Research Article

For reprint orders, please contact: reprints@futuremedicine.com

Journal of **Comparative Effectiveness Research**

Streamlined versus traditional consent for low-risk comparative effectiveness trials: a randomized experimental study to measure patients' and public attitudes

Nancy E Kass*[,‡,1,2,3], Ruth R Faden[‡,1], Stephanie R Morain[§,1,3], Kristina Hallez[§,4], Rebecca A Stametz[‡,5], Amanda R Milo[‡,5] & Deserae Clarke[‡,6]

[1]Johns Hopkins Berman Institute of Bioethics, Baltimore, MD 21205, USA
[2]Johns Hopkins University, Baltimore, MD 21205, USA
[3]Johns Hopkins Bloomberg School of Public Health, Baltimore, MD 21205, USA
[4]Center for Effective Global Action, University of California, Berkeley
[5]Steele Institute for Health Innovation, Geisinger, Danville, PA 17822, USA
[6]University of Arizona College of Medicine – Phoenix, Division of Clinical Data Analytics & Decision Support, Phoenix, AZ 85004, USA
*Author for correspondence: nkass@jhu.edu
‡Current affiliation
§Previous affiliation

Aim: Streamlining consent for low-risk comparative effectiveness research (CER) could facilitate research, while safeguarding patients' rights. **Materials & methods:** 2618 adults were randomized to one of seven consent approaches (six streamlined and one traditional) for a hypothetical, low-risk CER study. A survey measured understanding, voluntariness, and feelings of respect. **Results:** Participants in all arms had a high understanding of the trial and positive attitudes toward the consent interaction. Highest satisfaction was with a streamlined approach showing a video before the medical appointment. Participants in streamlined were more likely to mistakenly think a signature was required. **Conclusion:** Streamlined consent was no less acceptable than traditional, signed consent. Streamlined and traditional approaches achieved similar levels of understanding, voluntariness and a feeling that the doctor–patient interaction was respectful.

First draft submitted: 16 July 2021; Accepted for publication: 17 December 2021; Published online: 3 March 2022

Keywords: comparative effectiveness research • ethics • informed consent • learning health system • streamlined consent

Traditionally in research ethics, the principle of respect for persons has been operationalized in clinical research contexts almost exclusively through requirements to obtain informed consent from individual participants for specific research projects. The request for consent is preceded by a detailed disclosure and documented by a signature. These requirements reflect a view that clinical research may compromise important patient interests in ways clinical care generally does not, and thus imposes a higher threshold for authorization than that required for many clinical interventions.

Increasingly, however, the appropriateness of this 'one size fits all' approach to consent for clinical research is being challenged, given the wide range of designs, risks, benefits and available evidence regarding interventions being studied [1,2]. Specifically, concerns are being raised that this traditional approach may be inappropriate for some kinds of patient-centered outcomes research (PCOR), including research in which the risks to participants are minimal and the benefits to patients, as a class, are potentially significant. Reports exist of PCOR studies delayed by Institutional Review Board (IRB) review, and of studies not being done at all in some practice settings due to fears about the time required for extensive informed consent processes [3,4]. Such delays and foregone opportunities result in fewer studies being done, and, according to some, conclusions being drawn based on less definitive methods when rigorously designed studies would have been more conclusive [5–7].

Future Medicine

Moreover, we have argued elsewhere that the principle of respect should be thought of more expansively in research than simply requiring disclosure and consent. Other ways to demonstrate respect to patients in PCOR include engaging patients in decisions about what research questions to prioritize and what ethical oversight or consent is appropriate for particular studies, transparency to the patient community regarding why ongoing learning is important and what types of learning projects are being undertaken, and holding institutions publicly accountable for altering clinical practices to align with research findings [8].

Increasingly, commentators have proposed that the structure and approach for consent, disclosure or participant authorization should be based on ethically relevant considerations specific to a particular study (e.g., its risk/benefit profile or patients' expectations) [9,10]. Some authors have proposed waivers of consent for some low-risk pragmatic trials [9,11,12], and in 2017 the US FDA joined the rest of the US Department of Health and Human Services (DHHS) in permitting waivers of informed consent for clinical investigations involving no more than minimal risk. Another approach that has attracted interest is streamlining, rather than waiving, consent procedures for low-risk comparative effectiveness research (CER) studies [13,14]. When the additional risk of studying or learning, compared with the risk of providing the same care in ordinary clinical practice, is low, when the study compares interventions widely used in clinical practice, and where differences in interventions are unlikely to be relevant to patients' values, some argue that streamlining consent procedures is ethically acceptable [9,12,15]. Streamlining could improve the efficiency of research, while still honoring ethically important considerations for a given research context, thereby balancing ethical protection with knowledge generation to improve patient and population health.

Although a moral case for streamlining consent in some low-risk research contexts can be made, a critical question is whether patients find streamlined approaches acceptable. Multiple recent empirical studies have found that patients may be willing to accept a streamlined model, at least for some low-risk CER trials [16–22]. The growing literature also suggests that, as patients come to appreciate trade-offs between lengthier consent requirements and the pace of generating new medical knowledge, patients become more willing to adopt streamlined approaches.

Many previous studies, however, presented both streamlined and traditional consent options to participants and then assessed their preferences about them in relation to one another. While streamlined approaches were reviewed favorably, patients still generally preferred traditional consent. These results may have been limited by biasing cognitive effects favoring the status quo.

Our study differed from most previous research in two ways. First, an experimental survey design avoided anchoring or comparison effects. Participants were randomly assigned to one of seven animated video modules, each portraying a different consent and authorization approach for a hypothetical CER blood pressure study (https://bioethics.jhu.edu/learning-health-systems/projects/patients-views-on-consent-and-respect/). Six of these were variations of streamlined consent, and one was a traditional, signed, written consent. In all the streamlined arms, the videos depicted a physician explaining key information about the CER study to a patient, including that: only approved, commonly used hypertension medications were being compared; the patient would be switched if the medicine didn't work for them; and whether the patient participates is entirely up to them. The arms then differed in the extent to which they provided different, additional information in the video and in how and when the information was presented. A particular research question was whether adding what we considered to be 'respect promoting practices' would increase the acceptability of streamlined approaches. For example, some arms emphasized that the decision was the patient's choice. Others included information about three respect-promoting practices at the institutional level – patient engagement before the study began, broad transparency about the types of studies ongoing, and accountability in terms of results being used to change and improve routine care (ETA). Ultimately, this study had two objectives: to determine respondents' views about alternative approaches to streamlined consent for a hypothetical low-risk CER trial, and to compare those views to those for traditional consent.

Methods

Study design

Participants were recruited from three populations: patients from Johns Hopkins Community Physicians (JHCP), patients from Geisinger (GHS) and an online, nationally representative panel. We created original animated videos portraying seven approaches to consent and authorization (Figure 1). Participants were randomly assigned to watch one of seven video modules and then asked to complete a survey. At JHCP and GHS, randomization of the seven video modules was executed through Qualtrics; for the national online panel, automatic randomization was programmed by Growth from Knowledge (GfK).

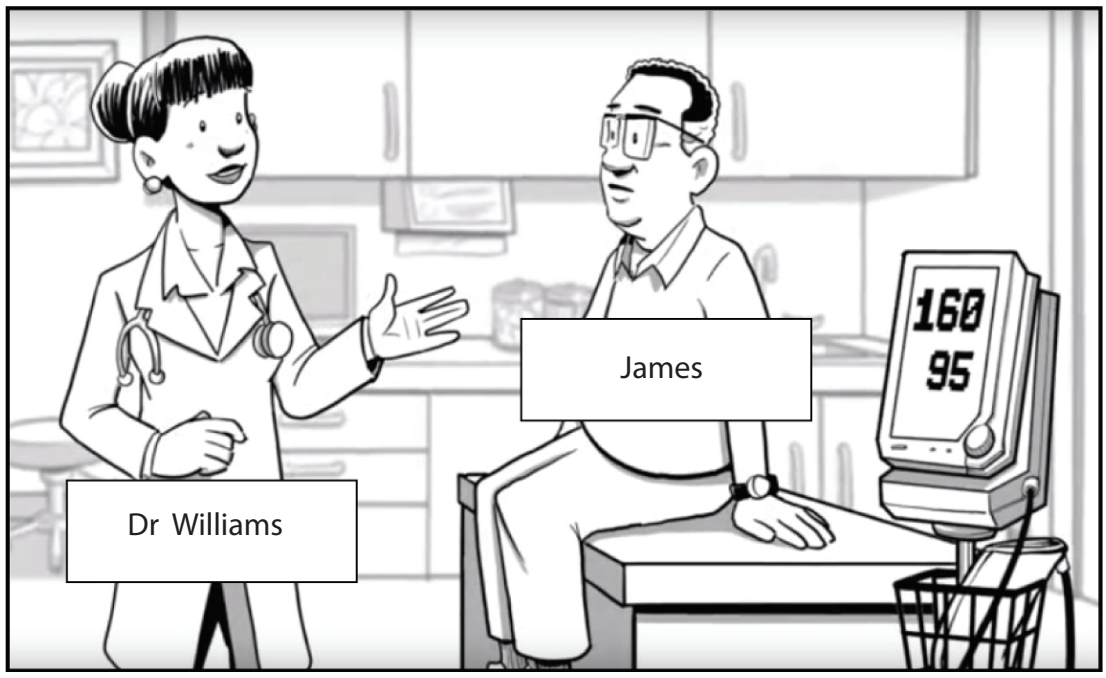

Figure 1. Still image from animated videos shown to survey respondents.

Including JHCP and GHS patient populations enabled comparisons based on patient demographics and health system design. JHCP is part of an urban, academic health system with a large population of both white and African–American patients, whereas GHS is an integrated health system with a demonstrated commitment to the learning health system model serving, primarily, a rural, predominantly white patient population [23]. The online sample enabled measurement of attitudes of a large, nationally representative sample. Analyses examining differences by subpopulation in willingness to participate in PCOR are reported elsewhere [24]. This paper focuses on differences between study arms in terms of respondents' views of consent where the study sample includes a broad spectrum of adults from a range of backgrounds and regions.

Sampling & recruitment

The online sample was recruited between 27 April and 10 May 2017 using GfK's KnowledgePanel, a standing, probability-based, nationally representative sample of USA adults [25]. Panel members were randomly selected using address-based sampling methods. GfK processed and weighted the data using Current Population Survey (CPS) benchmarks to adjust for known selection deviations during sampling, and noncoverage and nonresponse bias resulting from panel recruitment methods and attrition. Online participants received a US$5 incentive, consistent with GfK norms.

Self-administered surveys were completed electronically using touch-screen tablets at four JHCP clinics between June and December 2017 and at three GHS primary care clinics between July and December 2017. At JHCP, patients were recruited through posted signs and by clinic administrators telling patients about the survey and directing interested patients to study staff. At GHS, research assistants approached patients before or after scheduled medical appointments. At both JHCP and GHS, study staff described the survey to patients to determine interest in participating in the study. Interested patients-participants were provided with headphones and a tablet containing a link to the Qualtrics survey with videos embedded and asked to complete the survey in the clinic waiting room. Initial questions within the survey screened for eligibility (being 18 or over, being a patient at JHCP or GHS, and speaking English) and provided the survey disclosure statement. Once eligibility was appropriately met, patients were granted access to the remainder of the survey. JHCP and GHS participants received US$30 gift cards to reimburse for their time.

In this project, we aimed to detect at least a 10% difference in a key outcome of interest (e.g., understanding), assuming a baseline level of 0.8. Power calculations suggested that our target project sample of 2400 survey respondents was more than sufficient for 80% power in detecting differences among arms.

Survey design & video development

To model the hypothetical study comparing two blood pressure medications and how participants would be invited to participate, we created seven animated narrative whiteboard videos with Booster Shot Media, a production company specializing in multimedia patient education with previous experience in creating videos for another study on informed consent [21]. The videos were refined and revised based on feedback from patient advisory and focus groups. Once the seven videos were finalized, participants were randomized to one of seven study arms, and after watching their respective video, all participants then completed the same survey (see Table 1 for summary; full videos can be accessed here https://bioethics.jhu.edu/learning-health-systems/projects/patients-views-on-consent-and-respect/)). The core content of all videos was identical, with variations among arms linked to key research questions. In all videos, a hypothetical patient 'James' was told by his doctor, 'Dr Williams', that his blood pressure was still high and that it was time to begin antihypertensive medicine. Dr Williams explained to James that the health center was participating in a randomized blood pressure study. Randomization was explained using the analogy of a gumball machine.

The Arms 1–6 videos represented variations on streamlined, 'opt-out' consent approaches for the blood pressure study. For Arms 1–6, streamlining informed consent involved limiting study disclosure to the most important study information for potential participants by providing a shorter description of the study than traditional consent forms. The streamlined approach emphasized that the two approved drugs being compared had comparable benefits and similar side effects or risks, but did not specify what those risks were; used clear and simple language; presented information orally, rather than through a written form; and did not require the participant to sign a consent form. In these arms, Dr Williams explained that James would be in the study unless he objected, but that the decision was up to him (opt-out); she gave information orally, during the medical appointment, and she explained that he would not need to sign a consent form to participate. The videos presented in Arms 1–6 varied by whether they also: provided background explaining why comparing existing medicines through CER was important for improving patient care (opt-out CER); described processes within the health system to enhance ETA around research (opt-out ETA); emphasized to James that it was his choice whether or not to participate (opt-out choice) and depicted James as being provided with additional information through a waiting room video James watched before his appointment with Dr Williams, and not directly from Dr Williams (opt-out-previsit video). Videos explicated ETA as follows: engagement meant patients were involved in decisions about what types of research a health system should conduct and how patients should be informed about and invited into such studies; transparency meant health systems used multiple media outlets to regularly inform patients about all ongoing efforts to generate new knowledge and improve care; and accountability meant health systems translated findings of CER research into changes in practice to drive care improvements.

The Arm 7 video depicted a traditional, written consent interaction in which Dr Williams briefly described the study and its purpose. James was then referred to a research nurse, 'Jonathan', who was portrayed as reviewing multiple pages of a longer consent document with James that required James's signature before enrollment in the blood pressure study (traditional opt-in). Visual cues were used to communicate time passing, rather than having the participant watch a review of all of the specific information that would have been on every page of the consent form. All videos ended before James was asked his decision about participation in the study.

The assigned video was embedded as a YouTube link into participants' surveys. A participant could watch their assigned video as often as they liked by clicking the 'play' button. After watching the assigned video, respondents completed self-administered survey questions assessing their understanding of the study described to James, their own willingness to join a study like the one offered to James, whether they thought James would join, their satisfaction with the amount of information provided to James, and the respectfulness of the interaction between Dr Williams and James (the full survey instrument can be found here https://bioethics.jhu.edu/wp-content/uploads/2018/12/SurveyDevelopment-20.June_.18_Clean.pdf). The videos and survey instrument were developed with input from patient advisory groups at both JHCP and GHS, and from a focus group at each institution. Group members provided input on video clarity and meaning, character depictions, how to make materials more engaging, and their understanding of survey questions. The study team conducted 40 cognitive interviews (24 at JHCP and

Table 1. Description of study arms and video content.

Consent-related feature in videos	Arm 1 Opt-out	Arm 2 Opt-out–CER	Arm 3 Opt-out–ETA	Arm 4 Opt-out–choice	Arm 5 Opt-out–pre-visit video	Arm 6 Opt-out–all enhancements	Arm 7 Traditional opt-in
Dr Williams provides streamlined study information including the study purpose, that the study will compare two widely used medications, that medication will be chosen for James by randomization, James can switch medications if he has any problems, and James will get regular check-ups regardless of whether he joins the study	✓	✓	✓	✓	✓	✓	
Research nurse Jonathan goes over traditional, written consent document with James, with video implying longer explanations of study purpose, that the study will compare two widely used medications, that medication will be chosen for James by randomization, James can switch medications if he has any problems, and James will get regular check-ups regardless of whether he joins the study							✓
Additional information about why CER is important in improving patient care, including how CER compares approved and widely used treatments to see which might work better, examples of different kinds of CER (i.e. for chronic back pain or depression)		✓			✓	✓	
Explanation that CER trial is only carried out after discussion and approval by a patient group that reviews this kind of research for the health system (engagement)			✓		✓	✓	
Explanation that health systems will post information about all ongoing CER studies in newsletters, clinic bulletin boards, their website, and via other channels (transparency)			✓		✓	✓	
Explanation that health system is committed to implementing CER trial findings to improve patient care within that health system (accountability)			✓		✓	✓	
Waiting room video (instead of Dr Williams) presents all above information (purpose of CER, transparency, accountability, engagement). Dr Williams then provides the standard disclosure and the 'choice' enhancement listed below.					✓		
Patient not only told that participation is 'up to you' whether to join, but an additional sentence is added at the end of the discussion: "Remember, it's your choice whether you'd like to be in the study or not." (choice)				✓	✓	✓	
James' signature on consent form required							✓
James is enrolled in the study only if he signs the consent form							✓
James will be enrolled in the study unless he tells Dr Williams that he does not want to be in the study	✓	✓	✓	✓	✓	✓	
Sample (n)	361	385	382	374	358	369	389
Total video time (min:sec)	6:11	7:10	7:03	6:18	12:07	7:48	8:30

CER: Comparative effectiveness research; ETA: Improve routine care.

16 at GHS) in which participants viewed a version of the video and provided feedback on videos and survey questions including providing feedback on clarity of questions and meaning of key concepts being measured.

The study was designed to address two research questions. First, we were interested in whether small changes to the information provided in the streamlined video disclosure made a difference to participants, specifically: providing additional information about the importance of conducting a comparative effectiveness trial because little is still known about the relative merits of different blood pressure medicines (Arms 2, 5, 6); describing that additional respect-promoting procedures – ETA, or patient engagement around consent practices, transparency about ongoing studies, and accountability to implement what was learned – were in place (Arms 3, 5, 6); and further emphasizing that it was the patient's choice whether or not to join the study (Arms 4, 5, 6) (See Table 1). Our second research question was whether or how streamlined consent approaches compared with a traditional consent approach on outcomes that matter morally, such as understanding and perceived respectfulness.

Analysis

Sociodemographic, health status characteristics and survey responses were summarized using standard descriptive statistics. We compared responses (binary) to questions about understanding, adequacy of amount of information provided about the study, perceived voluntariness and willingness to join the study across experimental arms using Pearson's chi-squared tests or Fisher's exact test if any cell contained fewer than ten observations. We used Kruskal–Wallis tests and, where applicable, *post-hoc* pairwise Dunn's tests to compare responses (four- or five-point Likert scale) to questions measuring attitudes toward the consent process and attitudes toward research and the doctor portrayed in the videos. To answer our first research question – whether there were differences among the six streamlined, 'opt-out' arms – we performed the above tests on responses from Arms 1–6. For our second question – whether the streamlined or opt out arms differed from the traditional opt-in consent arm – we performed the same tests on the combined responses from Arms 1–6 compared with Arm 7. All statistical analyses were conducted using STATA IC version 15.

Role of the funding source

Research reported in this publication was funded through a Patient-Centered Outcomes Research Institute (PCORI) Award (ME-1310-07763). The views in this publication are solely the responsibility of the authors and do not necessarily represent the views of PCORI, its Board of Governors or Methodology Committee.

IRB approval

The institutional review board at the Johns Hopkins Bloomberg School of Public Health reviewed and granted exempt status to this study prior to data collection. The institutional review board at Geisinger (IRB# 2017-0149) reviewed the study under an expedited review and granted approval prior to data collection. These IRBs did not believe it was necessary either to inform participants who were asked to complete this self-administered, anonymous survey that they were being randomized to different versions of the study video or to seek written consent for survey completion.

Results

2618 respondents completed the survey: 1624 from the national sample, 500 from JHCP, and 494 from GHS. 4218 individuals were invited to complete the national survey; 1992 completed the screener, of whom 1624 qualified to participate and went on to complete the survey, for screener survey and main survey completion rates of 47 and 39%, respectively. At GHS, 1936 patients were approached to complete the survey, 1392 declined to complete the screener for the survey. Of the resulting 544 individuals screened at GHS, 494 met eligibility criteria and completed the survey, for screener survey and main survey completion rates of 28 and 26%, respectively. At JHCP, only patients interested in participating approached the enrollment table, so there were no refusal rates from this site. Of the 555 individuals who completed the screener survey at JHCP, 500 completed surveys, for a completion rate of 90%. The overall sample was 47% female, 70% non-Hispanic white, 30% had a Bachelor's degree or higher, and 95% had health insurance (Table 2). There were no statistically significant differences in demographics by study arm. Median completion time was 16.3 minutes (inclusive of videos).

Table 2. Demographic characteristics by site.

	Study site							
	Johns Hopkins		Geisinger		GfK panel		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gender								
Male	204	40.8	304	61.5	852	52.5	1360	51.9
Female	293	58.6	184	37.2	772	47.5	1249	47.7
Age								
18–20 years	30	6.0	4	0.8	69	4.2	103	3.9
21–26 years	105	21.0	21	4.3	137	8.4	263	10.0
27–44 years	149	29.8	119	24.1	496	30.5	764	29.2
45–64 years	181	36.2	215	43.5	600	36.9	996	38.0
65+ years	34	6.8	132	26.7	304	18.7	470	18.0
Missing	1	0.2	3	0.6	18	1.1	22	0.8
Race and ethnicity								
White non-Hispanic	216	43.2	459	92.9	1151	70.9	1826	69.7
Black non-Hispanic	236	47.2	13	2.6	140	8.6	389	14.9
Other non-Hispanic and 2+ race	32	6.4	9	1.8	130	8.0	171	6.5
Hispanic	16	3.2	9	1.8	203	12.5	228	8.7
Health insurance								
Medicare	57	11.4	91	18.4	322	19.8	470	18.0
Medicaid or JHHC Priority Partners	37	7.4	12	2.4	95	5.8	144	5.5
Private health plan	378	75.6	368	74.5	983	60.5	1729	66.0
Other military health plan	22	4.4	13	2.6	105	6.5	140	5.3
No health insurance	6	1.2	6	1.2	111	6.8	123	4.7
Education								
No HS diploma	16	3.2	40	8.1	145	8.9	201	7.7
HS diploma or GED	122	24.4	196	39.7	442	27.2	760	29.0
Some college or associate's degree	226	45.2	139	28.1	487	30.0	852	32.5
BA	68	13.6	55	11.1	327	20.1	450	17.2
Greater than BA	68	13.6	60	12.1	223	13.7	351	13.4
Health status								
Excellent	82	16.4	36	7.3	200	12.3	318	12.1
Very good	179	35.8	166	33.6	664	40.9	1009	38.5
Good	186	37.2	191	38.7	546	33.6	923	35.3
Fair	45	9.0	83	16.8	167	10.3	295	11.3
Poor	7	1.4	15	3.0	39	2.4	61	2.3
Missing	1	0.2	3	0.6	8	0.5	12	0.5
Income (annual)								
Less than US$20,000	60	12.0	89	18.0	161	9.9	310	11.8
US$20,000 – $39,000	146	29.2	148	30.0	279	17.2	573	21.9
US$40,000 – $74,999	146	29.2	123	24.9	380	23.4	649	24.8
US$75,000 – $124,999	85	17.0	89	18.0	432	26.6	606	23.1
US$125,000 or more	56	11.2	31	6.3	116	7.1	203	7.8
Missing	7	1.4	14	2.8	256	15.8	277	10.6
Total	500		494		1624		2618	

JHHC: Johns Hopkins healthcare.

Understanding

Over 90% of respondents across all seven arms answered correctly that: the study involved a comparison between two medicines and did not involve a placebo; Dr Williams believed James would do well on either medicine; the cost to James would be the same regardless of the medicine assigned; and if James were to experience any problems

with his assigned medicine, Dr Williams would switch him to a different drug (Tables 3 & 4). Over 83% correctly understood that medicines would be selected by randomization, rather than assigned by a patient's doctor.

There were no statistically significant differences in understanding across the six streamlined consent opt-out approaches (Table 3). There were, however, significant differences in two of the understanding items between the streamlined, opt-out (combined 1–6) arms and traditional, opt-in consent Arm 7 (Table 4). First, while the vast majority of participants in all arms understood correctly that James could switch medicines if he experienced any problems, this was more likely to be true for participants in the traditional, opt-in Arm 7 (98%) than for participants in the streamlined, opt-out Arms 1–6 (95%) ($p = 0.007$). Also, approximately one quarter of participants across all six of the streamlined, opt-out arms reported an incorrect belief that James would need to sign a consent form to join, despite statements by Dr Williams during streamlined, opt-out videos that no signature was required. By contrast, in the traditional consent arm, 97% of participants correctly understood that a signature was required in the animation they watched ($p = 0.000$).

Attitudes concerning how the doctor (or nurse) spoke with James about the study

We first examined whether there were differences in attitudes about likeability, respect and dignity of the video's doctor–patient interaction among the six streamlined study arms. While no consistent patterns emerged that favored some arms over others, certain differences were found. For example, there was a statistically significant difference across the streamlined consent approach arms on the item assessing views of how Dr Williams talked to James about the study ($p = 0.006$). Responses here ranged from 76% of respondents in the opt-out basic Arm 1 'really liked' how Dr Williams talked to James compared with 86% in the pre-visit video, opt-out enhanced Arm 5 (Table 3). Using pairwise analysis, Arm 1 respondents were significantly less likely to 'really like' the way the doctor spoke to James about the study than respondents in Arms 2, 3, 5 and 6 (Table 5).

In terms of respect, nearly 90% of respondents across all six streamlined arms reported that Dr Williams was 'very respectful' when talking with James about the study, with no statistical difference among streamlined arms (Table 3). In terms of dignity, while at least 54% of respondents in each streamlined arm 'strongly' agreed that Dr Williams treated her patients with dignity, there were significant differences across arms ($p = 0.036$) with pairwise comparisons highlighting that these were driven by variation between pre-visit video Arm 5 and Arms 1, 3, 4 and 6 (Table 5).

We detected no significant differences between respondent attitudes across all three of these measures when comparing the combined streamlined, opt-out consent Arms 1–6 and traditional consent Arm 7 (Table 4).

Appropriate amount of information

Most respondents in all arms said the amount of information Dr Williams provided to James was 'just right'. In comparing the streamlined arms, participants calling the amount 'just right' ranged from 87% in Arms 1 (opt out basic) and 4 (opt out choice) to 93% in Arms 3 (opt out ETA) and 5 (opt-out pre-visit video) ($p = 0.004$, Table 3). There were no significant differences between the combined streamlined Arms 1–6 and the traditional consent Arm 7 (Table 4).

Perceived voluntariness

At least 97% of participants in every arm believed that it was up to James whether to join the study, and at least 93% in each arm said that if James did not want to join it would be easy for him to say no (Tables 3 & 4). Although streamlined Arms 4, 5, and 6 included an extra sentence emphasizing that it was James's 'choice' whether to participate, there were no statistically significant differences among the six streamlined arms on either of the perceived voluntariness measures. There were also no differences on these measures between the opt-out and traditional opt-in consent arms.

Willingness to join

98% of all respondents thought that James would probably join the study, with no differences among the streamlined arms or between the streamlined arms and the traditional arm (Tables 3 & 4). When asked whether they would join the study described to James in the video, at least 85% of participants in all arms said they would probably join. There was a statistically significant difference among streamlined, opt-out Arms 1–6 (Table 3; $p = 0.006$), with more than 92% of participants in Arms 2 and Arms 5 reporting they would join. There were no significant differences between the streamlined arms and the traditional consent arm on this outcome (Table 4).

Table 3. Primary outcomes by arm (arms 1–6 only).

	Arm 1	Arm 2	Arm 3	Arm 4	Arm 5	Arm 6	Total	Test Stat	Test Type
Understanding (% correct)									
– Study compares two medicine	93.6	95.3	93.7	95.2	96.9	94.8	94.9	0.354	P. chi-sq
– Doctor thinks James would do well on either medicine	93.6	96.1	97.1	96.5	95.0	95.1	95.6	0.226	P. chi-sq
– Medicine is chosen for James by randomization	87.5	88.8	87.4	87.7	83.5	85.9	86.8	0.355	P. chi-sq
– Medicines in study cost the same amount	92.7	95.0	95.8	94.4	95.2	92.9	94.4	0.361	P. chi-sq
– James can switch medicines if there is a problem	92.5	95.5	95.5	95.4	94.7	95.1	94.8	0.404	P. chi-sq
– Does James need to sign a consent form	73.1	74.6	77.5	77.8	76.6	71.3	75.2	0.236	P. chi-sq
Attitudes concerning how doctor (or nurse) talked with James									
Did you like the way the doctor (or nurse) talked to James about the study (%)									
– Really liked (1)	76.4	82.0	85.1	80.7	86.3	81.5	82.0	0.006	K-W ties
– Somewhat liked (2)	18.1	13.8	13.6	16.4	11.5	16.0	14.9		
– Somewhat disliked (3)	4.2	3.4	1.1	2.1	2.0	1.6	2.4		
– Really didn't like (4)	1.4	0.8	0.3	0.8	0.3	0.8	0.7		
How respectful was the doctor (or nurse) when they talked to James about the study (%)									
– Really liked (1)	89.2	92.4	95.0	92.2	91.9	93.8	92.5	0.074	K-W ties
– Somewhat liked (2)	10.3	6.0	4.2	7.0	7.0	5.4	6.6		
– Somewhat disliked (3)	0.6	1.6	0.5	0.3	1.1	0.8	0.8		
– Really didn't like (4)	0.0	0.0	0.3	0.5	0.0	0.0	0.1		
Doctor treats her patients with dignity (%)									
– Strongly agree (1)	54.6	59.5	56.8	52.6	63.8	53.8	56.9	0.036	K-W ties
– Agree (2)	38.9	34.2	38.6	41.1	31.6	40.2	37.4		
– Neutral (3)	5.3	4.9	3.0	6.0	4.4	5.4	4.8		
– Disagree (4)	0.9	0.8	1.4	0.0	0.3	0.0	0.6		
– Strongly disagree (5)	0.3	0.5	0.3	0.3	0.0	0.6	0.3		
Amount of information (% appropriate amount)	87.2	88.3	93.2	87.4	93.3	91.9	90.2	0.004	P. chi-sq
Perceived voluntariness									
– How easy or hard is it for James to say no to joining study? (% easy to say no)	93.0	94.3	94.8	94.9	93.6	95.7	94.4	0.679	P. chi-sq
– Pick the statement most true of the study (% up to James)	98.3	97.9	98.2	97.9	97.8	97.8	98.0	0.994	P. chi-sq
Willingness to join study									
– Would James join study? (% prob. join)	96.7	99.2	99.2	97.6	98.6	98.1	98.2	0.067	Fischer's Exact
– Would participant join study? (% prob. join)	85.3	92.5	90.6	87.1	92.2	90.2	89.6	0.006	P. chi-sq
Patient attitudes toward doctor									
How important or unimportant is it to join CER studies? (%)									
– Very important (1)	67.2	70.4	69.1	67.0	76.8	72.2	70.4	0.034	K-W ties
– Somewhat important (2)	30.6	27.5	29.6	30.8	22.1	26.7	27.9		
– Somewhat unimportant (3)	1.4	1.1	1.3	1.6	0.6	0.8	1.1		
– Very unimportant (4)	0.8	1.1	0.0	0.5	0.6	0.3	0.5		
Doctor committed to doing best for patients (%)									
– Strongly agree (1)	56.2	61.4	60.9	55.9	65.8	58.7	59.8	0.030	K-W ties
– Agree (2)	33.2	31.1	32.8	33.9	28.3	33.9	32.2		
– Neutral (3)	9.5	6.8	4.5	9.1	5.0	6.0	6.8		
– Disagree (4)	1.1	0.5	0.8	0.0	0.8	0.8	0.7		
– Strongly disagree (5)	0.0	0.3	1.1	1.1	0.0	0.6	0.5		
Doctor is thorough and careful (%)									
– Strongly agree (1)	50.1	56.7	59.3	52.2	61.5	56.5	56.1	0.003	K-W ties
– Agree (2)	39.0	34.7	38.1	39.0	33.2	36.7	36.8		

CER: Comparative effectiveness research.

Table 3. Primary outcomes by arm (arms 1–6 only) (cont.).

	Arm 1	Arm 2	Arm 3	Arm 4	Arm 5	Arm 6	Total	Test Stat	Test Type
– Neutral (3)	8.9	6.3	2.1	7.8	4.2	5.7	5.8		
– Disagree (4)	1.4	1.6	0.5	0.5	1.1	0.8	1.0		
– Strongly disagree (5)	0.6	0.8	0.0	0.5	0.0	0.3	0.4		
Doctor makes good decisions about medical treatments for patients (%)									
– Strongly agree (1)	41.9	41.4	40.4	37.9	45.1	43.4	41.7	0.115	K-W ties
– Agree (2)	42.8	41.9	46.5	41.7	43.4	41.5	43.0		
– Neutral (3)	12.8	15.2	12.1	19.1	10.9	14.4	14.1		
– Disagree (4)	1.9	0.8	1.1	1.1	0.6	0.0	0.9		
– Strongly disagree (5)	0.6	0.8	0.0	0.3	0.0	0.8	0.4		
Doctor is a trustworthy doctor (%)									
– Strongly agree (1)	42.2	47.3	43.2	39.5	49.9	46.7	44.8	0.052	K-W ties
– Agree (2)	42.5	37.9	46.1	41.4	36.1	38.0	40.4		
– Neutral (3)	13.6	14.1	9.7	18.4	13.2	14.4	13.9		
– Disagree (4)	1.1	0.3	1.1	0.3	0.8	0.0	0.6		
– Strongly disagree (5)	0.6	0.5	0.0	0.5	0.0	0.8	0.4		
Doctor communicates clearly (%)									
– Strongly agree (1)	59.9	62.6	65.1	57.7	65.4	59.5	61.7	0.088	K-W ties
– Agree (2)	34.0	32.5	33.1	36.9	31.3	35.1	33.8		
– Neutral (3)	5.9	3.4	1.6	4.3	3.4	4.4	3.8		
– Disagree (4)	0.3	1.1	0.3	0.8	0.0	0.0	0.4		
– Strongly disagree (5)	0.0	0.5	0.0	0.3	0.0	1.1	0.3		
Doctor is rushed with her patients (%)									
– Strongly agree (1)	2.0	1.6	1.3	0.5	3.4	1.1	1.6	0.452	K-W ties
– Agree (2)	3.9	2.1	2.4	3.0	3.1	4.9	3.2		
– Neutral (3)	9.8	6.0	7.4	7.3	7.8	7.3	7.6		
– Disagree (4)	42.6	44.1	43.7	48.4	42.2	42.9	44.0		
– Strongly disagree (5)	41.8	46.2	45.3	40.8	43.6	43.8	43.6		

CER: Comparative effectiveness research.

Attitudes toward comparative effectiveness research & toward Dr Williams

Among participants in the six streamlined arms, 70% reported it was 'very important' for patients to join CER studies (Table 3), ranging from 67% in Arms 1 and 4 to 77% in pre-visit video Arm 5 (Table 3, p = 0.034). Pairwise comparisons suggest that Arm 5, which contained all the enhancements in the pre-visit video, was driving this difference (Table 5). There were also differences among the streamlined Arms 1–6 in whether respondents felt Dr Williams was committed to doing what was best for her patients (p = 0.030, Table 3), with 66% of respondents in Arm 5 'strongly agreeing' compared with 56% in Arm 4 and 56% in Arm 1. Pairwise tests suggest that Arm 4 was significantly lower than Arms 2, 3, and 5, while Arm 5 was significantly higher than 1, 4, and 6 (Table 5).

Nonetheless, across the six streamlined arms, and for all six of these items, there were no significant differences regarding whether respondents believed Dr Williams made good decisions for her patients (42% strongly agree), was a trustworthy doctor (45% strongly agree), communicated clearly (62% strongly agree), or was rushed with patients (44% strongly disagree) (Table 3). There was a significant difference across the streamlined arms in respondents 'strongly agree[ing]' that Dr Williams was 'thorough and careful' (Table 3; p = 0.003), ranging from 50% in Arm 1 to 61% in Arm 5.

There were no differences across the seven outcomes measuring attitudes toward CER or Dr Williams when comparing the combined Arms 1–6 to Arm 7 (Table 4).

Across all seven arms, and for all six of these items, almost all respondents answered either 'strongly agree' or 'agree' for the positively framed items, or answered 'strongly disagree' or 'disagree' for the negatively worded item. Fewer than 7% of participants in any of the arms expressed views that could be construed as critical of Dr Williams's conduct.

Table 4. Primary outcomes by arm (arms 1–6 combined vs arm 7).

	Arm 1–6	Arm 7	Total	Test Stat	Test Type
Understanding (% correct)					
– Study compares two medicine	94.9	93.6	94.7	0.277	P. chi-sq
– Doctor thinks James would do well on either medicine	95.6	96.7	95.8	0.341	P. chi-sq
– Medicine is chosen for James by randomization	86.8	89.7	87.3	0.118	P. chi-sq
– Medicines in study cost the same amount	94.4	95.6	94.6	0.315	P. chi-sq
– James can switch medicines if there is a problem	94.8	97.9	95.3	0.007	P. chi-sq
– Does James need to sign a consent form	75.2	96.9	78.4	0.000	P. chi-sq
Attitudes concerning how doctor (or nurse) talked with James					
Did you like the way the doctor (or nurse) talked to James about the study (%)					
– Really liked (1)	82.0	79.9	81.7	0.320	K-W ties
– Somewhat liked (2)	14.9	16.8	15.2		
– Somewhat disliked (3)	2.4	2.1	2.3		
– Really didn't like (4)	0.7	1.3	0.8		
How respectful was the doctor (or nurse) when they talked to James about the study (%)					
– Really liked (1)	92.5	91.5	92.3	0.516	K-W ties
– Somewhat liked (2)	6.6	7.2	6.7		
– Somewhat disliked (3)	0.8	1.0	0.8		
– Really didn't like (4)	0.1	0.3	0.2		
Doctor treats her patients with dignity (%)					
– Strongly agree (1)	56.9	59.6	57.3	0.364	K-W ties
– Agree (2)	37.4	34.8	37.0		
– Neutral (3)	4.8	4.6	4.8		
– Disagree (4)	0.6	0.8	0.6		
– Strongly disagree (5)	0.3	0.3	0.3		
Amount of information (% appropriate amount)	90.2	91.8	90.4	0.337	P. chi-sq
Perceived voluntariness					
– How easy or hard is it for James to say no to joining study? (% easy to say no)	94.4	92.8	94.1	0.218	P. chi-sq
– Pick the statement most true of the study (% up to James)	98.0	98.2	98.0	0.774	P. chi-sq
Willingness to join study					
– Would James join study? (% would probably join)	98.2	97.9	98.2	0.677	P. chi-sq
– Would participant join study? (% would probably join)	89.6	89.2	89.6	0.780	P. chi-sq
Patient attitudes toward doctor					
How important or unimportant is it to join CER studies? (%)					
– Very Important (1)	70.4	68.6	70.2	0.440	K-W ties
– Somewhat important (2)	27.9	29.4	28.1		
– Somewhat unimportant (3)	1.1	1.8	1.2		
– Very unimportant (4)	0.5	0.3	0.5		
Doctor committed to doing best for patients (%)					
– Strongly agree (1)	59.8	59.2	59.7	0.896	K-W ties
– Agree (2)	32.2	33.6	32.4		
– Neutral (3)	6.8	5.2	6.6		
– Disagree (4)	0.7	1.3	0.8		
– Strongly disagree (5)	0.5	0.8	0.5		
Doctor is thorough and careful (%)					
– Strongly agree (1)	56.1	58.4	56.4	0.490	K-W ties
– Agree (2)	36.8	33.9	36.4		
– Neutral (3)	5.8	6.5	5.9		
– Disagree (4)	1.0	1.3	1.0		
– Strongly disagree (5)	0.4	0.0	0.3		

CER: Comparative effectiveness research.

Table 4. Primary outcomes by arm (arms 1–6 combined vs arm 7) (cont.).

	Arm 1–6	Arm 7	Total	Test Stat	Test Type
Doctor makes good decisions about medical treatments for patients (%)					
– Strongly agree (1)	41.7	44.0	42.0	0.619	K-W ties
– Agree (2)	43.0	39.6	42.5		
– Neutral (3)	14.1	14.8	14.2		
– Disagree (4)	0.9	1.0	0.9		
– Strongly disagree (5)	0.4	0.5	0.4		
Doctor is a trustworthy doctor (%)					
– Strongly agree (1)	44.8	44.4	44.7	0.737	K-W ties
– Agree (2)	40.4	39.3	40.2		
– Neutral (3)	13.9	15.8	14.2		
– Disagree (4)	0.6	0.0	0.5		
– Strongly disagree (5)	0.4	0.5	0.4		
Doctor communicates clearly (%)					
– Strongly agree (1)	61.7	62.1	61.8	0.958	K-W ties
– Agree (2)	33.8	32.0	33.5		
– Neutral (3)	3.8	5.2	4.0		
– Disagree (4)	0.4	0.5	0.4		
– Strongly disagree (5)	0.3	0.3	0.3		
Doctor is rushed with her patients (%)					
– Strongly agree (1)	1.6	1.0	1.5	0.763	K-W ties
– Agree (2)	3.2	2.3	3.1		
– Neutral (3)	7.6	7.2	7.5		
– Disagree (4)	44.0	46.1	44.3		
– Strongly disagree (5)	43.6	43.3	43.6		

CER: Comparative effectiveness research.

Discussion

In this experimental study with a diverse sample of patients from Johns Hopkins, Geisinger, and a national probability sample of the general public and using videos to explain a hypothetical pragmatic trial, we found no evidence that traditional informed consent is preferable to streamlined consent approaches for low risk CER. Participant responses on measures of morally important components of informed consent, including understanding of the study design, voluntariness, respectfulness of the process, and adequacy of information provided did not differ between streamlined and traditional consent arms. The overwhelming majority of participants, across all arms, scored well on understanding measures; thought the amount of information provided was appropriate; believed that the patient in the video could easily say no to participation, with the choice being up to him; and that the process of soliciting consent was respectful.

In our design, instead of exposing respondents to both streamlined and traditional consent approaches and asking which they preferred, we randomly assigned participants to only one approach and then asked their attitudes toward and understanding of the interaction they observed. Almost all respondents, watching a brief video portrayal of a doctor and patient discussing low-risk CER, described the interaction as acceptable, sufficient, and respectful. It is perhaps not surprising that participants in other studies who were asked whether they preferred a traditional informed consent or a streamlined approach to consent often preferred the traditional one. Traditional consent has been the model for ethical research with human beings for over 40 years, and doctors and patients alike have been schooled to believe that research is unethical that does not include this approach.

This study also examined whether certain approaches to streamlined consent were preferable to others. Streamlined approaches varied from one another in terms of whether they provided more background about why CER was important for patient care, whether other 'respect-promoting' practices were in place in the health system where the research was being conducted, and whether extra emphasis was placed on participation being the patient's choice. While no single streamlined arm consistently did better or worse than the others, Arm 5 was preferred in multiple items, including mostly those related to the doctor–patient interaction (e.g., liking how the doctor

Table 5. Pairwise analysis for select primary outcomes.

	Arm 1	Arm 2	Arm 3	Arm 4	Arm 5
Did you like the way the doctor (or nurse) spoke to James about the study (%)					
Arm 2	2.026				
	0.021				
Arm 3	3.247	1.244			
	0.001	0.107			
Arm 4	1.631	-0.387	-1.621		
	0.051	0.349	0.053		
Arm 5	3.556	1.589	0.366	1.958	
	0.000	0.056	0.357	0.025	
Arm 6	1.936	-0.070	-1.301	0.313	-1.642
	0.026	0.472	0.097	0.377	0.050
Doctor treats her patients with dignity (%)					
Arm 2	1.245				
	0.107				
Arm 3	0.729	-0.524			
	0.233	0.300			
Arm 4	-0.457	-1.724	-1.202		
	0.324	0.042	0.115		
Arm 5	2.456	1.258	1.769	2.940	
	0.007	0.104	0.038	0.002	
Arm 6	-0.118	-1.381	-0.858	0.343	-2.604
	0.453	0.084	0.196	0.366	0.005
How important or unimportant is it to join CER studies? (%)					
Arm 2	0.944				
	0.173				
Arm 3	0.635	-0.314			
	0.263	0.377			
Arm 4	-0.049	-1.003	-0.691		
	0.480	0.158	0.245		
Arm 5	2.855	1.954	2.263	2.930	
	0.002	0.025	0.012	0.002	
Arm 6	1.542	0.616	0.927	1.606	-1.328
	0.062	0.269	0.177	0.054	0.092
Doctor committed to doing best for patients (%)					
Arm 2	1.631				
	0.052				
Arm 3	1.623	-0.005			
	0.052	0.498			
Arm 4	-0.018	-1.665	-1.658		
	0.493	0.048	0.049		
Arm 5	2.876	1.294	1.298	2.921	
	0.002	0.098	0.097	0.002	
Arm 6	0.975	-0.649	-0.643	1.002	-1.918
	0.165	0.258	0.260	0.158	0.028
Doctor is thorough and careful (%)					
Arm 2	1.870				
	0.031				
Arm 3	3.248	1.403			
	0.001	0.080			
Arm 4	0.739	-1.137	-2.528		
	0.230	0.128	0.006		

CER: Comparative effectiveness research.

Table 5. Pairwise analysis for select primary outcomes (cont.).

	Arm 1	Arm 2	Arm 3	Arm 4	Arm 5
Arm 5	3.409	1.595	0.214	2.701	
	0.000	0.055	0.415	0.004	
Arm 6	2.049	0.200	-1.189	1.324	-1.382
	0.020	0.421	0.117	0.093	0.084

CER: Comparative effectiveness research.

talked to the patient, feeling she was committed to doing her best for her patients, treating her patients with dignity, being trustworthy, and being thorough and careful). While the differences among the opt-out arms on the emphasis on choice or on ETA may be morally important, there was no evidence that these differences affected participants' attitudes about the acceptability of the consent process they observed. It is also noteworthy that almost all participants in all the study arms believed that James would join the trial, and that almost as many believed that they, themselves, would be willing to join such a study.

Of interest, two of the streamlined arms (Arms 5 and 6) included all of our experimental enhancements to streamlined consent. That is, both included more background on why CER is important to conduct, described how practices of engagement, transparency, and accountability are in place at the health system where the study was being done, and emphasized that joining ultimately was the patient's choice. However, Arm 5, which presented this information in a pre-appointment video for the hypothetical patient, did better than Arm 6, which provided the identical information during the interaction between the hypothetical doctor and patient. While it is not clear why the video approach did better in this study, it is possible that separating information into separate time periods was preferred among participants. A recently published study found that a video showing a question/answer interaction between a potential research participant and the investigator, shown in advance to potential participants, increased understanding [26]. Relatedly, a large cardiology study that used a video consent process for some participants found that when video consent was used, the study enrolled a more diverse participant population and experienced shorter times from site approach to patient enrollment [27]. Taken together, these findings suggest that at least in some low-risk consent contexts, it may be both more efficient in terms of staff time, and more effective in terms of communicating of information, to provide some information in pre-appointment videos. The use of videos, rather than always requiring more extended exchanges between doctor and patient, importantly can still meet ethics and patient acceptability standards. However, more research is needed to validate this finding.

A striking finding from our study was how high respondents' scores on understanding items were across all arms. Particularly noteworthy, over 80% of participants correctly answered the item assessing understanding of randomization. Multiple studies have documented the difficulty of communicating this concept, resulting in far lower levels of understanding for randomization, a key ethical challenge in randomized trials. One recent survey experiment comparing different approaches to consent for pragmatic trials found only 45% of respondents understood the use of random assignment to treatment [19]. Howard *et al.* found 44% of participants in a randomized trial of beta blockers did not know that they were assigned to a treatment or placebo arm by chance [28]. It is possible that the video, with compelling characters and an animated visual presentation of a gumball machine analogy, may have served as a successful intervention to help explain what randomization means to potential participants. Further testing of this segment of the video as an educational aide in explaining randomized trials should be explored in other studies and settings.

It is also noteworthy that participants in streamlined arms continued to believe that James would need to sign a consent form, even though no form was depicted in the video and Dr Williams explained that James' signature would not be required. That the signature requirement is instilled in patients can be viewed as a tribute to the success of multiple regulatory and research ethics efforts over many decades. If it is determined that streamlined consent approaches are acceptable for certain types of low-risk research in the future, attention will need to be paid to shifting the presumption held by patients and likely by many clinical researchers that research must be preceded by signed consent. Alternatively, simplified signature requirements could be built into streamlined models. For example, a streamlined approach could incorporate a patient signature on a consent document at its conclusion, but without the lengthy information that frequently characterizes many current consent documents today.

There were several limitations to this study. Most importantly, this study focused on a hypothetical blood pressure study and shared a series of alternative consent approaches occurring between a fictional patient and physician.

There is no way to know whether respondents' reactions to the scenario they viewed would be replicated if, as a patient, they were personally offered participation in an actual comparative effectiveness trial through any of the consent approaches the videos depicted. Nonetheless, our study aimed to determine any relative differences in patient response based on the differing experimental approaches to consent, and none were observed.

That respondents were asked to react to a hypothetical study also meant that our participants were observing and not participating in the consent interaction. In actuality real patients may not think to ask all of the questions that our depicted patient did, and thus our participants may have observed a fuller discussion than they would have experienced in real life. Further, the patient and doctor in the videos were good communicators and were highly engaged. While our participants reported that the amount of information provided was appropriate and acceptable, and while their answers demonstrated that they understood the trial even from streamlined discussions, we cannot assume that all discussions in real life would proceed as did those in the videos. Indeed, that Arm 5 (where the simulated patient watched a video in advance of their appointment) did best may suggest that observing someone else asking questions, and having those answered, may be a helpful consent and informing strategy, again consistent with other literature.

This study further took the view that streamlined consent procedures for CER should describe any additional risks the study posed compared with the risks of taking the blood pressure medicine during usual care. The side effects or risks of taking blood pressure medicine were not discussed. Further, this study recruited adults without regard for their health status or background, rather than targeting individuals with a history of hypertension for whom the hypothetical study might have been more salient. In choosing a range of adults, we aimed to be more inclusive while also assuming that high blood pressure was a familiar condition to most respondents. Another limitation was that several items were drafted specifically for this study and therefore had not been previously validated. The items were assessed for face validity with two patient advisory groups and further evaluated in 40 cognitive interviews to ensure that the meaning of the items was consistent with what was intended. Finally, while Arms 1–6 portrayed the entirety of the consent discussions, Arm 7 did not. It used visual images to convey that time was passing as a research nurse went over the information in what was presented as a lengthy consent document with James. This was the only arm in which the verbatim exchange between the provider and patient was not presented. While this was done to avoid respondents having to watch an approximately 20–30-min consent discussion, this arm, unlike the streamlined options, did not present the entirety of the consent process. It is unclear whether having respondents watch a full portrayal of a traditional informed consent discussion would have yielded different results.

In this study, we were interested not only in patients' and the public's responses to streamlined versus traditional consent, but also in whether modifying streamlined approaches in specific ways might alter either understanding or respondents' attitudes. Modifications tested in this study included explaining why CER is important for patient care, describing how some healthcare organizations promote engagement, transparency, and accountability activities around research, and emphasizing that it was the patient's choice whether or not to participate in research. Each of these variations were included because it was respect-promoting, independent of the authorization procedure used. In several measures – particularly those related to the quality of the interaction between 'Dr Williams' and 'James', Arm 5 – which included a pre-appointment video and all streamlined enhancements – did better than the other arms; in other outcomes, there were no differences among arms. Importantly, most participants in all arms 'really liked' the way the doctor talked with the patient, found how she talked with the patient about the study 'very respectful' and strongly agreed that the doctor was thorough and was doing her best for her patients. Further, that Arm 5, in which some of the information was presented to James via a background video before his appointment performed either as well as or better than the other arms in which all the information was presented to James by the MD or research nurse, supports the current interest in developing informational videos to assist in the consent solicitation process [29].

Conclusion

Most participants in all streamlined consent arms and in the traditional informed consent arm found consent interactions to be understandable, voluntary, and respectful. There was little evidence in this study to support the view that traditional informed consent is ethically preferable or more acceptable to patients than streamlined consent approaches for low-risk CER. The streamlined arms performed either the same as each other, or small differences were found in favor of an arm with a pre-appointment video that provided a bit more study background, described system-wide practices in patient engagement, transparency, and accountability to change practice based

on study information, and reinforced that participation was the participant's choice. These findings suggest that the core moral commitments of consent need not be compromised by using a streamlined approach for low-risk CER. Further, and consistent with other studies, most of the participants in this study endorsed the importance of conducting CER. People are supportive of CER, which suggests that it should be possible to find suitable ways to strike a balance between conducting such research and foundational ethical obligations to respect patients and to ensure that their interests are not compromised in the process. Our findings add additional support to a growing body of literature suggesting that streamlined approaches to consent for low-risk randomized research, including disclosure that research is occurring and patients can opt out if they prefer, can be acceptable to patients, and may be an important strategy toward striking this balance.

Summary points

- Traditionally, informed consent has been treated as a 'one size fits all' requirement, with lengthy forms being used for all types of clinical research.
- Low-risk comparative effectiveness research compares widely used, approved therapies to each other. Questions emerge whether comparing approved therapies might warrant a different or more streamlined approach to consent than studies testing experimental medicines and, if so, if there are additional ways to demonstrate respect to the patients who take part.
- We developed a seven-arm survey experiment to explore patient and public attitudes using animated videos depicting different ways that a physician could explain to a patient a hypothetical study comparing two widely used blood pressure medicines. Some videos were enhanced with practices we believed to be respect-promoting such as emphasizing that patient engagement would have occurred before the study began or that the institution would be transparent about ongoing research.
- Six of the study arms included videos that depicted variations on a streamlined, oral, opt-out consent approach; one arm depicted a traditional, longer, written and signed opt-in consent approach.
- 2618 adults from two large US healthcare systems or a nationally representative online sample were randomized to view videos corresponding to one of the seven study arms and then to complete a self-administered questionnaire asking their understanding of the study, how respectfully they thought the doctor in the video treated the patient, and whether they would join the study if offered to them.
- Across all arms, participants had a high understanding of the study. Understanding was no higher in the traditional, opt-in written consent arm than in the streamlined opt-out arms, with the exception of opt-out participants incorrectly believing that eventually a signature would be required.
- Participants in the streamlined arms were as likely to say that the amount of information provided was appropriate as were those in the traditional consent arm, and participants across all arms thought that the interaction between the doctor and the patient was respectful. Participants were slightly more likely to prefer the consent arm that provided some study information up front in a pre-appointment video.
- This study was limited by being a hypothetical study. We do not know whether participants actually told about a comparative effectiveness study by their own doctor would find a streamlined discussion appropriate.

Financial & competing interests disclosure

Research reported in this publication was funded through a Patient-Centered Outcomes Research Institute (PCORI) Award ME-1310-07763). The views presented in this publication are solely the responsibility of the author(s) and do not necessarily represent the views of the Patient-Centered Outcomes Research Institute (PCORI), its Board of Governors or Methodology Committee. The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

No writing assistance was utilized in the production of this manuscript.

Ethical conduct of research

The authors state that they have obtained appropriate institutional review board approval or have followed the principles outlined in the Declaration of Helsinki for all human or animal experimental investigations. The institutional review board at the Johns Hopkins Bloomberg School of Public Health reviewed and granted exempt status to this study prior to data collection. The institutional review board at Geisinger (IRB# 2017-0149) reviewed the study under an expedited review and granted approval prior to data collection. These IRBs did not believe it was necessary either to inform participants who were asked to complete this self-administered, anonymous survey that they were being randomized to different versions of the study video or to seek written consent for survey completion.

References

Papers of special note have been highlighted as: • of interest; •• of considerable interest

1. Grady C, Cummings SR, Rowbotham MC, McConnell MV, Ashley EA, Kang G. Informed consent. *N. Engl. J. Med.* 376(9), 856–867 (2017).

• **A review of the contemporary challenges in informed consent, including those pertaining to low-risk comparative effectiveness research and related study designs.**

2. Emanuel EJ, Menikoff J. Reforming the regulations governing research with human subjects. *N. Engl. J. Med.* 365(12), 1145–1150 (2011).
3. Peddicord D, Waldo AB, Boutin M, Grande T, Gutierrez L. A Proposal to protect privacy of health information while accelerating comparative effectiveness research. *Health Affairs* 29(11), 2082–2090 (2010).
4. Wilfond BS. Quality improvement ethics: lessons from the SUPPORT study. *Am. J. Bioethics* 13(12), 14–19 (2013).
5. Morain SR, Kass NE. Ethics issues arising in the transition to learning health care systems: results from interviews with leaders from 25 health systems. *EGEMS (Wash DC)* 4(2), 1212 (2016).
6. Gelijns AC, Gabriel SE. Looking beyond translation – integrating clinical research with medical practice. *N. Engl. J. Med.* 366(18), 1659–1661 (2012).
7. Flory J, Karlawish J. The prompted optional randomization trial: a new design for comparative effectiveness research. *Am. J. Public Health* 102(12), e8–e10 (2012).
8. Kass NE, Faden RR. Ethics and learning health care: the essential roles of engagement, transparency, and accountability. *Learn Health Sys.* 2(4), e10066 (2018).

• **This perspective argued for the importance of specific respect-promoting practices, beyond informed consent, for the ethical conduct of research in learning health systems.**

9. Truog RD, Robinson W, Randolph A, Morris A. Is informed consent always necessary for randomized, controlled trials? *N. Engl. J. Med.* 340(10), 804–807 (1999).

•• **This seminal paper argued that specific informed consent is not necessary for all randomized controlled trials.**

10. Kalkman S, Kim SYH, van Thiel GJMW, Grobbee DE, van Delden JJM. Ethics of informed consent for pragmatic trials with new interventions. *Value Health* 20(7), 902–908 (2017).
11. Faden R, Kass N, Whicher D, Stewart W, Tunis S. Ethics and informed consent for comparative effectiveness research with prospective electronic clinical data. *Med. Care* 51(3 Suppl. 8), S53–S57 (2013).
12. Dal-Ré R, Avendaño-Solà C, Bloechl-Daum B *et al.* Low risk pragmatic trials do not always require participants' informed consent. *BMJ* l1092 (2019).
13. Faden R. Addressing low-risk comparative effectiveness research in proposed changes to US Federal regulations governing research. *JAMA* 307(15), 1589 (2012).
14. Platt R, Kass NE, McGraw D. Ethics, regulation, and comparative effectiveness research: time for a change. *JAMA* 311(15), 1497 (2014).
15. Faden RR, Beauchamp TL, Kass NE. Informed consent, comparative effectiveness, and learning health care. *N. Engl. J. Med.* 370(8), 766–768 (2014).
16. Kass N, Faden R, Fabi RE *et al.* Alternative consent models for comparative effectiveness studies: views of patients from two institutions. *AJOB Empirical Bioethics* 7(2), 92–105 (2016).
17. Morain SR, Tambor E, Moloney R *et al.* Stakeholder perspectives regarding alternate approaches to informed consent for comparative effectiveness research. *Learning Health Syst.* 2(2), e10047 (2018).
18. Kraft SA, Cho MK, Constantine M *et al.* A comparison of institutional review board professionals' and patients' views on consent for research on medical practices. *Clin. Trials* 13(5), 555–565 (2016).

• **Demonstrates a gap between the attitudes of patients and those charged with research oversight regarding appropriate approaches to informed consent for comparative effectiveness studies and related research designs.**

19. Weinfurt KP, Bollinger JM, Brelsford KM *et al.* Comparison of approaches for notification and authorization in pragmatic clinical research evaluating commonly used medical practices. *Med. Care* 55(11), 970–978 (2017).

• **Presents the results of a nationally representative survey experiment of US adults about preferences for notification about comparative effectiveness research and related study designs.**

20. Nayak RK, Wendler D, Miller FG, Kim SYH. Pragmatic randomized trials without standard informed consent?: A National Survey. *Ann. Intern. Med.* 163(5), 356 (2015).

• **Presents the results of a survey experiment exploring the attitudes of US adults about pragmatic trials without traditional informed consent.**

21. Cho MK, Magnus D, Wilfond BS. Informed consent for research on medical practices. *Ann. Intern. Med.* 163(9), 725 (2015).
22. Dal-Ré R, Carcas AJ, Carné X, Wendler D. Patients' beliefs regarding informed consent for low-risk pragmatic trials. *BMC Med. Res. Methodol.* 17(1), 145 (2017).

23. Psek WA, Stametz RA, Bailey-Davis LD *et al.* Operationalizing the learning health care system in an integrated delivery system. *eGEMs* 3(1), 6 (2015).
24. Morain SR, Kass NE, Faden RR. What factors predict willingness to join low-risk pragmatic clinical trials? *Ethics Human Res.* 43(1), 17–24 (2021).
25. Hays RD, Liu H, Kapteyn A. Use of internet panels to conduct surveys. *Behav. Res.* 47(3), 685–690 (2015).
26. Taylor HA, Washington D, Wang N-Y *et al.* Randomized comparison of two interventions to enhance understanding during the informed consent process for research. *Clin. Trials* 18(4), 466–476 (2021).
27. Fanaroff AC, Li S, Webb LE *et al.* An observational study of the association of video- versus text-based informed consent with multicenter trial enrollment: lessons from the PALM study (Patient and Provider Assessment of Lipid Management). *Circ. Cardiovasc. Qual. Outcomes* 11(4), e004675 (2018).
28. Howard JM, DeMets D. How informed is informed consent? *Controlled Clin. Trials* 2(4), 287–303 (1981).
29. Baker JN, Leek AC, Salas HS *et al.* Suggestions from adolescents, young adults, and parents for improving informed consent in phase 1 pediatric oncology trials: suggestions to improve informed consent. *Cancer* 119(23), 4154–4161 (2013).