. Missing data were replaced by the individual’s mean when at least half of the scale was completed.

As the internal consistency of the 10 confidence scales was good (α = 0.80), scores were summed to reflect the participants’ overall level of confidence. To examine the moderating effect of overall confidence on the effect of language complexity, a multivariate analysis of covariance was conducted, including the main effect of overall confidence in the first step and the interaction between overall confidence and language complexity in the second step. To avoid multicollinearity, overall confidence was centered around the mean. Significance testing was carried out two-sided at α = 0.05.

Results
Participants
Two-hundred people agreed to participate. Data from 194 participants were available (two did not return the questionnaire; four completed less than half of the questions). The different scales were fully completed by at least 95% of these participants. Mean age was 38.9 ± 13.1 years, and 56.5% was male. A majority (78.8%) was highly educated, 18.6% had completed intermediate-level education and 21.1% had completed low-level education. One third (36.5%) indicated that they might have more knowledge about cancer than average, because they had experience with cancer in their personal lives (31.9%) or through their study/work (13.2%). The participants in the two conditions did not significantly differ on any of the background characteristics.

Understanding of cancer-related terms
Table 1 shows the number of participants with correct versus incorrect understanding of cancer-related terms, as well as the levels of confidence and worry by correctness of understanding. The participants understood an average of 6.8 ± 1.6 out of 10 scenarios correctly. Only 2.2% of the participants correctly understood all 10 scenarios; all participants were correct at least once. Most participants (70.3%) correctly understood between 6–8 scenarios. Scenarios 3 (‘having spots in the liver’) and 5 (‘being in remission’) were understood least often. Only educational level was related to understanding (t(187) = −2.2, p = 0.03), that is, the participants with a high-level education understood on average more scenarios correctly (M=6.9) than the participants with a low-level or intermediate-level of education (combined; M=6.3).

Except for scenario 2 and 3, the participants with correct understanding were significantly more confident about their understanding than the participants who were incorrect. Moreover, the participants who understood scenarios 3, 4, 5, 8, and 9 correctly, reported worry levels that better matched the scenario (i.e., higher in case of bad news; lower
in case of good news) than the participants who understood these scenarios incorrectly.

The effect of language complexity

The participants in the jargon condition considered the language use more difficult ($M = 3.7$) than the participants in the plain language condition ($M = 2.4$, $t(187) = 7.6$, $p < 0.001$). Language complexity had no significant effect on the two measures of perceived efficacy nor on trust (Wilks’ Lambda = .97, $F(3,188) = 1.7$, $p = 0.17$).

Overall confidence in understanding had a significant main effect on the outcomes (Wilks’ Lambda = .90, $F(3,187) = 7.0$, $p < 0.001$). Univariate tests revealed that overall confidence was positively related to perceived efficacy in interacting with the oncologist and decision-making participation ($F(1,187) = 12.5$, $p < 0.01$ and $F(1,187) = 20.0$, $p < 0.001$, respectively). Confidence was not related to trust ($F(1,187) = 2.5$, $p = 0.12$).

The effect of the interaction between language complexity and overall confidence was not significant, that is, the effect of language on outcomes was independent of participants’ overall confidence (Wilks’ Lambda = 0.96, $F(3,186) = 2.5$, $p = 0.06$).

Discussion

To our knowledge, this study is the first in the Netherlands to investigate lay peoples’ understanding of common cancer-related terms. The results suggest that the participants’ comprehension was suboptimal, that is, scenarios were misunderstood by a significant number of individuals and the number of correctly understood scenarios varied greatly across them. One could argue that lay people’s understanding does not need to be perfect, because they are not personally confronted with cancer. However, most scenarios referred to situations that can occur in or shortly after diagnostic consultations, such as ‘seedlings’, ‘spots’, ‘positive’, or ‘benign.’ Lay people may represent newly-diagnosed patients and, consequently, doctors should adjust to their level of understanding, especially in the early post-diagnostic period.

Understanding in the present study was both higher (two scenarios) and lower (three scenarios) compared with the study of Chapman et al., and higher for the two scenarios adopted from Sutherland et al. [17]. Our sample was fairly well-educated, which might explain the latter difference. Evidence suggests that understanding of medical terms is positively associated with education [e.g., 23]. In our study, educational level was significantly related to understanding. Given the existence of an educational bias, we expect that misunderstanding is more common than our results suggest. Importantly, oncologists often fail to recognize their patients’ misconceptions [3] and evidence from primary care suggests that doctors tend to overestimate patients’ literacy levels [24]. Our results suggest that oncologists should indeed invest effort into helping patients understand information correctly.

For 8/10 cancer-related terms, incorrect understanding was associated with less confidence in understanding. This result suggests that people often are aware of their misunderstanding. Yet, because patients tend not to ask for clarification [25], oncologists should assess understanding regularly, for example by asking patients to explain back what they understand, as Chapman et al. [1] recommend or how certain they are about their understanding.

Worry was generally higher after reading bad compared with good news, even for participants with low understanding. The latter may have understood the gist of the information (i.e., cause for worry), but not its exact meaning. Following half of the scenarios, correct understanding was associated with worry levels that better matched the scenarios than incorrect understanding, a finding similar to the results of Chapman et al. This result shows that worry might be a useful indicator of patient understanding for oncologists.

Contrary to our expectations, the participants who were provided with more complex language did not report lower levels of efficacy in patient–doctor interaction or decision-making participation, nor less trust. Moreover, language complexity did not seem to affect people with low versus high confidence in understanding cancer-related terms differently. Possibly, despite our efforts to create realistic vignettes, the participants may have had difficulties actually imagining being diagnosed with cancer. It is not clear from our data whether this is the case. In further research, we would recommend assessing how easy or difficult it was for the participants to imagine being a cancer patient. We did not provide specific detail on the background of the hypothetical patient because we thought this could hamper individual participants’ ability to identify themselves with a cancer patient. Yet, more detail, on the other hand, could have made the situation more concrete and thus easier to imagine. Possibly, asking the participants to visualize the situation could have helped them to imagine being the patient. Visualization of a simulated situation, that is, imagined experience, was shown to produce results very similar to findings obtained in real (non-health) situations and different from results obtained in the identical simulated situation without visualization [26]. Also, we only provided written cues. Videotaped patient–doctor interactions [27] might facilitate the task of imagining being a patient because visual information often is more engaging than print information [28]. Additionally, videotapes can convey oncologists’ non-verbal expressions including eye-contact, making the simulated situation more realistic. In future research on the effect of oncologists’ language use on (analog) patients’ outcomes, the application of video vignettes should be considered. The finding that the language used was not related to the level of trust in the presented doctor might be related to factors other than methodology, however. Leisen and Hyman [15] distinguish two dimensions of trust, that is, benevolence and technical competence. Clear and complete communication is suggested to be part of the ‘benevolence’ dimension: and therefore, unclear and incomplete communication was expected to lead to lower trust. On the other hand, the use of medical terms might increase the perceived ‘technical competence’ of the doctor and therefore heighten trust [29]. Hence, the fact that our vignettes included both ambiguous as well as technical language, might explain our null-findings.

Interestingly, overall confidence in understanding cancer-related terms was related to individuals’ perceived efficacy in interacting with the oncologist, as was shown earlier for

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patients with chronic hypertension in primary care [8] and in participating in decision making. This suggests that people’s understanding of the information oncologists provide may influence their degree of involvement in the interaction.

Limitations to the study should be noted. First, scenarios were presented without context and people could not ask for clarification. Not having that opportunity is inconsistent with actual medical consultations. Also, we may have underestimated or overestimated understanding of the open-ended scenarios because it was at times challenging to determine the exact meaning of the participants’ responses. This might explain why participants’ confidence in understanding was not related to the correctness of understanding in scenarios 2 and 3, which were both applying an open-ended response format. Moreover, possible differences in coding might limit the comparison between the responses to these three scenarios in our study and those in Chapman et al. [1]. Second, our sample was higher educated than the Dutch population in general [30]. Our results may therefore overestimate understanding in the general population.

In conclusion, these and other results [1,5] suggest that lay people’s understanding of commonly-used terms in cancer consultations is suboptimal. This study further shows that individuals’ confidence in understanding the oncologist was related to their perceived efficacy in participating in the consultation. Clinicians should be aware that especially newly-diagnosed cancer patients may have difficulties understanding their situation and options, which may cause patients to become less involved in their care than they may wish. Such involvement is important, as it can help clinicians tailor information as well as decision making to the individual patient’s needs. Tailoring to and sharing decisions with patients have been shown to be related to beneficial patient outcomes, such as quality of life [13] and adjustment [31,32]. To alleviate unnecessary worry and to facilitate patients’ active involvement, clinicians should regularly assess patients’ understanding during consultations.

Appendix A. Vignettes

Introduction to either version of the vignette

Please imagine that you are the patient. You have been diagnosed with cancer. This is the second time you talk to the doctor. He will tell you more about the results of the examination and treatment options.

Medical jargon

As you already know, the endoscopic ultrasound showed that you have a malignant tumor. In order to determine which risk group you belong and which treatment we will propose, we need to carry out a number of additional examinations. The main question is whether there are metastases. I estimate the probability to be 10%. According to the examination, your lymph nodes are negative. It also showed a number of anomalies in the liver. We shall carry out a liver puncture to determine this further. If the outcome is negative, there are two good options for treatment: a resection or radiotherapy. During or after resection, there may be complications. Radiotherapy may also provoke side effects. We try to minimize the probability of their occurrence. In case we opt for radiotherapy, we will keep the irradiation field to a minimum.

Plain language

As you already know, the internal examination during which we have examined your colon has shown that you have a cancer lump. In order to predict the course of your illness and to determine which treatment we will propose to you, we need to carry out a few more examinations. The main important question is whether there are cancer cells at other places in your body. In 10 out of a 100 patients like you, we find cancer cells elsewhere in the body. The examination has shown that your lymph nodes have not been affected. It also showed some unusual spots in the liver, which might indicate cancer. We shall need to extract a few cells from the liver for further examination. If there is no cancer in the liver, there are two good options for treatment: surgery or treatment with radiation. During or after surgery, there may be complications. Radiation treatment also may provoke side effects. We try to minimize the probability of their occurrence. In case we opt for radiation treatment, we shall do our best to keep radiation from reaching the healthy organs around the lump.

Acknowledgements

We thank the authors of the original study by Chapman et al. for giving us insight into their materials. We would like to thank the staff of the district office Westerpark, Amsterdam, for allowing us to approach visitors to their office. Also, we are grateful to the participants for taking the time to complete our questionnaire. At the time of this study, Arwen Pieterse and Inge Henselmans were both supported by postdoctoral fellowships from the Dutch Cancer Society.

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