



HAL
open science

Competing and conflicting interests in the care of critically ill patients

Alison E Turnbull, Sarina K Sahetya, E. Lee Daugherty Biddison, Christiane S. Hartog, Gordon D Rubenfeld, Dominique D Benoit, Bertrand Guidet, Rik T Gerritsen, Mark R Tonelli, J Randall Curtis

► To cite this version:

Alison E Turnbull, Sarina K Sahetya, E. Lee Daugherty Biddison, Christiane S. Hartog, Gordon D Rubenfeld, et al.. Competing and conflicting interests in the care of critically ill patients. *Intensive Care Medicine*, 2018, 44 (10), pp.1628-1637. 10.1007/s00134-018-5326-2 . hal-01962045

HAL Id: hal-01962045

<https://hal.sorbonne-universite.fr/hal-01962045v1>

Submitted on 20 Dec 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Competing and conflicting interests in the care of critically ill patients

Alison E. Turnbull^{1,2,3*}, Sarina K. Sahetya¹, E. Lee Daugherty Biddison¹, Christiane S. Hartog^{4,5,6}, Gordon D. Rubenfeld^{7,8}, Dominique D. Benoit⁹, Bertrand Guidet^{10,11,12}, Rik T. Gerritsen¹³, Mark R. Tonelli^{14,15} and J. Randall Curtis^{15,16}

Abstract

Medical professionals are expected to prioritize patient interests, and most patients trust physicians to act in their best interest. However, a single patient is never a physician's sole concern. The competing interests of other patients, clinicians, family members, hospital administrators, regulators, insurers, and trainees are omnipresent. While prioritizing patient interests is always a struggle, it is especially challenging and important in the ICU setting where most patients lack the ability to advocate for themselves or seek alternative sources of care. This review explores factors that increase the risk, or the perception, that an ICU physician will reason, recommend, or act in a way that is not in their patient's best interest and discusses steps that could help minimize the impact of these factors on patient care.

Keywords: Critical care, Patient-centered care, Research design, Clinical studies as topic, Conflict of interest

Introduction

Despite often meeting for the first time at admission, most hospitalized patients trust clinicians with their lives. In the intensive care unit (ICU), this trust is born of necessity—after all, most ICU patients are not stable enough to seek care elsewhere. However, it is naïve for clinicians to assume patient trust is invulnerable or entirely rational, especially as public trust in scientific, political, religious, and media institutions falters in some parts of the world [1–3].

Trust is the belief that another person or entity will act in our best interest [4, 5]. Public trust in the medical profession stems in part from policies instructing health-care providers to prioritize patient interests above other interests. For example, the American Medical Association (AMA) states in its Code of Medical Ethics [6] that

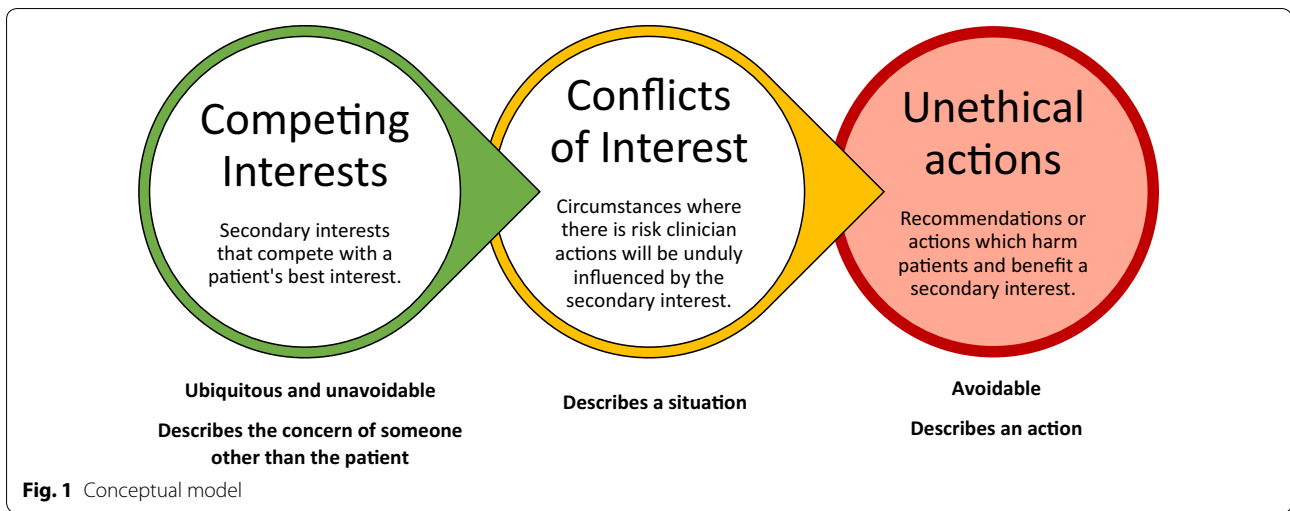
“physicians’ ethical responsibility [is] to place patients’ welfare above the physician’s own self-interest” (Opinion 1.1.1). As a result, unless they belong to a population that has historically been harmed by medical professionals [7–9], patients and their families rarely question clinician motives. But while patient welfare, or well-being, is a clinician’s primary interest, competing interests are ubiquitous [10]. Managing the competing interests of other patients, clinicians, hospital administrators, trainees, and one’s own implicit biases has become so routine that we often forget this balancing act is ever-present and yet generally invisible to patients.

Interests that influence physician decision-making and compete with patient well-being generate conflicts of interest [11, 12], defined as “circumstances that create a risk that professional judgments or actions regarding a primary interest will be unduly influenced by a secondary interest” [13] (Fig. 1). What constitutes “undue” influence, and therefore a conflict of interest, is subjective and context specific. Similarly, well-being encompasses how a patient thinks and feels about his or her life and is patient-specific [14]. Competing interests alone do

*Correspondence: turnbull@jhmi.edu

¹ Division of Pulmonary and Critical Care Medicine, School of Medicine, Johns Hopkins University, 1830 E. Monument St, 5th Floor, Baltimore, MD 21205, USA

Full author information is available at the end of the article



not necessarily constitute an ethical problem or result in harm to patients, but they do produce conditions that increase the risk of harm to patients [12]. The seriousness of the harm that can result when a conflict of interest impacts a decision about the care of a critically ill patient creates a special obligation for intensivists to develop both a high degree of situational awareness and self-awareness and the courage to name and discuss the competing interests they continually work to manage.

Ideally, conflicts of interest should be prevented through policies and practices that align clinician and patient interests. This idea underlies the recent formation of accountable care organizations (ACOs) in the USA as part of the Affordable Care Act [15]. Physicians participating in ACOs make more money if they keep patients healthy rather than if they provide more treatments. Similarly, the organization of some novel health-care financing systems in Europe intends to strengthen patient-specific decision-making [16]. When secondary competing interests cannot be eliminated, the risk that they will influence a physician's judgment should be minimized via procedures that allow decisions to be periodically reviewed for evidence of undue influence. Conflicts of interest are ubiquitous throughout medicine, but the potential consequences for critically ill patients who generally lack the ability to advocate for themselves or seek care elsewhere make it important to explicitly address this issue in the ICU setting.

Here, we explore factors that increase the risk, or the perception, that an ICU physician will reason, recommend, or act in a way that might be construed as not in their patient's best interest [17]. Our goal is not to dishonor or cast doubt on prior decisions. Rather, we hope that naming the many parties with a stake in these decisions and the pervasive competing interests will illustrate

both the ethical challenges intensivists are routinely expected to navigate and the vast faith patients and families place in the integrity of critical care professionals. Understanding, exploring, and explicitly addressing competing interests provide an opportunity to minimize the impact of these interests on patient care, thereby potentially preventing avoidable harm.

Interests of other ICU patients and patients being considered for ICU admission

Resources such as operating rooms, equipment, and physicians' or other clinicians' time and attention are finite. So while patient well-being is an intensivist's first priority, not every patient can be first. When multiple ICU patients stand to benefit from a limited resource, intensivists decide which patients to treat first [18] (Table 1). These decisions constitute a form of triage in which priority is generally given to patients who are most likely to benefit or are at the greatest risk of death. Managing the competing interests of admitted patients is generally not recognized as an ethical problem unless ethically irrelevant factors such as patient race, gender, religion, political preferences, citizenship status, ability to pay for care, celebrity status, personal relationships with hospital personnel, or sexual orientation influence decisions [19, 20]. However, because ICU patients are unaware of other patients' needs, how patients are prioritized is not transparent, and in the context of promotional campaigns that stress the philosophy of patient-centered care, waiting for care or attention is sometimes surprising or confusing for patients and their families.

The rationales supporting decisions about which patients to admit to an ICU differ across countries [21], are generally not communicated to patients [22, 23], and can impact the care of existing ICU patients. This is most

Table 1 How the interests of other patients, family members, and trainees compete or conflict with patient interests

Interested party	How a patient's care could be affected
Other ICU patients	When multiple patients need a procedure or intervention requiring a particular clinician or piece of equipment, some patients are forced to wait. Example: there are more patients requiring CVVHD than CVVHD units available in the hospital
Patients outside the hospital	When the ICU is full, patients for whom an additional day of ICU-level care is optimal may be downgraded to make an ICU bed available for a patient seeking ICU admission
ICU families	Families may gain financially from hastening (inheritance) or delaying (disability benefits) a patient's death. When family members do not support a patient's informed decision to forgo life support, therapies are initiated or continued to assuage family members
Medical trainees	Critical care fellows, who are not the most experienced clinicians available, must practice certain procedures a predetermined number of times to demonstrate proficiency. Example: Choosing to perform a bronchoscopy for a patient with community-acquired pneumonia when either a bronchoscopy or an endotracheal aspirate is appropriate and fellows need to practice bronchoscopy

CVVHD Continuous veno-venous hemodialysis, ICU intensive care unit

likely to happen in busy hospitals where ICU beds are a scarce resource. In these circumstances, patients who can safely be treated outside the ICU may be discharged or moved to a lower-intensity level of care, even though another day of higher-intensity ICU-level care may be in that patient's best interest. This situation differs from decisions about which ICU patient to treat first because the intensivist has entered into a patient-physician relationship with the current ICU patient, but not usually with the person seeking hospital or ICU admission. Triage dilemmas are further complicated in rural hospitals where the nearest comparable ICU may be many miles away. In urban centers with multiple tertiary care centers, intensivists arguably have less obligation to admit patients if they believe existing ICU patients may be adversely affected.

Interests of family members

Patients' family members are usually assumed to advocate for their loved one's best interests. But a patient's death can have major financial ramifications for families that motivate decisions. For example, when a recipient of disability benefits dies in the US, the Social Security Administration generally reduces or stops issuing payments. If the patient's family is financially dependent on these disability payments, death becomes a harbinger of destitution. Conversely, family members of patients with substantial wealth or a generous life insurance policy stand to benefit financially from a patient's death.

When patients decide to forgo or end treatment, some family members are unable to accept the decision. In this situation, patients may acquiesce to another round of chemotherapy or a few more weeks of mechanical ventilation to give their loved ones time to accept their prognosis. But other patients are adamantly opposed to additional treatment. Even when a patient has been unwavering and has legally documented their

preferences, a power differential remains between terminally ill patients and their families. This imbalance stems from the fact that patients with critical illness often lose the ability to communicate or advocate for themselves. Clinicians know such patients are unlikely to regain sufficient strength to create bad publicity for the hospital or file a lawsuit for assault, battery, or inadequate informed consent [24]. In contrast, distraught or aggrieved family members may register complaints with the hospital's office of patient relations, post scathing reviews online, file a wrongful death lawsuit, or even threaten physical violence. Even intensivists who believe a patient's decision to decline interventions is in that patient's best interest sometimes acquiesce to insistent family members in the US, although this is illegal in some European countries [25]. Recognizing when families constitute a competing interest to patient well-being offers the opportunity to strive for more informed and ethical decision-making in these taxing situations.

Interests of medical trainees

For teaching hospitals, medical education remains a core component of the tripartite mission. However, most patients do not understand the gradations of training within members of the medical team, and they are rarely asked to consent to involving physician trainees in their care. Teaching hospitals offer access to state-of-the-art technology and renowned clinicians. Many teaching hospitals in the US also offer non-teaching services for patients who do not want to be treated by trainees [26]. Outside these non-teaching wards, faculty in teaching hospitals attempt to ensure patients receive appropriate care from the most capable physician while also ensuring their trainees receive appropriate experience in directly caring for patients. If this balance is not appropriately achieved, unnecessary interventions may be performed primarily for "medical education" rather than the benefit

of the patient, or procedures may result in complications that would not have occurred if performed by a more experienced physician. Explicitly naming these competing interests with trainees should be a routine part of medical education.

Interests of physicians

In both Europe and the US, some intensivists work on a fee-for-service contract under which performing more procedures leads to more financial compensation. When intensivists in the US are salaried, clinical work quotas defined by relative value units (RVUs) are common (Table 2). A payment formula for every test and procedure covered by the US Medicare system has an associated number of RVUs for physician work [27]. Many US intensivists must bill for services associated with sufficient RVUs to fulfill their contract, and performing more than the minimum quota may result in a financial bonus. Under this system, performing tests and procedures remains in a physician's financial interest.

In some countries where physicians receive modest government salaries, patients and families have traditionally provided physician bonuses or given expensive gifts [28]. While some physicians in the former Soviet Republics view these "irregular payments" as an acceptable way for patients to express gratitude for good care and augment under-funded healthcare systems, others describe the system as medical bribery [29, 30]. The difference between accepting unregulated payments from patients

and illegal payments is also easily muddled. In these environments, it is perhaps unsurprising, then, that writing prescriptions in return for illegal bribes from pharmaceutical companies remains a problem [31, 32].

An intensivist, like any other clinician, may also consider his or her legal risk when developing a care plan. Most US physicians are involved in a malpractice claim at some point in their career [33]. In response, physicians order tests and procedures, or avoid high-risk patients or procedures, out of fear of malpractice litigation. This practice is referred to as "defensive medicine" [34]. The degree to which concern about legal risk impacts physician decisions is challenging to measure, but US hospitalists reported that 28% of their orders were at least partially defensive in a 2008 study [35]. After a life-threatening medical error has occurred, providers have a strong interest in avoiding being charged with a wrongful death, which is likely to influence decisions about the continued use of life-sustaining (or death-prolonging) therapies.

Intensivists conducting clinical research have a strong interest in enrolling patients in their studies. Enrolling ICU patients is difficult because most patients can not consent, and family members who can provide surrogate consent may be difficult to contact [36]. As a result, slow recruitment is the most frequent reason that randomized clinical trials are stopped prematurely in critical care [37]. Discontinuing a trial because of slow recruitment can have important professional consequences.

Table 2 How physician interests compete with ICU patient interests

Secondary interest	How a patient's care could be affected
Work quotas	Intensivist salaries may require billing patients for a minimum number of relative value units (RVUs) creating an incentive to perform tests and procedures
Legal risk	Diagnostic tests or imaging may be ordered out of concern about malpractice litigation. After an error, fear of a wrongful death suit may drive life-prolonging treatment
Study recruitment or outcome	Intensivists who are also clinical investigators have an interest in enrolling eligible patients in studies to meet recruitment targets and in study results. Example: If a patient is enrolled in a study with a primary outcome of extubation failure, intensivists may attempt to delay re-intubation with additional breathing treatments or non-invasive ventilation, while a similar patient not enrolled in the study is reintubated earlier
Conflict avoidance	Patients and their family experience high emotional distress, often expressed as sadness or anger when a poor prognosis is disclosed. Disclosure of prognosis is delayed to avoid witnessing and responding to this reaction
Maintaining team relations	Treatment decisions prioritize work flow rather than patient welfare. Example: A Foley catheter remains in place for a patient to increase ease of nursing care
Avoiding bureaucracy	Intensivists may be less likely to prescribe therapies requiring an approval process. Example: An intensivist waits until 22:01 to place an order for an antibiotic to avoid the additional forms and phone calls required for antibiotic approval when antibiotic stewards are on-duty
Curiosity	Desire to understand the pathophysiology of disease may influence diagnostic testing or imaging decisions even if results aren't expected to impact patient care
Fame	Unusual treatments are more likely to garner positive media attention than the standard of care
Religious belief	Intensivists who adhere to a religious tradition that condemns withdrawing life support may avoid discussing this option with patients or family members who are requesting evaluation of the goals of care
Financial gain	Intensivists may preferentially prescribe or utilize products from companies they have invested in or that provide financial support through grants or honoraria

Sponsors may be less likely to fund future trials proposed by the investigator, the ICU may be viewed as a less-desirable partner in future multi-site trials, and an academic clinical investigator's prospects for professional advancement dim. Therefore, if a patient must receive a particular treatment or intervention to be eligible for a trial, the prospect of being able to recruit the patient can create an incentive for treatment. While Institutional Review Boards (IRBs) provide oversight of how trials are advertised and consent is obtained, they generally do not have the ability to monitor whether triage or treatment decisions are being made to increase the number of potentially eligible patients. The research practices and elements of informed consent required by IRBs also vary considerably across institutions [38, 39]. Additionally, when trials are not blinded, desire to demonstrate the intervention's effectiveness may impact treatment decisions. For example, prior research has suggested that there is a higher threshold for initiating Do Not Resuscitate (DNR) orders for ICU patients enrolled in clinical trials [40].

Maintaining interpersonal relationships with patients, patients' family members, colleagues, and administrators is also in a physician's interest. Patients and their families understandably have strong emotional reactions when a poor prognosis is disclosed, and witnessing their distress or anger is uncomfortable. When physicians are busy or unprepared to respond to these emotions, the desire to maintain a cordial relationship with a patient or their family may influence decisions about when to disclose prognosis and inform patients of the option to prioritize comfort rather than longevity [41]. Maintaining relationships with colleagues in nursing is also a consideration. For example, removing urinary catheters or peripheral intravenous access as soon as possible is generally in the best interest of patients because this decreases the risk of infection. But removing these interventions also creates more work for busy bedside nurses who already struggle with high rates of burnout and moral distress [42]. Finally, hospitals sometimes require administrative approval before prescribing or performing certain therapies. When the process for requesting approval is burdensome, bureaucratic, or contentious, this creates an incentive for intensivists to seek alternatives rather than advocate for the therapy they believe is in the patient's best interest.

Physician curiosity or desire for recognition can also compete with patient interests. A desire to understand the complex pathophysiology underlying illness draws many physicians into the profession. Understandably, these physicians may desire to perform tests and imaging on patients representing unusual cases, even when the results of testing are not expected to impact treatment

decisions and are associated with risks. Of course, some patients and family members share this curiosity and are happy to undergo testing in pursuit of a diagnosis even when it is unlikely to impact treatment. But for critically ill patients who prioritize comfort and time outside the hospital, this testing for the sake of discovery can be burdensome. Unusual cases and treatments can also draw significant media attention. For example, an unorthodox sepsis treatment combining hydrocortisone, vitamin C, and thiamine [43] has generated substantial media attention [44, 45], celebrity for investigators, and funding for a multicenter randomized clinical trial.

Finally, a clinician's religious belief has been described as a competing interest in medicine [46]. Currently, most religious institutions condemn physician-assisted death despite its being legal in seven European countries and seven US states [47, 48]. Most ICU patients are too ill to complete the steps required to obtain approval for physician-assisted death, but opposition to the practice can influence a physician's feelings about other practices including palliative sedation and withdrawal of mechanical ventilation. With the exceptions of Sweden, Finland, and Iceland [49], most countries, professional societies [50], and hospitals have conscientious objection policies permitting clinicians who object to professionally contested interventions on religious grounds to avoid directly participating in those interventions as long as they provide accurate information and a timely referral to a colleague who will perform the intervention [51].

Interests of hospitals

The interests and concerns of hospital boards and administrators may differ from those of both clinicians and patients. Administrators are responsible for ensuring a hospital remains financially solvent and for advancing the mission of the institution, which may focus exclusively on providing medical care for a local population or balancing patient care, teaching, and research. Depending on the environment, hospital administrators may also feel compelled to consider the interests of the national healthcare system, regulators, political leaders, local employers, insurers, or hospital board members, and this can produce actions that would be in conflict with patients' interests.

The primary interest of any hospital is to continue existing and pursuing its mission. To achieve this, the organization must have sufficient funds to continue operating. Which patients are most advantageous to admit and what treatments are beneficial to offer from a hospital perspective depend on how the hospital is compensated for services (Table 3). In a capitated system where a fixed amount of money is provided per patient, or to care for a population within a given time frame, it is in

Table 3 How institutional interests compete with ICU patient interests

Secondary interest	How a patient's care could be affected
Hospital revenue	Hospitals with capitated payment models have an incentive to avoid costly treatments and avoid admitting costly patients Hospitals with fee-for-service payment models have an incentive to perform more costly procedures and admit as many patients as possible In health systems where hospital revenue depends on patients' ability to pay or their insurer, there is a strong incentive to admit patients with health insurance or the ability to directly pay full price
Hospital reputation	Questions on a publicly available patient satisfaction survey, which can effect hospital reputation and/or reimbursement, often ask about pain management and satisfaction with clinician communication creating incentives for physicians to treat pain aggressively and avoid discussing topics patients and families do not want to hear about
Program reputation	Organ transplant programs in the US are publicly evaluated on volume and on the number of patients alive with a functioning transplanted organ 1 year after transplant. Because people waiting for an organ may choose the transplant center where they wish to be wait-listed, using life-prolonging therapy for at least 1 year after transplant is in the best interest of the transplant program
Ensuring ICU beds are full	In some areas, there is pressure to keep ICU beds full to ensure adequate ICU reimbursement and several empty beds might incentivize admitting an elderly patient with multi-morbidity to the ICU when that might not be in the patient's best interest

a hospital's interest to avoid admitting costly patients or providing costly treatments. In contrast, a fee-for-service payment model incentivizes admitting as many patients as possible and performing costly procedures. In countries where hospital revenue depends on patients' ability to pay, or the price charged for care depends on a patient's insurance status, it is in a hospital's interest to admit wealthy or well-insured patients. Administrators often seek to shield providers from these considerations to avoid creating obvious conflicts of interest that could compromise patient care. But observational data and qualitative interviews suggest this shielding may be incomplete. For example, German physicians reported feeling increasing pressure to consider their hospitals' economic interests when making clinical decisions [52]. Similarly, a recent analysis found most patients who received ECMO for Acute Respiratory Distress Syndrome (ARDS)—an unproven but profitable intervention for hospitals [53]—did not first have a trial of prone positioning, which is considered a proven intervention for ARDS but is generally not billable [54].

Hospital administrators must also concern themselves with a hospital's reputation as assessed by quality metrics, rankings, and public opinion. One of the most common quality metrics in the US is the 30-day mortality rate [55]. However this metric does not take patient preferences into account, creating an incentive to continue life-prolonging treatments in patients with poor prognoses who wish to withdraw life support before 30 days post-operatively [56]. This conflict is even more pronounced in transplant patients. Organ transplant programs are evaluated on the number of patients alive with a functioning transplanted organ at specific time intervals after transplant. One-year survival is publicly reported for all programs in the US, and people who need an organ may

choose the transplant center where they wish to be wait-listed. Thus, even when a transplant recipient becomes ICU-dependent and wishes to withdraw life support, US transplant programs have an interest in ensuring the patient remains alive for 1 year.

Finally, hospital reputation and reimbursement may be impacted by measures of patient satisfaction. Such measures are designed to elevate the importance of patient experience, which is laudable and an important outcome in its own right [57]. But high satisfaction scores are also associated with greater prescription drug expenditures and higher mortality rates [58], causing some to worry these metrics encourage inappropriate prescribing of drugs with high abuse potential including opioids [59]. Satisfaction scores also create a disincentive for physicians to confront patients about dangerous behaviors such as drug and alcohol abuse or to share bad news about the prognosis, with some physicians reportedly foregoing these conversations as a result [60].

The role of cognitive biases

Cognitive biases are automatic psychological mechanisms that short-cut deliberate reasoning. While this may be helpful for decision-making under uncertainty, cognitive biases may aggravate competing or conflicting interests. For instance, reciprocity bias is a sense of obligation and can be triggered by presents or financial payments. Wish and confirmation biases lead to selective uptake of information, while commitment and consistency bias restrict our willingness to change our behavior even in the face of new evidence. Implicit bias, any form of cognitive bias about which we have no conscious awareness, may be particularly difficult to address [20, 61, 62]. Some of the more common biases, such as overconfidence and tolerance to risk and uncertainty, may make it more difficult

for clinicians to accurately assess the degree to which a competing interest exists or its potential for harm. Explicit exploration of how these biases interact with or exacerbate the challenge of preventing competing interests from exerting undue influence on patient care can become part of routine clinical care in an environment that is supportive of such exploration. Interactions with the pharmaceutical and device manufacturers in particular may give rise to cognitive biases regarding use of relevant pharmaceuticals and devices [63, 64]. Physicians should actively avoid, and be protected from, exposure to direct and indirect marketing efforts of drug and device manufacturers.

Recommendations

Competing interests in the ICU setting will always exist to varying extents. No clinician can, or should, focus solely on the well-being of one patient without concern for other patients, colleagues, or themselves. But to continue enjoying high levels of public trust, particularly about the use, withholding, and withdrawal of life-support technologies, professional societies should demonstrate commitment to ensuring competing interests do not unduly influence physician judgment or harm patients. The two primary ways to address conflicts of interest are avoidance and disclosure [17]. A comprehensive approach to conflicts of interest depends on a combination of both avoidance and disclosure, and implementation of this approach must be adapted to the specific circumstances (Fig. 2).

Although routinely mandated in many healthcare settings, the limitations of disclosure are well documented [65]. Asking clinicians to disclose potential conflicts of interest to patients in the ICU setting is often impractical and inappropriate for multiple reasons. First, it places the onus of responsibility on individual clinicians to determine whether they are unduly influenced by a competing interest. This level of objective self-assessment is often not feasible. Social science research has demonstrated that even motivated individuals are unable to remain objective about conflicts of interest because self-serving bias is unintentional [66]. Second, patients and their families struggle to understand the benefits and drawbacks of medical procedures [67] and billing under normal circumstances and are even less likely to understand complex professional and financial relationships in the midst of critical illness [68]. Third, most ICU patients are involuntary consumers. Unlike patients seeking elective procedures or an outpatient provider, they cannot choose their provider or decide to transfer to another institution or another physician after learning of a conflict of interest. Finally, disclosure can have adverse and paradoxical unintended consequences. Specifically, disclosure makes some people feel they have moral license to act in their own best interest [69, 70]. In addition, disclosure of immutable competing interests may serve to erode patient or family member trust in clinicians and thereby make shared medical decision-making more difficult without providing benefit.

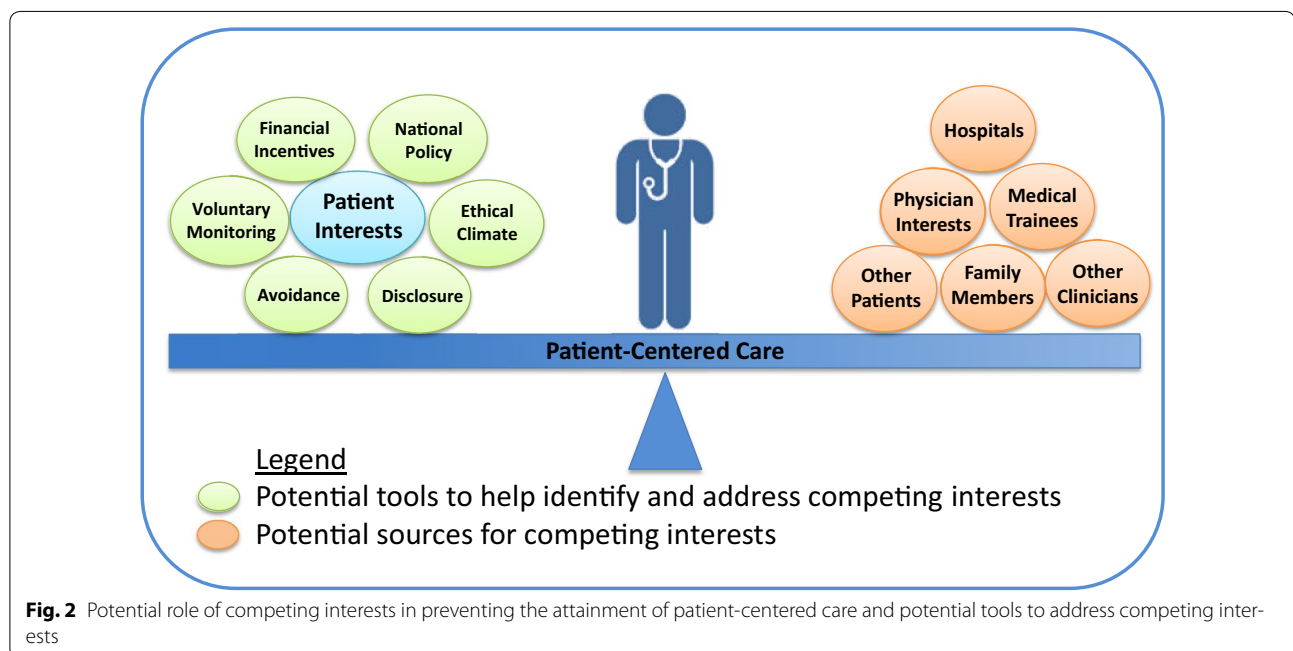


Fig. 2 Potential role of competing interests in preventing the attainment of patient-centered care and potential tools to address competing interests

Determining whether competing interests have undue influence requires explicit exploration of the competing interests and influences as well as data to support this exploration [71]. Ideally, empiric evidence should inform decisions about when secondary interests are adversely impacting patient care and need to be eliminated or disclosed. In some circumstances, hospitals may be able to monitor themselves, essentially creating a transparent quality improvement program for monitoring and mitigating conflicts of interest. For example, data on ethics committee consultations regarding disagreements on whether to offer cardiopulmonary resuscitation in the event of cardiac arrest at one hospital found that patients who were not offered CPR were more than three times as likely to be critically ill, but there was no association between the committee's recommendation and patient age, race, or functional status at admission [72]. These findings are reassuring for patients, demonstrate the hospital's commitment to ethical practice, reduce the likelihood that biases are permitted to influence decisions, and provide a strong defense against accusations of discrimination. Similarly, Institutional Review Boards and the Scientific Registry of Transplant Recipients monitoring programs could require data on the timing and results of DNR decisions in patients enrolled in trials or receiving organs to safeguard patients from inappropriate pressure.

Exploring and addressing competing and conflicting interests should be an activity supported by the entire ICU team and not be the sole responsibility of individual clinicians. The ethical decision-making climate of an ICU can either support or detract from such exploration. Ethical climate, defined as "individual perceptions of the organization that influences attitudes and behavior and serves as a reference for employee behavior" [73], should be recognized as an important characteristic of the quality of ICU care that will influence the ability of clinicians to explore and address competing interests. A recent study describes the development and validation of the Ethical Decision-Making Climate Questionnaire (EDMCQ) [74, 75]. This tool provides the opportunity to develop and evaluate interventions that improve an ICU's ethical climate to facilitate ethical decision-making. Importantly, a clinician's decisions, and the competing interests for those decisions, do not operate in a vacuum, but are instead embedded in a cultural milieu influenced by national policy, financial incentives, resource pressures, patient and family factors, and institutional leadership. A recent qualitative study found that an ICU's ethical priorities influenced the way physicians conceptualized autonomy and beneficence, which consequently influenced communication practices surrounding resuscitation decision-making [76]. The study also revealed

the importance of institutional cultural norms that contributed to inappropriately aggressive care at the end of life [77]. Other studies also highlight the understanding of these institutional and ethical norms as an important step to mitigate decisions that are not in the patient's best interests [78, 79].

When there are concerns about institutional conflicts of interest, an independent organization, similar to a consumer protection or watch-dog group, could be engaged to perform this monitoring function. Admittedly, hospitals are unlikely to embrace the idea of voluntary data-sharing with a monitoring group. But proactive, voluntary monitoring programs developed with buy-in from hospitals are more likely to set achievable standards than programs created in response to adverse events. As it stands, the task of explaining to the public how competing interests impact their medical care has thus far fallen to journalists. More often than not, these explanations have not been flattering [80–83]. As public trust in political, financial, and criminal justice systems wavers, the medical community would be wise to demonstrate its commitment to a primary goal of protecting patient welfare.

Author details

¹ Division of Pulmonary and Critical Care Medicine, School of Medicine, Johns Hopkins University, 1830 E. Monument St, 5th Floor, Baltimore, MD 21205, USA. ² Department of Epidemiology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA. ³ Outcomes After Critical Illness and Surgery (OACIS) Group, Johns Hopkins University, Baltimore, MD, USA. ⁴ Department for Anesthesiology and Intensive Care, Jena University Hospital, Jena, Germany. ⁵ Department of Anaesthesiology and Operative Intensive Care Medicine, Charité Universitätsmedizin Berlin, Kreischa, Germany. ⁶ Patient- and Family-Centered Care, Klinik Bavaria, Kreischa, Germany. ⁷ Interdepartmental Division of Critical Care Medicine, University of Toronto, Toronto, ON, Canada. ⁸ Department of Critical Care Medicine, Sunnybrook Health Sciences Centre, Toronto, ON, Canada. ⁹ Intensive Care Unit, Ghent University Hospital, Ghent, Belgium. ¹⁰ Assistance Publique–Hôpitaux de Paris (AP-HP), Hôpital Saint-Antoine, Service de Réanimation Médicale, Paris, France. ¹¹ Sorbonne Universités, Université Pierre et Marie Curie, Paris, France. ¹² Institut National de la Santé et de la Recherche Médicale (INSERM), UMR S 1136, Institut Pierre Louis d'Épidémiologie et de Santé Publique, Paris, France. ¹³ Department of Intensive Care, Medisch Centrum Leeuwarden, Leeuwarden, The Netherlands. ¹⁴ Department of Bioethics and Humanities, University of Washington, Seattle, WA, USA. ¹⁵ Division of Pulmonary, Critical Care, and Sleep Medicine, University of Washington, Seattle, WA, USA. ¹⁶ Cambia Palliative Care Center of Excellence, University of Washington, Seattle, WA, USA.

Acknowledgements

The authors wish to thank Medical Librarian Carrie Price, MLS, for her assistance.

Compliance with ethical standards

Conflicts of interest

The authors declare that no conflict of interest exists.

References

1. Gauchat G (2012) Politicization of science in the public sphere: a study of public trust in the United States, 1974 to 2010. *Am Soc Rev* 77:167–187. <https://doi.org/10.1177/0003122412438225>
2. Malone C (2016) Americans don't trust their institutions anymore. In: *FiveThirtyEight*. <https://fivethirtyeight.com/features/americans-dont-trust-their-institutions-anymore/>. Accessed 18 Apr 2018
3. Funk C (2017) Mixed messages about public trust in science. In: *Pew. Res. Cent. Int. Sci. Tech.* <http://www.pewinternet.org/2017/12/08/mixed-messages-about-public-trust-in-science/>. Accessed 18 Apr 2018
4. Cook K (2003) *Trust in Society*. Russell Sage Foundation, New York
5. Hardin R (2004) *Trust and Trustworthiness*. Russell Sage Foundation, New York
6. AMA Council on Ethical and Judicial Affairs (2016) *AMA code of medical ethics*. American Medical Association, Chicago
7. Gamble VN (1997) Under the shadow of Tuskegee: african Americans and health care. *Am J Public Health* 87:1773–1778
8. Jones DS (2002) The health care experiments at many farms: the Navajo, Tuberculosis, and the Limits of modern medicine, 1952–1962. *Bull Hist Med* 76:749–790. <https://doi.org/10.1353/bhm.2002.0186>
9. Stern AM (2005) Sterilized in the name of public health: race, immigration, and reproductive control in modern California. *Am J Public Health* 95:1128–1138. <https://doi.org/10.2105/AJPH.2004.041608>
10. Stell LK (2004) Two cheers for physicians' conflicts of interest. *Mt Sinai J Med N Y* 71:236–242
11. Schünemann HJ, Osborne M, Moss J et al (2009) An official American Thoracic Society Policy statement: managing conflict of interest in professional societies. *Am J Respir Crit Care Med* 180:564–580. <https://doi.org/10.1164/rccm.200901-01265T>
12. McCoy MS, Emanuel EJ (2017) Why there are no "potential" conflicts of interest. *JAMA* 317:1721–1722. <https://doi.org/10.1001/jama.2017.2308>
13. Institute of Medicine (US) Committee on Conflict of Interest in Medical Research, Education, and Practice (2009) *Conflict of Interest in Medical Research, Education, and Practice*. National Academies Press (US), Washington (DC)
14. Diener E, Scollon CN, Lucas RE (2009) The evolving concept of subjective well-being: The multifaceted nature of happiness. In: Diener Ed (ed) *Assessing well-being: The collected works of Ed Diener*. Springer, New York, 67–100
15. McClellan M, McKethan AN, Lewis JL et al (2010) A national strategy to put accountable care into practice. *Health Aff Proj Hope* 29:982–990. <https://doi.org/10.1377/hlthaff.2010.0194>
16. Pimperl A, Schulte T, Mühlbacher A et al (2017) Evaluating the impact of an accountable care organization on population health: the quasi-experimental design of the German *Gesundes Kinzigtal*. *Popul Health Manag* 20:239–248. <https://doi.org/10.1089/pop.2016.0036>
17. Tonelli MR (2007) Conflict of interest in clinical practice. *Chest* 132:664–670. <https://doi.org/10.1378/chest.07-0315>
18. Evans S, Darvall J, Gorelik A, Bellomo R (2018) Influence of ward round order on critically ill patient outcomes. *J Crit Care* 45:110–113. <https://doi.org/10.1016/j.jccr.2018.02.003>
19. Stepanikova I (2012) Racial-ethnic biases, time pressure, and medical decisions. *J Health Soc Behav* 53:329–343. <https://doi.org/10.1177/0022146512445807>
20. FitzGerald C, Hurst S (2017) Implicit bias in healthcare professionals: a systematic review. *BMC Med Ethics*. <https://doi.org/10.1186/s12910-017-0179-8>
21. Evans TW, Nava S, Mata GV et al (2011) Critical care rationing: international comparisons. *Chest* 140:1618–1624. <https://doi.org/10.1378/chest.11-0957>
22. Mielke J, Martin DK, Singer PA (2003) Priority setting in a hospital critical care unit: qualitative case study. *Crit Care Med* 31:2764–2768. <https://doi.org/10.1097/01.CCM.0000098440.74735.DE>
23. Cooper AB, Joglekar AS, Gibson J et al (2005) Communication of bed allocation decisions in a critical care unit and accountability for reasonableness. *BMC Health Serv Res* 5:67. <https://doi.org/10.1186/1472-6963-5-67>
24. Pope T (2017) Legal briefing: new penalties for disregarding advance directives and do-not-resuscitate orders. *J Clin Ethics Spring* 28:74–81
25. Abadir PM, Finucane TE, McNabney MK (2011) When doctors and daughters disagree: twenty-two days and two blinks of an eye. *J Am Geriatr Soc* 59:2337–2340. <https://doi.org/10.1111/j.1532-5415.2011.03700.x>
26. Reilly BM (2014) Don't learn on me—are teaching Hospitals Patient-Centered? *N Engl J Med* 371:293–295. <https://doi.org/10.1056/NEJMp1405709>
27. Laugesen MJ (2014) The resource-based relative value scale and physician reimbursement policy. *Chest* 146:1413–1419. <https://doi.org/10.1378/chest.13-2367>
28. Holt E (2015) Slovak bribery case sparks wider debate in eastern Europe. *The Lancet* 385:2242. [https://doi.org/10.1016/S0140-6736\(15\)61051-0](https://doi.org/10.1016/S0140-6736(15)61051-0)
29. Kakuk P, Domján A (2013) Healthcare financing and conflict of interests in Hungary: the system of irregular payments and its challenges to the integrity of healthcare ethics. *Camb Q Health Ethics* 22:263–270. <https://doi.org/10.1017/S0963180113000078>
30. Manea T (2015) Medical Bribery and the ethics of trust: the Romanian case. *J Med Philos* 40:26–43
31. Burashnikova IS, Ziganshin AU, Ziganshina LE (2008) Attitudes to pharmaceutical promotion techniques among healthcare professionals in the Republic of Tatarstan, Russia. *Int J Risk Saf Med* 20:57–71. <https://doi.org/10.3233/JRS-2008-0425>
32. Jofre S (2014) GSK faces accusations of bribing doctors in Poland. *BMJ* 348:g2768. <https://doi.org/10.1136/bmj.g2768>
33. Jena AB, Seabury S, Lakdawalla D, Chandra A (2011) Malpractice risk according to physician specialty. *N Engl J Med* 365:629–636. <https://doi.org/10.1056/NEJMsa1012370>
34. Mello MM, Chandra A, Gawande AA, Studdert DM (2010) National costs of the medical liability system. *Health Aff Proj Hope* 29:1569–1577. <https://doi.org/10.1377/hlthaff.2009.0807>
35. Rothberg MB, Class J, Bishop TF et al (2014) The cost of defensive medicine on 3 Hospital Medicine Services. *JAMA Intern Med* 174:1867–1868. <https://doi.org/10.1001/jamainternmed.2014.4649>
36. Burns KEA, Zubrinich C, Tan W et al (2013) Research recruitment practices and critically ill patients. *Am J Respir Crit Care Med* 187:1212–1218. <https://doi.org/10.1164/rccm.201208-1537OC>
37. Schandelmaier S, von Elm E, You JJ et al (2016) Premature discontinuation of randomized trials in critical and emergency care: a retrospective cohort study. *Crit Care Med* 44:130–137. <https://doi.org/10.1097/CCM.0000000000001369>
38. Silverman H, Hull SC, Sugarman J (2001) Variability among institutional review boards' decisions within the context of a multicenter trial. *Crit Care Med* 29:235–241
39. Khan MA, Barratt MS, Krugman SD et al (2014) Variability of the institutional review board process within a national research network. *Clin Pediatr (Phila)* 53:556–560. <https://doi.org/10.1177/0009922814527504>
40. Mehter HM, Wiener RS, Walkey AJ (2014) "Do not resuscitate" decisions in acute respiratory distress syndrome: a secondary analysis of clinical trial data. *Ann Am Thorac Soc* 11:1592–1596. <https://doi.org/10.1513/AnnalsATS.201406-244BC>
41. Darmon M, Ducos G, Coquet I et al (2016) Formal academic training on ethics may address junior physicians' needs. *Chest* 150:180–187. <https://doi.org/10.1016/j.chest.2016.02.651>
42. Rushton CH, Batcheller J, Schroeder K, Donohue P (2015) Burnout and resilience among nurses practicing in high-intensity settings. *Am J Crit Care* 24:412–420. <https://doi.org/10.4037/ajcc2015291>
43. Marik PE, Khangoora V, Rivera R et al (2017) Hydrocortisone, vitamin C, and Thiamine for the treatment of severe sepsis and septic shock: a retrospective before-after study. *Chest* 151:1229–1238. <https://doi.org/10.1016/j.chest.2016.11.036>
44. Simpson E A Norfolk doctor found a treatment for sepsis. Now he's trying to get the ICU world to listen. In: *Virginian-Pilot*. http://pilotonline.com/news/local/health/article_7a3063e5-24cf-56c1-b25c-142731604196.html. Accessed 23 Apr 2018
45. Did An IV Cocktail Of Vitamins And Drugs Save This Lumberjack From Sepsis? In: *NPR.org*. <https://www.npr.org/sections/health-shots/2018/02/21/583845485/did-an-iv-cocktail-of-vitamins-and-drugs-save-this-lumberjack-from-sepsis>. Accessed 23 Apr 2018
46. Smith R, Blazeby J (2018) Why religious belief should be declared as a competing interest. *BMJ* 361:k1456. <https://doi.org/10.1136/bmj.k1456>
47. Emanuel EJ, Onwuteaka-Philipsen BD, Urwin JW, Cohen J (2016) Attitudes and practices of euthanasia and physician-assisted suicide in the united states, Canada, and Europe. *JAMA* 316:79–90. <https://doi.org/10.1001/jama.2016.8499>

48. Pope T (2018) Legal history of medical aid in dying: physician assisted death in US courts and legislatures. *NML Rev* 48:267
49. Fiala C, Gemzell Danielsson K, Heikinheimo O et al (2016) Yes we can! Successful examples of disallowing "conscientious objection" in reproductive health care. *Eur J Contracept Reprod Health Care Off J Eur Soc Contracept* 21:201–206. <https://doi.org/10.3109/13625187.2016.1138458>
50. Lewis-Newby M, Wicclair M, Pope T et al (2015) An official American Thoracic Society policy statement: managing conscientious objections in intensive care medicine. *Am J Respir Crit Care Med* 191:219–227. <https://doi.org/10.1164/rccm.201410-1916ST>
51. Stahl RY, Emanuel EJ (2017) Physicians, not conscripts—conscientious objection in health care. *N Engl J Med* 376:1380–1385. <https://doi.org/10.1056/NEJMs1612472>
52. Wehkamp K-H, Naegler H (2017) The commercialization of patient-related decision making in hospitals. *Dtsch Arzteblatt Int* 114:797–804. <https://doi.org/10.3238/arztebl.2017.0797>
53. Blum JM, Lynch WR, Coopersmith CM (2015) Clinical and billing review of extracorporeal membrane oxygenation. *Chest* 147:1697–1703. <https://doi.org/10.1378/chest.14-2954>
54. Li X, Scales DC, Kavanagh BP (2018) Unproven and expensive before proven and cheap: extracorporeal membrane oxygenation versus prone position in acute respiratory distress syndrome. *Am J Respir Crit Care Med* 197:991–993. <https://doi.org/10.1164/rccm.201711-2216CP>
55. Schwarze ML, Brasel KJ, Mosenthal AC (2014) Beyond 30-day mortality: aligning surgical quality with outcomes that patients value. *JAMA Surg* 149:631–632. <https://doi.org/10.1001/jamasurg.2013.5143>
56. Walkey AJ, Barnato AE, Wiener RS, Nallamothu BK (2017) Accounting for patient preferences regarding life-sustaining treatment in evaluations of medical effectiveness and quality. *Am J Respir Crit Care Med* 196:958–963. <https://doi.org/10.1164/rccm.201701-0165CP>
57. Nash IS (2015) Why physicians hate "patient satisfaction" but shouldn't. *Ann Intern Med* 163:792. <https://doi.org/10.7326/M15-1087>
58. Fenton JJ, Jerant AF, Bertakis KD, Franks P (2012) The cost of satisfaction: a national study of patient satisfaction, health care utilization, expenditures, and mortality. *Arch Intern Med* 172:405–411. <https://doi.org/10.1001/archinternmed.2011.1662>
59. Zgierska A, Miller M, Rabago D (2012) Patient satisfaction, prescription drug abuse, and potential unintended consequences. *JAMA* 307:1377–1378. <https://doi.org/10.1001/jama.2012.419>
60. Johnston C (2013) Patient satisfaction and its discontents. *JAMA Intern Med* 173:2025–2026. <https://doi.org/10.1001/jamainternmed.2013.11356>
61. Blumenthal-Barby JS, Krieger H (2015) Cognitive biases and heuristics in medical decision making: a critical review using a systematic search strategy. *Med Decis Making* 35:539–557. <https://doi.org/10.1177/0272989X14547740>
62. Saposnik G, Redelmeier D, Ruff CC, Tobler PN (2016) Cognitive biases associated with medical decisions: a systematic review. *BMC Med Inform Decis Mak* 16:138. <https://doi.org/10.1186/s12911-016-0377-1>
63. Hartog CS, Skupin H, Natanson C et al (2012) Systematic analysis of hydroxyethyl starch (HES) reviews: proliferation of low-quality reviews overwhelms the results of well-performed meta-analyses. *Intensive Care Med* 38:1258–1271. <https://doi.org/10.1007/s00134-012-2614-0>
64. Wood SF, Podrasky J, McMonagle MA et al (2017) Influence of pharmaceutical marketing on Medicare prescriptions in the District of Columbia. *PLoS One* 12:e0186060. <https://doi.org/10.1371/journal.pone.0186060>
65. Rodwin MA (1989) Physicians' conflicts of interest. *N Engl J Med* 321:1405–1408. <https://doi.org/10.1056/NEJM198911163212010>
66. Dana J, Loewenstein G (2003) A social science perspective on gifts to physicians from industry. *JAMA* 290:252–255. <https://doi.org/10.1001/jama.290.2.252>
67. Wegwarth O, Gigerenzer G (2018) The barrier to informed choice in cancer screening: statistical illiteracy in physicians and patients. *Recent Results Cancer Res Fortschritte Krebsforsch Progres Dans Rech Sur Cancer* 210:207–221. https://doi.org/10.1007/978-3-319-64310-6_13
68. Netzer G, Sullivan DR (2014) Recognizing, naming, and measuring a family intensive care unit syndrome. *Ann Am Thorac Soc* 11:435–441. <https://doi.org/10.1513/AnnalsATS.201309-308OT>
69. Cain DM, Loewenstein G, Moore DA (2005) The dirt on coming clean: perverse effects of disclosing conflicts of interest. *J Leg Stud* 34:1–25. <https://doi.org/10.1086/426699>
70. Loewenstein G, Sah S, Cain DM (2012) The unintended consequences of conflict of interest disclosure. *JAMA* 307:669–670. <https://doi.org/10.1001/jama.2012.154>
71. Lo B (2012) The future of conflicts of interest: a call for professional standards. *J Law Med Ethics* 40:441–451. <https://doi.org/10.1111/j.1748-720X.2012.00677.x>
72. Courtwright AM, Brackett S, Cadge W et al (2015) Experience with a hospital policy on not offering cardiopulmonary resuscitation when believed more harmful than beneficial. *J Crit Care* 30:173–177. <https://doi.org/10.1016/j.jcrc.2014.10.003>
73. Olson LL (1998) Hospital nurses' perceptions of the ethical climate of their work setting. *Image—J Nurs Scholarsh* 30:345–349
74. Van den Bulcke B, Piers R, Jensen HI et al (2018) Ethical decision-making climate in the ICU: theoretical framework and validation of a self-assessment tool. *BMJ Qual Saf*. <https://doi.org/10.1136/bmjqs-2017-007390>
75. Benoit DD, Jensen HI, Malmgren J et al (2018) Outcome in patients perceived as receiving excessive care across different ethical climates: a prospective study in 68 intensive care units in Europe and the USA. *Intensive Care Med*. <https://doi.org/10.1007/s00134-018-5231-8>
76. Dzung E, Colaizzi A, Roland M et al (2015) Influence of institutional culture and policies on do-not-resuscitate decision making at the end of life. *JAMA Intern Med* 175:812–819. <https://doi.org/10.1001/jamainternmed.2015.0295>
77. Dzung E, Dohan D, Curtis JR et al (2018) Homing in on the social: system-level influences on overly aggressive treatments at the end of life. *J Pain Symptom Manag* 55(282–289):e1. <https://doi.org/10.1016/j.jpainsymman.2017.08.019>
78. Barnato AE, Tate JA, Rodriguez KL et al (2012) Norms of decision making in the ICU: a case study of two academic medical centers at the extremes of end-of-life treatment intensity. *Intensive Care Med* 38:1886–1896. <https://doi.org/10.1007/s00134-012-2661-6>
79. Kelley AS, Bollens-Lund E, Covinsky KE et al (2017) Prospective identification of patients at risk for unwarranted variation in treatment. *J Palliat Med* 21:44–54. <https://doi.org/10.1089/jpm.2017.0063>
80. Fields ProPublica R (2010) God help you. You're on dialysis. The Atlantic, Washington DC, USA
81. Rivière P (2003) Case notes on corruption. *Monde Dipl*, Paris, France
82. Creswell J, Abelson R, Sanger-Katz M (2017) The company behind many surprise emergency room bills. *N. Y. Times*, New York, NY, USA
83. Ornstein C, Hixenbaugh M (2018) At St. Luke's in Houston, Patients Suffer as a Renowned Heart Transplant Program Loses Its Luster. In: ProPublica. <https://www.propublica.org/article/baylor-st-lukes-medical-center-heart-transplants-houston-texas-patients-suffer>. Accessed 16 May 2018