Quality of informed consent in cancer clinical trials: a cross-sectional survey

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Summary

Background Investigators have to obtain informed consent before enrolling participants in clinical trials. We wanted to measure the quality of understanding among participants in clinical trials of cancer therapies, to identify correlates of increased understanding, and to assess providers' beliefs about clinical research. We also sought evidence of therapeutic misconceptions in participants and providers.

Methods We sent a standard questionnaire to 287 adult patients with cancer who had recently enrolled in a clinical trial at one of three affiliated institutions, and surveyed the provider who obtained each patient's consent.

Findings 207 of 287 (72%) patients responded. 90% (186) of these respondents were satisfied with the informed consent process and most considered themselves to be well informed. Nevertheless, many did not recognise non-standard treatment (74%), the potential for incremental risk from participation (63%), the unproven nature of the treatment (70%), the uncertainty of benefits to self (29%), or that trials are done mainly to benefit future patients (25%). In multivariate analysis, increased knowledge was associated with college education, speaking only English at home, use of the US National Cancer Institute consent form template, not signing the consent form at initial discussion, presence of a nurse, and careful reading of the consent form. Only 28 of 61 providers (46%) recognised that the main reason for clinical trials is benefit to future patients.

Interpretation Misconceptions about cancer clinical trials are frequent among trial participants, and physician/investigators might share some of these misconceptions. Efforts to educate providers and participants about the underlying goals of clinical trials are needed.

Lancet 2001: **358:** 1772–77
See Commentary 1742

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Introduction

Ethical and legal doctrines mandate that, with rare exceptions, research participants or their surrogates give informed consent before enrolment in clinical research.[1–7] However, concerns have been raised as to the adequacy of such consent.[8] Many studies have revealed difficulties with comprehension of clinical trials[9–17] (eg, the right of patients to refuse to participate in research, misunderstandings of research procedures—including randomisation, under-reporting of potential risks, and inadequate information about alternatives).[10,13–16] Perhaps most important, although trials are aimed to benefit future patients, many participants might have the therapeutic misconception that "every aspect of the research project . . . was designed to benefit [them] directly".[18]

Absence of simple, standard methods for assessment of outcomes of the consent process has restricted research on informed consent and prevented monitoring by Institutional Review Boards (IRBs).[19] Investigators have used heterogeneous methods that are tailored to their specific protocols, thereby restricting meaningful comparisons of their work. One generic method exists (the Deaconess Informed Consent Comprehension Test[20]), but its validity has not been established, it is difficult to administer and score, and it has not been widely used.

We have designed a new questionnaire, the Quality of Informed Consent (QuIC), to assess the informed consent process for clinical research of cancer therapies.[21] In the present study, our main objectives were to measure how well newly enrolled trial participants understood the trials in which they were participating, and to ascertain what factors were associated with greater understanding. In particular, we investigated whether a consent form template that was recently published by the US National Cancer Institute[22] resulted in a measurable improvement in participants' knowledge. This template uses a question-and-answer format that is easy to read and understand, to structure and simplify disclosure of important information. Our secondary objectives were to describe the informed consent process from the participant's point of view, and to describe how participants assessed their own comprehension. Finally, we assessed providers' understandings of central elements of informed consent. To account for the many types of clinical research in cancer, and to identify differences in participants' comprehension by phase, we questioned participants in phase I, II, and III trials.

Methods

Participants

We included only participants in trials that assessed a cancer-directed treatment (ie, not supportive care) and were phase I safety and dose-escalation trials, safety trials, phase II single-group efficacy trials, or phase III randomised controlled trials. All open trials were reviewed in advance to see if they met these criteria. Potential patients were identified by the quality control centre at the Dana-Farber Cancer Institute, which registers all patients enrolled in clinical trials at its affiliated institutions.

Individuals were eligible if they were aged 18 years or older and had signed consent to a qualified cancer trial at Dana-Farber Cancer Institute, Brigham and Women's Hospital, or Massachusetts General Hospital, within the previous 14 days. We excluded people if consent had been obtained in a language other than English or by an investigator of this study, if their mailing address was outside the USA, or if they had died (n=3) or had been removed from the clinical trial within 14 days of signing consent. Enrolment took place from June 28, 1999, to Jan 1, 2000. We sent questionnaires to all eligible patients, and did not require permission from the respondent's physician. The Dana-Farber Cancer Institute IRB, which oversees all cancer-related research at the institutions participating in this project, approved the study protocol.

Survey methods

Surveys were mailed to the participant's home or delivered to their hospital room 3–14 days after consent to participation in the clinical trial. If the completed survey was not returned within 2 weeks, a second questionnaire was sent, together with a card on which the patient could decline participation. 2 weeks later, we telephoned non-respondents to ensure receipt of the questionnaire and to answer any questions. If requested, we mailed a third questionnaire. Follow-up questionnaires were not sent to patients who had discontinued participation in their clinical trial. Concurrent with the initial mailing, we sent a brief questionnaire to the provider who had signed the consent form. If necessary, a second questionnaire was sent to the provider 14 days later.

The QuIC[21] consists of two parts. Part A, which measures the knowledge of participants, has 20 questions on the basic elements of informed consent specified in US federal regulations.[1] Responses to individual questions are combined in a knowledge score, which ranged from 0 (least) to 100. Four items included in our QuIC were not analysed because of absence of expert validation (n=1) or inapplicability to some phase I participants with curable cancers (3).[21] Part B has 14 questions, in which participants rated their understanding of important elements of the trial on a 5-point scale. Responses were averaged and normalised from 0–100 to generate a self-assessment score. The questionnaire also included questions about the consent process (eg, time spent, when they signed the form, who was present), supplemental information sources (eg, internet), the consent form (eg, care in reading, clarity), previous participation in research, and demographic characteristics (eg, age, race, sex, education, marital status, first language). Additionally, we assessed respondents' preferences for information and decisional involvement using modified Autonomy Preference Index subscales.[23]

The questionnaire sent to providers included questions about the participant's Eastern Cooperative Oncology Group (ECOG) performance status,[24] outlook (likelihood of 5-year disease-free survival), disease status (newly diagnosed, relapsed, or progressive), and time since original diagnosis. The provider was asked to rate the participant's overall understanding of the trial on a 5-point scale.

To clarify providers' beliefs about the issues we had addressed with participants, at the conclusion of the study we sent the QuIC (Part A) to all providers whose patients had previously received our survey. We instructed them to complete the questionnaire as though they were fully informed patients on a clinical trial. We identified phase-specific questions and directed providers to answer them accordingly, whereas we instructed providers to answer generic questions without regard to phase. We calculated phase-specific knowledge scores for each provider with the same algorithm used for research participants.[21]

We measured the length and Flesch reading ease[25] of the consent form for each protocol included in our study, using the grammar function of Microsoft Word for Windows 97. The Flesch reading ease is a readability formula based on average sentence length and number of syllables per 100 words; scores range from 0 (most difficult) to 100 (easiest).[25] We removed two pages of standard institutional language before analysis of each form. Also, we classified each consent form according to use of the NCI template. The Dana-Farber Cancer Institute IRB mandated that all newly submitted protocols use the NCI template as of March, 1999, but consent forms that had been previously submitted were not updated.

Statistical analysis

Bivariate associations with knowledge scores were assessed with *t* tests, ANOVA, or Pearson correlation coefficients. To ascertain which predictors were independently associated with respondents' knowledge of their clinical trials, we developed a multiple linear regression model, with knowledge score as the dependent variable. Predictors that were significant ($p<0{\cdot}10$) in bivariate analyses were entered into the original model. We then sequentially eliminated, in a backwards stepwise fashion, all variables for which p was 0·05 or greater. Because questionnaires were partly phase-specific, we kept indicator variables for phase in all models to control for potential confounding resulting from differences in the questionnaire itself. First, however, we calculated a summary score derived from phase-independent questions only and then verified that this generic score did not vary by phase (data not shown). Finally, we assessed the relation between providers' responses to the QuIC and respondents' summary scores using a separate linear regression model that accounted for within-provider clustering.

A sample size of 200 participants was needed to achieve greater than 90% power ($\alpha=0{\cdot}05$) to detect a difference of two-thirds SDs in knowledge score between respondents whose consent forms did and did not use the NCI template. We assumed that 15% of respondents would receive a template-based form. Analyses were done with Stata version 5.0.

Results

Questionnaires were mailed to 287 trial participants, of whom 207 (72%) responded. We received 240 of 287 (84%) provider assessments. Respondents were from 73 clinical trials and 77 providers. Respondents completed the questionnaire a median of 16 days after consent to their trials. The mean age of participants was 55·0 years (SD 12·7) with 23% (48 of 207) aged 65 years or older (table 1). Over half (92 of 175) for whom provider responses were available had relapsed or progressive cancer and almost two-thirds (111 of 171) had a 10% or less chance of 5-year disease-free survival (as recorded by their provider). A quarter were in phase I trials, half in phase II trials, and the remainder in phase III trials (table 1). More non-respondents than respondents were symptomatic (75% *vs* 55%, p=0·006), went off-protocol because of progression of disease or toxic effects within 60 days of enrolling (25% *vs* 15%, p=0·05), and had newly diagnosed cancer (61% *vs* 47%, p=0·06). Non-respondents did not differ from respondents in age, sex, race, phase, provider-estimated prognosis, provider-estimated understanding, or use of NCI template.

Characteristic	Patients (n=207)
Age (years)	
<45	42 (20%)
45–64	117 (57%)
⩾65	48 (23%)
Sex	
Women	114 (55%)
Race*	
White	184 (91%)
Hispanic	6 (3%)
African-Americans	6 (3%)
Asians	4 (2%)
Others	2 (1%)
College education†	107 (53%)
Married/living with partner‡	156 (76%)
Only English used at home§	194 (95%)
NCI template-based consent form	64 (31%)
Phase	
I	50 (24%)
II	103 (50%)
III	54 (26%)
Off-protocol for toxic effects, or progression within 60 days of consent	31 (15%)
Probability of 5-year disease-free survival ⩽10%¶	111 (65%)
Symptomatic from cancer (ECOG Performance Status >1)‖	97 (55)
Relapsed or progressive cancer‖	92 (53%)
Physician estimate of understanding ⩽3 (5–point scale**)††	38 (22%)

*n=202 because of missing data. †n=203. ‡n=204. §n=204. ¶n=171 (of 175 patients for whom provider questionnaires were returned). ‖n=175. **1=didn't understand trial at all, 5=understood trial very well. ††n=174.

Table 1: **Respondent characteristics**

Two (1%) respondents denied that they were participating in a clinical trial. Table 2 summarises the remaining respondents' descriptions of the consent process. Almost half of consent discussions lasted 1 h or longer. Participants signed the consent form a median of 6 days (IQR 0–14) after their initial discussion; only 28% (56 of 200) reported signing at the first meeting. An adult friend or relative was present for 84% (170 of 202) of discussions, and a nurse for 39% (79 of 201). Few respondents gave consent as inpatients, and 14% (29 of 203) reported previous participation in a clinical trial. Most felt that they, rather than their physician, had the main role in the enrolment decision. Many respondents sought additional information elsewhere. Most easily understood their consent forms, considered them important sources of information, and reported having read them carefully, but few judged the forms to be important to their decisions. Most reported having had adequate time to consider their decisions, having had sufficient opportunities to ask questions, and having received thorough answers. Most were satisfied with the informed consent process and reported that the decision to enrol was easy. Few respondents had felt pressure from their physician to participate, but most had felt urgency to begin treatment (table 2).

The proportion of correct answers varied greatly across individual questions of the QuIC. Table 3 shows selected responses. A quarter of respondents did not agree that the main purpose of clinical trials is to benefit future patients. Many did not realise that the treatment being researched was not proven to be the best for their cancer, that the study used non-standard treatments or procedures, that participation might carry incremental risk, or that they might not receive direct medical benefit from participation. Most participants in phase III trials (48 of 53) were aware that they were being randomly allocated to treatment, but fewer phase I participants (22 of 50) knew that their trial involved dose-escalation to assess toxic effects. Most respondents (170 of 204) recalled being offered alternatives to participation, and almost all knew that they could decline participation (202 of 204) or withdraw from the trial (183 of 204). More than half knew that outside parties might have access to their medical records because of trial participation. Appendix 1, which shows complete responses to all questions, is available from *The Lancet* or from the authors on request.

Mean knowledge score was 77·8 (SD 9·4). The knowledge score was not related either to time between signature of consent and completion of questionnaire, or to whether the respondent had already begun protocol treatment when he completed the questionnaire (data not shown). In bivariate analyses, higher scores were associated with college education, speaking only English at home, being white, receiving an NCI template-based consent form, not signing consent at the initial discussion, presence of a nurse at the consent discussion, and supplemental use of pamphlets, internet, magazines, or books (table 4). Respondents who were symptomfree, had reported that they had read the consent form carefully, had had adequate time to decide, and thought they had had sufficient opportunity for questions had higher scores than those who did not. Knowledge scores correlated weakly with consent form readability as measured by the Flesch Reading Ease (r=0·13, p=0·07). Sex, age, previous research participation, length of consent discussion, marital status, consent obtained by the trial's principal investigator, phase, time since diagnosis, relapse status, and physician-estimated outlook, among other factors, were not significantly associated with knowledge scores.

In the multivariate model, six factors were independently associated with improved knowledge scores—college education (β=5·2, 95% CI 2·8–7·6), use of only English at home (10·0, 4·6–15·3), use of the NCI template (3·0, 0·2–5·8), not signing the consent form at the initial discussion (3·0, 0·3–5·7), presence of a nurse at the consent discussion (2·5, 0·1–5·0), and careful reading of the consent form (3·9, 0·7–7·2).

Among participants in phase III trials, those randomly allocated to standard groups probably misinterpreted two questions in the QuIC to refer to their own groups rather

Questions	Patients (n=205)*
Consent discussions lasted ⩾1 h	97 (48%)
Signed consent form at first discussion	56 (28%)
Presence of adult friend or relative at consent discussion	170 (84%)
Presence of nurse at consent discussion	79 (39%)
Inpatient during consent	11 (5%)
Participation in previous clinical trial	29 (14%)
Enrolment decision made mainly by respondent	151 (74%)
Consulted pamphlets for supplemental information	97 (49%)
Consulted outside physician	88 (44%)
Sought information on internet	84 (42%)
Consulted books or magazines	55 (28%)
Discussed trial with other patients	42 (21%)
Consent form read carefully†	170 (84%)
Consent form important source of information†	149 (73%)
Consent form easy to understand†	173 (86%)
Consent form important to the decision†	76 (37%)
Enough time to learn about trial†	177 (87%)
Pressure from provider to sign consent form†	6 (3%)
Sufficient opportunity to ask questions†	190 (93%)
Questions answered thoroughly†	189 (92%)
Satisfied with informed consent process†	185 (90%)
Treatment needed to begin as soon as possible†	183 (90%)
Decision to participate easy or very easy	152 (75%)

Because of missing data, denominators do not all equal 205. *Two respondents denied participation in clinical trials and are excluded from these data. †Proportion of subjects who responded agree or strongly agree.

Table 2: **Participants' reports of the informed consent process**

	Paticipants' responses (n=205)			Providers' responses* (n=61)		
	Disagree	Unsure	Agree	Disagree	Unsure	Agree
Questions						
The main reason cancer clinical trials are done is to improve the treatment of future cancer patients†	31 (15%)	20 (10%)	153 (75%)	15 (25%)	18 (30%)	28 (46%)
All the treatments and procedures in my clinical trial are standard for my type of cancer‡	52 (26%)	53 (27%)	95 (48%)	49 (80%)	11 (18%)	1 (2%)
The treatment being researched in my clinical trial has been proven to be the best treatment for my type of cancer‡	62 (30%)	82 (40%)	60 (29%)	50 (82%)	10 (16%)	1 (2%)
Compared with standard treatments for my type of cancer, my clinical trial does not carry any additional risks or discomforts‡	75 (37%)	52 (26%)	77 (38%)	43 (71%)	17 (28%)	1 (2%)
There may not be direct medical benefit to me from my participation in this clinical trial†	33 (16%)	25 (12%)	145 (71%)	1 (2%)	2 (3%)	58 (95%)

Values are number (%). Participants' and providers' responses to all items on the QuIC are available from *The Lancet* or from the author. *Providers were asked to answer what they believed was right—ie, what a fully and accurately informed patient would answer. Four providers left questions 1–5 blank and wrote in comments suggesting that the appropriate response was context-dependent. These were coded as unsure. †Correct answer=agree. ‡Correct answer=disagree.

Table 3: **Participants' and providers' responses to selected questions on the quality of informed consent (QuIC)**

than to the trial as a whole. Responses to "all the treatments and procedures in my clinical trial are standard for my type of cancer" varied by group, with those in the intervention group (disagree=10, unsure=9, agree=10) more likely to be correct than those in the standard group (disagree=10, unsure=1, agree=18; p=0·005). Similarly, responses to "compared with standard treatments for my type of cancer, my clinical trial does not have any additional risks or discomforts", with those in the intervention group (disagree=10, unsure=12, agree=8) more likely to be correct than those in the standard group (disagree=6, unsure=3, agree=14; p=0·03). We therefore reanalysed the data after adjusting for this difference between groups. Neither bivariate nor multivariate analyses were substantially changed.

	Knowledge score (n=204)*	p value
Answers		
Ethnic origin		
White	78·2 (9·4)	0·01
Other	72·2 (7·8)	
Education		
Not College-educated	74·9 (8·3)	<0·0001
College-educated	80·2 (9·6)	
Language		
English	78·2 (9·3)	0·003
Other (with or without English)	69·3 (7·6)	
NCI Template		
No	76·7 (9·4)	0·01
Yes	80·1 (9·0)	
Signed at first discussion?		
No	79·2 (9·5)	0·0005
Yes	74·2 (8·1)	
Presence of nurse at consent discussion		
No	76·2 (9·5)	0·005
Yes	80·0 (8·7)	
Pamphlets		
No	76·5 (9·5)	0·03
Yes	79·4 (9·1)	
Use of Internet		
No	76·2 (9·3)	0·01
Yes	79·6 (9·2)	
Magazines/books		
No	76·6 (9·7)	0·004
Yes	80·9 (7·9)	
Symptomatic from cancer		
No	79·3 (9·5)	0·07
Yes	76·6 (9·2)	
Consent form read carefully†		
No	73·4 (8·4)	0·003
Yes	78·7 (9·3)	
Enough time to decide†		
No	73·8 (9·1)	0·02
Yes	78·5 (9·3)	
Sufficient opportunity to ask questions†		
No	73·8 (8·9)	0·09
Yes	78·1 (9·4)	

Data are means (SDs). *Could not be calculated for one patient because of missing data. †Subjects who responded agree or strongly agree.

Table 4: **Correlates of improved knowledge score in cancer clinical trial participants**

The median self-assessment score was 89·3 (IQR 82·1–96·4). A weak but significant correlation (Spearman's r=0·25, p=0·0004) was recorded between respondents' knowledge and self-assessment scores. Of a maximum possible rating of 5, the median provider rating of respondent understanding was 4 (IQR 4–5); one-fifth of respondents were rated 3 or less (table 1). Providers' ratings correlated weakly with respondents' knowledge scores (ρ=0·23, p=0·003).

Of 91 providers who received the QuIC after completion of the patient survey, 61 (67%) responded. Table 3 shows selected answers for comparison with participants' responses. Fewer than half agreed that the main reason trials are done is to improve treatment of future patients. Additionally, up to a third of providers were uncertain whether clinical trials always use non-standard treatments or procedures, whether treatments assessed in clinical trials are by definition unproven, and whether trials involved some, however minor, incremental risk or discomfort. Most agreed that research participants might not benefit from participation. For phase I, II, and III trials, respectively, the mean providers' summary scores were 92·6 (SD 6·2), 91·9 (7·1), and 92·5 (6·5). Providers' scores did not predict the knowledge scores of individual respondents whose consent they had obtained (data not shown). Appendix 2 (available from *the Lancet* or from the author) shows complete provider responses to all questions.

Discussion

We investigated informed consent in clinical trials of cancer, using a questionnaire that was designed to assess the elements required by US federal regulations.[1] On average, providers spent much time with participants, and most participants took several days to consider their decisions. Few found their decisions difficult, almost none reported coercion, most were satisfied with the consent process, and most felt that they understood their trials well. Most respondents had used additional sources of information and had support from family or friends. Nonetheless, knowledge varied widely and there were important misunderstandings. Major deficiencies included not being aware of non-standard treatment, the potential for incremental risk or discomfort, the unproven nature of treatment, and the uncertainty of benefits to self. These problems characterise what Appelbaum and colleagues[18] have referred to as "the therapeutic misconception".

Lower knowledge scores were associated with absence of college education and use of languages other than

English in the home.[9,11] Although there were few non-native English speakers, their reduced scores are of great concern. Efforts are needed to ensure that their consent is adequately informed, perhaps by expanding the use of interpreters and translated consent forms.

Participants who were given consent forms that used the NCI template had higher knowledge scores than those who received other forms, suggesting that structure and simplification of such consent forms might be effective. Respondents who had time to consider participation and those who had a nurse present at their consent discussions were also more knowledgeable than those who did not. Previous studies[9,26,27] lend support to these results. Finally, respondents who reported reading their consent forms carefully achieved higher knowledge scores than those who did not. The quality of informed consent might thus be substantially enhanced by addressing these deficiencies.

Contrary to expectations, several factors were unassociated with respondents' knowledge after adjustment for confounders in the multivariate model. Knowledge scores were not lower among elderly patients, those who were sicker, or those who had poorer outlooks. Neither readability of the consent form nor relapse status affected the knowledge scores. Despite differences in the circumstances of enrolled individuals, knowledge scores did not differ by phase of trial, although participants of phase III trials were more aware of purposes and procedures than those in phase I or II trials, and phase I participants were more likely to recognise the possibility of incremental risk than other participants. These findings contrast with those of previous investigators, possibly because of differences in study populations or outcome measures.[9–11] In particular, we emphasised conceptual issues rather than trial details, a strategy that should facilitate cross-setting comparisons in the future.

Many providers seemed to share the same therapeutic misconceptions as participants. Despite all providers surveyed being on the academic staff at research institutions, fewer than half recognised that the main purpose of clinical trials is to benefit future patients. Although individual providers' uncertainties did not correlate with lower scores in their patients, our findings support Miller's[28] assertion that physician/investigators often deal with the moral tensions inherent in their role by adopting the perspective of the pure clinician. Research ethics rest on the realisation that the goals of advancing science or treatment, however noble, could conflict with the interests of present patients.[29] That providers and investigators appreciate this conflict is essential if they are to help participants distinguish research goals from therapeutic intentions.[7,30] Thus, education about the dilemmas of clinical research, and efforts to provide a coherent professional identity for physician/investigators, are needed.[28]

Although our results suggest the need for improvements in informed consent to research, they also point to its complexity in the setting of cancer clinical trials. Physicians often recommend that patients with cancer enrol in trials because they feel that trials offer the best therapeutic option under the circumstances. Furthermore, patients are increasingly demanding access to research for similar reasons.[31] Thus, beliefs about best interests could explain why, in our survey, many patients were entered in trials despite providers' concerns that patients might not fully understand the implications of participation. How best to reconcile legitimate hopes for benefit with the need to help research participants understand central concepts of clinical research remains an essential unanswered question in research ethics.

Several limitations to this study merit discussion. First, the study investigated three affiliated institutions, the characteristics of which could differ from other sites. However, in view of the evidence of attention to process and the high satisfaction in respondents, the problems we identified are likely to be widespread. Second, response bias could have been introduced. The few differences we detected between respondents and non-respondents suggest that non-respondents were more acutely ill. Any resulting bias is therefore likely to be conservative, with respondents both being more knowledgeable and having a more positive attitude than non-respondents. Third, our questionnaire addressed mainly conceptual issues associated with clinical research. We did not ask respondents to reiterate details of risks, procedures, or other technical issues. Also, there was little ethnic diversity in our sample, and we recommend further study in more varied populations.

We did not have enough respondents in each phase to draw phase-specific conclusions. Also, there might be disagreement about whether some items on the QuIC fit the special circumstance of a randomised trial that compares two accepted therapies. In our study, however, all phase III trials compared one or more investigational groups to a standard group. Our data also suggest that some respondents who were enrolled in the standard group of a phase III trial might have misinterpreted two questions to refer to their own group rather than to the trial as a whole. Because participants in cancer clinical trials are generally aware of treatment assignment, we intend to change those questions to reduce the likelihood of such misinterpretation.

Respondents filled out the questionnaire a median of 16 days after consenting to their clinical trials and their understanding of the concepts we measured might have been better at the time of consent than at this later time. Furthermore, information that contradicts the therapeutic misconception might be difficult for patients to assimilate in the context of their natural hopes and anxieties. Finally, because we did not directly observe the consent process, we cannot address whether deficiencies were due to providers' failures to discuss certain issues, or to respondents' lack of recall. We suspect that the quality of written and verbal communication about clinical trials varied greatly. Additional studies that directly monitor the consent process and then assess how variability affects participants' comprehension would be valuable.

We recorded important flaws in research participants' understandings of their cancer clinical trials, despite much attention by providers to procedural details. The nature of these flaws suggests that to improve the quality of informed consent we need to directly address the therapeutic misconception. Because providers and investigators seem to share this misconception, educational efforts aimed at professionals are also needed. Finally, several simple interventions, including use of a structured consent template, presence of a professional third party such as a nurse, giving patients time to consider participation, and encouraging careful reading of consent forms, might result in meaningful gains.

Contributers

All authors contributed to the design, implementation, analysis of the study, and writing of the report.

Acknowledgments

We thank Ezekiel Emanuel, Paul Appelbaum, Walter Robinson, Mary McCabe, David Harrington, and Christopher Daugherty for their expert reviews of and assistance with development of the QuIC; Stephen E Sallan for his support and encouragement; Gwendolyn Magnan, Alicia Peters, Suzanne Goucher, Donald Banik,

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