

Addressing Implicit Bias as Standard of Care II:

Organizational Ethics and Solutions

February 17, 2022 6:15-8:15 p.m.

- 1) What does implicit bias by an organization look like in a clinical, ethical, and legal sense?
- 2) What is the impact of implicit bias on organizational behavior?
- 3) How should implicit bias influence a hospital's approach to evaluating the quality of care provided to patient, and the quality of health promoted in the community?
- 4) What legal obligations do health care institutions have to use I.T. systems and quality assurance tools to identify patterns of systemic racism?
- 5) What can, and should institutions do to identify implicit bias in it's service area/community in order to quantify and redress the instances of implicit bias it identifies?

Case Study and Reading Material

Case Study on Implicit Bias, possibly:

From: **Mir d** <mir.d@gmail.com> Date: Thu, Jan 13, 2022 at 5:35 AM
Subject: Urgent need for legal advice
To: <davidnhoffman@gmail.com>

Hi Mr. Hoffman,

I am writing with an urgent need for legal advice. I am in a NYC hospital in the early stages of labor and being induced. I have had a fraught relationship with the hospital since I was admitted on Monday 1/10, as I have rejected several of their recommendations for my care during labor and delivery in an effort to have the birth experience best suited for me as opposed to one best designed to protect the hospital from potential liability/the hospital's business considerations. I have advocated for myself strongly to say the least.

I just reviewed my medical notes which are on the hospital's online portal. In her notes from yesterday 1/12, the head of OB/GYN at this branch of the hospital (whom I've had three separate interactions with during my admission) made repeated references to my possibly needing psychiatric evaluation and being incapable of making proper medical decisions for myself and my baby. According to the notes, there were a series of meetings yesterday afternoon involving the above head of OB/GYN as well as the head of OB/GYN for the entire hospital network, a member of the Ethics department for the hospital, and other high level parties, discussing their plan of care for me. The note references a separate detailed note made by the Ethics department employee, but that note is not included in my online chart. In addition, beginning on Tuesday and through yesterday, my medical notes have become increasingly inaccurate as far as how the staff recorded my responses to their recommendations and the conversations about my care that we have had.

I am in the middle of being given medications to induce labor. At 10 am I will have to decide whether to be hooked up to an IV and medicated with pitocin, which, if successful, will send me into active labor. I am extremely concerned that the hospital is setting the stage to have me psychiatrically evaluated and deemed incapable of making my own medical decisions. I am most concerned that as labor progresses and I become less and less able to be clear-headed and calm, the hospital will attempt to justify taking away my right to make my own medical decisions just when I want to be able to make those decisions and when I am at my most vulnerable. I feel extremely uncomfortable receiving any more care here, but I am not sure what options I have realistically to change hospitals at this point. For one, the health risks to myself and my baby, and second, I fear that even if I can coordinate another hospital to immediately receive and care for me, if I try to leave this hospital against medical advice, I will provide fodder to establish that I am incapable of making responsible medical decisions.

I am a lawyer myself so I don't expect you to respond immediately. But if you can, please do as I need immediate help and advice.

Thank you,

Reading Material:

[Examining the presence, consequences, and reduction of implicit bias in health care: A narrative review](#)

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Sources of Concern about the Patient Self-Determination Act

[December 5, 1991](#)

N Engl J Med 1991; 325:1666-1671

DOI: 10.1056/NEJM199112053252334

<https://www.nejm.org/doi/full/10.1056/nejm199112053252334>

CAHPS® Hospital Survey (HCAHPS) Version 15.0 March 2020

https://www.hhs.gov/guidance/sites/default/files/hhs-guidance-documents/2020_QAG_V15.0.pdf

Jahi McMath – A Dispute over Brain Death

Federal complaint

<https://thaddeuspope.com/images/Jahi-McMath-Federal-Complaint-20151223.pdf>

[Order of Dismissal \(Feb. 1, 2019\)](#)

https://thaddeuspope.com/images/Dismiss_fed_McMath.pdf

[Rosen Motion to Dismiss 03-29-16](#)

https://thaddeuspope.com/images/Rosen_motion_to_dismiss_ND_Cal_03-29-16.pdf

[Plaintiff Opp to Motion to Dismiss \(ND Cal June 3, 2016\)](#)

https://thaddeuspope.com/images/McMath_ND_Cal_June_3,_2016_Opp_to_motion_dismiss.pdf

[Law, Religion, and Health in the United States](#), pp. 293 - 305

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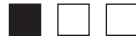
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Implicit Bias Training in a Residency Program: Aiming for Enduring Effects

Michelle D. Sherman, PhD; Jason A. Ricco, MD, MPH; Stephen C. Nelson, MD; Sheila J. Nezhad, MDP; Shailendra Prasad, MBBS, MPH

BACKGROUND AND OBJECTIVES: Implicit bias often affects patient care in insidious ways, and has the potential for significant damage. Several educational interventions regarding implicit bias have been developed for health care professionals, many of which foster reflection on individual biases and encourage personal awareness. In an attempt to address racism and other implicit biases at a more systemic level in our family medicine residency training program, our objectives were to offer and evaluate parallel trainings for residents and faculty by a national expert.

METHODS: The trainings addressed how both personal biases and institutional inequities contribute to structural racism, and taught skills for managing instances of implicit biases in one's professional interactions. The training was deliberately designed to increase institutional capacity to engage in crucial conversations regarding implicit bias. Six months after the trainings, an external evaluator conducted two separate 1-hour focus groups, one with residents (n=18) and one with program faculty and leadership (n=13).

RESULTS: Four themes emerged in the focus groups: increased awareness of and commitment to addressing racial bias; appreciation of a safe forum for sharing concerns; new ways of addressing and managing bias; and institutional capacity building for continued vigilance and training regarding implicit bias.

CONCLUSIONS: Both residents and faculty found this training to be important and empowering. All participants desired an ongoing programmatic commitment to the topic.

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cognitive shortcuts that allow us to efficiently interpret stimuli by categorizing them in manageable bits. These instantaneous cognitive processes are more likely to be triggered in stressful situations when efficient decision-making is required, such as commonly occurs in medicine.⁵

Most studies attempting to address implicit bias in health care strive to increase awareness of individual biases through self-assessments (eg, Implicit Association Test).⁶⁻⁸ Several strategies have been suggested for individuals to act on specific biases once they are recognized, including conceptualizing bias as a habit of mind,^{8,9} individuating,¹⁰ and perspective-taking.¹¹ Curricula on racism training have depended on pedagogical models that aim to improve individuals' awareness of cultural differences, self assessments and technical skills, or opportunities for self-reflection. These approaches emphasize awareness and action on an individual rather than at a systemic level. For enduring change, there is a need for approaches that act as catalysts for systemic change.¹²

In an era of increasing tension regarding race and racism, trainees

More than a decade since the Institute of Medicine's (IOM) *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* report highlighted that racial disparities are due in part to health care providers' own biases, health disparities have persisted or worsened for some

groups.¹⁻³ Both individual and organizational biases play a role in perpetuating health disparities along dimensions such as race/ethnicity, age, sexual orientation, gender, and socioeconomic status.^{1,4} These biases, when acted on without an individual's intentional control, are called implicit bias, and stem from automatic

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are looking to faculty for direction. How faculty engage in these difficult conversations with learners, as well as broader communities and institutions, is important. There is a need for a health professionals curriculum that will move beyond simply identifying implicit biases through self-reflection to (a) provide insight into how such insidious biases perpetuate institutional inequities and potentially exacerbate structural racism,¹³ and (b) empower health care professionals with skills for managing instances of racism and other implicit biases in their professional lives. The objective of this multimethod study was to evaluate participant experience with a parallel curriculum we simultaneously delivered to University of Minnesota North Memorial Family Medicine Residency Program residents and faculty (Minneapolis, MN) that aimed to meet these goals.

Methods

Our curriculum was based on a training module for residents that employs a transformative learning framework to address issues of race, racism, and “whiteness” (the overwhelming presence of white centrality and normativity in our society).¹⁴ Besides providing opportunities for individual level self-reflection, our curriculum emphasized engagement in critical dialogue with system factors involved in institutionalized racism. We broadened our training approach by (a) offering two 60 to 90-minute parallel workshops for residents and faculty, focusing on both patient care and teaching, and (b) incorporating more practical, applied recommendations for how to address implicit bias in practice. Training sessions were led by a national expert on implicit bias, and involved group discussion and reflection (Table 1). Anonymous satisfaction surveys were completed immediately after the second training (response rate=100%).

Recognizing that measuring implicit bias and the change in bias is problematic,¹⁵ we opted to primarily study our intervention qualitatively.

Six months after the trainings, an external evaluator conducted two separate 1-hour focus groups—one with residents and one with faculty. The groups were conducted during weekly faculty meetings and resident meetings, both in March, 2018. Demographics of participants are in Table 2. Both groups followed the same semistructured interview protocol of five questions. These questions were determined before the focus group, and were codeveloped by the research team and an independent external evaluator with expertise in evaluation of programs that advance social change within complex systems. The questions, guided by a formative evaluation approach, related to participants’ experiences within the training, impacts of the training on individual roles and on the broader residency program, and areas for growth related to implicit bias.

The external evaluator analyzed the data using a phenomenological approach to further understand experience with the curriculum, using MaxQDA software. Data were coded using an inductive approach by identifying emerging themes and key points in the transcripts. Upon completion of coding of the second transcript (focus group 2), the full coding scheme was again applied to the first transcript (focus group 1) to achieve thematic saturation. The University of Minnesota Institutional Review Board reviewed the project and deemed it exempt.

Results

Participants reported high levels of satisfaction with the training on the anonymous surveys completed at the second training session, with 88% of residents describing it as excellent (5/5 on a Likert scale) and 13% as very good (4/5). Similarly 100% of faculty reported they would strongly recommend the training to other family medicine residency programs, with almost all noting the training will help them as providers, preceptors, and community advocates.

Four overarching themes emerged from the focus groups. Exemplar quotations are shown in Table 3.

Increased Awareness of and Commitment to Addressing Racial Bias

Many participants reported that the training increased their awareness of racial bias, especially biases specific to medicine. Participants universally committed to increasing their awareness of racism and managing racial bias, both individually and as a program.

Safe Forum for Sharing Concerns

Participants in both focus groups expressed feeling safe sharing concerns with one another, noting the trainings strengthened their existing culture of open and safe communication. Residents reported feeling less comfortable going to faculty with their concerns about biases, noting worry about how such disclosures would be handled.

Implementing New Ways of Addressing and Managing Bias

Some participants reported they used new practices to address racial bias after the trainings. Some faculty members are collaborating with the larger affiliated hospital system to advance health equity work, asking for health equity officers and staff training on implicit bias. Some residents shared that the trainings provoked reflection regarding how their racial biases may affect how they choose treatment plans for patients. Since the training, several have been deliberately moderating that bias by challenging their decision making and assumptions.

Institutional Capacity Building: Iterative Trainings and Continued Vigilance

Both groups emphasized the importance of ongoing trainings and dialogue about implicit bias, resulting in the issue being part of a program’s culture rather than a one-time training. Both groups highlighted the importance of continued vigilance and

Table 1: Curriculum for Training Sessions

	Part 1 – Race	Part 2 – Racism	Part 3 – Whiteness	Part 4 - Implicit Bias
Session 1: Race, Racism, and Whiteness	<ul style="list-style-type: none"> • Differentiate race, culture, and ethnicity • History <ul style="list-style-type: none"> • Colonization • Social construction • Creation of white • Human Genome Project • Racial narratives 	<ul style="list-style-type: none"> • General dynamics of oppression <ul style="list-style-type: none"> • Institutional power • Cultural power • Transactional racial oppression • Structural racism 	<ul style="list-style-type: none"> • Racial identity exercise • Demographics <ul style="list-style-type: none"> • Health care <ul style="list-style-type: none"> • Physicians • Faculty • Nurses • Clinical trials • Whiteness <ul style="list-style-type: none"> • Whiteness= white privilege +white supremacy • White fragility/innocence • Role of whiteness in our work <ul style="list-style-type: none"> • Norms for lab values • Medical education 	<ul style="list-style-type: none"> • What is it? When does it operate? <ul style="list-style-type: none"> • Implicit vs explicit • Stereotyping • Implicit association test • Does implicit bias really affect care? <ul style="list-style-type: none"> • Examples in research literature • Aversive racism model • What can I do about it? <ul style="list-style-type: none"> • Racial justice training • Critical race lens • Recognize discomfort/Emotional regulation • Humanistic care • Levels of racism exercise
Session 2: Barriers and Tools	Part 1 - Group Discussion of Barriers to Addressing Implicit Bias		Part 2 - Tools to Address Barriers	
	<ul style="list-style-type: none"> • Personal and institutional: money, time, ego • Myth of meritocracy <ul style="list-style-type: none"> • YouTube video: <i>The Unequal Opportunity Race</i> • Lack of awareness of bias • Equality vs equity exercise • Pitfalls of discussing race <ul style="list-style-type: none"> • Individualistic • Legalistic • Tokenistic • Ahistorical • Fixed • Aversive racism <ul style="list-style-type: none"> • Racism without racists • Culture of medicine • Whiteness 		<ul style="list-style-type: none"> • Find allies • Mission-driven <ul style="list-style-type: none"> • Conceptualize an equity climate as a safety climate • Personal motivation/core values <ul style="list-style-type: none"> • Active listening • Validation • “In the past I FELT that way, I FOUND out (xxx), and now I FEEL...” • Raise awareness <ul style="list-style-type: none"> • Collect accurate data • Race as an independent variable in outcomes • Use a critical race lens <ul style="list-style-type: none"> • Policies • Systems • Individual cases • Take a health equity timeout <ul style="list-style-type: none"> • Humanism • Be in the moment • Function consciously vs unconsciously 	

transparency in these efforts, noting the real challenges in this work.

Discussion

There is no single magic bullet approach that would eradicate implicit bias; residencies need to cultivate learning communities where difficult

issues like implicit bias will be openly discussed. Participants indicated our training created a safe forum for sharing ideas, while recognizing the need for iterative learning and maintaining transparency in addressing implicit bias. Although participants learned skills regarding how to

address racism, some wanted ongoing support for assertively addressing incidents of implicit bias.

Replication of this training and evaluation in other settings will allow comparison of findings; in so doing, contextual factors should be considered, including power

Table 2: Characteristics of Focus Group Participants (n=31)

Mean age in years (standard deviation)	37.39 (9.10)
Range (years)	28-59
Gender	
Male (n=6)	19%
Female (n=25)	81%
Role	
Faculty (n=13)	42%
Resident (n=18)	58%
Race	
White/Caucasian (n=19)	61%
African American (n=5)	16%
Asian Pacific Islander (n=4)	13%
Hispanic/Latino	
Yes (n=2)	6%
No (n=29)	94%

dynamics inherent in residency programs. Institutions must include mechanisms to navigate these power imbalances, empowering those with less perceived power to feel comfortable sharing their experiences and perceptions. For example, dedicating time in meetings attended by both residents and faculty to discuss implicit bias together has the potential to open communication and facilitate appreciation of everyone’s shared commitment to this topic.

Limitations of this study include a sample of 31 people from a single institution and the fact that not all focus group participants attended both training sessions due to scheduling challenges. While our focus groups

Table 3: Qualitative Themes from Focus Groups

Increased Awareness of and Commitment to Addressing Racial Bias
I think it showed us how many times as white people we say, “Oh...that’s not how it is. We didn’t mean it like that.” (faculty)
We need to check ourselves and that’s why when you said “turning the mirror around on us,” it’s like, “yeah, look inward...” (resident)
I think too often things like this are so abstract and sometimes don’t have quick fixes... so we don’t engage with them... (faculty)
Safe Forum for Sharing Concerns
I think this [is a] particularly...sensitive topic... I think there was a sense of this being an okay place for us to [discuss] it. (resident)
Being a white person who is also struggling with my white privilege at times, I know that sometimes I make mistakes and I say the wrong things and I need to be challenged on stuff. When things like that happen, having a culture where - like if I was there on labor and delivery, you could like, hey, is there a reason that you didn’t give her pain medication? And feeling like that’s okay, and that I’m not going to snap your head off because you brought [that] up. (faculty)
Implementing New Ways of Addressing and Managing Bias
I’ve learned how to identify when I’m feeling triggered by a specific patient or situation, whether it’s I’m feeling annoyed or I’m feeling like I don’t feel like I’m connecting as well with them... how to take that extra time to think to myself, why is this bothering me? Why do I feel this way?” (resident)
I think that the training gave us a firmer ground to stand on. I felt a little more confident in going and saying, “What you’re doing is not acceptable and you have to change it.” (resident)
In my teaching, I’m trying to ask questions or prompt discussions about [implicit bias] with the residents...talking about how the person’s race affects their experience. And then in working with my patients as well... helping me reflect and put myself in their situation, having better empathy or understanding for their experience. (faculty)
...[when there may be several treatment options for a patient], for whatever reason...I just know they’re not going to do this. And so I don’t even offer that as a choice because I’ve already made the decision that they’re not going to do it. I catch myself much more often [saying] okay, don’t make that choice [for the patient]. (resident)
Institutional Capacity Building: Iterative Trainings and Continued Vigilance
In my ideal program, I would want more iterative training for myself, to recognize my [own bias] and also to recognize when to speak up and how to speak up. (resident)
Being able to challenge each other, and continuing that kind of openness...almost like, “if you hear something, see something, say something.” (faculty)

were conducted 6 months after the trainings, indicating lasting effects, sustained enduring effects are difficult to predict. We are hopeful that continued programmatic vigilance and each person's ongoing journey regarding overcoming our biases will increase our institutional capacity and anchor ongoing work.

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Abstract

Recent evidence suggests that one possible cause of disparities in health outcomes for stigmatized groups is the implicit biases held by health care providers. In response, several health care organizations have called for, and developed, new training in implicit bias for their providers. This review examines current evidence on the role that provider implicit bias may play in health disparities, and whether training in implicit bias can effectively reduce the biases that providers exhibit. Directions for future research on the presence and consequences of provider implicit bias, and best practices for training to reduce such bias, will be discussed.

Keywords

bias reduction, health care, health disparities, implicit bias

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A number of stigmatized social groups face broad and persistent health disparities. Many ethnic/racial groups, such as African Americans and American Indians, have shorter life expectancies than their White peers (e.g., Williams & Mohammed, 2009; but see Ruiz, Hamann, Mehl, & O'Connor, 2016, for an example of the “Hispanic paradox”). Individuals with lower socioeconomic statuses face increased risk of disease, and women are more likely to be the victims of rape and intimate partner violence and suffer from depression than men (e.g., Coker et al., 2002; Nolen-Hoeksema, 2001). Sexual orientation may also be another key factor in continued health disparities such that gay men, lesbian women, and bisexuals tend to have poorer health

than their heterosexual counterparts (e.g., Dille, Wynkoop Simmons, Boysun, Pizacani, & Stark, 2010).¹

The causes for such disparities are linked to three broad factors: Genetic/biological antecedents, socioeconomic predictors, and psychological processes that contribute to biased health care (e.g., Adler & Rehkopf, 2008; Sankar et al., 2004; Schnittker & McLeod, 2005). Prominent among

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the psychological biases that have been discussed are the nonconscious or implicit prejudice and stereotypes held by health care providers. Despite their explicit commitment to providing equal care, some studies suggest that implicit prejudice and stereotyping can impact the judgment and behavior of health care providers when they interact with stigmatized patients (e.g., Green et al., 2007; see Chapman, Kaatz, & Carnes, 2013, for a review). To address this problem, several health care organizations have proposed, and in some cases tested, new approaches to raising awareness and providing skills for reducing implicit bias in patient care. Not surprisingly, most of the research on implicit bias in health care draws heavily from the theories and research methods developed by social psychology for the study of intergroup processes. Indeed, many social psychologists directly collaborate on the work being done to document and prevent implicit bias in health care.

The purpose of this paper is to provide an overview of the research on implicit bias among health care providers and the steps being taken to develop interventions to reduce such bias using articles found on the PsycINFO, PubMed, and Google Scholar search databases. We also highlight gaps in the scientific literature, and suggest future directions for research on the role of implicit bias in creating disparities for stigmatized patients.

Persistent Concerns About Bias in Health Care Delivery

One of the more troubling explanations for continuing health disparities is bias on the part of health care providers (Smedley, Stith, & Nelson, 2002; van Ryn & Fu, 2003). Although bias seems anathema to the profession, this has not always been the case. For example, the *Tuskegee Syphilis Study of Untreated Syphilis in the Negro Male* (1932 to 1972) was a long running study conducted by the United States Public Health Service in which hundreds of African American men infected with syphilis were studied to understand the life history of the disease. Not only were the men unaware

that they had the disease, but they were never given treatment to cure it—even though the treatment had become commonplace while the study was being conducted. The effects of the Tuskegee study can still be seen today in that African Americans who have knowledge of the study report greater medical and research mistrust (Freimuth et al., 2001; Shavers, Lynch, & Burmeister, 2000).

Three converging lines of evidence make it difficult to dismiss provider bias as playing some role in creating or maintaining health disparities. First, ethnic/racial differences in care have been observed even after economic, educational, and access differences were accounted for, leading some to conclude that bias must be at work (e.g., Kressin & Petersen, 2001; Sheifer, Escarce, & Schulman, 2000). Second, careful examinations of providers' perceptions of actual patients showed that African American patients were perceived in more negative terms than White patients (e.g., Finucane & Carrese, 1990; van Ryn & Burke, 2000). Finally, controlled experiments have found that providers' perceptions and treatment recommendations for hypothetical Black patients differed significantly from those made for hypothetical White patients with the exact same symptoms (for a review see Paradies, Truong, & Priest, 2013).

Another source of evidence that cannot be ignored is the consistent finding that ethnic/racial minorities report greater dissatisfaction with their health care providers—especially when the providers are not of the same ethnicity (i.e., typically White)—and they perceive significantly more bias in health care compared to Whites (e.g., Cooper, Johnson, Ford, Steinwache, & Powe, 2003; Cooper-Patrick et al., 1999; LaVeist, Nickerson, & Bowie, 2000; Saha, Komaromy, Koepsell, & Bindman, 1999). A national survey by The Commonwealth Fund (Collins et al., 2002) found that compared to Whites, Hispanics and African Americans were nearly twice as likely to report problems communicating with their providers, 14 times more likely to believe that they would receive better health care if they were of a different ethnicity, and nearly twice as likely

to feel that they had been treated with disrespect during a recent health care visit.

Based on this evidence and increasing awareness of the subtle ways in which bias may affect judgment and behavior, a ground-breaking report by the Institute of Medicine (IOM; Smedley et al., 2002) concluded that unrecognized or implicit bias among health care providers may contribute to health disparities, but additional research was needed to provide more direct evidence on the processes at work.

Direct Evidence of Biased Attitudes and Stereotypes Among Health Care Providers

The IOM report was based on inferences drawn from observational or survey data within the field of medicine, and evidence provided by (nonmedical) social psychology studies. The latter providing the strongest evidence that implicit (if not explicit) intergroup bias is implicated in worse interpersonal interactions and biased behavior (e.g., Dovidio, Kawakami, & Gaertner, 2002; Fazio, Jackson, Dunton, & Williams, 1995). In the time since the IOM report was published, however, numerous studies have provided direct evidence on the attitudes and beliefs of health care providers.

Implicit Attitudes Among Health Care Providers

Consistent with other populations, health care providers demonstrate implicit biases indicative of more negative attitudes toward African Americans than Whites (Blair, Havaraneck, et al., 2013; Cooper et al., 2012; Green et al., 2007; Haider, Schneider, Sriram, Dossick, et al., 2015; Haider, Schneider, Sriram, Scott, et al., 2015; Haider et al., 2011; Hausmann et al., 2015; Oliver, Wells, Joy-Gaba, Hawkins, & Nosek, 2014; Sabin, Nosek, Greenwald, & Rivara, 2009; Schaa, Roter, Biesecker, Cooper, & Erby, 2015; Stepanikova, 2012; for null effects, see Penner et al., 2010; Sabin, Rivara, & Greenwald, 2008), more negative attitudes toward Latinos than Whites (Blair,

Havaraneck, et al., 2013; Blair, Steiner, et al., 2013; Stepanikova, 2012), and somewhat more negative attitudes toward Native Americans than Whites (Sabin, Moore, Noonan, Lallemand, & Buchwald, 2015). Health care providers also exhibit negative implicit biases against overweight/obese individuals (Phelan et al., 2014; Sabin, Marini, & Nosek, 2012; Teachman & Brownell, 2001; Waller, Lampman, & Lupfer-Johnson, 2012), gay and lesbian people (Burke et al., 2015; Sabin, Riskind, & Nosek, 2015), lower social class (Haider, Schneider, Sriram, Dossick, et al., 2015; Haider, Schneider, Sriram, Scott, et al., 2015; Haider et al., 2011), injecting drug users (von Hippel, Brener, & von Hippel, 2008), and wheelchair users with spinal cord injuries (Galli, Lenggenhager, Scivoletto, Molinari, & Pazzaglia, 2015).

Implicit Stereotypes Among Health Care Providers

Although the majority of the research has focused on attitudes (i.e., positive/negative associations), a handful of studies have explored specific implicit associations and stereotypes of stigmatized groups. Research suggests that health care providers implicitly hold associations that African American patients are less compliant and less cooperative in medical settings than White patients, despite the fact that the health care providers were not provided with evidence that African American patients are especially noncompliant or uncooperative (Green et al., 2007; Sabin & Greenwald, 2012; Sabin et al., 2008). What is more, research does not support the association that African American patients are more noncompliant in health care settings (e.g., Steiner et al., 2009). Diseases stereotypically associated with African Americans (e.g., sickle cell anemia, HIV, drug abuse) were also recognized faster by providers following subliminal presentation of Black than White faces (Moskowitz, Stone, & Childs, 2012). Although some diseases may possess a genetic component and thus reflect an accurate stereotype, physicians' responses demonstrated inaccurate (e.g., drug abuse) as well as accurate (e.g., sickle cell anemia) disease stereotypes. Bean,

Stone, Badger, Focella, and Moskowitz (2013) further showed stereotypes of Hispanics among nursing and medical students, who were faster to respond to words associated with noncompliance and risky health behavior following subliminal images of Hispanics than Whites. Importantly, Bean and colleagues suggested that these stereotypes may stem from health care providers perceiving communication difficulties as a barrier when treating Hispanic patients (Lipton, Losey Giachello, Mendez, & Girotti, 1998). Health care providers, in the absence of any validating information, have also been found to implicitly stereotype obese people as more lazy, stupid, and worthless than thin people (Schwartz, O'Neal Chambliss, Brownell, Blair, & Billington, 2003).

Explicit Attitudes and Stereotypes Among Health Care Providers

Despite the numerous findings of health care providers showing implicit bias toward stigmatized groups, the findings on explicit or more controlled forms of bias generally show relatively low or even reversed bias. For example, Blair, Havaraneck, et al. (2013) found that while doctors held implicit bias against Latino and African American patients, negative explicit attitudes against these groups were virtually nonexistent. In other research, health care providers explicitly reported that African American patients are no more likely than White patients to be noncooperative (Green et al., 2007). However, some studies have found indications of explicit bias by health care providers. Cooper et al. (2012) found that providers explicitly stereotyped African American patients as less cooperative than White patients, even though the providers had similar explicit *attitudes* toward both groups. When asked about what most health care providers believe, Bean et al. (2014) found that medical and nursing students perceived Hispanic and American Indian patients as engaging in more risky health behavior and as more noncompliant than White patients.

In general, then, health care providers appear to have many of the same attitudes and beliefs toward stigmatized groups as found in other

populations, with higher levels of implicit than explicit bias (Blair, Havaraneck, et al., 2013; Galli et al., 2015; but see Peris, Teachman, & Nosek, 2008, for an example of providers showing less implicit mental health bias than nonproviders). Importantly, although health care providers show mean levels of bias against stigmatized groups, there is wide variance from provider to provider. For example, White, Hispanic, and Asian health care providers exhibited moderate levels of implicit bias toward African Americans whereas African American health care providers showed no such implicit bias (Sabin et al., 2009). Moreover, Sabin and colleagues found that, in general, male health care providers showed greater implicit racial bias than did female health care providers. Other findings show that higher body mass index (BMI), as well as male, health care providers had less implicit bias toward obese individuals (Sabin et al., 2012; Schwartz et al., 2003), and providers with more contact with patients with spinal cord injuries showed less implicit bias toward wheelchair users (Galli et al., 2015).

Associations Between Implicit Bias and Medical Judgments/Treatment

Does the level of bias of a particular provider matter in the perception and treatment of patients? As noted earlier, previous studies outside of health care have examined how implicit bias relates to biased judgment and behavior in other domains (e.g., Dovidio, Kawakami, & Gaertner, 2002). Based on that work, researchers have developed a general model on the ways in which provider bias may contribute to health disparities (Blair, Steiner, & Havaraneck, 2011; Dovidio et al., 2008; van Ryn, 2002; van Ryn & Fu, 2003; see Figure 1). As shown in Figure 1, health care providers' implicit bias may contribute to disparities through two paths. In Path A, providers' implicit bias may affect their judgments and medical decisions regarding patients in their care (i.e., worse for stigmatized patients), with downstream consequences for health disparities. In Path B, providers' implicit bias may negatively impact

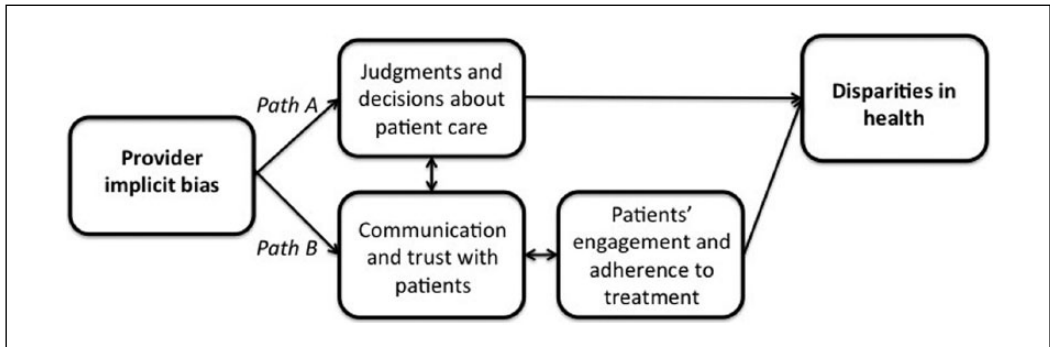


Figure 1. Model of paths through which provider implicit bias may contribute to health disparities.

their communication and interaction with stigmatized patients, impacting the patients' perceptions, judgments, and trust with their provider; this in turn would impact the patients' engagement and adherence to treatment and increase health disparities. Importantly, these two paths may interact with one another such that the poor medical decision-making by the provider in Path A may undergird negative communication and mistrust with the patient (and vice versa).

Most of the research that has been conducted to test Path A has presented health care providers with hypothetical clinical cases that, randomly assigned, vary in the patients' social group membership (e.g., White vs. Black). The researchers then examine the extent to which providers' implicit biases correlate with judgments and decisions, according to the patients' group membership. Consider, for example, a highly cited study by Green et al. (2007), who found that medical residents with greater implicit racial bias were less likely to recommend thrombolysis ("clot-busting") treatment for a Black patient suffering from chest pain in a hypothetical scenario; implicit racial bias did not relate to treatment recommendations for a White patient with the same symptoms.

Research published since Green et al. (2007), however, has revealed a more complex picture. Studies show that providers' implicit bias predicts some, but not all, medical judgments. For example, Sabin and Greenwald (2012) found that providers' implicit race bias predicted less prescribed postsurgical pain medication for African American

than White patients, but implicit race bias did not predict race differences in decisions for other medical issues, such as treatment of urinary tract infections, attention deficit hyperactivity disorder, and asthma. Many other studies have failed to find any association between providers' implicit race or class biases and their medical judgments (Haider, Schneider, Sriram, Dossick, et al., 2015; Haider, Schneider, Sriram, Scott, et al., 2015; Haider et al., 2011; Oliver et al., 2014; Sabin et al., 2008).

Only one study has investigated providers' implicit bias and actual medical treatment, rather than responses to a hypothetical scenario. Blair et al. (2014) assessed implicit bias among experienced providers and then examined the medical records of a random sample of patients diagnosed with hypertension (stratified by ethnicity/race). An analysis of patients' medications showed that increases in treatment intensification—physicians' decisions to start a new medication or increase medication dosage when hypertension persists—for minority (vs. White) patients bore no relation to providers' implicit biases. Furthermore, although hypertension control was worse among African American than White patients, this difference was also unrelated to their providers' implicit biases.

Considering the evidence thus far, it appears that provider bias may play only a limited role in explaining ethnic/racial health disparities through providers' medical judgments and decisions (Pathway A in Figure 1). This finding is consistent with laboratory research that shows stronger

associations between implicit bias and nonverbal behavior than explicit statements or judgments (Dovidio et al., 2002; Fazio et al., 1995). Many decisions about specific medications and treatment options are based on practice guidelines that leave little room for the influence of providers' feelings and beliefs. Additional research is needed that directly compares these types of decisions with those that allow for more discretion in providers' decision-making (e.g., giving narcotics for pain management, recommending a novel treatment that may be more effective but requires strict adherence and follow-up).

In addition, the majority of research on bias in medical decision-making has been conducted through hypothetical scenarios. Although a hypothetical scenario may accurately reflect some types of decision scenarios (i.e., careful consideration of written information, no time limit, and judgments that one knows will be carefully analyzed by researchers), other decisions are made under more stressful and ambiguous conditions (e.g., addressing pain complaints in a busy, understaffed emergency department). The one study to date that examined real patient care by Blair et al. (2014) was conducted under conditions that are likely to mitigate bias: a primary care setting in which patients and providers developed working relationships over the course of many years; processes and outcomes that were made over time, with many opportunities for adjustment; strong organizational expectations for meeting hypertension control guidelines and awareness of the problem of uncontrolled hypertension, particularly among African Americans. Implicit bias may be more likely to affect care delivered outside of established relationships, or in decisions made under time pressure, with limited information, and without the benefit of clear guidelines (Burgess, van Ryn, Dovidio, & Saha, 2007; Stepanikova, 2012).

Evidence on Associations Between Implicit Bias and Patients' Perceptions and Behavior

The second pathway (B) through which provider bias may contribute to health disparities, as shown in Figure 1, focuses on the effect of implicit bias

on interpersonal communication. As noted previously, a number of lab studies have shown that people with more implicit ethnic/racial bias have poorer interpersonal interactions with minority individuals, often in very subtle ways (e.g., Dovidio et al., 2002). In the medical context, such interactions may impact the providers' ability to accurately assess the patients' views on treatment plans and curtail productive discussion, especially if the topic is sensitive (e.g., the need for lifestyle changes or the use of drugs and alcohol). On the patient side, a poor interaction due to provider bias could undermine trust and engagement in care, leading to less follow-up and worse adherence to the treatment plan.

Several studies have shown that African American patients report less positive clinical interactions with providers who have higher levels of implicit bias favoring Whites over Blacks (Blair, Steiner, et al., 2013; Cooper et al., 2012; Penner et al., 2010). For example, Blair, Steiner, et al. (2013) examined the association between providers' implicit ethnic/racial bias and their patients' perceptions of the "patient centeredness" of their provider during medical visits. African American patients in this study consistently rated their providers lower on interpersonal treatment, communication, trust, and knowledge of the patient to the extent that the providers had more implicit bias. However, the study found no association between Latino patients' perceptions of their providers and their providers' implicit bias against Latinos, suggesting that implicit bias may not be expressed or may not be perceived in the same way with different groups.

Other researchers have attempted to assess provider behaviors more objectively. For example, Cooper et al. (2012) measured providers' implicit prejudice and stereotyping of African Americans and then audio-recorded their clinical visits with African American and White patients. These recordings were subsequently coded for possible behavioral indicators of bias, such as verbal dominance, amount of patient-centered communication, and length of the clinical visit. Although providers' implicit race bias showed some associations to these behavioral indicators with African American patients, the same bias

also predicted similar outcomes with White patients. Interestingly, African American and White patients differed in their perceptions of providers with greater implicit bias, with African American patients reporting worse interactions with biased providers than White patients. Thus, providers' implicit bias may have a negative impact on clinical visits with both African American and White patients, but the providers' implicit bias may especially damage the perceptions of African American patients.

Another study found a similarly complex view of providers' implicit bias predicting more objective behaviors. In a partial reanalysis of the Penner et al. (2010) data, Hagiwara et al. (2013) measured the amount of time that providers talked during the clinical interaction compared to the amount of time that the patients talked (i.e., talk-time ratio). Results revealed that providers with more implicit bias had higher talk-time ratios (greater dominance) with African American patients. However, this dominance during the interaction was *positively* related to patient adherence with medications 16 weeks later. As speculated by Hagiwara and colleagues, this pattern may reflect the influence of a third variable (past experiences with discrimination) that could have affected how much the patients asserted themselves during the interaction and their subsequent (lower) adherence. Note that while Cooper et al. (2012) provided a White patient reference group, there was no such comparison group included in Hagiwara and colleague's analysis.

To summarize, research shows that providers' implicit bias is a relatively consistent predictor of ethnic/racial differences in patients' subjective experiences with their health care providers, at least for African American patients. However, objective indicators of specific provider behaviors involved in these experiences have been more difficult to pin down (but see Hagiwara et al., 2016). One may certainly argue that the patients' perception of the situation is more important than objective events when it comes to trust and willingness to follow treatment recommendations or engage further with the health care system. Indeed, a vast amount of research

shows that perceived discrimination may undermine health among stigmatized groups (for a review see Pascoe & Richman, 2009).

Importantly, additional work is needed on the conditions under which provider bias is more or less likely to affect communication with patients. Basic research suggests a number of moderating conditions that have yet to be mapped on to medical practice (see Perugini, Richetin, & Zogmaister, 2010). Similarly, little is known about the ways in which the effects of provider bias may be exacerbated by patient characteristics. Patients who have experienced many prior episodes of bias in other settings (e.g., school or work) may be particularly sensitive to implicit bias in the medical setting (Hagiwara et al., 2016); or, a patient who is assertive or challenges the providers' judgment may be more likely to activate provider bias. We turn next to examine the work being done to help providers understand the experiences of stigmatized patients.

Reducing Implicit Bias Among Health Care Providers

In response to the evidence that health care providers exhibit implicit bias, and that it may affect patients' perceptions of their care, health care organizations and faculty are developing and testing new training in implicit bias for health care providers. Several papers describe best practices for helping students in health care learn about their biases, and emerging research indicates that adopting approaches developed for reducing implicit bias in science, technology, engineering, and math (STEM) and other fields show promise for reducing implicit bias in health care.

Research suggests that contemporary approaches to teaching cultural competence and minority health are generally insufficient to reduce implicit bias among health care providers. Several reviews, including the previous section, indicate that implicit prejudice and stereotyping is present when students begin training in health care, and that the level of implicit bias remains constant or increases as students matriculate through their training (see Chapman et al., 2013). Rubineau and Kang (2012) reported significant

increases in medical students' disparate behaviors toward Black standardized patients between their first and second years of medical school. Results from the CHANGES project, a 4-year longitudinal study that tracked implicit and explicit bias among 3,959 students across 49 medical schools in the United States, revealed similar shortcomings in medical training. For example, Phelan et al. (2014) found that whereas implicit bias toward obese patients remained constant, explicit bias increased during the 4 years of medical school. Also using the CHANGES data set, van Ryn et al. (2015) identified several factors that predicted increases in implicit bias during medical school, such as having heard negative comments from supervising medical staff about African American patients, and having had unfavorable contact with African American physicians. Although the van Ryn paper reported that formal training in minority health or cultural competence showed small, but significant, relationships to reduced implicit bias during medical school, these effects were eliminated after controlling for other variables.

Most educational interventions designed to reduce implicit bias appear to use a two-step approach that includes (a) making the students aware of their implicit biases, and (b) providing instruction on strategies they can use to either reduce the activation of implicit associations, or control how those associations influence judgment and behavior (Blair et al., 2011; Burgess et al., 2007; Stone & Moskowitz, 2011; Teal, Gill, Green, & Crandall, 2012). At this writing, only a handful of studies have examined whether teaching single or multiple strategies for reducing implicit bias is effective among health care providers.

Bias Awareness Strategies

Self-reflection activities that challenge self-perceptions are a common educational tool for helping students in health care become aware of bias (Teal et al., 2012). However, research suggests that awareness, by itself, may not always change the way health care providers think about stigmatized patient groups (Chapman et al., 2013). For

example, Teal et al. (2010) had medical students complete a Black/White race Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) and then participate in peer discussion groups to discuss their experience with the IAT and their observations about implicit bias during ongoing clinical experiences. The results suggested that whereas students improved their awareness of provider-focused strategies for reducing implicit bias, they reported less interest in using patient-focused strategies like perspective-taking. In a similar approach, Gonzalez, Kim, and Marantz (2014) exposed medical students to a single session about the role of provider implicit bias in health disparities. Participants read papers on the topic, completed an IAT and self-reflection exercises, and discussed their perspectives in class. Whereas the majority of students reported positive attitudes and beliefs about implicit bias, 22% of the sample doubted the validity of the IAT and the existence of health disparities overall. In contrast, van Ryn et al. (2015) reported that having completed an IAT (with feedback) was a significant predictor of decreases in implicit bias after controlling for instruction in cultural competence and minority health. Overall, these results suggest that being made aware of implicit bias through self-reflection activities, like feedback from an IAT, may motivate health care providers to address their implicit biases, but perhaps only if the feedback and reflection activity does not induce the defensiveness that can lead them to deny their bias, or counterargue the issue of disparities.

Control Strategies

One way to reduce provider resistance to learning about implicit bias is by instructing them in strategies for controlling their automatic responses to stigmatized patients, such as affirming egalitarian goals, seeking common-group identities, perspective-taking, and individuation via counterstereotyping (Blair et al., 2011; Burgess et al., 2007; Stone & Moskowitz, 2011). A recent study by Lai et al. (2014) comparing these and other strategies suggests that seeking counterstereotypic and

common-identity information (e.g., shifting group affiliations or boundaries) may be especially effective for reducing implicit bias among a non-health-care sample (also see Prati, Crisp, Pratto, & Rubini, 2016, for an example of cross-categorization as a tool to garner majority support for immigrant access to health services). The authors also concluded that the success of any approach requires active involvement or engagement when using the strategy.

Perspective-Taking Strategies

Perspective-taking is a common clinical skill taught in most health care training programs. Instruction in perspective-taking shows positive effects on implicit bias in laboratory studies (Todd & Galinsky, 2014) and among health care providers (Drwecki, Moore, Ward, & Prkachin, 2011). For example Blatt, LeLacheur, Galinsky, Simmens, and Breenberg (2010) showed that training medical students in perspective-taking improved African American patient satisfaction relative to control training. The authors suggest that learning about perspective-taking increased patient satisfaction across medical schools, clinical disciplines, and for interactions between racially diverse students and patients.

Use of Multiple Strategies

Other research outside of the health care domain suggests that exposing providers to multiple strategies could attenuate implicit bias both immediately after training, and in some cases, the effects might last for several weeks (Rudman, Ashmore, & Gary, 2001). Devine, Forscher, Austin, and Cox (2012) developed a two-step intervention for college undergraduates in which, after making the participants aware of their implicit prejudice toward African Americans through IAT feedback, they instructed participants in the use of stereotype-replacement thinking, counterstereotypic imaging, seeking individuating information, perspective-taking, and how to increase positive contact with out-group members. The results showed that participants who completed the intervention

reported significantly lower implicit prejudice toward African Americans at 4 and 8 weeks, compared to participants in a control intervention group.

Stone, Moskowitz, and Zestcott (2016) tested a similar two-step approach in a series of workshops with first-year medical students. The students first completed a Hispanic–White/noncompliance IAT (without feedback) and read an article about implicit bias in medicine. The next week, all attended a lecture on implicit bias and learned about their own implicit biases by completing a classroom IAT demonstration. Two days later, the students participated in a team learning activity during which they discussed and developed implementation intentions for activating egalitarian goals, seeking common-identity and counterstereotypic information, and for taking their patient’s perspective during a clinical encounter. When they completed the same IAT 3 to 7 days following the workshops, the results showed that participants demonstrated significantly less implicit stereotyping of Hispanics. The lasting effect of this and the intervention in Devine et al. (2012) supports the call for developing training modules that, in addition to making providers aware of their biases, provide instruction in how to control implicit bias, and features active learning exercises for practicing the new skills.

Promoting Bias Reduction at an Institutional Level

Finally, health care institutions can make changes that facilitate implicit bias reduction. Recent research indicates that positive intergroup contact is associated with reduction in implicit bias in a health care context (Burke et al., 2015; van Ryn et al., 2015). These studies suggest that implicit bias may fade when health care training features opportunities for positive contact across group boundaries (provider–patient; student–faculty).

Suggestions for Future Reduction Strategies

While the previous research suggests that interventions can reduce implicit bias among health

care providers, more empirical work is needed. One area to investigate is how to provide information and feedback about implicit bias without causing defensive resistance to the issue. The available data suggest that simply confronting providers with evidence of their implicit biases may not, in and of itself, be sufficient to motivate them to change the way they think about, and interact with, stigmatized patients. Students in training may perceive information and feedback about implicit bias as assigning blame and responsibility for health disparities, which is likely inconsistent with their egalitarian goals to provide the best care possible to all patients (Burgess et al., 2007). However, research suggests that students may be more open to learning about their own biases, and accepting responsibility for changing them, if instructors start by activating and affirming their egalitarian goals and commitment to provide equal care, before having them engage in self-reflection activities or receive feedback from an IAT (Harris, Mayle, Mabbott, & Napper, 2007; Howell & Shepperd, 2012). Emphasizing from the start that reducing disparities is a shared responsibility, and that providers can learn to control their implicit responses to stigmatized patients, may also encourage openness and acceptance of the information (Moss-Racusin et al., 2014).

It is also important to examine how best to train health care providers in the use of strategies for reducing implicit bias. The current literature suggests that there are two key elements for success: (a) instructors need to translate the abstract, theoretical concepts and processes that support the effectiveness of the strategies into practical, concrete clinical skills, and (b) instructors need to develop active learning exercises that allow students the opportunity to practice the skills before they use them in the clinic. But it is not clear which strategies, either in isolation or combination, work best for reducing implicit bias in patient care (Devine et al., 2012; Lai et al., 2014). It may be that some strategies (e.g., seeking counterstereotypic information; perspective-taking) are relatively easy to use and more effective in a clinical setting than others (e.g., stereotype-replacement), but that there are clinical settings in

which using any strategy would be difficult to employ (e.g., during an emergency room triage). Moreover, examining reduction strategies for patient groups who are not stigmatized due to race/ethnicity (e.g., obese individuals, gay and lesbian people, individuals with physical disabilities) may lend further insight into which type of strategies are more effective for treatment of different patient groups. Understanding the parameters to using implicit bias reduction strategies in a clinical setting and toward a variety of stigmatized patient groups is vital for helping providers adopt them in their practices.

Finally, the ultimate goal of training providers to reduce implicit bias is to reverse the disparities in care that many stigmatized patient groups receive. It is therefore critical to examine if any reductions in implicit bias, observed after providers receive training in bias reduction, subsequently translate into more positive outcomes for stigmatized patient groups. Indeed, real changes in patient care may not occur with a one-time training in the first year of medical or nursing school; students may need continued exposure to an implicit bias curriculum in each year of their training in order to fully integrate the information into the other knowledge and skills they learn for patient care. Naturally, extended training will require a relatively high level of commitment, in terms of instruction time and resources, by health care training programs (Penner, Blair, Albrecht, & Dovidio, 2014). Nevertheless, integrating instruction on implicit bias into existing health care training appears necessary to address the role that providers may play in creating disparate care for stigmatized patients.

Conclusions

The evidence in this review suggests that, similar to the general population, health care providers in the United States have implicit negative attitudes and stereotypes about many stigmatized groups. Only recently have efforts been made to directly investigate whether provider implicit bias contributes to the health disparities experienced by these groups. Whereas some studies suggest that provider bias

may negatively impact clinical interactions with stigmatized patients, provider bias has not been consistently linked to worse medical judgment and decisions. More research is needed to document the conditions under which these processes play out in different clinical settings, with different patient populations.

Research on best practices for addressing and reducing implicit bias in health care is also underway. While recent papers describe several interventions that may effectively translate when training future and current providers, there is an urgent need for more research to test the extent to which these interventions are effective, both immediately and during the course of health care delivery. A stronger understanding of how provider implicit bias influences clinical care, and how to motivate providers to adopt strategies for controlling implicit bias, could play an important role in the reduction of disparities in health care for stigmatized patient groups.

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Note

1. Although the problem of health disparities affect a variety of groups, much of this review will focus on ethnic/racial groups because there is very little research on health care bias with other groups. We include research with other groups where it exists.

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BOATLAND OF HOUSTON, INC. v. BAILEY

No. B-8827.

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609 S.W.2d 743 (1980)

BOATLAND OF HOUSTON, INC., Petitioner, v. Valerie BAILEY et al., Respondents.

Supreme Court of Texas.

July 30, 1980.

On Rehearing December 17, 1980.

Attorney(s) appearing for the Case

Butler, Binion, Rice, Cook and Knapp, Donald B. McFall, Richard A. Sheehy and Richard E. Gray, III, Houston, for petitioner.

Kronzer, Abraham & Watkins, James E. Robinson, Edwards & Hitt, Tom Edwards, Houston, for respondents.

McGEE, Justice.

This is a product defect case involving an alleged defect in the design of a 16-foot bass boat. The plaintiffs were the widow and adult children of Samuel Bailey, who was killed in a boating accident in May of 1973. They sued under the wrongful death statute, alleging that Samuel Bailey's death occurred because the boat he was operating was defectively designed. The boat had struck a partially submerged tree stump, and Bailey was thrown into the water. With its motor still running, the boat turned sharply and circled back toward the stump. Bailey was killed by the propeller, but it is unclear whether he was struck when first thrown out or after the boat circled back toward him.

Bailey's wife and children sought damages under a strict liability theory from the boat's seller, Boatland of Houston, Inc. At trial, they urged several reasons why the boat was defectively designed, including inadequate seating and control area arrangement, unsafe stick steering and throttle design, and the failure of the motor to automatically turn off when Bailey was thrown from the boat.

The trial court rendered a take-nothing judgment based on the jury's failure to find that the boat was defective and findings favorable to Boatland on several defensive issues. The court of civil appeals, with one justice dissenting, reversed and remanded the cause for a new trial because of errors in the admission of evidence and the submission of the defensive issues. ¹ [585 S.W.2d 805](#). We reverse the judgment of the court of civil appeals and affirm that of the trial court.

EVIDENCE OF DESIGN DEFECT

The alleged design defects are causally related to Bailey's being thrown from the boat and struck by the propeller and not to the boat's hitting the stump. Nevertheless, the same rules of strict liability govern cases in which the defect caused the initial accident and cases in which the defect caused the injuries. *Turner v. General Motors Corp.*, [584 S.W.2d 844](#), 848 (Tex. 1979).

In *Turner v. General Motors Corp.*, this court discussed the strict liability standard of "defectiveness" as applied in design defect cases. Whether a product

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was defectively designed requires a balancing by the jury of its utility against the likelihood of and gravity of injury from its use. The jury may consider many factors before deciding whether a product's usefulness or desirability are outweighed by its risks. Their finding on defectiveness may be influenced by evidence of a safer design that would have prevented the injury. ² *Turner v. General Motors Corp.*, *supra* at 849. See Keeton, *Product Liability and the Meaning of Defect*, 5 St. Mary's L.J. 30, 38 (1973); Wade, *Strict Tort Liability of Manufacturers*, 19 Sw.L.J. 5, 17 (1965). Because defectiveness of the product in question is determined in relation to safer alternatives, the fact that its risks could be diminished easily or cheaply may greatly influence the outcome of the case.

Whether a product was defectively designed must be judged against the technological context existing at the time of its manufacture. Thus, when the plaintiff alleges that a product was defectively designed because it lacked a specific feature, attention may become focused on the feasibility of that feature—the capacity to provide the feature without greatly increasing the product's cost or impairing usefulness. This feasibility is a relative, not an absolute, concept; the more scientifically and economically feasible the alternative was, the more likely that a jury may find that the product was defectively designed. A plaintiff may advance the argument that a safer alternative was feasible with evidence that it was in actual use or was available at the time of manufacture. Feasibility may also be shown with evidence of the scientific and economic capacity to develop the safer alternative. Thus, evidence of the actual use of, or capacity to use, safer alternatives is relevant insofar as it depicts the available scientific knowledge and the practicalities of applying that knowledge to a product's design. This method of presenting evidence of defective design is not new to the Texas law of product liability. See, e. g., *Rourke v. Garza*, [530 S.W.2d 794](#) (Tex.1975); *Henderson v. Ford Motor Co.*, [519 S.W.2d 87](#) (Tex. 1974); *Williams v. General Motors Corp.*, [501 S.W.2d 930](#) (Tex.Civ.App.—Houston [1st Dist.] 1973, writ ref'd n.r.e.); *Hartzell Propeller Co. v. Alexander*, [485 S.W.2d 943](#) (Tex.Civ.App.—Waco 1972, writ ref'd n.r. e.); *Pizza Inn, Inc. v. Tiffany*, [454 S.W.2d 420](#) (Tex.Civ.App.—Waco 1970, no writ).

As part of their case-in-chief, the Baileys produced evidence of the scientific and economic feasibility of a design that would have caused the boat's motor to automatically shut off when Bailey fell out. According to the Baileys, the boat's design should have incorporated an automatic cut-off system or the boat should have been equipped with a safety device known as a "kill switch."

The deposition of J. C. Nessmith, president of Boatland, was read, in which he stated that there were presently several types of "kill switches" available, and that they were now installed by Boatland when it assembled and sold bass boats.

The deposition of Bill Smith, who was a passenger in the boat with Bailey at the time of the accident, was also read. Smith had not heard of automatic kill switches before the accident, but afterwards he got one for his own boat.

The deposition testimony of George Horton, the inventor of a kill switch designed for open-top carriers, was also introduced. Horton began developing his "Quick Kill" in November of 1972 and applied for a patent in January of 1973. According to Horton, his invention required no breakthroughs in the state of the art of manufacturing or production. He stated that his invention was simple: a lanyard connects the operator's body to a device that fits over the ignition key. If the operator moves, the lanyard is pulled, the device rotates, and the

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ignition switch turns off. When he began to market his "Quick Kill," the response by boat dealers was very positive, which Horton perceived to be due to the filling of a recognized need. He considered the kill switch to be a necessary safety device for a bass boat with stick steering. If the kill switch were hooked up and the operator thrown out, the killing of the motor would prevent the boat from circling back where it came from. Horton also testified that for 30 years racing boats had been using various types of kill switches. Thus, the concept of kill switches was not new.

Robert Swint, a NASA employee who worked with human factors engineering, testified that he had tested a bass boat similar to Bailey's. He concluded that the boat was deficient for several reasons and that these deficiencies played a part in Bailey's death. According to Swint, when the boat struck a submerged object and its operator became incapacitated, the seating and control arrangement caused the boat to go into a hard turn. If the operator were thrown out, the boat was capable of coming back and hitting him. Swint also stated that a kill switch would have cut off the engine and the motor would not have been operative when it hit Bailey.

Jim Buller, who was fishing in the area when Bailey was killed, testified that his own boat did not have a kill switch at that time, but he ordered one within "a matter of days."

Boatland elicited evidence to rebut the Baileys' evidence of the feasibility of equipping boats with kill switches or similar devices in March of 1973, when the boat was assembled and sold. The Baileys had been granted a running objection to all evidence of this nature. In response to the Baileys' evidence that kill switches were presently used by Boatland, Nessmith testified that he did not know of kill switches until the spring of 1973, and first began to sell them a year later.

In response to the Baileys' evidence that the "Quick Kill" was readily available at the time of trial, Horton stated on cross-examination that until he obtained the patent for his "Quick Kill" in 1974 he kept the idea to himself. Before he began to manufacture them, he investigated the market for competitive devices and found none. The only applications of the automatic engine shut-off concept in use at the time were homemade, such as on racing boats. He first became aware of competitive devices in August of 1974.

Boatland introduced other evidence to show that kill switches were not available when Bailey's boat was sold. The deposition of Jimmy Wood, a game warden, was read in which he stated that he first became aware of kill switches in 1975. He testified that he had a "Quick Kill" on his boat since 1976, and he thought it was the only kill switch made. Willis Hudson, who manufactured the boat operated by Bailey, testified that he first became aware of kill switches in 1974 or 1975 and to his knowledge no such thing was available before then. Ralph Cornelius, the vice-president of a marine appliance dealership, testified that kill switches were not available in 1973. The first kill switch he saw to be sold was in 1974, although homemade "crash throttles" or foot buttons had long been in use.

Apart from evidence of the feasibility of an automatic motor cut-off design, evidence was introduced pertaining to whether such a design would have prevented Bailey's injuries. After considering the feasibility and effectiveness of an alternative design and other factors such as the utility and risk, the jury found that the boat was not defective. The trial court rendered judgment for Boatland. The Baileys complained on appeal that the trial court erred in admitting Boatland's evidence that kill switches were unavailable when Bailey's boat was assembled and sold. The court of civil appeals agreed, holding that the evidence was material only to the care exercised by Boatland and thus irrelevant in a strict liability case.

In its appeal to this court, Boatland contends that the court of civil appeals misconstrued the nature and purpose of its evidence. According to Boatland, when the Baileys introduced evidence that kill

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switches were a feasible safety alternative, Boatland was entitled to introduce evidence that kill switches were not yet available when Bailey's boat was sold and thus were not a feasible design alternative at that time.

The primary dispute concerning the feasibility of an alternative design for Bailey's boat was the "state of the art" when the boat was sold. The admissibility and effect of "state of the art" evidence has been a subject of controversy in both negligence and strict product liability cases. In negligence cases, the reasonableness of the defendant's conduct in placing the product on the market is in issue. Evidence of industry customs at the time of manufacture may be offered by either party for the purpose of comparing the defendant's conduct with industry customs. An offer of evidence of the defendant's compliance with custom to rebut evidence of its negligence has been described as the "state of the art defense." See generally 2 L. Frumer & M. Friedman, *Products Liability* § 16A[4][i] (1980). In this connection, it is argued that the state of the art is equivalent to industry custom and is relevant only to the issue of the defendant's negligence

and irrelevant to a strict liability theory of recovery.

In our view, "custom" is distinguishable from "state of the art." The state of the art with respect to a particular product refers to the technological environment at the time of its manufacture. This technological environment includes the scientific knowledge, economic feasibility, and the practicalities of implementation when the product was manufactured. Evidence of this nature is important in determining whether a safer design was feasible. The limitations imposed by the state of the art at the time of manufacture may affect the feasibility of a safer design. Evidence of the state of the art in design defect cases has been discussed and held admissible in other jurisdictions. *See, e. g., Raney v. Honeywell, Inc.*, [540 F.2d 932](#) (8th Cir. 1976); *Caterpillar Tractor Co. v. Beck*, [593 P.2d 871](#) (Alaska 1979); *Barker v. Lull Engineering Co.*, [20 Cal.3d 413](#), [573 P.2d 443](#), [143 Cal.Rptr. 225](#) (1978); *Kerns v. Engelke*, [76 Ill.2d 154](#), 28 Ill.Dec. 500, [390 N.E.2d 859](#) (1979); *Cepeda v. Cumberland Engineering Co., Inc.*, [76 N.J. 152](#), [386 A.2d 816](#) (1978). *See generally* J. Sales & J. Perdue, *The Law of Strict Tort Liability in Texas* 41 (1977). Note, *The State of the Art Defense in Strict Products Liability*, 57 Marq.L.Rev. 491 (1974). Note, *Product Liability Reform Proposals: The State of the Art Defense*, 43 Albany L.Rev. 944, 944-45 (1979). In this case, the evidence advanced by both parties was relevant to the feasibility of designing bass boats to shut off automatically if the operator fell out, or more specifically, the feasibility of equipping bass boats with safety switches.

The Baileys offered state of the art evidence to establish the feasibility of a more safely designed boat: They established that when Bailey's boat was sold in 1973, the general concept of a boat designed so that its motor would automatically cut off had been applied for years on racing boats. One kill switch, the "Quick Kill," was invented at that time and required no mechanical breakthrough. The Baileys were also allowed to show that other kill switches were presently in use and that the defendant itself presently installed them.

Logically, the plaintiff's strongest evidence of feasibility of an alternative design is its actual use by the defendant or others at the time of manufacture. Even if a safer alternative was not being used, evidence that it was available, known about, or capable of being developed is relevant in determining its feasibility. In contrast, the defendant's strongest rebuttal evidence is that a particular design alternative was impossible due to the state of the art. Yet the defendant's ability to rebut the plaintiff's evidence is not limited to showing that a particular alternative was impossible; it is entitled to rebut the plaintiff's evidence of feasibility with evidence of limitations on feasibility. A suggested alternative may be invented or discovered but not be feasible for use because of the time necessary for its application and implementation. Also, a suggested alternative may be available, but

[609 S.W.2d 749]

impractical for reasons such as greatly increased cost or impairment of the product's usefulness. When the plaintiff has introduced evidence that a safer alternative was feasible because it was used, the defendant may then introduce contradictory evidence that it was not used.

Thus in response to the Baileys' evidence of kill switch use in 1978, the time of trial, Boatland was properly allowed to show that they were not used when the boat was sold in 1973. To rebut proof that safety switches were possible and feasible when Bailey's boat was sold because the underlying concept was known and the "Quick Kill," a simple, inexpensive device had been invented, Boatland was properly allowed to show that neither the "Quick Kill" nor any other kill switch was available at that time.

It could reasonably be inferred from this evidence that although the underlying concept of automatic motor cut-off devices was not new, kill switches were not as feasible an alternative as the Baileys' evidence implied. Boatland did not offer evidence of technological impossibility or absolute nonfeasibility; its evidence was offered to show limited availability when the boat was sold. Once the jury was informed of the state of the art, it was able to consider the extent to which it was feasible to incorporate an automatic cut-off device or similar design characteristic into Bailey's boat. The feasibility and effectiveness of a safer design and other factors such as utility and risk, were properly considered by the jury before it ultimately concluded that the boat sold to Bailey was not defectively designed.³

In cases involving strict liability for defective design, liability is determined by the product's defective condition; there is no need to prove that the defendant's conduct was negligent. Considerations such as the utility and risk of the product in question and the feasibility of safer alternatives are presented according to the facts as they are proved to be, not according to the defendant's perceptions. Thus, even though the defendant has exercised due care his product may be found defective. When the Baileys introduced evidence of the use of kill switches, Boatland was entitled to introduce rebuttal evidence of nonuse at the time of manufacture due to limitations imposed by the state of the art. Evidence

offered under these circumstances is offered to rebut plaintiff's evidence that a safer alternative was feasible and is relevant to defectiveness. It was not offered to show that a custom existed or to infer the defendant's compliance therewith. We would be presented with a different question if the state of the art in 1973 with respect to kill switches had not been disputed and Boatland had attempted to avoid liability by offering proof that Bailey's boat complied with industry custom.

THE DEFENSIVE ISSUES

In its remaining points of error Boatland contends that the submission of several defensive issues was proper, and alternatively, error in their submission, if any, was harmless. Three defensive issues were submitted, and the jury found that Bailey had misused the boat, had failed to follow proper warnings and instructions, and had assumed the risk of injury in using the boat as he did.

The Baileys reply that the submission of the misuse and assumption of the risk issues was not warranted by any evidence. They also urge that failure to follow warnings was not a defense in this case.

Assuming without deciding that the Baileys are correct, we believe that the error, if any, in the submission of the defensive issues was harmless. The improper submission of issues constitutes reversible error when harm is suffered by the complaining

[609 S.W.2d 750]

party. Whether harm has been suffered may be considered in light of the charge as a whole. *Texas Employers Insurance Association v. McKay*, 146 Tex. 569, 210 S.W.2d 147, 149 (1948). Generally, error in the submission of an issue is harmless when the findings of the jury in answer to other issues are sufficient to support the judgment. *Texas & New Orleans Railroad Co. v. McGinnis*, 130 Tex. 338, 109 S.W.2d 160, 163 (1937). An exception exists, however, when the erroneously submitted issue confuses or misleads the jury. *H. E. Butt Grocery Co. v. Johnson*, [226 S.W.2d 501](#), 504 (Tex.Civ.App.—San Antonio 1949, writ ref'd n.r.e.).

In this case, the jury failed to find that Bailey's boat was defective. This finding was sufficient to support the judgment of the trial court. The focus of the defensive issues was different from the defectiveness issue. The Baileys have failed to demonstrate, and our review of the record fails to disclose, how erroneous submission of the defensive issues would probably result in an improper verdict.

CONCLUSION

For the reasons stated above the judgment of the court of civil appeals is reversed. The judgment rendered by the trial court, that the Baileys take nothing against Boatland, is affirmed.

POPE, J., concurring, in which BARROW, J., joins.

POPE, Justice, concurring.

I concur in the majority opinion because the jury finding that there was no defect disposes of the cause. I also concur in its holding that state of the art may be developed by the evidence directed at the issue concerning defect, but that state of the art is not itself an issue which should be submitted to the jury. This case, however, dramatically illustrates the problems with shadowy distinctions between defenses in products cases and negligence cases, and the need to reexamine certain defenses.

Defendant Boatland asserted three defenses, each of which the court submitted to the jury, and all of which the jury answered favorably to the defendant Boatland. The jury made findings that (1) decedent misused the boat, (2) decedent failed to follow proper warnings and instructions, and (3) decedent voluntarily assumed the risk.

It is my opinion that all of those defensive issues are issues which mix and ask about the decedent's contributory negligence. The defendant alleged that the decedent misused the boat in these ways: (1) he drove the boat at an unsafe speed, (2) he failed to keep a proper lookout, (3) he permitted passengers to stand in the boat, and (4) he failed to place the motor in a tilt position. Those are traditional contributory negligence allegations even though we call them "misuse" when we move from a negligence case to a products case.

Strict liability is a doctrine which excuses a harmed plaintiff from proving privity of contract and that the seller of goods was negligent. The doctrine looks to the defect in the product and not to the conduct of the supplier. That rule which

excuses proof is inapplicable, however, to the plaintiff, because his conduct is and ought to be examined to determine whether it was up to standard or was substandard. Misuse, as in this case, does look to the plaintiff's conduct. Hence, while the conduct of the manufacturer or supplier is not a suitable inquiry in products liability cases, the conduct of the plaintiff is an important inquiry, and we should clarify this fact.

One of the policy reasons for the doctrine of strict liability is that the manufacturer or supplier can spread the losses occasioned by the supplier's defective product; but in spreading those losses, the general consumer should not have to pay additionally for that percentage of the loss that was caused by the plaintiff's own fault.

In an action in which the plaintiff pleads an action in contributory negligence and alternatively as strict liability, the defendant receives an issue on contributory negligence and another issue on misuse. The same evidence bears on both. This is, however,

[609 S.W.2d 751]

a double submission of the same acts or omissions. If the jury answers that there was no contributory negligence, but that there was misuse, we run into the problem of conflicts.

Misuse is really contributory negligence, and it would simplify trials if we treated it as such. We should recognize this fact and hold a plaintiff to the standard of an ordinary prudent person or of reasonableness in his use of the product. We should eliminate the confusing misuse defense and return to contributory negligence as an appropriate defense in strict liability cases.

Voluntary assumption of risk should also be eliminated as a viable defense in strict liability cases. There is no more reason for an all-or-nothing defense in strict liability cases than there is in negligence cases. We held in *Farley v. M M Cattle Co.*, [529 S.W.2d 751](#) (Tex.1975), writing about voluntary assumption of risk, "the reasonableness of an actor's conduct in confronting a risk will be determined under principles of contributory negligence." The doctrine is a variant of contributory negligence, and it stands alone, as an all-or-nothing defense in strict liability cases. As stated by Professor Hadley Edgar in 11 Texas Tech.L.Rev. 22, 50 (1979):

The strict liability tortfeasor should be allowed a reduction in damages corresponding to the quantum of the victim's contributory negligence. The distribution of loss between the victim and several tortfeasors, either with or without settlement should be applied uniformly rather than turning upon whether the nonsettling tortfeasor was negligent or strictly liable. The legislature's failure to act leaves the supreme court no reasonable alternative except to resolve these issues when next called upon to do so.

The defense under the more familiar format of contributory negligence, which would subsume and supplant the confusing defenses of misuse and voluntary assumption of risk could restore simplicity to the trials of product liability cases. *Daly v. General Motors Corp.*, [20 Cal.3d 725](#), 144 Cal.Rptr.380, [575 P.2d 1162](#) (1978). In such a trial, the fault of the supplier and the plaintiff should be apportioned between the products defect and the plaintiffs' sub-par conduct. *See, e. g., Caterpillar Tractor Co. v. Beck*, [593 P.2d 871](#) (Alaska 1979); *Daly v. General Motors Corp.*, [20 Cal.3d 725](#), [144 Cal.Rptr. 380](#), [575 P.2d 1162](#) (1978). The fault of the supplier and the plaintiff should be apportioned in both kinds of cases. We have on two occasions, judicially fashioned a method for such an apportionment. In *General Motors Corp. v. Hopkins*, [548 S.W.2d 344](#) (Tex.1977), we held that the misuse of a carburetor on a truck was a partial defense to a strict liability action. We also held that the trier of fact should determine the percentages by which the defect and the misuse contributed to cause the event. *General Motors Corp. v. Hopkins*, *supra* at 352. In *Signal Oil & Gas Co. v. Universal Oil Products*, [572 S.W.2d 320](#) (Tex.1978), Signal Oil sued the defendant for negligence, strict liability, and breach of implied warranty. We wrote:

The seller should only be held liable for that portion of the consequential damages caused by the breach of implied warranty. Therefore, this court holds that in a cause of action for breach of an implied warranty the buyer may not recover consequential damages to the extent that the buyer's negligence or fault was a concurring proximate cause of such damages. [Emphasis in opinion.]

Sooner or later, and the sooner the better, we must bring products liability cases within a manageable format. Simplicity, order and consistency can be advanced in those cases, in my opinion by:

1. The elimination of the misuse and voluntary assumption of risk issues and by substituting in their place the more familiar issue about contributory negligence on the part of the plaintiff

ISSUE ABOUT CONTRIBUTORY NEGLIGENCE ON THE PART OF THE PLAINTIFF.

2. The submission of a products liability case to determine the percentage that the defective product caused the event and the percentage that the substandard conduct of the plaintiff caused it.

BARROW, J., joins in this concurring opinion.

[609 S.W.2d 752]

ON REHEARING

CAMPBELL, Justice, dissenting.

I dissent.

"State of the art" does not mean "the state of industry practice." "State of the art" means "state of industry knowledge." At the time of the manufacture of the boat in question, the device and concept of a circuit breaker, as is at issue in this case, was simple, mechanical, cheap, practical, possible, economically feasible and a concept seventy years old, which required no engineering or technical breakthrough. The concept was known by the industry. This fact removes it from "state of the art."

Boatland is a retail seller. It is not the manufacturer. From the adoption of strict liability in this case, and consideration of public policy, each entity involved in the chain of commercial distribution of a defective product has been subject to strict liability for injuries thereby caused, even though it is in no way responsible for the creation of a defective product or could not cure the defect. The remedy for a faultless retail seller is an action for indemnity against the manufacturer.

In products liability, the measure is the dangerously defective quality of the specific product in litigation. The focus is on the product, not the reasoning behind the manufacturer's option of design or the care exercised in making such decisions. Commercial availability or defectiveness as to Boatland is not the test. Defectiveness as to the product is the test. If commercial unavailability is not a defense or limitation on feasibility to the manufacturer, it cannot be a defense to the seller.

The manufacturer of the boat, Mr. Hudson, testified as follows as concerns the concept of a "kill switch." It is practically without dispute that this is one of the simplest mechanical devices and concepts known to man. Its function is, can be, and was performed by many and varied simple constructions. It is more a concept than an invention. The concept has been around most of this century. It is admittedly an easily incorporated concept. Was an invention required in order to incorporate a circuit breaker on a bass boat? Absolutely not! Did the manufacturer have to wait until George Horton invented his specific "Quick Kill" switch before it could incorporate a kill switch of some sort on its bass boats? Absolutely not! Mr. Hudson uses an even simpler electrical circuit breaker on his boats.

Mr. Hudson testified he could have made a kill switch himself, of his own, and of many possible designs, but simply did not do it. Why didn't he do it? He didn't think about it. He never had any safety engineer examine his boats. He hadn't heard of such, he puts them on now, but still thinks people won't use them.

Was the manufacturer faced with a limitation or state of the art due to commercial unavailability? No. If the manufacturer of this boat were the defendant in this case, would the majority hold under this evidence that the commercial unavailability of someone else's simple product is a limitation on the manufacturer's capability (feasibility) to incorporate a device performing the same safety function on its boat? Not if any semblance of strict product liability is to be preserved.

The test for defectiveness of a given product is the same, whether the defendant is the manufacturer, wholesaler or retail seller. The focus is upon the product and not the care or conduct of the particular defendant. The majority opinion has made a new test for each.

The next critical point that the majority fails to take cognizance of is that the factors held by this Court in *Turner v. General Motors Corp.*, [584 S.W.2d 844](#), 848 (Tex. 1979), to apply as to a manufacturer, in its design of a product, have absolutely no relevance or relation to the reasons for holding the mere retail supplier strictly liable to a consumer. The

Turner decision and its departure from the RESTATEMENT definition of the term "unreasonably dangerous," was limited solely to the liability of a *manufacturer* in its *design* of products. The definition of "unreasonably dangerous" in the RESTATEMENT (2d) of Torts,

[609 S.W.2d 753]

§ 402A, Comment (i) remains applicable to a retail supplier who did not participate in the product design. The focus is thus upon the expectation of an ordinary consumer instead of the propriety of the manufacturer's decision as to design. The harm to the plaintiff in the admission of evidence of commercial unavailability to a retail seller lies in the certainty of such evidence to divert the jury's thought to the reasonableness of the supplier's conduct instead of the true issue; whether the danger was beyond the contemplation of the ordinary use.

What is this Court faced with in this case? Nothing more than a defendant seller attempting to avoid liability by offering proof that Bailey's boat complied with industry practice (which it did at that time) but not because of any limitations on manufacturing feasibility at that time. This is an industry practice case. The evidence does not involve "technological feasibility." The law of the majority opinion is that a simple device, not supplied by the manufacturer, is a defense in a strict liability suit, against a retailer, even though the industry practice was created by the manufacturing industry.

There is no dispute that commercially marketed "kill switches" for bass boats were unavailable to Boatland at the time it sold the boat. Horton's "Quick Kill" was unavailable. The important point is that there is no dispute that at the time of the manufacture of Mr. Bailey's boat, a circuit breaker, whether electrical or mechanical could have easily and cheaply been incorporated into the boat.

Evidence of commercial unavailability to this retail seller should not be admissible. If it is, the majority opinion has created a new and separate test for defectiveness for a retail seller in a strict liability case. The type of commercial unavailability evidence offered here is not true limitation on feasibility to the manufacturer and therefore relevant to the existing state of the art, rather, it is the result of practice in the bass boat manufacturing industry. Subjective commercial unavailability to a retail seller does not operate as a limitation on objective state of the art.

Feasibility as to Boatland is not the test. In a design case, the test is one of feasibility, or a limitation on feasibility as to the manufacturer. If, as to the manufacturer, unavailability to a retail seller is due to the manufacturer's custom or standard, then such evidence should not be admitted because this would allow the manufacturer to set its own standards for liability.

I would hold that the trial court erred in permitting such evidence by Boatland to go to the jury, and would affirm the judgment of the Court of Civil Appeals.

I further disagree with the majority opinion and agree with the Court of Civil Appeals on the submission of the issues pertaining to Bailey's conduct in handling the boat. There is no evidence that Bailey was struck when first thrown from the boat. The evidence is that he was hit when the boat circled.

The theory of Valerie Bailey's lawsuit is that if the manufacturer had incorporated a circuit breaker in the manufacture of the boat, the boat motor would have cut off when Mr. Bailey was first thrown from the boat. The boat would not have circled back to where he was thrown and struck him with a rapidly spinning propeller. Under this theory, Mr. Bailey's conduct is not determinative of anything. The result would have been the same if he had been in a stump-free lake, hit a submerged log which had just drifted in, and had been thrown from the boat.

The evidence stated in the opinion of the Court of Civil Appeals clearly shows the alleged conduct of Mr. Bailey in operating the boat was reasonably foreseeable by Boatland. The foreseeability of that deviation in the manufacturer's intended use of the product is relevant to the basic question of whether the product was unreasonably dangerous when and as it was marketed. *General Motors Corp. v. Hopkins*, 548 S.W.2d 344. (Tex.1977).

The harmful effect of the submission of these issues cannot be more vividly displayed than by considering the emphasis placed on them by counsel for Boatland in his argument to the jury. I would affirm the judgment of the Court of Civil Appeals.

[609 S.W.2d 754]

RAY, J., joins in this dissent.

Footnotes

1. Because no error was assigned to the jury's failure to find that Bailey's adult children suffered pecuniary loss, the cause was severed and remanded only as to Mrs. Bailey's claims.
 2. In *Turner*, this court stated that a number of evidentiary factors may be considered in determining whether a product's design is defective. The product's usefulness and desirability, the likelihood and gravity of injury from its use, the ability to eliminate the risk without seriously increasing the product's usefulness or cost, and the expectations of the ordinary consumer are some of these factors. *Turner v. General Motors Corp.*, [584 S.W.2d 844](#), 849 (Tex. 1979).
 3. This opinion, insofar as it holds that certain evidence of the state of the art is admissible on the issue of defectiveness in product design cases, is not intended to suggest that such evidence constitutes a defense, such as do misuse and assumption of the risk. Nor does evidence of the state of the art entitle the defendant to a defensive issue inquiring whether it complied with the state of the art at the time of manufacture.
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CALL FOR ABSTRACTS

Abstracts are now being accepted for the "7th International Interdisciplinary Conference on Hypertension in Blacks: Clinical Trials in Minority Populations," to be held in Atlanta, May 26–31. Deadline for receipt is Jan. 31.

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Contact Jeff Rasco, Conf. Services, Box 131, 1515 Holcombe Blvd., Houston, TX 77030-4095; or call (713) 792-2222.

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Contact Laura J. Keech, GSHS, Flagler Dr. at Palm Beach Lakes Blvd., P.O. Box 024308, West Palm Beach, FL 33402-4308; or call (407) 650-6236.

CORRECTIONS

Effect of Strict Glycemic Control on Renal Hemodynamic Response to Amino Acids and Renal Enlargement in Insulin-Dependent Diabetes Mellitus (June 6, 1991;324:1626-32). On page 1629, in Table 1, the units for the plasma amino acid concentrations should have been $\mu\text{mol/liter}$, not mmol/liter as printed.

Book Review of *Introduction to Medical Procedures: Venous and Arterial Punctures* (September 5, 1991;325:745). The names of two of the three authors of the review were omitted: Jonathan Bogan and Camilo Martinez.

What Drives Neonatal Screening Programs? (September 12, 1991;325:802-4). On page 803, in the left-hand column, beginning in the fourth line, the text should have read ". . . and the absence of public pressure are *responsible*," not *negotiable*, as printed. We regret the error.

Breast-Feeding in 1991 (October 3, 1991;325:1036-8). On page 1037, in the left-hand column, next to last line, the word "sucrose" should have been "lactose."

SPECIAL REPORT

SOURCES OF CONCERN ABOUT THE PATIENT SELF-DETERMINATION ACT

ON December 1, 1991, the Patient Self-Determination Act of 1990 (PSDA)¹ went into effect. This is the first federal statute to focus on advance directives and the right of adults to refuse life-sustaining treatment. The law applies to all health care institutions receiving Medicare or Medicaid funds, including hospitals, skilled-nursing facilities, hospices, home health and personal care agencies, and health maintenance organizations (HMOs).

The statute requires that the institution provide written information to each adult patient on admission (in the case of hospitals or skilled-nursing facilities), enrollment (HMOs), first receipt of care (hospices), or before the patient comes under an agency's care (home health or personal care agencies). The information provided must describe the person's legal rights in that state to make decisions concerning medical care, to refuse treatment, and to formulate advance directives, plus the relevant written policies of the institution. In addition, the institution must document advance directives in the person's medical record, ensure compliance with state law regarding advance directives, and avoid making care conditional on whether or not patients have directives or otherwise discriminating against them on that basis. Finally, institutions must maintain pertinent written policies and procedures and must provide staff and community education on advance directives. The states must help by preparing descriptions of the relevant law, and the Secretary of Health and Human Services must assist with the development of materials and conduct a public-education campaign. The Health Care Financing Administration has authority to issue regulations.

A goal of the statute is to encourage but not require adults to fill out advance directives — treatment directives (documents such as a living will stating the person's treatment preferences in the event of future incompetence), proxy appointments (documents such as a durable power of attorney appointing a proxy decision maker), or both. There is widespread agreement that directives can have many benefits.²⁻⁵ These include improved communication between doctor and

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patient, increased clarity about the patient's wishes, and ultimately greater assurance that treatment accords with the patient's values and preferences. Yet few Americans have executed advance directives. Estimates range from 4 to 24 percent⁶⁻⁸ (and Knox RA: personal communication).

A second goal of the PSDA is to prompt health professionals and institutions to honor advance directives. The U.S. Supreme Court's *Cruzan* decision suggests that advance directives are protected by the federal constitution.⁹ The great majority of states and the District of Columbia also have specific statutes or judicial decisions recognizing treatment directives.¹⁰ In addition, all states have general durable-power-of-attorney statutes, and most states further specify how this or another format can be used to appoint a proxy for health care decisions.¹⁰ Patients thus have a right to use directives that is based in constitutional, statutory, and common law, and others must honor the recorded choices.¹¹ There is evidence, however, that advance directives are ignored or overridden one fourth of the time.¹²

Efforts to educate patients about directives and to educate health care professionals about their obligation to honor them thus seem warranted. But the PSDA has caused concern.^{6,13,14} Implementation may result in drowning patients in written materials on admission, insensitive and ill-timed inquiry into patients' preferences, and untrained bureaucrats attempting a job that should be performed by physicians. Indeed, one can favor directives yet oppose the PSDA because of these dangers. The question is how to accomplish the statute's positive underlying goals while minimizing the potential adverse effects.

The key to avoiding an insensitive and bureaucratic process is to ensure that physicians integrate discussion of directives into their ongoing dialogue with patients about current health status and future care. Many have urged that doctors do this.^{4,6,15} Yet the literature shows that physicians still have reservations about advance directives,^{6,12,13,16-19} and some remain reluctant to initiate discussion.^{7,15,20,21} Only by forthrightly addressing these reservations can we successfully make directives part of practice, realize the potential benefits for all involved, and avoid implementing the PSDA in a destructive way.

Our multidisciplinary group — including physicians, a nurse, philosophers, and lawyers — convened to address those reservations in order to dispell doubts when appropriate and delineate continuing controversy where it exists.

RESERVATIONS ABOUT TREATMENT DIRECTIVES

Patients do not really want to discuss future incompetence and death, and so would rather not discuss advance directives. Future incompetence, serious illness, and death are not easy topics to discuss for either patients or physicians. Yet studies indicate

that most patients want to discuss their preferences for future treatment^{4,7,18,22} and that such discussion usually evokes positive reactions and an enhanced sense of control.^{18,23}

Misconceptions nonetheless remain and may produce anxiety in some patients. Some people wrongly assume that treatment directives are used only to refuse treatments and thus shorten life.²⁴ But people use directives to request treatments as well.^{4,25} Such a demand for treatment can raise important ethical problems later if the physician becomes concerned that the treatment may be medically inappropriate or futile for that patient. These problems are currently being debated.²⁶⁻²⁹ Yet they are not peculiar to advance directives; they can arise whenever a patient or surrogate demands arguably inappropriate treatment. The point is that treatment directives are a way to express the patient's preferences for treatment, whatever they may be.

There are substantial advantages to both patients and doctors in discussing and formulating treatment directives. A discussion of future medical scenarios can reduce the uncertainty of patients and physicians, strengthen rapport, and facilitate decision making in the future.^{16,23,30} Beyond their clinical advantages, directives are one way to fulfill the legal requirement in some states that there be "clear and convincing evidence" of the patient's wishes before life-sustaining treatment is withdrawn.^{31,32} The state statutes on treatment directives also generally give physicians a guarantee of civil and criminal immunity when they withhold or withdraw life-sustaining treatment relying in good faith on a patient's directive.

Some debate remains, however, about when directives should first be discussed and with which patients.^{4,21,33} The PSDA requires giving information to all adults when they first enter a relevant institution or receive care. This will involve some healthy patients and patients who are expected to return to good health after treatment for a reversible problem. Yet even healthy persons and young people wish to engage in advance planning with their physicians.⁴

Concern nonetheless persists about whether the time of admission or initial receipt of treatment is an appropriate moment to broach the topic of directives. Ideally, initial discussion should take place in the outpatient setting, before the patient experiences the dislocation that often attends inpatient admission. Many patients, however, will reach admission without the benefit of such discussion. If the discussion on admission is handled sensitively and as the first of many opportunities to discuss these matters with the physician and other care givers, admission is an acceptable time to begin the process. For patients who already have directives, admission is a logical time to check the directives in the light of their changed medical circumstances.

Discussion of advance directives takes too much time and requires special training and competence. The discussion of advance directives is an

important part of the dialogue between doctor and patient about the patient's condition, prognosis, and future options. But the physician need not discharge this function alone. Others in the health care institution may play an important part in answering questions, providing information, or assisting with documents. The PSDA helpfully makes health care institutions and organizations responsible for the necessary staff education. However, because patients considering treatment directives need to understand their health status and treatment options, physicians have a central role.

Physicians may nonetheless harbor understandable concern about the amount of time that will be required to counsel each patient. An initial discussion of directives structured by a document describing alternative medical scenarios can be accomplished in 15 minutes,⁴ but some will undoubtedly find that the initial discussion takes longer, and further discussion is also necessary in any case. Institutions may want to acquire brochures, videotapes, and other materials to help educate patients, and may enlist other personnel in coordinated efforts to assist patients. In addition, the PSDA requires institutions and organizations to engage in community education, which may reach patients before they are admitted. All these efforts promise to facilitate the discussion between doctor and patient.

Treatment directives are not useful, because patients cannot really anticipate what their preferences will be in a future medical situation and because patients know too little about life-support systems and other treatment options. The first part of this objection challenges the very idea of making decisions about medical situations that have not yet developed. Patients who make such decisions will indeed often be making decisions that are less fully informed than those of patients facing a current health problem.⁶ Yet the decisions recorded in directives, even if imperfect, give at least an indication of what the patient would want. If the goal is to guide later treatment decisions by the patient's preferences, some indication is better than none.

The question, then, is not whether the decisions embodied in directives are just as informed as those made contemporaneously by a competent patient. It is instead whether the recorded decisions accurately indicate the patient's preferences as best he or she could know them when competent. The answer to that question depends largely on how skillful physicians are in explaining possible medical scenarios and the attendant treatment options. There are many spheres in which we ask people to anticipate the future and state their wishes — wills governing property and most contracts are examples. But in each case the quality of their decisions depends a good deal on the quality of the counseling they receive. It is incumbent on physicians to develop their skills in this regard. Several instruments have been described in the literature to help them communicate successfully with patients.^{19,34,35} In addition, the patient's designation

of a proxy can provide a person to work with the physician as the medical situation unfolds.

Good counseling by physicians is the best remedy for patients' ignorance about life-support systems, too. Patients need to understand these treatments in order to judge whether the expected burdens will outweigh the benefits in future medical circumstances. Yet a patient choosing in advance will usually have a less detailed understanding than a patient facing an immediate and specific decision, who may even try the treatment for a time to gain more information.³ This too supports the wisdom of designating a proxy to work with the medical team.

Treatment-directive forms are too vague and open to divergent interpretations to be useful guides to treatment decisions later. Some forms do contain outmoded language. Terms such as "extraordinary" treatment and "heroic" care have been widely discredited as being overly vague^{3,36} (even though "extraordinary" is used in some state laws³⁷), and patients should be discouraged from using such generalities. Instead, patients who wish to use treatment directives should be encouraged to specify which treatments they wish to request or refuse, and the medical circumstances under which they want those wishes to go into effect. Although such specification has been challenged,¹⁷ it is a more effective way for patients to communicate their wishes than a general refusal of life-sustaining treatment. The desire for a particular treatment may well vary according to diagnosis and prognosis^{4,38} — for instance, artificial nutrition may be desired if the patient is conscious and has a reversible condition, but unwanted if the patient is in a persistent vegetative state. Another way to communicate wishes is for patients to state their preferred goals of treatment, depending on diagnosis³⁹ — for example, in case of terminal illness, provide comfort care only.

It is nonetheless almost impossible to write a directive that leaves no room for interpretation. Whatever language the patient uses, the goal is to try to determine the patient's intent. Often family members or other intimates can help. Even a vague directive will usually provide some guidance. Some patients will choose to avoid problems of interpretation and application by appointing a proxy and writing no treatment directive. The proxy can then work with the physician as circumstances unfold. Yet the proxy must still strive to choose as the patient would. If the patient has left a treatment directive or other statement of preferences, it will fall to the proxy to determine what the patient intended.

The incompetent patient's best interests should take precedence over even the most thoughtful choices of a patient while competent. Some people argue that the choices stated in a directive are sometimes less relevant than the current experience of the now incompetent patient.^{40,41} In the vast majority of cases, this problem does not arise, because the patient's earlier decisions do not conflict with his or her best interests when incompetent. Yet some demented

patients, in particular, may seem to derive continued enjoyment from life, although they have a directive refusing life-sustaining treatment. The argument for discounting the directive is that these patients are now such different people that they should not be bound by the choices of their earlier selves, they may no longer hold the values embodied in the directive, and they may appear to accept a quality of life they formerly deemed unacceptable.

Our group did not reach agreement on this argument for overriding some directives. Members who rejected it argued that it is essential that competent patients who record their wishes know those wishes will be followed later, a person's values and choices should govern even after loss of competence because he or she remains essentially the same person, and to recognize the proposed exception would invite widespread disregard of treatment directives. Although we did not resolve this controversy, we did agree on certain procedural safeguards. A treatment directive should not be overridden lightly. In cases in which this controversy arises, only the patient's appointed proxy, a court, or a court-appointed decision maker should be able to consider overriding the directive. Finally, physicians should specifically discuss with patients what the patients' preferences are in the event of dementia.

Even if a directive is valid in all other respects, it is not a reliable guide to treatment because patients may change their minds. Patients may indeed change their minds as their circumstances change. Physicians should therefore reexamine directives periodically with their patients. Data suggest, however, that there is considerable stability in patients' preferences concerning life-sustaining treatment.^{16,42-44} In one study of hospitalized patients, 65 to 85 percent of choices did not change during a one-month period, the percentage depending on the illness scenario presented ($\kappa = 0.35$ to 0.70 , where 0 represents random and 1 perfect agreement).⁴² In another study there was 58 and 81 percent stability in patients' decisions over a six-month period when they were presented with two scenarios ($\kappa = 0.23$ and 0.31).⁴³ Further research is necessary, but in any case, patients are always free to change or revoke earlier directives. Once a patient has lost competence and the physician can no longer check with the patient about treatment preferences, a directive becomes the most reliable guide to what the patient would want. Physicians cannot justifiably disregard directives because the patient might hypothetically have changed his or her mind.

RESERVATIONS ABOUT PROXY APPOINTMENTS

Patients may appoint a proxy to make treatment decisions in the event of incompetence, using a durable power of attorney or other document. Some patients both appoint a proxy and execute a treatment directive. Proxy appointments raise some different sources of concern than treatment directives.

The appointed proxy may later seem to be the wrong surrogate decision maker. This concern may

arise for one of several reasons. The proxy may have had no involvement in the patient's health planning and may not even realize that the patient has chosen him or her as proxy. To avoid this problem the physician should encourage the patient both to secure the proxy's acceptance of the appointment and to consider involving the proxy in the process of making decisions about future care. The proxy will then be prepared to discharge the function and will have some knowledge of the patient's wishes. The physician should also encourage the patient to tell family members and other intimates who the chosen proxy is, especially since some patients will prefer to designate a proxy from outside their families. This will reduce the chance of surprise and disagreement later.

Physicians may nonetheless encounter appointed proxies with little previous involvement in the patient's planning process and daily life. Yet a patient's designation of a proxy is an exercise in self-determination. The physician is bound to contact that person if the patient loses competence and the appointment goes into effect, rather than ignore the appointment and simply turn to someone else. There may be no further problems, because everyone may agree anyway on what course of treatment the patient would wish. But uncertainty or disagreement about the right choice of treatment may force the resolution of questions about who the most appropriate proxy is. If the medical team or the patient's relatives or other intimates have serious doubts about whether the designated proxy can fulfill the required functions, it is their responsibility to address these doubts through discussion. If the problem cannot be resolved in this way, they may need to seek judicial resolution and the appointment of an alternate.

Sometimes the designated proxy seems inappropriate not because the person is too remote but because the person is so involved that his or her own wishes and interests seem to govern, rather than the patient's. Family members and other intimates almost always have to deal with their own emotional and financial issues in serving as a proxy decision maker, and the mere existence of such issues does not disqualify them. Physicians and other members of the medical team have a responsibility to work with proxies, helping them to identify their own matters of concern, to separate those from the patient's, and to focus on the patient's wishes and interests in making decisions about treatment. Occasionally, the medical team will encounter a proxy who simply cannot do this. If efforts among the involved parties to remedy the problem fail, then care givers may have to seek judicial scrutiny and the appointment of another proxy.

Even a diligent proxy cannot tell what the patient wanted without an explicit treatment directive, so a proxy's choice should carry no particular weight. Family members, other intimates, and physicians often fail to select the same treatment the patient chooses when asked.⁴⁵⁻⁴⁹ In one study there was 59 to 88 percent agreement, depending on the illness scenario the researchers posed ($\kappa \leq 0.3$ in

all cases)⁴⁵; in another study, agreement was 52 to 90 percent ($\kappa \leq 0.4$ in all cases).⁴⁹ Advising the proxy to choose as the patient would, rather than simply asking for a recommendation, seems to act as a partial corrective.⁴⁶

These data should come as no surprise. Even a person's relatives and other intimates are not clairvoyant and may not share identical values. Moreover, proxies are not always adequately informed that their choices for the patient must be based on the patient's wishes and interests, even when those do not accord with the proxy's. Yet there is often no one better informed about the patient's past values and preferences than the proxy, and the patient in any case has manifested trust by appointing that person. Physicians should encourage patients not only to appoint a proxy, but also to provide instructions to guide the proxy. Physicians should also explicitly clarify for the proxy the primacy of the patient's wishes and interests.

The proxy may make a treatment choice contrary to the patient's treatment directive, claiming that the proxy appointment takes precedence over the directive. Some patients will appoint a proxy and leave no treatment directive or other instructions to limit the proxy's authority. Others will guide their proxy by writing a treatment directive or other record of preferences.⁵ Problems may then arise if the proxy tries to override the preferences. The law in individual states often directly addresses the relation between proxy appointments and treatment directives.⁵⁰⁻⁵³ In general, the proxy is ethically and legally bound to effectuate the patient's treatment choices. When the patient has failed to make explicit treatment choices, either in a treatment directive or orally, the proxy is bound to extrapolate from what is known of the patient's values and preferences to determine as best he or she can what the patient would want; this is typically labeled an exercise in "substituted judgment." If not enough is known of the patient's values and preferences to ground such a judgment, the proxy is bound to decide in the patient's best interests. A proxy's authority is thus governed by certain decision-making standards, and the proxy is obligated to honor the patient's wishes, whether stated in a treatment directive or elsewhere. One caveat has been noted: there is some disagreement over whether a proxy can override a treatment directive that seriously threatens an incompetent but conscious patient's best interests.

The proxy may make a decision with which the physician or institution disagrees. This is not a problem peculiar to appointed proxies or advance directives. Disagreement surfaces with some frequency between physicians and patients, families, other intimates, and proxies. As always, it is crucial for the physician to discuss the disagreement with the relevant decision maker, attempting to understand the source and resolve the matter. If resolution is elusive, others within the institution can sometimes assist. Judicial resolution is available if all else fails.

One source of disagreement deserves special mention. The proxy (or for that matter, the treatment di-

rective itself) may state a treatment choice that the individual physician believes he or she cannot carry out as a matter of conscience or that violates the commitments and mission of the institution. There has been scholarly discussion^{54,55} and some adjudication⁵⁶ of the circumstances under which institutions and physicians or other care givers can exempt themselves from carrying out treatment choices. Care givers and institutions are not free to impose unwanted treatment. The PSDA recognizes, however, that a number of states (such as New York) allow providers to assert objections of conscience.⁵⁷ Before a patient is admitted, institutions should give notice of any limitation on their willingness to implement treatment choices. Similarly, an individual physician should give as much notice as possible and should assist in the orderly transfer of the patient to a physician who can carry out those choices.

CONCLUSION

Advance directives have provoked a number of reservations. As the PSDA goes into effect, requiring discussion and implementation of directives, it will be essential to address physicians' further reservations as they arise.

Yet that necessary step will not be sufficient to ensure that the PSDA produces more benefit than harm. There is a risk that written advance directives may wrongly come to be viewed as the only way to make treatment decisions for the future. Physicians and other care givers may improperly begin to require an advance directive before treatment may be forgone for incompetent patients. To avoid this, staff education must include discussion of the various ways to decide about life-sustaining treatment and plan future care. Even under the PSDA, not all patients will use advance directives.

There is a further risk of confusion about the procedures and materials to use in implementing the PSDA. All personnel in the relevant institutions will need clarification of the step-by-step process to be followed with patients, the written materials to use, and how to resolve specific questions. The information conveyed to patients must be understandable, accurate in summarizing the patients' rights, and sensitively communicated. All staff members who are involved must be trained. Institutions must design appropriate protocols,

Finally, there is a risk that the PSDA will reduce the discussion of treatment options and directives to a bureaucratic process dominated by brochures and forms. To avoid this, the discussion of advance directives must be part of an ongoing dialogue between physician and patient about the patient's health status and future. Doctors must accept responsibility for initiating these discussions and conducting them skillfully. Such discussions should begin early in the patient's relationship with the doctor, and the content of directives should be reviewed periodically. Institutions and organizations should set up complementary systems to support this effort. The PSDA's requirements must become not a ceiling but a floor — a catalyst for

broader innovation to integrate directives into good patient care.

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