

Rational Patient Apathy

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Patients with serious or life-threatening illness are frequently asked to make complex, high-stakes medical decisions. The impact of anxiety, low health literacy, asymmetric information and inadequate communication between patients and health care providers, family pressures, rational apathy by health care providers, cognitive biases of both patients and health care providers, and other factors make it quite difficult for patients in these circumstances to process and comprehend the strategic uncertainty and resultant risks and benefits of, and alternatives to, whatever therapeutic or life-prolonging treatment physicians are offering. All of these factors render the classic goal of “informed consent” unachievable in all but the rarest of circumstances: The effort to discuss and evaluate strategic uncertainty, its rational reduction into risks and benefits, and alternatives of treatment for purposes of optimizing decisional outcomes will have genuine intrinsic value only for ultra-rational patients (and physicians).

In addition to these alterable barriers to rational decision-making—i.e., barriers that can, in theory, be overcome by ultra-rational patients and physicians with sufficient time and persistent inquiry—there is a second decision-making realm in which the added complexities of bounded rationality, clinical uncertainty and, in particular, of overall Knightian uncertainty provide insurmountable, unalterable barriers to confident rational decision-making. Within this more fundamental human realm of irreducible uncertainty, even ultra-rational, good-Bayesian decision-makers can never confidently calculate a highest-utility treatment option. In order to better describe this secondary realm of unalterable barriers to rational patient choice, including its usually subversive effect on end-of-life decisional behavior, by both average, minimally-rational patients and ultra-rational patients, we coin the terms “rational patient apathy” and, relatedly, “rational patient ignorance.”

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Given that confronting the absolute uncertainty inherent in facing one's mortality is cognitively, psychologically and emotionally daunting, and thus largely left unexplored and unpracticed by most patients for most of their healthier decisional lives, rational patient apathy at the sudden onset of a serious or life-threatening illness overwhelmingly defaults to negative decision-making: an affirmative choice to not make any balanced decision on the merits but rather to remain rationally ignorant of some or all aspects of the choice situation. In the context of this persistent patient avoidance of substantive decision-making, empirical evidence demonstrates frequent reversion to a quantity-over-quality approach, allowing health care providers to "do everything" until continued medical intervention reaches the point of obvious medical or economic futility. As a result—and as a largely discounted trade-off of choosing to avoid decisional burdens through non-careful consideration or no consideration at all—the overwhelming result of rational patient apathy in end-of-life decision-making is an irrational calculation and decision unto itself. Not only does rational patient apathy negate the classic (and utopian) goal of informed consent, it also exerts tremendous costs—on patients, on loved ones, on health care providers and on society at-large—in terms of adverse effects, avoidable suffering, constantly recurring decisional commitment costs, and the wasting of scarce economic resources.

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[I]gnorance more frequently begets confidence than does knowledge.—Charles Darwin¹

Ipse se nihil scire id unum sciat.—Tullius Cicero²

I. INTRODUCTION

Patients with serious or life-threatening illness are frequently asked to make complex, high stakes medical decisions. The impact of anxiety, low health literacy, asymmetric information and inadequate communication between patients and health care providers, family pressures, rational apathy by health care providers, cognitive biases of both patients and health care providers, and related factors weighs heavily on seriously ill patients. These factors make it quite difficult for patients to process and comprehend the strategic uncertainty and resultant risks and benefits of, and alternatives to, whatever therapeutic or life-prolonging treatment physicians are offering. All of these factors render the classic goal of “informed consent” unachievable in all but the rarest of circumstances. In previous articles,³ one of the authors described contextual barriers to fully-informed medical decision-making and, in spite of these barriers, urged physicians and patients to attempt to make the “best” end-of-life decisions possible. This article explains why, for terminally ill patients, it can never be known, *ex post*, whether or not the “best” was achieved. Similarly, for purposes of informed decision-making, it also can never be known, *ex ante*, whether the “best” is even rationally achievable.

People avoid acknowledging mortality in general or making and documenting decisions in advance about health care preferences prior to diagnosis with terminal illness.⁴ Rates of advance directive completion remain low.⁵ Once faced with a life-threatening diagnosis, however, many

¹ 1 CHARLES C. DARWIN, *THE DESCENT OF MAN, AND SELECTION IN RELATION TO SEX* 3 (1871).

² He himself thinks he knows one thing, that he knows nothing. M. TULLIUS CICERO, *ACADEMICORUM RELIQUIAE CUM LUCULLO*, Book I, §16 (O. Plasberg, ed., Leipzig, Teubner 1922).

³ See Barbara A. Noah & Neal R. Feigenson, *Avoiding Overtreatment at the End of Life: Physician-Patient Communication and Truly Informed Consent*, 36 *PACE L. REV.* 736, 737–800 (2016); Barbara A. Noah, *The (Ir)rationality of (Un)informed Consent*, 34 *QUINNIPIAC L. REV.* 691 (2016).

⁴ See generally Barbara A. Noah, *In Denial: The Role of Law in Preparing for Death*, 21 *ELDER L.J.* 1 (2013).

⁵ See U.S. GOV'T ACCOUNTABILITY OFFICE, *PATIENT SELF-DETERMINATION ACT: PROVIDERS OFFER INFORMATION ON ADVANCE DIRECTIVES BUT EFFECTIVENESS UNCERTAIN* 2 (1995) (concluding that “advance directives have been advocated more than they have been

patients seek to exert substantial control over their treatment in order to make the “best” medical decisions under the circumstances. Given that confronting the absolute uncertainty inherent in facing one’s mortality is cognitively, psychologically and emotionally daunting,⁶ and thus largely avoided by most patients for most of their healthier decisional lives, rational patient apathy⁷ at the sudden onset⁸ of a serious or life-threatening illness overwhelmingly defaults to *negative* decision-making: an affirmative choice to not make any balanced decision on the merits but rather to remain rationally ignorant of some or all aspects of the choice situation.

In the context of this persistent patient avoidance of substantive decision-making, empirical evidence demonstrates frequent reversion to a quantity-over-quality approach, allowing health care providers to “do everything”⁹ until the continued medical treatment reaches the point of obvious medical or economic futility. As a result—and as a largely discounted trade-off of choosing to avoid decisional burdens through non-careful consideration (or no consideration at all)—the overwhelming result of rational patient apathy in end-of-life decision-making is an irrational calculation and decision unto itself. Not only does rational patient apathy negate the classic (and utopian) goal of informed consent, it also exerts tremendous costs—on patients, on loved ones, on health care providers and

used” and that “in general, only 10 to 25 percent of Americans have documented their end-of-life choices or appointed a health care agent”); Angela Fagerlin & Carl E. Schneider, *Enough: The Failure of the Living Will*, 34 HASTINGS CTR. REP. 30, 32, 36 (2004) (noting that less than 20% of Americans have living wills and that studies also suggest that living wills rarely influence the level of medical care—in fact at least a quarter of patients with living wills receive care that is inconsistent with their instructions). The most recent data suggest a slight uptick in the percentage of Americans who have completed advance directives. See Jaya K. Rao et al., *Completion of Advance Directives Among U.S. Consumers*, 46 AM. J. PREVENTIVE MED. 65, 65–67 (2014) (finding, based on survey data from 2009–2010, that 26.3% of respondents had completed an advance directive and that older age, higher income, and higher educational attainment were correlated with a higher likelihood of having an advance directive).

⁶ Cf. SHELDON SOLOMON ET AL., *THE WORM AT THE CORE: ON THE ROLE OF DEATH IN LIFE* 23 (2015) (“By around age three, the grim handmaiden of self-consciousness—death awareness—begins to make her appearance.”).

⁷ For a global definition of rational apathy, see *infra* notes 215–227 and accompanying text. For a phenomenological explanation of rational patient apathy, see *infra* Part III.C.

⁸ The piercing awareness and urgency of mortality delivered by such sudden onset was once laconically described by Christopher Hitchens as follows: “In whatever kind of a ‘race’ life may be, I have very abruptly become a finalist.” CHRISTOPHER HITCHENS, *MORTALITY* 4 (2012).

⁹ Logically, it is impossible to “do everything” as a single human being locked in a linear space-time continuum. In general, once one starts to do something (as one always does as a living being), one is no longer doing everything (else)—indeed, one is excluding oneself from doing everything (else) in every course of action. The notion of “doing everything” would also have to include the choice of “doing nothing”—which is teleologically impossible since, as a living being, one is still doing something when the professed purpose of one’s chosen (in)action is to “do nothing.”

on society at-large—in terms of adverse health effects, avoidable suffering, constantly recurring decisional commitment costs, and the utilization of scarce economic resources.

A. *Uninformed Over-Provision of Medical Care*

Although the challenges to rational decision-making that we discuss within this article are not specific to the United States, the importance of recognizing these challenges and how they limit good decision-making are particularly important in this country. For purposes of this paper, there are two contexts in which to consider the factors driving utilization of care: first, in the case of medical decisions regarding treatment of life-threatening illness and, second, in the case of medical decisions regarding end-of-life care when a patient is no longer likely to recover. In this first context, it is difficult to quantify or describe whether and when patients are receiving “too much” therapeutic or life-prolonging care for life-threatening illnesses, but various studies of cancer care in particular suggest that patients often continue with second- and third-line therapies and unproven experimental therapies that are unlikely to improve quality of life or significantly prolong life.¹⁰ Second, it is well-documented that patients in the United States receive high amounts of intensive and invasive care at the end of life, compared with patients in some other countries.¹¹

At the same time, there is evidence that suggests that this comparatively high level of end-of-life care is frequently delivered without much meaningful reflection, let alone truly informed consent, on the part of patients. Physicians acknowledge that they are providing unnecessary medical care for a variety of reasons, including fear of malpractice litigation,

¹⁰ See, e.g., A. Saito et al., *The Effect on Survival of Continuing Chemotherapy to Near Death*, BMC PALLIATIVE CARE (Sept. 21, 2011), <https://bmcpalliatcare.biomedcentral.com/articles/10.1186/1472-684X-10-14> (concluding that, in the case of patients with small cell lung cancer, chemotherapy was associated with two months additional survival time but that there was no additional survival benefit from continuing chemotherapy within fourteen days of death and that patients receiving chemotherapy at the end of life were significantly less likely to utilize hospice care); Holly G. Prigerson et al., *Chemotherapy Use, Performance Status, and Quality of Life at the End of Life*, 1 JAMA ONCOLOGY 778, 778–84 (2015) (evaluating the effect of chemotherapy on patients with end-stage cancer and varying functional statuses and concluding that chemotherapy did not improve quality of life near death for patients with moderate and poor performance status and actually worsened quality of life near death for patients with good performance status); cf. Martin R. Stockler et al., *Chemotherapy for Advanced Breast Cancer – How Long Should It Continue?*, 81 BREAST CANCER RES. & TREATMENT S49, S49–S52 (Supp. 2003) (describing the life-extending benefits of chemotherapy for advanced, terminal breast cancer and the debate over whether to provide this therapy when it achieves modest life extension coupled with significant side-effects).

¹¹ See David Line, *2015 Quality of Death Index*, ECONOMIST (Oct. 5, 2015), <http://www.eiuperspectives.economist.com/healthcare/2015-quality-death-index>.

Medicare's fee-for-service reimbursement mechanism, patient and family requests for care, difficulty accessing medical records, a culture of denial of mortality, and a physician culture of viewing death of a patient as a professional failure.¹² Recent data suggest that more than one-fifth of all medical care provided is unnecessary.¹³ The challenge in this environment is to identify those situations in which over-provision of care is likely occurring and to respond with treatment that is both clinically appropriate and consistent with the patient's wishes. Given that every patient is unique and that baseline end-of-life preferences vary significantly, any decision-making about treatment options in the face of serious illness or imminent death must, by definition, constitute a complex, high opportunity-cost process.

Patients say that they wish for a "good death," but this abstract concept means different things to different people. Even so, most people's idea of a "good death" have some elements in common, such as avoiding unnecessary physical suffering.¹⁴ And most patients also state that they would prefer to die in the comfort of their home,¹⁵ yet only about 30% of patients actually

¹² See Heather Lyu et al., *Overtreatment in the United States*, PLOS ONE (Sept. 6, 2017), <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181970>.

¹³ In a recent study that attempts to measure physicians' perceptions of when they are delivering "futile" care to their patients, the data suggested that approximately 20% of patients in five critical care units were receiving futile or "probably futile" treatment. See Thanh N. Huynh et al., *The Frequency and Cost of Treatment Perceived to Be Futile in Critical Care*, 173 JAMA INTERNAL MED. 1887, fig. 1 (2013). The survey instrument defined five situations in which treatment might be considered futile or medically inappropriate: burdens grossly outweigh benefits; patient will never survive outside an ICU; patient is permanently unconscious; treatment cannot achieve the patient's goals; death is imminent. See *id.* at 1888; see also Robert D. Truog & Douglas B. White, *Futile Treatments in Intensive Care Units*, 173 JAMA INTERNAL MED. 1894 (2013) (critiquing the study design, arguing that legal complexities make it difficult for physicians to say "no" to futile treatment requests, and pleading for better communication and a conflict resolution process to address these situations).

¹⁴ For a review of the research on the multiple dimensions that influence perceived quality of dying and death, see Sarah Hales et al., *The Quality of Dying and Death*, 168 ARCHIVES INTERNAL MED. 912, 912–18 (2008) (identifying several commonly identified qualities that a "good death" requires, such as freedom from pain and suffering, circumstances of death (home versus hospital), and cultural variables in different studied countries such as maintaining independence, control, self-determination, and entrusting decisions to others). *Id.* at 913. For an excellent overview of the idea of a good death and of the emotional issues surrounding death and dying, see SHERWIN B. NULAND, *HOW WE DIE: REFLECTIONS ON LIFE'S FINAL CHAPTER* (Vintage Books 1995).

¹⁵ See GEORGE H. GALLUP, JR., *SPIRITUAL BELIEFS AND THE DYING PROCESS: A REPORT ON A NATIONAL SURVEY* (1997) (reporting results of a survey of U.S. residents commissioned by the Nathan Cummings Foundation and Fetzer Institute); I.J. Higginson & G.J. Sen-Gupta, *Place of Care in Advanced Cancer: A Qualitative Systematic Literature Review of Patient Preferences*, 3 J. PALLIATIVE MED. 287, 287–300 (2000) (finding that despite the fact that the majority of patients in England suffering from serious illnesses wish to die at home, most die in either hospital or a long-term care facility).

do so.¹⁶ Instead, large amounts of hospital-based health care resources are routinely utilized at the end of life,¹⁷ often with little or no measurable benefit to the physical well-being of dying patients. As a result, many patients receive aggressive interventions such as cardiopulmonary resuscitation, ventilator support, or intensive care unit (ICU) care, and bear the inevitable physical suffering that comes with such interventions, even when death is imminent.¹⁸

Recent data suggest that the overutilization problem continues unabated. In the context of terminal illness, many people believe that more therapeutic care (including tests, procedures and drug therapies) leads to

¹⁶ See Joan M. Teno et al., *Change in End-of-Life Care for Medicare Beneficiaries: Site of Death, Place of Care, and Health Care Transitions in 2000, 2005, and 2009*, 309 JAMA 470 (2013) (concluding that, although only 24.6% of patients died in hospital in 2009 compared with 32.6% in 2000, percentages of deaths in long-term care facilities held steady at around 27% and deaths at home rose from 30.7% in 2000 to 33.5% in 2009); see also Yafu Zhao & William Encinosa, *The Costs of End-of-Life Hospitalizations, 2007*, HEALTHCARE COSTS & UTILIZATION PROJECT (Nov. 2009), <http://www.ncbi.nlm.nih.gov/books/NBK53605> (describing data from 2007 indicating that one-third of Americans died in hospital); Jeanne Lenzer, *Unnecessary Care: Are Doctors in Denial and Is Profit Driven Healthcare to Blame?*, 345 BRIT. MED. J. e6230 (2012) (referring to another estimate that 65% of deaths in the United States occur in hospitals). Yet another study found that 45% of U.S. deaths occur in hospitals and 22% in long term care facilities. See DIV. VITAL STATISTICS, NAT'L CTR. FOR HEALTH STATISTICS, DEATHS FROM 39 SELECTED CAUSES BY PLACE OF DEATH, STATUS OF DECEDENT WHEN DEATH OCCURRED IN HOSPITAL OR MEDICAL CENTER, AND AGE: UNITED STATES, 1999-2005 (2009), <http://www.cdc.gov/nchs/nvss/mortality/gmwk307.htm>.

¹⁷ Empirical research documents that approximately one-third of medical expenses for the last year of life are spent in the final month and that aggressive therapies and technologies in that final month account for nearly 80% of these costs. See Baohui Zhang et al., *Health Care Costs in the Last Week of Life: Associations with End-of-Life Conversations*, 169 ARCHIVES INTERNAL MED. 480, 482-84 (2009). Moreover, 30% of Medicare dollars spent go to care for the 5% of Medicare beneficiaries who die each year. See Amber E. Barnato et al., *Trends in Inpatient Treatment Intensity Among Medicare Beneficiaries at the End of Life*, 39 HEALTH SERV. RES. 363, 363-64 (2004); see also Teno et al., *supra* note 16, at 473 tbl. 2 (noting that, in 2009, 29.2% of patients who died had received care in an ICU in the previous 30 days); Donald M. Berwick & Andrew Hackbarth, *Eliminating Waste in U.S. Health Care*, 307 JAMA 1513 (2012) (describing six categories of health care spending waste, including overtreatment such as use of surgery when watchful waiting is better and unwanted intensive care at the end of life and estimating that wasteful spending in the overtreatment category accounts for between \$158 billion and \$226 billion in 2011).

¹⁸ See Amresh Hanchate et al., *Racial and Ethnic Differences in End-of-Life Costs: Why Do Minorities Cost More than Whites?*, 169 ARCHIVES INTERNAL MED. 493, 497-98 (2009) (surveying use of expensive end-of-life interventions among a large sample of Medicare beneficiaries and finding patterns of substantial expenditure on life-sustaining treatment in the final six months of life). One palliative care specialist describes the ICU as a place "where a Wild West culture makes it a challenge for palliative care to get a foothold," adding that it is difficult "to slow a wild horse, particularly one that believes it can outrace death." See Jessica Nutik Zitter, *They Call Me 'Dr. Kevorkian,'* N.Y. TIMES (Nov. 14, 2013), <http://well.blogs.nytimes.com/2013/11/14/they-call-me-dr-kevorkian/> (adding that she "believe[s] in letting the dying determine how and when they die, as opposed to coaxing their organs at all costs").

longer life and improved physical well-being.¹⁹ Data concerning utilization reflect this belief. Recent data indicate that, in 2009, 28.4% of patients received hospice care for only three days or fewer before dying, an increase from 22.2% nine years earlier. Moreover, 29.2% of Medicare beneficiaries received care in an ICU during the final month of life compared with 24.3% in the earlier period.²⁰ This pattern of systematic overutilization of non-palliative terminal care means that dying patients continue to receive costly therapeutic care and life-prolonging treatment even when it is very likely that the benefits in terms of enhanced quality of life, increased survival time, or other measurable physical outcomes are limited or non-existent.²¹ Still, a large majority of dying patients consistently elects to pursue therapeutic care and supposedly life-prolonging treatment even though their marginal costs equal or, when measured wholistically by the notion of a “good death,” vastly exceed their marginal benefit.

As a related consequence, dying patients also tend to underutilize hospice and palliative care.²² In 2015, the *Economist Intelligence Unit* research team published its latest *Quality of Death Index* (QDI) which ranks access to palliative care across the world. While the United Kingdom, “due to comprehensive national policies, the extensive integration of palliative care into [its universal, nationalized health care delivery system], a strong hospice movement, and deep community engagement on the issue,”²³

¹⁹ See Sean Palfrey, *Daring to Practice Low-Cost Medicine in a High-Tech Era*, 364 NEW ENG. J. MED. e21 (2011), <http://www.nejm.org/doi/pdf/10.1056/NEJMp1101392?ssource=herc.pdf> (commenting on the mistaken belief that “‘doing everything’ is the best practice and the way to prevent harm”).

²⁰ See Teno et al., *supra* note 16, at 471–73, tbl. 2 (also finding that 11.5% of patients had been hospitalized three or more times in the three months before death, up from 10.3% in the previous studied period).

²¹ See R. Sean Morrison et al., *When Too Much Is Too Little*, 335 NEW ENG. J. MED. 1755, 1755–56 (1996) (describing a case of aggressive treatment of an elderly patient with advanced, terminal disease despite his repeated requests that he receive no further treatment and observing that such over-provision interferes with quality of life for these patients with little offsetting benefit).

²² See Teno et al., *supra* note 16, at 474 (noting that, although the use of hospice services has increased during the early 2000s, only 42.2% of Medicare beneficiaries with dementia and 59.5% of Medicare beneficiaries with cancer received hospice services at the time of death); Corita Grudzen & Deborah Grady, *Improving Care at the End of Life*, 171 ARCHIVES INTERNAL MED. 1202, 1202–04 (2011) (discussing over-use of therapeutic interventions at the end of life and advocating that better quality care often requires emphasizing palliative measures and avoiding unavailing therapies that risk unnecessary suffering and iatrogenic harm); Haiden A. Huskamp et al., *Discussions with Physicians About Hospice Among Patients with Metastatic Lung Cancer*, 169 ARCHIVES INTERNAL MED. 954, 955–56 (2009) (finding that only half of patients with stage IV lung cancer had had any discussion with their physicians about hospice in the two months prior to death). These patterns are even more marked among racial and ethnic minorities in the United States. See generally Barbara A. Noah, *The Role of Race in End-of-Life Care*, 15 J. HEALTH CARE L. & POL’Y 349 (2012).

²³ See Line, *supra* note 11.

repeated its first-place ranking from the first QDI in 2010, the United States remained stuck in ninth place.²⁴ Part of the explanation here lies in the fact that the current U.S. health care delivery system creates an artificial dichotomy, and resultant structural separation, between curative and palliative care.²⁵ Physicians who practice in the curative role tend to focus on clinical problem solving, will continue to advocate for therapy even when the prognosis is grim, and may often view death as a failure. Physicians who practice in the palliative-care role focus on the patient as a whole person rather than as a disease diagnosis and will view unnecessary suffering at the end of life as a failure. Thus, the underutilization of palliative and hospice care in this country represents a missed opportunity on a massive scale. A growing body of evidence demonstrates that an emphasis on palliative care,²⁶ in conjunction with carefully considered therapeutic care, can not only improve patients' quality of life wholistically but also provide a significant comparative advantage in prolonging life over standard therapeutic treatment.²⁷

When patients receive inadequate palliative care coupled with possibly inappropriate therapeutic care, they are more likely to experience avoidable suffering and reduced quality of life, during their last months and weeks of life. When, however, care for a seriously ill patient integrates curative goals (for as long as they are clinically appropriate) with palliative measures, the patient, and also her loved ones and her health care providers, are all better off. One major challenge to arriving at a mindset where the patient and her physician can discuss how to achieve this sort of balance between care and cure lies in the various obstacles to understanding the clinical picture with

²⁴ The QDI rankings are based on scores derived from twenty quantitative and qualitative indicators across five categories, which include palliative and healthcare environment, human resources, affordability of care, quality of care, and community engagement. *Id.*

²⁵ See Kathy Cerminara & Barbara A. Noah, *Removing Obstacles to a Peaceful Death*, 25 ELDER L.J. 101 (2018) (describing this artificial dichotomy, reasons for its perpetuation, and suggesting approaches to integrating palliative care more routinely with therapeutic care and smoothing the transition to hospice).

²⁶ Palliative care refers to medical care intended to alleviate symptoms associated with illness, whatever the patient's prognosis and may address pain, shortness of breath, insomnia, depression, nausea and lack of appetite, among other symptoms. See Lise M. Stevens, *Palliative Care*, 296 JAMA 1428 (2006). Palliative care is often appropriate even while the patient is receiving therapeutic care; the two are not mutually exclusive. Once therapeutic care is discontinued, palliative care continues in order to manage symptoms.

²⁷ See Jennifer S. Temel et al., *Early Palliative Care for Patients with Metastatic Non-Small-Cell Lung Cancer*, 363 NEW ENG. J. MED. 733, 736–38 (2010) (finding that patients recently diagnosed with lung cancer who began receiving palliative care immediately lived an average of three months longer than patients who received standard therapeutic treatment only); Matthijs Kox & Peter Pickkers, *"Less Is More" in Critically Ill Patients Not Too Intensive*, 173 JAMA INTERNAL MED. 1369 (2013) (concluding, based on a meta-analysis of multiple clinical trials, that many common treatments for critically ill patients pose a high risk of iatrogenic harm compared with their potential benefit and ought to be used more cautiously); see also Cerminara & Noah, *supra* note 25.

all of its variables and unanswerable questions. The first step to achieving some understanding is for the patient and her physician to acknowledge the possibility of death from the disease, including a realistic assessment of prognosis.

B. *Clinical Scenario*

In order to ground the abstract concepts and theories of medical decision-making and informed consent that follow, we use the following hypothetical clinical scenario to illustrate what roles clinical uncertainty, bounded rationality, heuristic biases and, most importantly, Knightian uncertainty play in the interactions between a physician and her seriously-ill patient:

June Morton is a forty-six-year-old woman who recently visited her gynecologist for a routine annual exam. The gynecologist discovered that one of June's ovaries was noticeably enlarged and referred her to an oncologist. An MRI of June's chest and abdomen reveals masses on the ovary, and in the liver and lungs. Biopsy has confirmed that the mass on the ovary is malignant and, as a result of these tests, June has been diagnosed with Stage IV invasive epithelial ovarian cancer. June is shocked by the diagnosis, particularly because at the moment she is experiencing no major symptoms.

The oncologist, Dr. Mary Savoy, knows that, even with aggressive, multi-modal treatment, it is estimated that June has statistically only a 17% chance of surviving for five years. Rather than frighten her patient, the doctor tells June that the disease is "very serious, potentially life-threatening," and that it is important to begin treatment immediately. Dr. Savoy and the treatment team recommend that June immediately undergo cytoreductive surgery in which surgeons attempt to remove as much of the cancer as possible. This surgery reduces the remaining cancer cells present that must be addressed with chemotherapy. When June asks what the surgery entails, she is also told the purpose of the surgery and that she can expect to spend about seven days in the hospital and can expect recovery to take approximately four to six weeks, depending on how much tissue must be removed from her abdomen. Dr. Savoy also explains to June that cytoreductive surgery may involve removal of both ovaries, the uterus, and parts of the colon, bladder, gall bladder, and other affected organs.

June is also told that, given her young age and otherwise good health, she should consider intraperitoneal chemotherapy in which chemotherapeutic drugs are introduced into the abdomen directly during surgery in order to "bathe" cancer cells directly in the drugs and kill more cells.

The oncologist, Dr. Savoy, explains that, once the cytoreductive therapy is completed (with or without intraperitoneal chemotherapy), there are multiple post-surgery treatment options available. In addition to describing standard chemotherapy, she discusses with June the option of “dose dense” chemotherapy, in which multiple chemotherapeutic agents are delivered simultaneously to the patient at the highest doses that the patient can tolerate, in order to kill as many cancer cells as possible and to prevent the cancer cells from becoming resistant to the drugs. She also tells June about some promising clinical trials of new chemotherapeutic agents, and about standard and experimental targeted therapy and immunotherapy. Finally, Dr. Savoy points out to June that every patient is unique and that survival rates and other prognostic factors are only averages which vary according to the patient’s age and overall health.

June is divorced with two children, a sixteen-year-old daughter who is a junior in high school and a twenty-one-year-old son who is in his third year of university. She hopes for a cure and would at a minimum like to survive long enough to see them both graduate from high school and college respectively. June herself has an associate’s degree and works as a bookkeeper. She purchases her insurance as an individual through the insurance market in her state and receives a premium subsidy under the Patient Protection and Affordable Care Act (ACA) because her income is relatively low.

II. RATIONAL HUMAN DECISION-MAKING AND CARE FOR LIFE-THREATENING ILLNESS

The rationality of all human decision-making, including June’s choice of any highest-utility treatment course of action for her cancer,²⁸ is severely limited under all circumstances. Even if June were an ultra-rational²⁹

²⁸ The juxtaposition may perhaps be subtle but is certainly intended. See Mark Schlesinger, *Choice Cuts: Parsing Policymakers’ Pursuit of Patient Empowerment From an Individual Perspective*, 5 HEALTH ECON. POL’Y & L. 365, 365 (2010) (“Some terms come redolent with positive associations. This is no less true in the policy lexicon of democracy (freedom, responsiveness, leadership and voting) than in everyday English (hope, friend, kindness and chocolate). ‘Choice’ makes both lists.”) (internal citation omitted); cf. Mary Frances Luce, *Decision Making As Coping*, 24(4) HEALTH PSYCHOL. S23, S23 (Supp. 2005) (“[F]ew words rival *cancer* for pure emotional impact, and decisions regarding cancer control are likely among the most threatening decisions that many individuals will ever make.”).

²⁹ As used throughout this Article, being “ultra-rational” means that decisional agents (think Star Trek’s half-human, half-Vulcan Mr. Spock, first officer on the “USS Enterprise” or, alternatively, the “rational investors” in modern financial portfolio theory) will form only rational expectations; they are always in possession of all relevant information that, under the circumstances, can be available to them; they are aware that information asymmetries may, and that bounded rationality and opportunism inevitably do, apply to and constrain their decision-making (thus, they do not have the perfect omniscience and foresight of

decisional agent, she could never make a perfectly rational decision. In order to explain and model why that is the case—why there are always several, insurmountable rational limitations applicable to all human decision-making regarding an ineluctably uncertain and scarce future—it is useful to carefully distinguish among three different realms of rational utility calculation and resultant models of rational decision-making:³⁰ (i) the perfect calculation of choice in a “Coasean world,”³¹ (ii) the transaction-cost efficient calculation of choice under conditions of bounded rationality and opportunism in a “Williamsonian world,”³² and (iii) the non-Bayesian updating of beliefs in an uncertain “Knightian world”³³ of constantly new information which triggers the perpetual, imperfect revision of homogenized past experience in order to achieve predictive utility. Only the third, Knightian realm is “real” within the concrete world of human existence, learning, and decision-making. The Coasean and Williamsonian realms are purposely oversimplified, rational utility-maximization utopias of varying degree.

hyperrational decisional agents in traditional price theory, *see infra* note 38); they “coldly,” “detachedly” and “formally” evaluate the entire, subjectively knowable choice situation by competently calculating and comparing the expected future performance of each available choice/transaction; and, in doing so, they are able to bypass any and all cognitive and psychological “shortcomings” (heuristics, emotions, empathy, etc.) that would otherwise render their decision-making and self-interested utility maximization processes and outcomes suboptimal. *See, e.g.*, James R. Hackney, Jr., *The Enlightenment and the Financial Crisis of 2008: An Intellectual History of Corporate Finance Theory*, 54 ST. LOUIS UNIV. L.J. 1257, 1260 (2010). *See generally* Amitai Etzioni, *Guidance Rules and Rational Decision Making*, 66 SOC. SCI. Q. 753 (1985). *See also* Vanessa Houlder, *Richard Thaler’s Advice: Be a Lazy Investor—Buy and Forget*, FIN. TIMES, Dec. 22, 2017 (“[Humans] are far from being the ultra-rational machines assumed by traditional economic theory. Instead, they are error-prone, blinded by prejudices and fond of mental short cuts that lead them astray.”); Paul Slovic et al., *Affect, Risk, and Decision Making*, 24(4) HEALTH PSYCHOL. S35, S39 (Supp. 2005) (“One cannot assume that an intelligent person can understand the meaning of and properly act on even the simplest of numbers, not to mention more esoteric measures or statistics pertaining to risk, unless these numbers are infused with affect.”); Peter A. Ubel, *Beyond Costs and Benefits: Understanding How Patients Make Health Care Decisions*, 15 ONCOLOGIST 5, 7 (Supp. 2010) (“[R]isk information is rarely received dispassionately, but is usually processed by people in affective and intuitive ways, too. Risks create feelings.”).

³⁰ *See infra* Figure 1.

³¹ *See, e.g.*, Michael Klausner, *The Contractarian Theory of Corporate Law: A Generation Later*, 31 J. CORP. L. 779, 796 (2006).

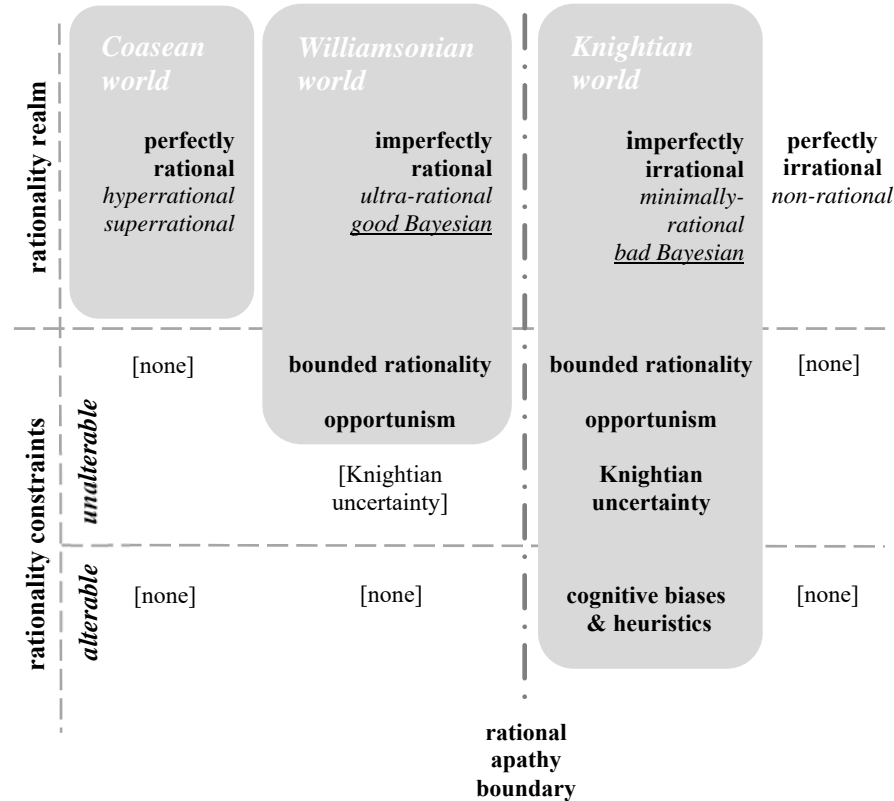
³² *See, e.g.*, René Reich-Graefe, *Calculative Trust: Oxymoron or Tautology?*, 4 J. TRUST RES. 66, 68 (2014).

³³ *See, e.g.*, Tan Wang, *Conditional Preferences and Updating*, 108 J. ECON. THEORY 286, 291–92 (2003). *See generally* Shabnam Mousavi & Gerd Gigerenzer, *Risk, Uncertainty, and Heuristics*, 67 J. BUS. RES. 1671 (2014).

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*Figure 1**Rationality Realms and Constraints*A. *The Coasean World*

In this first, flawlessly utopian realm of neoclassical utility theory, the main prerequisite for the prediction and achievement of perfect competition and, accordingly, perfectly rational decision-making is a colossal simplification of the otherwise imperfect reality of human cooperation. Here, perfectly rational, overtly self-interested, and omniscient actors, unrestricted by bounded rationality,³⁴ with access to complete and perfectly available information, and with perfectly stable tastes and preferences, can account for every stochastic variable and, hence, can rationally calculate everything. These Coasean actors calculate choice using well-defined mathematical, wealth-maximizing utility functions, without regard to

³⁴ See Herbert A. Simon, *A Behavioural Model of Rational Choice*, 69 Q. J. ECON. 99 (1955); see also Renée A. Stiles & Stephanie A. So, *Impact of Transaction Costs on Healthcare Outcomes*, 3 EXPERT REV. PHARMACOECON. & OUTCOMES RES. 283, 285 (2003).

Knighthian uncertainty, transaction costs, or resource scarcity, and within a calculative environment that also provides for perfectly neutral governments and perfectly specified and costlessly enforced property rights.³⁵ In other words, in this Coasean world of zero transaction costs and total prescience, everything is always certain. Nothing is ever scarce. Indeed, genuine decision-making—in terms of “exercising discretion, generating and evaluating proposals and, finally, ratifying an informed choice from among a multiplicity of viable best-interest options”³⁶—does not occur in such a perfect realm.³⁷ Where hyperrational³⁸ actors with perfect foresight can

³⁵ See, e.g., FRANK H. KNIGHT, RISK, UNCERTAINTY AND PROFIT 197 (1921) (“Chief among the simplifications of reality prerequisite to the achievement of perfect competition is . . . the assumption of practical omniscience on the part of every member of the competitive system.”); Douglass C. North, *Structure and Performance: The Task of Economic History*, 16 J. ECON. LIT. 963, 964 (1978) (summarizing the assumptions underlying neoclassical economic theory as “(1) perfectly competitive markets, (2) perfectly specified and costlessly enforced property rights, (3) neutral government, and (4) unchanging tastes”).

³⁶ Reich-Graefe, *supra* note 32; see also Eugene F. Fama & Michael C. Jensen, *Separation of Ownership and Control*, 26 J. L. & ECON. 301, 303 (1983).

³⁷ See, e.g., Harold Demsetz, *The Theory of the Firm Revisited*, in THE NATURE OF THE FIRM: ORIGINS, EVOLUTION, AND DEVELOPMENT 159, 161 (Oliver E. Williamson & Sidney G. Winter eds., 1993) (“The only management task that seems to remain, and which is the focus of attention in the firm of traditional price theory, is the selection of profit-maximizing quantities of outputs and inputs. But, since the required information for doing this is also freely at hand, and the required calculations are costless to make, the model strips management of any meaningful productivity in the performance of even these tasks. The *cost of maximizing* is ignored or implicitly assumed to be zero. De facto, the resources that might be required to make maximizing decisions are treated as if they are not scarce.”) (footnote omitted).

³⁸ Hyperrationality (also termed “super rationality” or “perfect rationality” in neoclassical economics and game theory) describes decision-making by *homo economicus*, i.e., by an economic agent who only engages with a homogenous group of other hyperrational thinkers; who, like them, strictly pursues utility and profit maximization in *all* of her choices; who, like them, is capable of solving highly complex mathematical coordination problems in the blink of an eye; who, like them, can therefore predict the decisional behavior of *all* other hyperrational agents (given that (i) everyone is following the same hyperrational decisional rule (or strategy) when facing the same choice situation and (ii) everyone has internalized their counterparties’ hyperrationality within their own hyperrational utility calculation); and who, like them, can evaluate *all* possible choice options leading to *all* possible outcomes in an instant and, accordingly, can confidently and correctly select the highest-utility/highest-profit personal course of action in every given choice situation. See Herbert A. Simon, *Rationality as Process and as Product of Thought*, 68 AM. ECON. REV. 1 (1978); see also Lee Roy Beach & Raanan Lipshitz, *Why Classical Decision Theory Is an Inappropriate Standard for Evaluating and Aiding Most Human Decision Making*, in DECISION MAKING IN ACTION: MODELS AND METHODS 21, 21 (Gary A. Klein et al. eds., Ablex 1993) (pointing out that “classical decision theory is an abstract system of propositions that is designed to describe the choices of an ideal hypothetical decision maker—omniscient, computationally omnipotent Economic Man”); Oliver E. Williamson, *The Economics of Organization: The Transaction Cost Approach*, 87 AM. J. SOC. 548, 553 (1981). For critical accounts of hyperrationality, see, for example, JON ELSTER, SOLOMONIC JUDGEMENTS: STUDIES IN THE LIMITATIONS OF RATIONALITY 17 (1989) (defining hyperrationality as “the failure to recognize the failure of rational-choice theory to yield unique prescriptions or predictions” and as the “irrational belief

calculate everything, and time (at least, time for rational in-advance calculation) is non-scarce, “there is no limitation on the computation of the optimal transactional choice that will achieve the largest net-gain outcome [so that] such computation always self-ratifies the final choice simply through calculation, comparison and ranking.”³⁹ Strictly speaking, any decisional behavior beyond mere rational calculation—i.e., decision-making that would evaluate, make utility judgments among, and prioritize, different behavioral options in accordance with their expected future payoffs—would be engaging in unreason and constitute perfect irrationality.

In this Coasean world, a perfectly omniscient and rationally clairvoyant June would simply gather and process *all* relevant internal and external information—past, present, and future—pertaining to her treatment options, her personal preferences, and her overall life circumstances and calculatively arrive at a highest-utility treatment or non-treatment decision. She would then be able to costlessly implement this perfect choice—without any hitch or requiring any post-decisional monitoring, interim assessment, or subsequent revision of her choice. Since June would know *everything* about the present and the future that would be necessary to know, she would know (as fully-measured facts and completely accurate projections): (i) how long she would have to live under each possible treatment or non-treatment option, (ii) how much pain, disability, and physical and emotional distress would accompany each of those options, (iii) how her overall life circumstances would change in the future (for example, her sixteen-year-old daughter might become pregnant in four months from June’s decision-point, or June herself might die in a car accident before the end of the year), (iv) what her exact future personal preferences and thresholds would be when addressing treatment-related pain and suffering as well as under changing life circumstances and, thus, (v) cumulatively, what her exact and perfect balance point would be for purposes of choosing between the quality (thriving) and the quantity (surviving) of her remaining lifetime.⁴⁰

in the omnipotence of reason”); Steven Shulman, *What’s So Rational About Rational Expectations? Hyperrationality and the Logical Limits to Neoclassicism*, 20 J. POST KEYNESIAN ECON. 135 (1997).

³⁹ Reich-Graefe, *supra* note 32.

⁴⁰ To perhaps state the obvious, in a Coasean world “where infinity and eternity are ignorant states of mind that can be overcome by rational, competent calculation,” Reich-Graefe, *supra* note 32, June would never have arrived at this particular adaptive decision-making point (or, for that matter, any other decision-making point). Rather, at some behavior-adapting point in the past, when she went through a perfectly rational calculation of her future, she would have known that (i) she would develop Stage IV ovarian cancer under certain circumstances (thus, no ovarian cancer would have ever been “discovered” during her recent routine gynecological exam—indeed, any and all routine annual exams would have no purpose whatsoever given that everything they could possibly “discover” would already be known) and (ii) that something could be done about those circumstances in terms of avoidance. In other words, June would have only arrived at her current medical diagnosis if *nothing* could have been done about it in terms of avoidance behavior at any point in the past

Even under those computational conditions, however, June would not be able to ever make a “best,” i.e., highest-utility choice. Assuming that her overall preference would be to return to her pre-diagnosis outlook of an indeterminable-length survival for an average forty-six-year-old woman, i.e., to a statistically close-to-100% chance of surviving for five years (and longer), June can never make a Coasean “best” choice that correlates with, and achieves, her preference. She can never opt out of mortality and is always forced—even in a modelled Coasean utopia—to pick the better bad choice, namely, the most surviving coupled with the most thriving. Accordingly, the insurmountability of death even under conditions of Coasean utility calculation render the model *per se* useless for current purposes because surviving and thriving are never endless, absolute states of being. Logically, they are always time-limited. Otherwise, any and all concepts of “quantity” and “quality” (and, similarly, of “life,” “survival” and “death”) would be destroyed by infinity. Human life is only “real” life and worth living because of the uncertainty of life and the certainty of death.⁴¹ There is no life without death and no death without living. As a mortal being, June is spending her life, by neither choice nor consent but simple (chrono)logical choice “architecture,”⁴² within a spatially and temporally linear and scarce world.

Consequently, any “aspiring toward a consistent perfection”⁴³ in a Coasean world which would move beyond its utility in modeling rational choice would be an “aspiring toward annihilation [and infinite] nothingness.”⁴⁴ “Perfection, we know, is finality; and finality is death.”⁴⁵ Thus, any Coasean inquiry into real-life end-of-life decision-making must return empty-handed to its very starting point. Coasean perfection, human mortality and adaptive decision-making never go together. To “rigidly confine[]” a predictive model of June’s rational decision-making behavior within the “paradigm of neoclassical economic[]” choice theory will mean

and, therefore, would have resulted in a “better bad” outcome. If something was to be done, June would have “chosen” and pursued this option a long while ago and her current diagnosis and choice situation would have never evolved.

⁴¹ Cf. SAUL BELLOW, HUMBOLDT’S GIFT 265 (1975) (“Death is the dark backing that a mirror needs if we are to see anything.”).

⁴² Lawrence Lessig introduced the term “architecture” to describe a particular grouping of behavioral constraints (in addition to law, markets and social norms) as “the very basic feasibility limitations imposed on resources (physical, technological, budgetary, etc.), in both time and space, by the present circumstances and conditions under which decision-making and resultant action may only take place.” René Reich-Graefe, *Deconstructing Corporate Governance: The Mechanics of Trusting*, 38 DEL. J. CORP. L. 103, 132 (2013) (citing Lawrence Lessig, *The New Chicago School*, 27 J. LEGAL STUD. 661, 663–67 (1998)).

⁴³ CHRISTOPHER HITCHENS, LETTERS TO A YOUNG CONTRARIAN 19 (Basic Books 2001).

⁴⁴ *Id.*

⁴⁵ CYRIL NORTHCOTE PARKINSON, PARKINSON’S LAW OR THE PURSUIT OF PROGRESS 85 (1958).

that “large parts of [June’s] urgent reality are outside its comprehension.”⁴⁶ As a result, the rational calculability of outcomes and modeling of choice behavior in a Coasean world provides little or no assistance in navigating June’s pressing decisional dilemmas.

B. *The Williamsonian World*

In order to better reflect the “urgent reality” of June’s life and decision-making in the face of omnipresent mortality—and, in general, to better adjust rational choice models to the insurmountable non-perfection of human life that requires cooperation and organization under inherent temporal and spatial constraints—the second calculative realm, Williamsonian transaction cost economics, attempts “to describe ‘man as he is, acting within the constraints imposed by real institutions’”⁴⁷ rather than in “caricature terms.”⁴⁸ In other words, the Williamsonian world endeavors to “find substantive criteria [of rationality] broad enough to extend the concept of rationality beyond the [Coasean world] boundaries of static organization under certainty”⁴⁹ and, in doing so, accepts two fundamental rational limitations which can never be altered by ultra-rational actors: *bounded rationality* and *opportunism*.⁵⁰ Bounded rationality acknowledges the built-in cognitive limitations of the human mind to accumulate, filter and process all decision-relevant information as a result of the imperfect search and computational capacities of humans as well as the computational restrictions provided by both scarce and asymmetric information.⁵¹ Opportunism assumes that human agents are not “simpl[y] self-interest seeking [but] self-interest seeking with guile,”⁵² so that, strategically, they may disguise or otherwise keep undisclosed their personal preferences and commitments to others in order to maximize their individual utility from cooperation.⁵³

These two limitations for perfectly rational calculation, in turn, frame the resulting twin dilemmas of *adverse selection* and *moral hazard* applicable to all strategic decision-making and, thus, human cooperation. Adverse selection refers to a choice situation where one party (namely, the agent/fiduciary—for example, a physician), prior to a particular transaction or commitment has more and better information available to assist with

⁴⁶ George J. Stigler, *The Conference Handbook*, 85 J. POL. ECON. 441, 443 (1977).

⁴⁷ Oliver E. Williamson, *Calculativeness, Trust, and Economic Organization*, 36 J.L. & ECON. 453, 458 (1993) (quoting Ronald H. Coase, *The New Institutional Economics*, 140 J. INSTITUTIONAL & THEORETICAL ECON. 229, 231 (1984)).

⁴⁸ Oliver Hart, *An Economist’s View of Fiduciary Duty*, 43 U. TORONTO L.J. 299, 300 (1993).

⁴⁹ Simon, *supra* note 38, at 10.

⁵⁰ See, e.g., Williamson, *supra* note 47, at 458.

⁵¹ Simon, *supra* note 34.

⁵² Williamson, *supra* note 47.

⁵³ See generally Stiles & So, *supra* note 34, at 285–87.

calculating her self-interested future utility to be derived from the transaction or commitment than has the other party (namely, the principal/beneficiary—for example, a patient). As a result, the second party with the less well-developed set of information is at a competitive disadvantage compared to the first party and is subject to exploitation at the time of their initial “contracting.” Accordingly, the informational asymmetry between them will result in a lack of efficiency in setting a mutually beneficial price-quality equilibrium as regards the services provided by the agent-fiduciary-physician.⁵⁴ Moral hazard describes the general strategic phenomenon and dilemma which occurs when one party’s (i.e., the agent-fiduciary-physician’s) behavior is subject to change *after* a particular contemplated transaction or commitment by another party (i.e., the principal-beneficiary-patient), because the first party will be placed in a control position where her actions can no longer be (fully) observed and (completely) contracted for, or otherwise controlled by, the second party. As a result, the first party can unilaterally shift the downside risk and cost of her opportunistic underperformance to another party, either directly to the second party (i.e., the principal-beneficiary-patient, in which case the coping costs of moral hazard are *agency costs*)⁵⁵ or to one or more third parties who do not participate in the particular transaction or commitment (in which case the manifestation of moral hazard constitutes negative externalities that present

⁵⁴ See, e.g., George A. Akerlof, *The Market for “Lemons:” Quality Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488, 490–91 (1970); Masako N. Darrough & Neal M. Stoughton, *Moral Hazard and Adverse Selection: The Question of Financial Structure*, 41 J. FIN. 501 (1986).

⁵⁵ Put into the context of decision-making by seriously ill patients, moral hazard may, for example, manifest in June’s “selection” of Dr. Savoy as her oncologist because, in her first meeting, Dr. Savoy also promised her (either expressly or impliedly) to personally stay on top of everything (as regards June’s treatment and interim assessments of her treatment progress) at all times and to communicate all relevant information to June promptly and completely, but suppose that, at some later point and for some unknown reason, Dr. Savoy is often distracted, misses some scheduled appointments with June, and in other ways does not follow through with her original promise. June can obviously observe some of the moral-hazard manifestation in the missed appointments (in particular, if there is also no explanation from Dr. Savoy and no other communication from Dr. Savoy, in lieu of appointments, to apprise June of treatment progress, etc.). But, otherwise, any other forms of sub-par performance by Dr. Savoy in light of her original promise will remain hidden from June and can no longer be effectively controlled by June (other than by terminating the relationship). Thus, in all instances in which Dr. Savoy could meet her original promise but decides for whatever reason not to, moral hazard has manifested and June has to bear the *agency costs* (in the form of less information, less assurance, less trust, etc.) of having a distracted, less-communicative-than-promised oncologist.

as *social costs*).⁵⁶ Moral hazard leaves the second party vulnerable⁵⁷ and subject to exploitation for the entire duration of her contracting with the first party, so that the informational asymmetry between them will now result in a lack of efficiency in even maintaining whatever mutually beneficial price-quality equilibrium the first party was able to negotiate and contract for with the second party in the first place.⁵⁸

Notwithstanding the limitations of bounded rationality and opportunism and the resultant twin dilemmas of adverse selection and moral hazard, human agents are deemed capable in the Williamsonian world to make competent and confident in-advance calculations of their respective utility in that they:

- (1) are aware of the range of possible outcomes and their associated probabilities,
- (2) take cost-effective actions to mitigate hazards and enhance benefits,
- (3) proceed with the transaction only if expected net gains can be projected, and
- (4) [assign the transaction to that counterparty] for which the largest net gain can be projected.⁵⁹

Nevertheless, this confident calculation and decision-making is significantly more complex and fraught with largely insurmountable obstacles in the context of health care decision-making in general, and in end-of-life rational choice behavior in particular. To begin with, an acutely ill, terminally ill or

⁵⁶ Again, put into the context of decision-making by seriously ill patients and elaborating on the above example, *see supra* note 55, moral hazard may manifest in this regard with June's twenty-one-year-old son who is in his third year of university. For example, if the son decided to miss some of his university classes in order to drive June to some of her scheduled appointments with Dr. Savoy (because June is too weak to drive herself) and, because of Dr. Savoy's underperformance on her promise to June, some of those scheduled appointments do not happen, moral hazard has also manifested with regard to June's son who now has to bear the *social costs* (in the form of having to comfort his mom, worrying about her treatment progress, wasting class time, labor, gasoline, etc. in getting his mom to and from Dr. Savoy's office, etc.) of his mother having a distracted, less-communicative-than-promised oncologist.

⁵⁷ *See, e.g.*, COUNCIL FOR INT'L ORGS. OF MED. SCIS., INTERNATIONAL ETHICAL GUIDELINES FOR BIOMEDICAL RESEARCH INVOLVING HUMAN SUBJECTS 64 (2002) (including patients with incurable diseases among human-subject populations that are deemed "vulnerable").

⁵⁸ *See, e.g.*, Bengt Holmström, *Moral Hazard and Observability*, 10 BELL J. ECON. 74 (1979); Mark V. Pauly, *The Economics of Moral Hazard: Comment*, 58 AM. ECON. REV. 531 (1968); David Rowell & Luke B. Connelly, *A History of the Term "Moral Hazard"*, 79 J. RISK & INS. 1051 (2012); *see also* M. Gregg Bloche, *Trust and Betrayal in the Medical Marketplace*, 55 STAN. L. REV. 919, 930 (2002) (stating that "sick people are singularly ill-situated to monitor the exercise of medical discretion").

⁵⁹ Williamson, *supra* note 47, at 467. The Williamsonian model is, accordingly, still grounded in the classical Von Neumann-Morgenstern expected utility theorem. *See* JOHN VON NEUMANN & OSKAR MORGENSTERN, *THEORY OF GAMES AND ECONOMIC BEHAVIOR* (1944).

dying patient is, by large measures, a captive individual in any given physician-patient relationship⁶⁰ and, therefore, has “a limited capacity or freedom to consent [to] or to decline”⁶¹ medical treatment at any point in time of her physician-patient relationship. In addition to this relational captivity, any critically ill or dying patient will also have a severely limited capacity or freedom to engage in rational Williamsonian-world utility calculations in the first place. Although June undoubtedly has decisional capacity in the commonly understood meaning of capacity to make medical decisions, her mental and psychological facility for self-interest protection and resilience—in terms of rational contracting (for example, as regards hazard mitigation and benefits enhancement), fending off opportunistic behavior, and controlling for moral hazard in her physician’s relational behavior—is severely reduced, both personally and situationally.

As systematically examined in Kenneth Arrow’s seminal 1963 article, *Uncertainty and the Welfare Economics of Medical Care*,⁶² the special characteristics of the marketplace for health care services and delivery finds the patient at “a departure from the normal state of affairs,”⁶³ making her “demand for medical services . . . not steady in origin as, for example, for food or clothing, but irregular and unpredictable”⁶⁴ and, overall, “associated, with a considerable probability, with an assault on personal integrity.”⁶⁵ At the same time, the patient’s stakes in making “efficient” decisions in purchasing health care services as well as “good” decisions in selecting and consenting to treatment options are significantly increased. “[A]part from the cost of medical care,” associated risks of “death, . . . impairment of full functioning [and] loss or reduction of earning ability” apply which will turn illness, in any form, into “a costly risk” in and of itself.⁶⁶ Given that the patient “cannot test the product before consuming it,”⁶⁷ so that her credence consumption of a particular form of medical care by definition will forego the use of her personal resources (including time and energy) on alternative

⁶⁰ See, e.g., Katrina George, *Autonomy and Vulnerability at the Death Bed*, 10 U. W. SYDNEY L. REV. 139, 143 (2006). See generally Louis Lasagna, *Special Subjects in Human Experimentation*, 98 DAEDALUS 449 (1969).

⁶¹ Ruth Macklin, *Bioethics, Vulnerability, and Protection*, 17 BIOETHICS 473, 474 (2003) (discussing vulnerability in the context of human-subject research).

⁶² Kenneth J. Arrow, *Uncertainty and the Welfare Economics of Medical Care*, 53 AM. ECON. REV. 941 (1963).

⁶³ *Id.* at 948.

⁶⁴ *Id.*

⁶⁵ *Id.* at 949; cf. Matthew A. Butkus, *Free Will and Autonomous Medical Decision-Making*, 3 J. COGNITION & NEUROETHICS 75, 95 (2015) (“There is a common reaction in medicine that patients are expected to react negatively to bad health news—in fact, many consider it a sign of pathology if bad news does not engender some manner of depressive reaction.”).

⁶⁶ Arrow, *supra* note 62, at 949.

⁶⁷ *Id.*

options of care that she otherwise could have pursued, her overall opportunity cost⁶⁸ in making “good” health care decisions is compounded further. Accordingly, the patient’s “inherent vulnerability created by illness and by the process of treatment,”⁶⁹ has an immediate and distortive effect on the physician-patient relationship and expected physician behavior in terms of marginality. The physician, as an agent-fiduciary, should (but not necessarily will) orient her behavior towards “a concern for the customer’s welfare,” thus, distinguishing “medicine . . . from business,” making “self-interest on the part of participants [no longer] the accepted norm,”⁷⁰ and requiring a “[d]eparture from the profit motive [and] pure cash nexus.”⁷¹ Finally, product uncertainty in medical care, i.e., “the existence of uncertainty in the incidence of disease and in the efficacy of treatment,”⁷² is strongly amplified given (i) the unavailability of “an adequate number of trials,” (ii) the resultant inability of “learning from one’s own experience or that of others,” (iii) the greater “utility variability [particularly] in severe cases,” and (iv) the “informational inequality” based on the actual or imagined better “information possessed by the physician as to the consequences and possibilities of treatment.”⁷³

In light of these factors, the rationally choosing patient now faces a vast and complex optimality gap. It may therefore be posited that an ultra-rational, repeat-player patient will be fully aware of and, therefore, unable to confidently overcome, two cognitive constraints on her medical decision-making: *ambivalence* and *ambiguity*. As regards ambivalence, Williamsonian calculativeness carries over the Coasean-model assumption that a calculating rational choice actor will never encounter a change in her own tastes, preferences, and beliefs once her utility function has been fully set and the largest net gain-transaction has been adopted. In real life, the opposite must often be true: humans are frequently unable, *a priori*, to assign

⁶⁸ See Robert Charles Clark, *Vote Buying and Corporate Law*, 29 CASE W. RES. L. REV. 776, 780–81 n.18 (1979) (“The cost attributable to doing one thing to the exclusion of another stems from opportunities sacrificed to pursue the chosen course. This sacrifice is called ‘opportunity cost.’”).

⁶⁹ Mark A. Hall, *Arrow on Trust*, 26 J. HEALTH POL. POL’Y & L. 1131, 1136 (2001).

⁷⁰ Arrow, *supra* note 62, at 949.

⁷¹ *Id.* at 950–51; see also R.H. TAWNEY, *THE ACQUISITIVE SOCIETY* 94–95 (Dover 2004) (1920) (“The difference between industry as it exists to-day and a profession is, then, simple and unmistakable. The essence of the former is that its only criterion is the financial return which it offers to its shareholders. The essence of the latter, is that, though men enter it for the sake of livelihood, the measure of their success is the service which they perform, not the gains which they amass So, if they are doctors, they recognize that there are certain kinds of conduct which cannot be practiced, however large the fee offered for them, because they are unprofessional The meaning of a profession is that it makes the traitors the exception, not as they are in industry, the rule.”).

⁷² Arrow, *supra* note 62, at 941.

⁷³ *Id.* at 951.

well-defined utilities to projected outcomes.⁷⁴ Given their cognitive limitations, they will only arrive at utility outcomes via a *solvitur-ambulando* strategy.⁷⁵ Thus, in particular, part (3) of Williamson's definition of calculativeness—making the transactional choice subject to the confident projection of expected net gains—remains subject to what has been described as a calculating actor's own "opportunistic dissonance"⁷⁶ (or, as Williamson has called it, the "frailty of motive"⁷⁷). Every human being encounters subjective uncertainty as regards her future preferences.⁷⁸ Ambiguity also affects the same Williamsonian calculativeness definition, in particular, its part (4)—arriving at a largest net-gain transactional choice through comparison and ranking of what potential counterparties have to offer. Under conditions of ambiguity,⁷⁹ humans are unable, *a priori*, to map out all of the "possible outcomes and their associated probabilities"⁸⁰ and, thus, to fully apprehend the entire choice situation⁸¹—even in circumstances of minimal-to-zero ambivalence (little to no opportunistic dissonance). Accordingly, their projection and ranking of transactional net gains is subject to what has been labeled "rational vacuity."⁸² Every human being, because of bounded rationality, experiences objective uncertainty about the effects of external and internal influences on her subjective assessment of what is her best choice.

⁷⁴ See, e.g., Akos Rona-Tas, *Uncertainty and Credit Card Markets* 3 (unpublished manuscript), <http://cor.web.uci.edu/research/>.

⁷⁵ It is solved by walking. Cf. Thomas Mackay Cooper, *The Common Law and the Civil Law—A Scot's View*, 63 HARV. L. REV. 468, 470–71 (1950) ("A civilian system differs from a common law system much as rationalism differs from empiricism or deduction from induction. The civilian naturally reasons from principles to instances, the common lawyer from instances to principles. The civilian puts his faith in syllogisms, the common lawyer in precedents; the first silently asking himself as each new problem arises, 'What should we do this time?' and the second asking aloud in the same situation, 'What did we do last time?' . . . The instinct of the civilian is to systematize. The working rule of the common lawyer is *solvitur ambulando*.").

⁷⁶ Reich-Graefe, *supra* note 32, at 69.

⁷⁷ Oliver E. Williamson, *Opportunism and Its Critics*, 14 MANAGERIAL & DECISION ECON. 97, 97 (1993).

⁷⁸ See, e.g., Isabella Hatak & Dietmar Roessler, *Trust Between Boundary-Spanning Agents: The Role of Relational Competencies*, 3 OPEN J. SOC. SCI. 1, 2 (2015); Donald A. Redelmeier, Paul Rozin & Daniel Kahneman, *Understanding Patients' Decision: Cognitive and Emotional Perspectives*, 270 JAMA 72, 74 (1993) ("[P]sychologists have shown that people are prone to err when making decisions about long-term consequences because they fail to anticipate how their preferences will change over time.").

⁷⁹ Shabnam Mousavi & Gerd Gigerenzer, *Heuristics Are Tools for Uncertainty*, 34 HOMO OECOMICUS 361, 363 (2017) (defining ambiguity as "unknown probability distributions over known outcomes").

⁸⁰ Williamson, *supra* note 47, at 467.

⁸¹ See, e.g., Rona-Tas, *supra* note 74.

⁸² Reich-Graefe, *supra* note 32, at 69.

Therefore, in a non-static Williamsonian world, June's decision-making, driven by utility calculation and optimization under conditions of bounded rationality and opportunism, will now run into an overwhelming number of rational choice complications. For example, June may have chosen (and learned to appreciate for competence and patient beneficence) her gynecologist, but she was referred by her gynecologist to Dr. Savoy, her oncologist. She will know that she knows next to nothing about her oncologist, making already her "selection"⁸³ of this medical provider affected—to an in-advance unknown and largely unknowable degree—by adverse selection and moral hazard. June will also know, in terms of rational vacuity, that she knows next to nothing about "the range of possible [treatment options and] outcomes and their associated probabilities"⁸⁴ applicable to her diagnosis—other than what information Dr. Savoy has directly divulged to her and what of this information June has been able to comprehend. She will be further aware that Dr. Savoy's diagnosis, recommended treatment, and prognosis are all subject to having been formed under conditions of Dr. Savoy's own bounded rationality and opportunism. Therefore, the possible adverse selection inherent in her physician-patient relationship with Dr. Savoy—post-selection of Dr. Savoy but pre-selection of medical treatment—may now include questions of her oncologist's professional competence and beneficent patient-orientation in general as well as Dr. Savoy's correct application of this competence and patient-welfare orientation in June's particular case. For example, these questions will involve correct diagnosis, correct recall of treatment and prognosis information, correct collection, processing, and comprehension of all other relevant information as it pertains to June's treatment, and accurate, efficient communication of the complete set of relevant information to June. Moreover, in terms of moral hazard, June will know that she knows next to nothing about the financial and personal choice infrastructure that Dr. Savoy operates in—she is not privy to the fee reimbursement arrangements Dr. Savoy has with June's health insurer;⁸⁵ she has not been apprised of any

⁸³ If June can be said to have made a choice of oncologist, her selection of Dr. Savoy, controlled by her gynecologist, was, at best, indirect and delegated. See generally Gwyn Bevan et al., *Changing Choices in Health Care: Implications for Equity, Efficiency and Cost*, 5 HEALTH ECON. POL'Y & L. 251, 258–62 (2010) (discussing archetypal Beveridge and Bismarck models of financing and organizing health care delivery and resultant scope of patient choice of provider); Mark Schlesinger et al., *Complexity, Public Reporting, and Choice of Doctors: A Look Inside the Blackest Box of Consumer Behavior*, 71(5) MED. CARE RES. REV. 38S (Supp. 2014).

⁸⁴ Williamson, *supra* note 47, at 467.

⁸⁵ Cf. Ubel, *supra* note 29, at 9 ("[F]inancial conversations are not a routine part of most clinical encounters. Outside settings like plastic surgery, most patients do not often talk about the financial cost of interventions with their providers. Indeed, it is rare for doctors to talk about the cost of care when patients face life-threatening illnesses."). See generally Mark A. Hall & Carl E. Schneider, *Patients as Consumers: Courts, Contracts, and the New Medical*

financial conflicts or incentives which Dr. Savoy may have in recommending particular treatment options; she knows nothing about the personal circumstances of Dr. Savoy's life that could make Dr. Savoy's actions more or less opportunistic—either already now or later in June's cancer treatment.

In addition to these examples of hard-to-impossible-to-measure objective uncertainty and resultant ambiguity, June will know, in terms of opportunistic dissonance, that she knows next to nothing about her own tastes, preferences, and beliefs with regard to her treatment options for Stage IV ovarian cancer.⁸⁶ Accordingly, there must remain large-scale ambivalence about possible outcomes, hazards to be avoided, and benefits to be enhanced (affecting parts (1) and (2) of the Williamsonian rational utility calculation above). For example, June's ambivalence will be based on her present subjective uncertainty about her future attitudes towards the pain and suffering associated with different treatment options (in particular, when encountered midstream in any given treatment scenario). Similarly, her ambivalence will be nurtured by doubts about how over-optimistic her in-advance calculation of these subjective treatment parameters may be, especially given her lack of any prior experience with cancer treatment. Finally, June must be aware that she neither has the luxury to “proceed with the transaction *only* if expected net gains can be projected”⁸⁷ (i.e., June cannot wait until the time that she could calculatively reduce ambiguity and ambivalence to tolerable levels). She also lacks the luxury to cost-efficiently question, negotiate, or monitor Dr. Savoy's performance and to assign her medical-treatment transaction to Dr. Savoy only when she is the medical provider with whom “the largest net gain can be projected.”⁸⁸ June cannot efficiently comparison-shop to begin with and, if attempting to do so beyond a standard second opinion, can expect to strategically increase the risk of moral hazard in her eventual physician-patient relationship given her overt

Marketplace, 106 MICH. L. REV. 643, 647–67 (2008) (analyzing in detail the “miserable market for medical fees”).

⁸⁶ Cf. Butkus, *supra* note 65, at 91–92 (“[T]he process of informed consent requires the clinician to disclose the risks, benefits, and outcomes of particular interventions. Ostensibly the patient then decides which option best suits his needs and values, but this concept does not take into account the plasticity of human emotion—his needs and values may not be the same once the intervention has been selected and performed.”). See generally George Loewenstein, *Hot–Cold Empathy Gaps and Medical Decision Making*, 24(4) HEALTH PSYCHOL. S49 (Supp. 2005) (analyzing how people mispredict their own behavior and preferences across affective “cold” and “hot” states and examining the consequences of resultant empathy “gaps” for medical, and specifically cancer-related, decision-making); Peter A. Ubel et al., *Misimagining the Unimaginable: The Disability Paradox and Healthcare Decision Making*, 24(4) HEALTH PSYCHOL. S57 (Supp. 2005) (describing how people often mispredict the emotional impact of unfamiliar circumstances and suggesting that healthy people generally mispredict the emotional impact that chronic illness and disability will have on their lives).

⁸⁷ Williamson, *supra* note 47, at 467 (emphasis added).

⁸⁸ *Id.*

display of “distrustfulness”—and the resulting lack of her reciprocal trustworthiness at the outset of their relationship.⁸⁹ Accordingly, any rational calculability of outcomes and modeling of choice behavior in a Williamsonian world provides mainly one type of certainty for June’s decisional dilemmas: if she is brutally honest with herself (i.e., if she reflects and acts ultra-rationally), a Williamsonian decisional calculus only supports and emphasizes how little she knows and how little she may *ever* confidently know and calculate in terms of preferred treatment utility.⁹⁰ June is not *homo economicus*, hyperrationally maximizing choice under constraints of bounded rationality and opportunism. June is *homo mortalis*, unable to opt out of the certainty of death and the absolute uncertainty of life.

C. *The Knightian World*

How can I behave urgently and with conviction when there are so many doubtful variables to contend with?—Kenneth Arrow⁹¹

Accordingly, as the third and final fundamental realm of rational utility calculation, Knightian uncertainty⁹² is essentially disregarded in the Williamsonian definition of calculativeness. Here, the starting point is that *all* of human decision-making *always* occurs under *unalterable* conditions of true uncertainty. In this very real realm of genuine (as opposed to strategic) uncertainty, no meaningful rational computability of costs and benefits is attainable. In Frank Knight’s own words, “there is no possibility of forming *in any way* groups of instances of sufficient homogeneity to make possible a quantitative determination of true probability.”⁹³ Knightian uncertainty is insurmountable by advance calculation and so cannot be reduced to probabilities and risks.⁹⁴ It fundamentally disrupts the predictive

⁸⁹ Cf. Ernst Fehr & Simon Gächter, *Fairness and Retaliation: The Economics of Reciprocity*, 14 J. ECON. PERSP. 159, 159 (2000) (“Reciprocity means that in response to friendly actions, people are frequently much nicer and much more cooperative than predicted by the self-interest model; conversely, in response to hostile actions they are frequently much more nasty and even brutal.”).

⁹⁰ Cf. Nora Szech, *Becoming a Bad Doctor*, 80 J. ECON. BEHAV. & ORG. 244, 245–46 (2011) (“Especially patients, i.e., consumers in medical markets, have been shown to apply anecdotal reasoning. Even if statistical information on different forms of therapy is available, patients often prefer to rely on personal stories.”); *id.* at 252 (“We have seen that if consumers are unfamiliar with the market and rely on anecdotes, all firms, no matter how bad, yield positive profits.”).

⁹¹ KENNETH J. ARROW, *THE LIMITS OF ORGANIZATION* 15 (Norton & Co. 1974).

⁹² For a concise discussion of Knight’s seminal differentiation between risk and uncertainty, see, for example, Shabnam Mousavi & Gerd Gigerenzer, *Heuristics Are Tools for Uncertainty*, 34 HOMO OECOMICUS 361, 363–64 (2017); Reich-Graefe, *supra* note 32, at 70–71.

⁹³ KNIGHT, *supra* note 35, at 231.

⁹⁴ Cf. JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST AND*

utility (a form of meta-utility) of *all* rational choice models. Accordingly, this type of uncertainty as regards anything and everything the future may bring is *sui generis* compared to what has been encountered by Williamsonian calculativeness up to this point in the discussion: instead of strategic uncertainty (the main problem for an actor's utility function in a transaction-cost economic world), "a world of Knightian uncertainty recogni[z]es that ambivalence and ambiguity are ultimately calculatively insurmountable."⁹⁵ In a Coasean world characterized by the neoclassical expected utility hypothesis and the perfect rational measurability of one's future utility, everything is always perfect, everything is always certain, nothing is ever scarce.⁹⁶ In contrast, in a Knightian uncertain world of universal and constant human vulnerability and certain mortality, everything is—at all times—imperfect, uncertain and scarce. In their real world, humans are never able to transcend this existential imperfection and rational constraint. The uncertainty and scarcity of their own future internal and external worlds will always remain unmeasurable and irreducible.⁹⁷ Not only is this uncertainty humanly unavoidable, but the degree of uncertainty and its impact on patient outcomes is, *ex ante*, unknowable. In the context of complex medical decision-making, with its attendant anxiety, asymmetric information and communication problems, the realities of the Knightian world coalesce into a perfect decisional storm.

Human knowledge and foresight are always severely limited. Furthermore, humans' first-hand, prior knowledge of the experience of dying is logically non-existent—one simply cannot test death. On an individual basis, humans *positively* know little about the world around them. They know even less about their inner worlds.⁹⁸ Outside the very limited realm of their own purposeful actions as and when they take them, humans have, in principle, no predictive idea as to what their respective tomorrows will bring. In consequence—and in order to be able to still form expectations and, based on them, orient their actions and choices in the present towards a future that

MONEY 162–63 (Macmillan 1936) ("We are merely reminding ourselves that human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectation, since the basis for making such calculations does not exist; and that it is our innate urge to activity which makes the wheels go round, our rational selves choosing between the alternatives as best we are able, calculating where we can, but often falling back for our motive on whim or sentiment or chance.").

⁹⁵ Reich-Graefe, *supra* note 32, at 70.

⁹⁶ *Id.* at 68.

⁹⁷ Cf. Richard Zeckhauser, *New Frontiers Beyond Risk and Uncertainty: Ignorance, Group Decision, and Unanticipated Themes*, in 1 HANDBOOK OF THE ECONOMICS OF RISK AND UNCERTAINTY xvii, xxviii (Mark J. Machina & W. Kip Viscusi eds., Elsevier 2014) ("It is worth reiterating that the economics of risk and uncertainty lost its vitality in a prison of methodology that did not admit the real world.").

⁹⁸ See, e.g., Roland Bénabou & Jean Tirole, *Willpower and Personal Rules*, 112 J. POL. ECON. 848 (2004) (analyzing imperfect self-knowledge, will-power and recall).

remains uncertain (but, prior to the onset of a terminal illness, generally attainable)—human decision-makers regularly calculatively suppress⁹⁹ their awareness of Knightian uncertainty by discounting to zero its impact on their “imperfectly rational”¹⁰⁰ decision-making. In other words, as part of imperfectly rational decision-making, human decision-makers always have to engage in a pervasive form of rational delusion. In particular, with respect to the certainty of mortality, they strategically reduce their imperfection-, uncertainty- and scarcity-bearing through a collective, shared reality of quasi-certainty, pseudo-homogeneity and “as-if”-utility.¹⁰¹ In doing so, humans—ineluctably caught “in a world of constant decisional demand and limited resources—calculatively *mimic* calculativeness”¹⁰² in order to respond to their mortality-induced vulnerability and to confidently calculate,

⁹⁹ Such suppression calculation is deliberate but blind (i.e., at best, semi-conscious), an exercise in, and product of, necessary self-delusion. *See, e.g.*, William von Hippel & Robert Trivers, *The Evolution and Psychology of Self-Deception*, 34 BEHAV. & BRAIN SCI. 1 (2011).

¹⁰⁰ As used throughout this Article, decision-making is “imperfectly rational” when it is *unalterably* limited by bounded rationality and opportunism (of other and self). Additionally, imperfectly rational decision-making is regularly constrained by rational errors and calculative flaws in the form of biases and other heuristics as identified in behavioral economics. Unlike bounded rationality and opportunism, however, those biases and heuristics are *alterable* constraints for rational decision-making. Only when they are fully remedied, thus, overcome within a given individual decision-making process can the resultant choice be described as “imperfectly rational”—namely, in the sense that the decision-maker is a good Bayesian and her decision-making “ultra-rational.” When biases and heuristics are not fully remedied, thus, continue to implicate the rationality of decision-making notwithstanding their avoidability, the resultant choice may be described as “imperfectly irrational” and the decision-maker as being a “bad Bayesian.” *See infra* notes 168–176 and accompanying text.

¹⁰¹ Coasean and Williamsonian models of rational decision-making are premised on the assumption that human actors actually work through an optimization calculus for purposes of maximizing utility. However, in a reality of constant informational scarcity and bounded rationality, proper calculation remains a rare occurrence. Thus, as a logical result of universally imperfect rational welfare calculability and as an effort to protect the remnants of this calculability as a minimally rational mode of human behavior (given that there is *nothing* else to replace these remnants with), humans rather “tend to *behave* ‘as though’ they assigned numerical probabilities, or ‘degrees of belief,’ to the events impinging on their action . . . [and to] behave[] ‘as if’ [t]he[y] assigned quantitative likelihoods to events.” Daniel Ellsberg, *Risk, Ambiguity, and the Savage Axioms*, 75 Q. J. ECON. 643, 643 (1961); *see also* MILTON FRIEDMAN, *ESSAYS IN POSITIVE ECONOMICS* 21–22 (1953) (“[U]nder a wide range of circumstances individual firms behave *as if* they were seeking rationally to maximize their expected returns . . . and had full knowledge of the data needed to succeed in this attempt; *as if*, that is, they knew the relevant cost and demand functions, calculated marginal cost and marginal revenue from all actions open to them, and pushed each line of action to the point at which the relevant marginal cost and marginal revenue were equal.”) (footnote omitted). For a critical assessment of this “as-if” calculative choice behavior, *see, for example*, Itzhak Gilboa et al., *Rationality of Belief Or: Why Savage’s Axioms Are Neither Necessary Nor Sufficient for Rationality*, 187 SYNTHESIS 11, 28 (2012) (“It is sometimes *more* rational to admit that one does not have sufficient information for probabilistic beliefs than to pretend that one does.”).

¹⁰² Reich-Graefe, *supra* note 32, at 72.

predict, and come to expect, in a minimally-rational manner, the contours of what their respective futures *should* bring.¹⁰³

Unfortunately, a diagnosis of potentially terminal illness will bring this life-long discounting and masking of Knightian uncertainty to an abrupt and, assuming a fully self-aware and honest ultra-rational patient, complete end. Prior to this diagnosis, discounting of Knightian uncertainty meant that surviving and thriving were both always attainable—an illusorily endless, in-tandem accrual of both quantity and quality of future life. Once the diagnosis hits, *dis*-illusion ensues.¹⁰⁴ The realization of the sudden non-attainability of one's future life will also bring with it the cognitive certainty that, at some point in the not-too-distant future, the surviving-thriving nexus will necessarily turn to an unavoidable in-tandem *loss* of both quantity and quality of life—namely, during the active, possibly prolonged and possibly painful dying process. Since, in many cases, this active dying process will not have yet commenced at the time of diagnosis, the patient must enter a never-before-experienced realm where the co-conditionality of surviving and thriving completely ceases. Instead, quantity/surviving and quality/thriving of remaining life become antagonistic, and possibly, mutually exclusive conditions. The patient now has to choose one over the other or discriminate in terms of more of one at the expense of less of the other.¹⁰⁵ There is no longer any later point in one's lifetime where, through a delayed-gratification strategy in the present (i.e., sacrificing the accrual of quality over quantity in the short-term), long-term utility will accrue in the future (i.e., accrual of both quality and quantity will again break even). Similarly, there is no longer a later point in time where the first course of action can simply be corrected later for a better second course of action (while necessarily assuming the costs of some lost time and of the first "transaction"). Now, opportunity cost sky-rockets, and decisional delay will quickly turn into decisional sacrifice.¹⁰⁶ It's now or never. Accordingly, the

¹⁰³ Including in such utility, of course, a reduction in their cognitive awareness of vulnerability-bearing, i.e., of their overall vulnerability costs in the first place.

¹⁰⁴ Cf. SOLOMON ET AL., *supra* note 6, at 48 ("When people lose confidence in their core beliefs, they become literally 'dis-illusioned' because they lack a functional blueprint of reality.").

¹⁰⁵ A patient opting for the decisional default of "deciding nothing" or "waiting things out" (i.e., of not making an active decision for or against treatment) is, of course, still making a choice, possibly even an in-correctible one, vis-à-vis the distribution of her scarce future quantity and quality of life. See also Ubel, *supra* note 29, at 9 ("Patients' decisions become more difficult when they are asked to compare apples to oranges, metaphorically speaking of course. For instance, some decisions require patients to make trade-offs between length of life and health-related quality of life.").

¹⁰⁶ In other words, delaying and deferring choice, seeking additional information, searching for alternative options and choosing default options in the interim becomes overtly futile choice behavior and is no longer "valuable" or "efficient." See generally Amos Tversky & Eldar Shafir, *Choice Under Conflict: The Dynamics of Deferred Decision*, 3 PSYCHOL. SCI. 358 (1992).

insurmountable rational impact of Knightian uncertainty is heavily, if not existentially, pronounced in all interim decision-making that remains before one of the following events will occur: (i) a complete cure (returning to the in-tandem accrual of surviving and thriving) or (ii) the commencement of an active dying process (arrival at the in-tandem loss of surviving and thriving).

In a Coasean world, June could, at all times, calculatively establish for all interim decision-making what her exact and perfect balance point would be in order to choose between the quality/thriving and the quantity/surviving of her remaining lifetime. Instead, in the real world, June has to acquaint herself with two realms of Knightian uncertainty: the one directly pertaining to her illness, its diagnosis, treatment and prognosis—*clinical uncertainty*—and the larger realm of her uncertain life circumstances and overall future in which her illness and clinical uncertainty is wholistically embedded¹⁰⁷ (including the relational uncertainty caused by the asymmetry of “presumably quite different medical knowledges”¹⁰⁸ between herself and her medical providers)—*non-clinical uncertainty*.

1. Clinical Uncertainty

Once a patient receives a diagnosis of a potentially life-threatening condition, all of Knightian uncertainty, of course, continues—but at an amplified level in the sense that the ambivalence and ambiguity affecting rational decision-making pose graver potential consequences. Physicians and patients want to make the “best” choices about medical care for serious illness but, given their bounded rationality, lack the omniscience needed to calculate all future possibilities without error. All medical decision-making (as with all other types of human decision-making) occurs under conditions of irreducible uncertainty and resultant ambivalence and ambiguity. Philosophers Samuel Gorovitz and Alasdair MacIntyre offer a persuasive theory of the nature of physician fallibility in this regard.¹⁰⁹ As they explain, fallibility in medical decision-making and treatment arises out of three distinct causes. The first is ignorance based on a limited understanding of the medical issue—the physician has full access to information and collects it but cannot subjectively fully understand it.¹¹⁰ The second is ineptitude based on the physician’s failure to access and follow available medical information—all of the information is available to arrive at an evidence-

¹⁰⁷ See, e.g., Tracey A. Revenson & Julie R. Pranicoff, *A Contextual Approach to Treatment Decision Making Among Breast Cancer Survivors*, 24(4) HEALTH PSYCHOL. S93 (Supp. 2005) (describing four contexts of the “social ecological framework” in which treatment decision-making is embedded: “the situational context, the interpersonal context, the sociocultural context, and the temporal context”).

¹⁰⁸ Arrow, *supra* note 62, at 964.

¹⁰⁹ See Samuel Gorovitz & Alasdair MacIntyre, *Toward a Theory of Medical Fallibility*, 1 J. MED. & PHIL. 51 (1976).

¹¹⁰ *Id.* at 65.

based “correct” diagnosis and treatment plan but the physician, while capable of understanding the relevant information, fails to fully collect, process, and comprehend the information.¹¹¹ In either case, the physician either underperforms and fails to follow best practices or the physician suffers from and applies biases that interfere with a (boundedly) rational processing of the information. Both of these forms of fallibility can be overcome with more skilled, more careful, more conscientious, and more rational effort. In other words, they can be optimized in a Williamsonian world.

By contrast, Gorovitz’s & MacIntyre’s third cause of fallibility is necessary fallibility in which the information that must be understood scientifically in order to make the “best” decision simply cannot be known or predicted.¹¹² In this scenario, no physician, no matter how skilled, careful, conscientious, and rational, can provide a solution or “best” recommendation because the solution is (at least, *ex ante*) unknowable due to the unpredictability of the multiple objectively unknown and unknowable variables involved in any patient’s prognosis or response to a particular treatment—in spite of the statistical averages that generally apply to the patient’s diagnosis.¹¹³ Necessary fallibility applies to every patient and every prognosis because every patient’s prognosis and future response to treatment remains subject to Knightian uncertainty.¹¹⁴ Not only is this uncertainty humanly and rationally unavoidable, but the degree of uncertainty and its impact on individual patient outcomes is, *ex ante*, unknowable. Therefore, even the most skilled, careful, conscientious and rational physician’s judgment can turn out to be 100% incorrect about a particular patient’s prognosis or response to treatment. Assuming that June, as an ultra-rational patient, were to again be brutally honest with herself, she would now have a much more complex and much less confident calculation to make than perhaps first assumed: acknowledging the (statistical) likelihood for some ignorance and ineptitude among her medical providers as regards her prognosis, recommended treatment, or both is already a tall order—particularly given June’s expert dependency and, thus, her severely curtailed ability to cost-effectively control and bargain for Williamsonian hazard

¹¹¹ *Id.* at 62–63.

¹¹² *Id.* at 63. “[W]e have provided a theoretical account of why it is that knowledge about the individual patient is not merely essential, but is always and necessarily potentially inadequate to the extent that damaging error may result from conscientious, well-motivated clinical intervention by even the best-informed physicians.” *Id.* at 65.

¹¹³ *See, e.g.,* Zeckhauser, *supra* note 97, at xvii–xviii (“[A] patient who presses a physician will learn that aggregate statistics do not apply to the individual’s case, that the physician and delivery institution can significantly affect risk levels, and that no data are so finely parsed as to predict individual outcomes. Uncertainty rules.”).

¹¹⁴ Hence, necessary fallibility is irreducible to quantifiable risks, and so is unpredictable in absolute terms. *See generally* KNIGHT, *supra* note 35, at ch. 7.

mitigation and benefit enhancement. Still, June can somewhat reduce the fallibility created by ignorance and ineptitude and “buy” herself more confidence in the form of a second medical opinion. Of course, a second opinion will suffer from the same statistical likelihood of ignorance and ineptitude. But June can take some comfort in the fact that the stochastic regularity of ignorance and ineptitude committed by two independent clinical teams in the same patient’s prognosis and treatment recommendations should, statistically, be substantially lower than when only consulting one team of medical providers. If the second opinion supports Dr. Savoy’s prognosis and treatment recommendations, June has reason to worry somewhat less about fallibility in terms of ignorance and ineptitude.¹¹⁵

Unfortunately, the same is *never* true for necessary fallibility which, of course, also always occurs with some statistical likelihood. Here, an ultra-rational June would know that her physician’s judgment is unavoidably affected by Knightian uncertainty. She also would know that it is impossible to calculate in advance *how much* of Dr. Savoy’s judgment is affected by this true, irreducible form of fallibility.¹¹⁶ As a result, June cannot “buy” any more confidence through a second opinion. From an ultra-rational perspective, any second opinion would only aggravate what is already an infinite regression problem caused by Knightian uncertainty. For starters, given the stochastic regularity of necessary fallibility, June can never be fully confident that her best-treatment-option calculus based on Dr. Savoy’s expert judgment is correct—even in the complete absence of ignorance and ineptitude. Accordingly, the “remaining” Knightian uncertainty-induced lack of confidence about the correctness of her first-order calculus (which must always be larger than zero and may be as large as 100%) will necessitate a second-order probability judgment designed to gauge how confident June is about the correctness of her first-order probability

¹¹⁵ Still, a second opinion always “cuts both ways” in terms of confidence enhancement vis-à-vis ignorance and ineptitude. Remember that Dr. Savoy estimates that, even with aggressive, multi-modal treatment, June has statistically only a 17% chance of surviving for five years. But, in an effort to not frighten June, she decides to not disclose this specific information and rather tells June that the disease is “very serious, potentially life-threatening,” and that it is important to begin treatment immediately. What could be expected to happen if a second opinion both affirms Dr. Savoy’s five-year-survival estimate and discloses that information to June, in particular, if Dr. Savoy were to mention to June that the second opinion confirms her original estimate? Notwithstanding the reduction of fallibility as regards her diagnosis in terms of ignorance and ineptitude, we would expect June to now have less confidence in her oncologist in general and also less confidence in the correctness and ultimate success of the treatment recommendations made by Dr. Savoy (i.e., she omitted telling June about a crucial aspect of the diagnosis, so what else did she miss, for example, in terms of treatment recommendations, both as regards the substance and the complete disclosure thereof?).

¹¹⁶ Indeed, Dr. Savoy has cautioned her in this regard, namely that “every patient is unique and that survival rates and other prognostic factors are only averages which vary according to the patient’s age and overall health.”

calculus—namely, that Dr. Savoy’s diagnosis and recommended treatment is “correct” and the “best” way forward for June. Obviously, June’s second-order probability judgment (possibly aided by a second opinion) will suffer from the same Knightian uncertainty cum necessary fallibility that has affected the first-order calculus,¹¹⁷ thereby, logically, necessitating a third-order probability judgment and so on into infinity.¹¹⁸ In other words, an ultra-rational June would now have to acknowledge to herself that neither patient nor doctor can ever predict how incorrect a given prognosis may turn out to be in a particular patient’s case and how useless (or even harmful) an incorrect medical treatment may be if undertaken by the particular patient.

Most likely, however, June is not deciding and proceeding in an ultra-rational manner. Rather, she is understandably shocked by the diagnosis. She also must be very scared given all of the uncertainty and change which the diagnosis and recommended treatment will bring to all aspects of her life. Most likely, among other minimally-rational decision-making strategies, she will resort to loss-aversion,¹¹⁹ optimism-bias,¹²⁰ and confirmation-bias¹²¹ behaviors, all of which would be common responses in critical-illness situations like hers.

¹¹⁷ Namely, that no number of skilled, careful, conscientious and rational physicians can correctly predict *with certainty* the correctness of a particular patient’s prognosis or the patient’s response to treatment.

¹¹⁸ See generally Reich-Graefe, *supra* note 32, at 69–70.

¹¹⁹ Here, June can be expected to prefer avoiding the chance of further loss of remaining lifetime through opting for treatment intervention than acquiring the chance of gaining more remaining lifetime (or more quality of remaining lifetime) through opting for less aggressive medical treatment not recommended by her oncologist. In fact, Dr. Savoy urges her to undergo the recommended treatment. See generally Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *ECONOMETRICA* 263 (1979) (describing loss-aversion behavior).

¹²⁰ Here, June can be expected to be over-optimistic in the sense that she will over-emphasize the positive aspects about her treatment situation and will over-estimate the probability of positive outcomes. In fact, June has been told that, given her young age and otherwise good health, she should consider having more aggressive surgery and more aggressive chemotherapy, that there are multiple post-surgery treatment options available, and that some promising clinical trials of new chemotherapeutic agents (both standard and experimental targeted therapy, as well as immunotherapy) are all available in order to “fight” her cancer into submission. See generally John Chapin & Grace Coleman, *Optimistic Bias: What You Think, What You Know, or Whom You Know?*, 11 *N. AM. J. PSYCHOL.* 121 (2009).

¹²¹ Here, June can be expected to gather and remember information selectively in order to protect the confidence and optimistic outlook “bought” through her optimism-bias behavior. In fact, even though she is told that her cytoreductive surgery may involve removal of both ovaries, the uterus, and parts of the colon, bladder, gall bladder, and other affected organs, she can be expected to discount and ignore (i.e., to selectively remember) such information in an effort to preserve and entrench a belief that hers is, at worst, an average case in which no such “complications” will materialize. See generally Raymond S. Nickerson, *Confirmation Bias: A Ubiquitous Phenomenon in Many Guises*, 2 *REV. GEN. PSYCHOL.* 175 (1998).

June has now had the debulking surgery with intraperitoneal chemotherapy and has endured a long recovery and missed eight weeks of work. She has residual pain from the surgery, digestive problems due to the removal of her gall bladder and a length of small bowel, and she has continuous nausea. She has also lost a good deal of weight due to the nausea and difficulty eating. Dr. Savoy informs June that now is the time to begin chemotherapy in order to try to kill as many of the remaining cancer cells in her body as possible. The chemotherapy proposed is proven to be effective in about 60% of patients (about 40% of patients with ovarian cancer do not respond to this particular chemotherapy drug) in reducing cancer cells and prolonging life, but its side effects are very toxic and will leave June exhausted and nauseated after each weekly infusion. There is no way to predict the likelihood or degree of response or the effects of toxicity with respect to any individual patient. June is distressed at the fact that, if she begins the chemotherapy, she will be unable to return to work and that she will have little energy to care for her teenage daughter. But June considers herself a “fighter” and believes that her cancer will respond well to the chemotherapy and that, because of her prior good health, the side effects will be manageable. At Dr. Savoy’s urging, she agrees to the treatment.

When considering a decision with respect to a cancer treatment using chemotherapy like June’s and assuming that the chemotherapy has a hypothetical 60% chance of “success” and a 40% chance of “no success” based on past application and experience—“success” in this context is simply defined as killing a significant number of cancer cells and, thus, theoretically contributing significantly to the prolongation of June’s life. It is known that chemotherapy kills cancer cells—this is an example of a knowable fact that is also actually known—a “known known.” It is also known that chemotherapy will do damage to other parts of the body and will cause severe side effects, but not known what or how bad the damage might be in a particular person like June—this is an example of a “known unknown” contingent outcome. Based on the known knowns and known unknowns, a patient must make a decision about chemotherapy treatment. The 60% chance of success only correlates with the known knowns and the known unknowns—and only as a statistical average for a homogenized group of past cancer patients that does not include June. These statistical averages are certainly useful information.¹²² But they are only one piece of

¹²² As Lawrence Schneiderman has observed, “[m]ost of us probably would agree that if a treatment has not worked in the last 100 cases, almost certainly it is not going to work if it is tried again The experience of 100 cases is attainable in many areas of medicine. This proposal is . . . one that seeks reasonable consensus where absolute certainty is impossible and therapeutic benefit is the goal.” Lawrence J. Schneiderman, *Defining Medical Futility and Improving Quality of Care*, 8 *BIOETHICAL INQUIRY* 123, 125 (2011) (adding that “in the

salient information with regard to a significantly larger choice situation that must include different chemotherapy and non-chemotherapy options and that rarely, if ever, acknowledges the inevitable necessary fallibility and Knightian uncertainty that is attached to these statistical averages (as well as to any other pieces of information relevant to June's decision-making).¹²³

Therefore, acknowledging the limited rational intelligibility of statistical averages is only a first step in accepting the full extent of true uncertainty in making medical decisions. A particular patient's decision based on a statistical 60% chance of benefit as described above must, by definition, entirely ignore the additional category of "unknown unknowns"—those contingent future variables impacting patient outcomes that are objectively unknowable at the time of decision-making.¹²⁴ To make as rational a decision as possible, physicians and patients must acknowledge that unknown unknowns always exist and that they may substantially impact the prognosis calculus (but in *ex ante* unknown and unknowable ways) so that they do not, and rationally cannot, know the extent of any unknown unknowns or how they might materialize in the particular patient's future course of treatment and treatment outcomes.¹²⁵ For example, the 60-40 success ratio might have only a 10% chance of being applicable to the particular patient (determinable only after the fact) due to unknown unknowns unique to the patient. In other words, this particular patient, because of unknown variables, is 90% likely not to fall into the average 60-40 benefit-risk calculus that applies to the broader population of superficially like patients. Notwithstanding this non-quantifiable-in-advance Knightian uncertainty (of known unknowns and unknown unknowns), patients who desire to survive will form expectations¹²⁶ based on statistical averages,

end we all will have to accept some empirical notion of medical futility or else throw all commonsense to the wind").

¹²³ Cf. Zeckhauser, *supra* note 97, at xvii–xviii.

¹²⁴ See, e.g., *id.* at xxii ("Unrecognized [ignorance] means that we are venturing forth, not anticipating that something we have not even conjectured might occur."). Cf. KARL R. POPPER, *THE LOGIC OF SCIENTIFIC DISCOVERY* 280 (1961), cited in Schneiderman, *supra* note 122, at 124 n.1 ("The old scientific ideal of *episteme*—of absolute certain, demonstrable knowledge—has proved to be an idol. The demand for scientific objectivity makes it inevitable that every scientific statement must remain *tentative forever*. It may indeed be corroborated, but every corroboration is relative to other statements which, again, are tentative. Only in our subjective experiences of conviction, in our subjective faith, can we be 'absolutely certain.'").

¹²⁵ Cf. Zeckhauser, *supra* note 97, at xxii ("Ignorance, although it cannot be conquered, can be defended against. An attentive decision theorist cannot see into the future, but should always contemplate the possibility of consequential surprise. A decision maker should always be aware of the factor of Ignorance and should try to draw inferences about its nature from the lessons taught by history, from experiences recounted by others, from accounts given in the media, from possibilities developed in literature, etc. Decision makers who anticipate Ignorance in this fashion are in a situation of Recognized Ignorance.").

¹²⁶ See Niklas Luhmann, *Familiarity, Confidence, Trust: Problems and Alternatives*, in

although these expectations may be irrational (or more imperfectly rational than warranted). Physicians, when failing to acknowledge to themselves or disclose to patients this form of necessary fallibility, become complicit in the patients' demanding and receiving potentially ineffective and harmful care.

In the specific context of medical decision-making, the concept of "clinical uncertainty" is one form of necessary fallibility. The term clinical uncertainty refers to the idea that, despite growing bodies of evidence with respect to particular medical conditions,¹²⁷ their prognoses, and the potential efficacy of treatments, there is no way for a clinician to be entirely sure that the relevant body of evidence applies to or will predict the outcomes for any individual patient. Patients facing terminal illness frequently want their treating physicians to advise them as to the "best" treatment for their illness or condition. The problem is that, for multiple reasons, there is many times no obvious, medically "best" approach for any particular patient at any particular time. As two commentators explained:

The existence of an information mountain provides a myth of certainty for the patient, the public and perhaps for health care policy-makers. Certainty is an illusion. In most professional spheres the expert is more critical of the available evidence, than is the lay person. Hopefully, clinicians are taught to be more critical than patients but they are faced with a dilemma. They appear to be very well informed yet are acutely aware of the fallibility of the information that is expected to guide their practice. How do clinicians respond to this dilemma? Their day consists of a succession of points at which decisions have to be made on the basis of incomplete and inadequate information and in a context in which risk, never mind error, is outlawed.¹²⁸

First, patients must understand that what is "best" depends at least to some extent on the patient's own goals, values, and preferences. While one patient may be seeking maximal life extension no matter what the costs in terms of adverse effects, increased suffering, or medical dollars, another patient may prefer to focus on maintaining physical and intellectual functionality even at

TRUST: MAKING AND BREAKING COOPERATIVE RELATIONS 94, 97 (Diego Gambetta ed., 1988) ("You cannot live without forming expectations with respect to contingent events and you have to neglect . . . the possibility of disappointment . . . because it is a very rare possibility, but also because you do not know what else to do. The alternative is to live in a state of permanent uncertainty . . .").

¹²⁷ For further discussion of the interrelationship between clinical uncertainty and evidence-based medicine, see generally Trisha Greenhalgh, *Uncertainty & Clinical Method, in CLINICAL UNCERTAINTY IN PRIMARY CARE: THE CHALLENGE OF COLLABORATIVE ENGAGEMENT* 23 (L.S. Sommers & J. Launer eds., Springer Science+Business Media 2013); Stefan Timmermans & Alison Angell, *Evidence-Based Medicine, Clinical Uncertainty, and Learning to Doctor*, 42 J. HEALTH & SOC. BEHAV. 342–59 (2001).

¹²⁸ A.F. West & R.R. West, *Clinical Decision-Making: Coping with Uncertainty*, 78 POSTGRADUATE MED. J. 319, 319 (2002).

the cost of a potentially shorter lifespan. For this latter group of patients, the prospect of loss of meaningful ability to interact with the world might drive decisions to focus more on palliation of symptoms than on (hypothetical) life prolongation. Second, clinical uncertainty means that the ability of physicians and patients to make rational calculations about the comparative desirability of various options within the context of the patient's subjective goals is always limited by the imperfections of predictive data on therapeutic response, adverse effects, and prognosis.¹²⁹

It is, therefore, impossible to determine with any rational certainty a “best” or “optimal” treatment before the fact. Even after the fact, given the logical lack of any availability of a same-patient comparator treatment course of action and outcome, uncertainty will remain insurmountable—who is to say that a different treatment might not have been better or that *all* other available treatments would have been worse? Patients (and perhaps physicians) mistakenly view the “best” or “optimal” treatment recommendations and resultant decisions like forks in the road at which one can take a “right turn” or a “wrong turn” when they are in fact more like a river delta into which multiple rivers flow but all of which end up in the sea.¹³⁰ Choosing the best treatment is very different from a financial

¹²⁹ See generally JEROME GROOPMAN, *HOW DOCTORS THINK* (2007) (discussing clinical uncertainty in diagnosis and treatment recommendations); see also George A. Diamond, *Future Imperfect: The Limitations of Clinical Predictive Models and the Limits of Clinical Prediction*, 14 J. AM. C. CARDIOLOGY 12A (1989) (describing different ways in which statistical regressive models to predict clinical outcomes can go awry). Prognosis for meaningful recovery in many medical circumstances, such as for stroke patients, requires a discussion between physician and patient of complex variables such as the likelihood of regaining degrees of physical function and this, too, is difficult to predict as a scientific matter because there are so many variables. A meta-analysis of data from multiple studies on the recovery of stroke patients who were receiving mechanical ventilation found that prognosis was generally poor, with 58% of these patients dying within thirty days, but that a minority of patients survived without severe disability. See Robert G. Holloway et al., *Prognosis and Decision Making in Severe Stroke*, 294 JAMA 725, 725–27, tbl.1 (2005). The authors of this study caution that physicians can be unrealistically optimistic or pessimistic in various circumstances and argue that physicians should think carefully about how they convey prognostic evidence. See *id.* at 729, tbl.3 (offering the example of explaining to a patient a surgical intervention as giving a person “a 50% better chance of an improved outcome” versus that same intervention increasing the person’s chance “of an improved outcome from 5% to 7.5%” (internal quotation marks omitted)). Prognosis and optimal treatment is similarly difficult to predict in the case of patients with cardiovascular disease. See Haider J. Warraich et al., *How Medicine Has Changed the End of Life for Patients with Cardiovascular Disease*, 70 J. AM. C. CARDIOLOGY 1276, 1276–77 (2017) (explaining how improvements in treatment of patients with heart failure have resulted in longer lives and fewer deaths from sudden cardiac death but less predictable end-of-life progressions and more time with disability, comorbidity and frailty for these patients).

¹³⁰ For readers who are reminded of the tributaries-and-rivers metaphor in Judge Andrews’ dissent in the *Palsgraf* case, this is no coincidence. Just as discerning how one causal actor among several plays a role in an injury, it is similarly difficult to determine after the fact whether one chosen treatment among several was “the best.” See *Palsgraf v. Long Island R.R. Co.*, 162 N.E. 99, 103 (N.Y. 1928) (Andrews, J., dissenting) (“Should analogy be

investment in which one attempts to buy the “best” stock. With stock investing, one can look at past data and make a bet. If the initial money invested creates a return, one can assess retrospectively whether the chosen stock gave the best return on investment by comparing how the same amount of money would have performed if invested in a different stock. With humans and medical treatment, by contrast, one can never look back and assess with any certainty whether a different choice would have been “better”—because humans can only make the investment once and with no ability to compare alternative outcomes.¹³¹ Moreover, as soon as a treatment decision has been made and implemented, biases will often continue to kick in in order to shore up confidence in the decision. In this case, June’s belief that she is a “fighter” will support her confidence in the decision to proceed with chemotherapy despite its toxicity. At some point—if not at many points in the treatment of life-threatening illness—patients have to make a decision to begin (or forego) particular treatment, and they naturally crave reassurance that they are doing the “best,” or at least, the “right” thing. These decisions are perhaps “informed” to the extent that physicians provide information about likelihood of success, but the concept of “informed,” even in an optimally informed scenario, is greatly limited by the fallibility factors described above.

Six months have passed. Unfortunately, June has not responded well to the chemotherapy. Her various tumors continue to grow, and she has experienced very severe side effects including nausea, dizziness, and wasting. She is now extremely weak and has lost thirty pounds. The tumors in her lungs have continued to grow, making it more and more difficult to breathe. She also cannot take in enough nutrition orally to maintain even her very diminished body weight. June has come to the emergency

thought helpful, however, I prefer that of a stream. The spring, starting on its journey, is joined by tributary after tributary. The river, reaching the ocean, comes from a hundred sources. No man may say whence any drop of water is derived. Yet for a time distinction may be possible. Into the clear creek, brown swamp water flows from the left. Later, from the right comes water stained by its clay bed. The three may remain for a space, sharply divided. But at last, inevitably no trace of separation remains. They are so commingled that all distinction is lost. As we have said, we cannot trace the effect of an act to the end, if end there is.”).

¹³¹ In addition, while modern portfolio theory would hold that a rational investor would invest in a diversified portfolio of stock in order to spread risk, *see, e.g.*, HARRY M. MARKOWITZ, PORTFOLIO SELECTION: EFFICIENT DIVERSIFICATION OF INVESTMENTS 6 (2d ed. 1991), a patient cannot invest into a “diversified portfolio of treatment” in order to minimize the “risk” of any future “underperforming” treatment. Similarly, a holder of stock in a publicly-held corporation enjoys limited liability—if, in the worst-case scenario, the entire investment is lost in the corporation’s bankruptcy, no other personal assets of the stockholder would be affected. The stockholder enjoys limited-to-no-recourse liability. In contrast, a patient’s “investment” in a particular treatment option that fails completely may, in the worst-case scenario, amount to a death sentence. Therefore, a patient always bears “full-recourse liability” for bad treatment choices.

room at the hospital and has been admitted to the critical care unit. Dr. Savoy recommends that June have a feeding tube surgically implanted in order to supplement her nutrition and that June be intubated so that a ventilator can assist with her breathing. Dr. Savoy suggests that these measures will “buy time” so that they can pursue the possibility of enrolling June in a clinical trial to test an immunotherapy drug that has been approved to treat other cancers but has not been thoroughly tested for metastatic ovarian cancer. Dr. Savoy mentions that she is one of the principal investigators in the clinical trial, which June understands to mean that Dr. Savoy believes in the potential of the studied therapy. June agrees to the feeding tube and ventilator, hoping to live long enough to see both her children graduate from high school and university respectively. She also has heard good things about immunotherapy and hopes that it might make her tumors disappear or at least shrink significantly so that she can live some additional months or years feeling relatively healthy.

Unfortunately, further testing confirms that June has certain clinical manifestations of her disease that make her ineligible for the clinical trial. She is now in the CCU at the hospital, intubated and receiving nutrition through a feeding tube. Her pain is well-managed but she is not likely to experience any improvement to her condition. Although June is frightened and sad, she is stable for now and enjoys daily visits from her children and friends. Dr. Savoy explains that June can choose to cease the life-sustaining interventions at any time. She assures June that, if she chooses to stop these technologies, the palliative care staff will be able to manage any symptoms such as pain and shortness of breath. She also asks June whether she would like to sign a do-not-resuscitate order (DNR) so that, if she goes into cardiac arrest, she will be allowed to die.

The same effects of clinical uncertainty described with respect to the decision about whether June should consent to chemotherapy also applied when she consented to artificial nutrition and hydration. At the time that she consented, she had no idea whether she would be admitted to the immunotherapy clinical trial and no idea how long she would have to live either with the immunotherapy or without it. These are two examples of the known unknowns inherent in the choice situation. Even if Dr. Savoy had more explicitly described her potential conflict of interest as a principal investigator of the trial, it is likely that June would still have trusted that Dr. Savoy was acting in June’s best medical interests in proposing the trial and the life-prolonging interventions that would be necessary for her to survive long enough to enroll in the trial. Now June must decide whether and, if so, when she should request that these life-sustaining technologies be withdrawn so that she can die peacefully. In these circumstances, many conscious

patients will find it difficult to contemplate foregoing additional days or weeks of life but simultaneously fear “losing control” of the situation, i.e., lapsing into unconsciousness or losing decisional capacity and being “stuck” with a prolonged death due to the effects of the life-sustaining technologies. This series of events illustrates how clinical uncertainty can lead to the default choice of continuing existing therapy and adding more interventions (instead of perhaps scaling back some treatment)—even when this situation is not what June would have ultra-rationally chosen if well-informed in advance.¹³²

2. Non-Clinical Uncertainty

In addition to clinical uncertainty, a separate layer of what we call “non-clinical uncertainty” adds complexity to the decision-making process, and it is useful to distinguish the two concepts in the context of medical decision-making. Non-clinical uncertainty can refer to, among other things, the *ex ante* uncertainty that every patient experiences with respect to what level of pain, disability, and physical and emotional distress (resulting from both the disease itself and the adverse effects of treatment) she can or is willing to tolerate. This tolerance level will, naturally, change with the experience of the disease and treatment over time and in the context of changes in the patient’s life circumstances. Unforeseeable and unknowable-in-advance changes in personal circumstances might also impact treatment decisions and consequent patient tolerance for disability and suffering. With respect to June, for example, she might discover that her sixteen-year-old daughter is pregnant, and this discovery might substantially alter her surviving-thriving calculus, in terms of her willingness to now tolerate more severe adverse effects of treatment in a quest to prolong her survival, take care of her daughter and future grandchild, and therefore perhaps enjoy an additional period of thriving.

In addition to this non-clinical uncertainty inherent in June’s own life, various aspects of health care delivery outside of the clinical realm also influence a patient’s ability to make the “best” health care decisions. Imperfectly rational calculation in a Williamsonian world gets more complex because it is severely implicated by bounded rationality and accompanying strategic external uncertainty—in particular, with regard to global aspects of health care delivery and culture that make end-of-life decision-making occur under suboptimal conditions.¹³³ These decisions therefore become

¹³² Instead, June has ended up in a situation where her choice is between cutting her remaining life short (i.e., even less surviving of what is left of surviving) and continuing remaining life under the burden of life-sustaining technologies (i.e., even less thriving of what is left of thriving).

¹³³ See Barry R. Furrow, *Smashing into Windows: Limits of Consumer Sovereignty in Health Care*, in *TRANSPARENCY IN HEALTH AND HEALTH CARE IN THE UNITED STATES: LAW AND ETHICS* (I. Glenn Cohen, Holly Fernandez Lynch, Barbara J. Evans & Carmel Shachar

significantly more “expensive” in terms of opportunity cost. A multiplicity of factors contribute to the earlier discussed overutilization of aggressive therapeutic care for potentially fatal illness and at the end of life. They aggravate the uncertainty (acknowledged or not) in which each and every treatment decision is necessarily embedded and create serious obstacles to a non-flawed, confident gathering and processing of decision-relevant information by both patients and health care providers. In response, patients and their physicians frequently—if not routinely and by default—short-circuit the previously-described initiation and ratification segments of rational decision-making and revert, almost reflexively, to a quantity over quality approach.

Broadly speaking, the U.S. medical system operates within a culture of denial of death. A combination of trends provides evidence of denial. Longer average lifespans, together with the promise of new therapies, encourages individuals to avoid confronting mortality. Some researchers now promote the possibility of substantial life extension, even of a “cure for death,”¹³⁴ and speak of “[d]eath [a]s a series of preventable diseases”¹³⁵ Although commentators have criticized this mindset,¹³⁶ research into lifespan extension continues with little regard for the consequences of the distorted message it sends.¹³⁷ This quest for a fountain of youth denies the reality of mortality and also ignores the fact that more years of life do not necessarily translate into a better quality of remaining life. These cultural influences have played a significant role in transforming the natural process of dying into a technologically-driven and, often, illogically overzealous

eds., Cambridge University Press 2018) (describing limits on patient capacity to make health care decisions and behavioral interventions designed to compensate for bounded rationality limits); Omri Ben-Shahar & Carl E. Schneider, *The Failure of Mandated Discourse*, 159 U. PA. L. REV. 647, 720–29 (2011) (describing the negative impact of various cognitive processes and deficiencies on medical (and other) decision-making); Wendy Netter Epstein, *Nudging Patient Decision-Making*, 92 WASH. L. REV. 1255, 1274–85 (2017) (describing the negative impact of various biases and heuristics on informed medical decision-making).

¹³⁴ *Closing in on the Cure for Death*, FIGHT AGING! (Sept. 2, 2003), <https://www.fighting.org/archives/2003/09/closing-in-on-the-cure-for-death.php>.

¹³⁵ Daniel Callahan, *Death and the Research Imperative*, 342 NEW ENG. J. MED. 654, 654–55 (2000) (quoting William Haseltine, then CEO of Human Genome Sciences).

¹³⁶ *See id.* at 655 (arguing that research “should not, even implicitly, have eradication of death as its goal” because it supplants emphasis on the importance of relieving suffering at the end of life and it “promotes the idea among the public and physicians that death represents a failure of medicine.”); *see also* Penni Crabtree, *Fountain of Youth with Just a Shot in the Arm?*, SAN DIEGO UNION TRIB., July 25, 2004, at A1 (explaining that mainstream science has debunked anti-aging claims as “hucksterism” that offers little or no benefit but poses potentially serious health risks).

¹³⁷ Recent news stories document the efforts of tech billionaires to fund research into lifespan extension. *See, e.g.*, Ariana Eunjung Cha, *Tech Titans’ Latest Project: Defy Death*, WASH. POST (Apr. 4, 2015), <http://www.washingtonpost.com/sf/national/2015/04/04/tech-titans-latest-project-defy-death/>.

prolongation of the lives of terminally ill patients—at all costs.¹³⁸

Physicians' professional culture also contributes to the problem. Physicians themselves sometimes exhibit a striking reluctance to cease curative care for their patients, acknowledge that the patient is dying and turn to symptom management, and instead will continue to treat the illness aggressively or implement life-prolonging technologies such as artificial nutrition or ventilation. While physicians' attitudes towards these issues can vary according to their specialty,¹³⁹ some specialists, such as surgeons, tend to have more difficulty relinquishing control over post-surgical patients who are not faring well.¹⁴⁰ One physician tells a story of an oncologist who was upset about his patient's decision to stop chemotherapy and enroll in hospice care. The oncologist confronted the hospice physician and said, "We might as well just be walking away, and we might as well just shoot [the patient] now."¹⁴¹ Interestingly, physicians themselves, when fatally ill, frequently refuse invasive treatment and life-prolonging technology, including CPR, preferring instead to accept the prognosis and spend their remaining time feeling as well as possible.¹⁴² Although the data is limited, it suggests that

¹³⁸ See Noah, *supra* note 4, at 22–24 (describing and discussing longevity research and cultural denials of mortality).

¹³⁹ See Soumitra R. Eachempati et al., *The Surgical Intensivist as Mediator of End-of-Life Issues in the Care of Critically Ill Patients*, 197 J. AM. C. SURGEONS 847, 849–51 (2003).

¹⁴⁰ See *id.* at 850 (adding that surgeons may also wish to avoid appearing to lack confidence in themselves or may worry that losing a surgical patient will ruin their statistical success numbers).

¹⁴¹ See Kevin B. O'Reilly, *End-of-Life Care: Pain Control Carries Risk of Being Called a Killer*, AM. MED. NEWS (Apr. 16, 2012), <http://www.amednews.com/article/20120416/profession/304169955/2/> (relating an anecdote from a physician who directs a hospice program).

¹⁴² See Vyjeyanthi S. Periyakoil et al., *Do Unto Others: Doctors' Personal End-of-Life Resuscitation Preferences and Their Attitudes Toward Advance Directives*, PLOS ONE (May 28, 2014), <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0098246> (finding that attitudes towards advance directives varied substantially by physician subspecialty, race and ethnicity, and gender and that physicians themselves strongly prefer to avoid high-intensity treatments for themselves at the end of life—over 88% of physicians in one of the studied groups stated that they would forego resuscitation); Teresa A. Hillier et al., *Physicians as Patients: Choices Regarding Their Own Resuscitation*, 155 ARCHIVES INTERNAL MED. 1289, 1289–92 (1995) (finding that, when physicians were asked whether they would want cardiopulmonary resuscitation if diagnosed with Alzheimer's Disease, or various other advanced chronic diseases at various ages, most physicians would not want CPR, particularly with advancing age); Gregory P. Gramelspacher et al., *Preferences of Physicians and Their Patients for End-of-Life Care*, 12 J. GEN. INTERNAL MED. 346, 349–50 (1997) (finding that physicians preferred significantly less care at end of life than patients usually receive); cf. Garrett M. Chinn et al., *Physicians' Preferences for Hospice if They Were Terminally Ill and the Timing of Hospice Discussions With Their Patients*, 174 JAMA INTERNAL MED. 466, E1, E1–E2 (2014) (finding that physicians who preferred hospice for themselves were more likely to discuss hospice with terminally ill cancer patients); Ken Murray, *How Doctors Die: It's Not Like the Rest of Us, But it Should Be*, ZOCALO PUB. SQUARE (Nov. 30, 2011), <http://zocalopublicsquare.org/thepublicsquare/2011/11/30/how-doctors-die/read/nexus>.

some physicians may internally acknowledge impending death to themselves while avoiding discussing it with their patients.

Another cause of overutilization of medical tests and interventions is the fear of making a medical error or being accused of hastening death, with the accompanying prospect of malpractice litigation.¹⁴³ Fear of liability, and an understandable reluctance to deprive patients of hope, has created a culture in which physicians may hesitate to initiate a discussion about ceasing therapeutic care or withdrawal or withholding of life-sustaining medical technologies unless the patient or family broaches the subject. Research suggests that a significant number of physicians in the United States has been accused of, investigated for, and occasionally prosecuted for murder and euthanasia in circumstances in which physicians discontinued life-supportive measures, provided drugs for pain control, or sedated patients whose suffering they were unable to alleviate in other ways.¹⁴⁴ Even when a patient has a DNR order or other advance directive in place, physicians may override the directive out of concern for potential liability.¹⁴⁵ Nevertheless, court decisions penalizing physicians and hospitals for non-compliance with advance directives, along with administrative sanctions, are becoming more common.¹⁴⁶

Pinpointing the drivers behind unnecessary care, particularly at the end of life, remains difficult, probably because the overall trend results from a

¹⁴³ See Alan Meisel et al., *Seven Legal Barriers to End-of-Life Care: Myths, Realities, and Grains of Truth*, 284 JAMA 2495, 2495 (2000) (explaining that physicians overestimate the risk of malpractice lawsuits and that poor communication by physicians about end-of-life issues increased the risk of litigation); Palfrey, *supra* note 19, at e(21)(1) (“Most doctors are intensely risk-averse. We don’t tolerate uncertainty. Not wanting anything bad to happen, we reflexively overtest and overtreat in order to protect our patients—and ourselves.”); Phillip Wickenden Bale, *Honoring Patients’ Wishes for Less Health Care*, 171 ARCHIVES INTERNAL MED. 1200 (2011) (describing the repeated hospitalization of a very elderly patient in a long term care facility in contravention of surrogate decision-makers’ request to provide only comfort care in apparent reaction to a government fine of the facility due to the accidental death of another patient).

¹⁴⁴ See Nathan E. Goldstein et al., *Prevalence of Formal Accusations of Murder and Euthanasia Against Physicians*, 15 J. PALLIATIVE MED. 334 (2012) (finding, based on survey data, that over half of respondents had been accused of euthanasia or murder by a patient or patient’s family member within the previous five years and 4% of those surveyed had been formally investigated for hastening a patient’s death); Lewis Cohen et al., *Accusations of Murder and Euthanasia in End-of-Life Care*, 8 J. PALLIATIVE MED. 1096, 1096–97, 1101 (2005) (describing examples of such accusations along with occasional prosecutions and providing data for rates of prosecution in end-of-life care cases).

¹⁴⁵ INST. OF MED., DYING IN AMERICA: IMPROVING QUALITY AND HONORING INDIVIDUAL PREFERENCES NEAR THE END OF LIFE 133 (2015), <http://www.nationalacademies.org/hmd/Reports/2014/Dying-In-America-Improving-Quality-and-Honoring-Individual-Preferences-Near-the-End-of-Life.aspx> (finding that physicians worried that complying with advance directives could lead to malpractice liability).

¹⁴⁶ See Thaddeus Mason Pope, *Legal Briefing: New Penalties for Ignoring Advance Directives and Do-Not-Resuscitate Orders*, 28 J. CLINICAL ETHICS 74, 75–76 (2017).

combination of patient and family requests for such care and physicians' unwillingness to be candid about the likely ineffectiveness of the care in prolonging life or improving quality of life. There is, however, clearly a causal connection between overtreatment at the end of life and poor communication between physicians and patients. Research suggests that physicians avoid or delay disclosing details about patients' prognoses or spontaneously initiating discussions about ending therapeutic care and making the transition to hospice.¹⁴⁷ With respect to patients with likely incurable cancers, research demonstrates that, while two-thirds of physicians tell their patients at the initial visit that they have an incurable form of cancer, only one-third ever state the prognosis at any point in the treatment process.¹⁴⁸ Physicians also tend to overestimate the remaining life spans of seriously ill patients and to convey prognoses in overly optimistic terms.¹⁴⁹ Moreover, a remarkable number of physicians acknowledge deliberately deceiving patients when discussing prognoses. In a recent survey of physicians, one in ten physicians admitted to lying to a patient within the previous year, and over half acknowledged that they had been unreasonably optimistic about a patient's prognosis.¹⁵⁰ Physicians also report that even

¹⁴⁷ See, e.g., Nancy L. Keating et al., *Physician Factors Associated with Discussions About End-of-Life Care*, 116 *CANCER* 998 (2010) (concluding that most physicians surveyed indicated that they would not discuss end-of-life decisions and choices with terminally ill patients until they exhibited symptoms or there were no remaining treatments available); Bethel Ann Powers et al., *Meaning and Practice of Palliative Care for Hospitalized Older Adults with Life Limiting Illnesses*, 2011 *J. AGING RES.* (2011) (discussing the distinctions between and intersection of palliative care and end-of-life care and recommending better training of health care providers to understand that "end-of-life" is not a "well-demarcated period of time before death").

¹⁴⁸ See Belinda E. Kiely et al., *Thinking and Talking About Life Expectancy in Incurable Cancer*, 38 *SEMINARS ONCOLOGY* 380, 380–81 (2011).

¹⁴⁹ See Nicholas A. Christakis & Elizabeth B. Lamont, *Extent and Determinants of Error in Doctors' Prognoses in Terminally Ill Patients: Prospective Cohort Study*, 320 *BRIT. MED. J.* 469, 470–71 (2000) (finding that, in predicting patients' remaining life expectancies, physicians were correct only 20% of the time and were over-optimistic 63% of the time and concluding that a closer doctor-patient relationship was associated with over-optimistic predictions); Elizabeth B. Lamont & Nicholas A. Christakis, *Prognostic Disclosure to Patients with Cancer Near the End of Life*, 134 *ANNALS INTERNAL MED.* 1096 (2001) (finding that, in communicating expected survival times to patients with terminal cancer, physicians were frank with patients only 37% of the time, provided deliberately inaccurate survival estimates 40.3% of the time and preferred to offer no estimate for 22.7% of the patients studied). The authors concluded that "for all of these patients, physicians were able and willing to formulate objective prognoses, whether accurate or not, but had difficulty communicating them, even to insistent patients"; cf. Elisa J. Gordon & Christopher K. Daugherty, *Hitting You Over the Head: Oncologists' Disclosure of Prognosis to Advanced Cancer Patients*, 17 *BIOETHICS* 142, 142–68 (2003) (describing the results of a small focus group discussion with physicians in which many expressed reluctance to convey statistical details about prognosis because they felt that the information would seem too abrupt and would interfere with patients' hope).

¹⁵⁰ See Lisa I. Iezzoni et al., *Survey Shows That at Least Some Physicians Are Not Always Open or Honest with Patients*, 31 *HEALTH AFFAIRS* 383, 383–88 (2012); Sandeep Jauhar, *The*

when cancer patients specifically request prognostic estimates, they would either withhold their opinion or intentionally provide an inaccurate figure in almost two-thirds of cases.¹⁵¹ The logical result is flawed decision-making by patients, creating an uncontrolled-for risk that patients will pursue aggressive and debilitating treatments in the misguided hope of prolonging life and without fully understanding (i) their respective choice situations and (ii) the potentially negative welfare implications of their choices.

All of these already suboptimal decisional contexts are exacerbated by the fact that the system of reimbursement for health care in the federal Medicare program often distorts the type and quantity of care offered, by incentivizing physicians to provide more treatments and tests than necessary. Although Medicare now reimburses physicians for having advance care planning discussions with patients,¹⁵² this provision may do little to encourage the iterative conversations over the course of treatment for a serious illness that allow physicians to convey to patients changes in the calculus regarding continuing treatment. Moreover, the Medicare program still reimburses physicians and hospitals in some situations on a fee-for-service basis. Simply put, this means that the more treatments, tests, and procedures the patient receives, the more reimbursement the physician and/or hospital will receive.¹⁵³ Many commentators have recognized the general

Lies That Doctors and Patients Tell, N.Y. TIMES (Feb. 20, 2014, 10:21 AM), http://well.blogs.nytimes.com/2014/02/20/the-lies-that-doctors-and-patients-tell/?_r=0 (explaining, with reference to his over-treatment of a very elderly and dying patient, that “[a]t their core, my actions were a kind of deception—convincing myself, despite all the evidence, that I could save her, stay the inexorable course of her disease. Perhaps I was afraid of failure, or embarrassed by my impotence. Those last few days of her life she almost ceased to be a person for me. She became an experiment, a puzzle—one that I desperately wanted to solve”); *cf.* *Arato v. Avedon*, 858 P.2d 598 (Cal. 1993) (involving a claim by a deceased patient’s family that the physicians’ failure to disclose specific information about survival rates and times with pancreatic cancer impaired the patient’s ability to get his financial and business affairs in order). Of course, if the patient’s preference is to avoid receiving explicit information about prognosis, this is a different matter.

¹⁵¹ See Lamont & Christakis, *supra* note 149, at 1096–98 (concluding that physicians would provide an honest estimate only 37% of the time and would provide no estimate, or a deliberate overestimate or underestimate 63% of the time).

¹⁵² See CTRS. FOR MEDICARE & MEDICAID SERVS., ADVANCE CARE PLANNING 2 (2018), <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/AdvanceCarePlanning.pdf> (explaining that “[e]ffective January 1, 2016, the Centers for Medicare & Medicaid Services (CMS) pays for voluntary Advance Care Planning (ACP) under the Medicare Physician Fee Schedule (PFS) and the Hospital Outpatient Prospective Payment System (OPPS).”). It remains to be seen whether this small change will have any measurable impact on the pattern of heavy utilization of therapeutic and life-prolonging care in patients with serious illness.

¹⁵³ See, e.g., Stephen F. Jencks et al., *Rehospitalizations Among Patients in the Medicare Fee-for-Service Program*, 360 NEW ENG. J. MED. 1418, 1419 (2009) (discussing the Medicare fee-for-service reimbursement system in the context of rates of rehospitalization for Medicare beneficiaries); Robert Steinbrook, *The End of Fee-for-Service Medicine? Proposals for Payment Reform in Massachusetts*, 361 NEW ENG. J. MED. 1036, 1036 (2009) (discussing the

problem of overutilization of health care resources and have recommended the implementation of various programs designed to target this problem.¹⁵⁴

Physicians also must recognize that patients frequently fail to understand the likely efficacy of certain invasive treatments, either because this information is not included in the discussion or because it is impossible to predict with any accuracy the curative or palliative effects of the treatment on any particular patient. Patients accept treatment with the hope of a cure, but sometimes fail to understand that a proffered treatment may, at best, prolong life. With respect to chemotherapy for metastatic cancer, one study found that 69% of patients with lung cancer and 81% of patients with colorectal cancer mistakenly believed that the chemotherapy they were receiving was likely to cure their disease.¹⁵⁵ The problem with this unrealistic or inaccurate expectation of cure is that patients will be more likely to consent to treatment that, while it may possibly palliate symptoms or even extend life, is also likely to cause significant toxic effects that will impair quality of life. Patients who are fully apprised and, thus, at least in theory have the informational tools to understand that chemotherapy under these circumstances cannot cure their illness and will at best have a palliative effect on it may weigh the value of this treatment differently and may be more likely to decline it. Another study suggests that some physicians (and thus, their patients) misperceive certain types of care as palliative when the evidence suggests that they are not providing any benefit and may cause iatrogenic harm to dying patients. In this regard, this study indicates that many cancer patients are offered chemotherapy for palliative purposes when they are in the end stages of their disease, even though the evidence suggests that chemotherapy worsens quality of life near death for many patients.¹⁵⁶

incentives for overutilization of medical services created by a fee-for-service payment system). There is some promising news on this front. The U.S. recently passed a bill that will attempt to remedy the worst effects of fee-for-service medicine in the Medicare Program. The revamped reimbursement system will pay physicians based on the quality of the care they deliver rather than the quantity of care. See Carol W. Cassella, *Keep Patients Healthy, and Doctors Sane*, N.Y. TIMES (Apr. 15, 2015), http://www.nytimes.com/2015/04/16/opinion/keep-patients-healthy-and-doctors-sane.html?_r=0; see also Siobhan Hughes, *House Passes Medicare 'Doc Fix' Bill*, WALL ST. J. (Mar. 26, 2015, 7:03 PM), <http://www.wsj.com/articles/house-passes-medicare-doc-fix-bill-1427386278>.

¹⁵⁴ See, e.g., Christine K. Cassel & James A. Guest, *Choosing Wisely: Helping Physicians and Patients Make Smart Decisions About Their Care*, 307 JAMA 1801, 1801–02 (2012) (describing various programs such as Choosing Wisely, Less is More, and the Good Stewardship Working Group that aim to educate physicians about commonly overutilized tests and procedures).

¹⁵⁵ See Jane C. Weeks et al., *Patients' Expectations About Effects of Chemotherapy for Advanced Cancer*, 367 NEW ENG. J. MED. 1616, 1620 (2012) (noting that, “[p]aradoxically, patients who reported higher scores for physician communication were also at higher risk for inaccurate expectations” regarding the curative potential of chemotherapy).

¹⁵⁶ See Prigerson et al., *supra* note 10, at 778–84 (evaluating the effect of chemotherapy on patients with end-stage cancer and varying functional statuses and concluding that chemotherapy

All of these non-clinical, contextual problems surrounding the delivery of health care increase the uncertainty inherent in June's decision-making, even if she is unaware of them. Table 1 provides a systematic summary of the known knowns, known unknowns, and unknown unknowns, which an ultra-rational June would have to competently calculate for purposes of making a treatment decision with the highest attainable utility and the smallest remaining amount of clinical and non-clinical uncertainty:

Table 1
June's World of Uncertainty

Clinical Uncertainty	<u>Known Knowns</u>	<ul style="list-style-type: none"> • Chemotherapy kills cancer cells • Chemotherapy causes toxic adverse effects • Surgery and anesthesia have inherent risks for all patients
	<u>Known Unknowns</u>	<ul style="list-style-type: none"> • June's diagnosis and treatment prognosis may be incorrect • June may not respond to the proposed chemotherapy • June may have more or fewer complications and adverse effects than average
	<u>Unknown Unknowns</u>	<ul style="list-style-type: none"> • June may be so atypical in her physiologic makeup that the statistics about potential response to chemotherapy simply do not apply to her • June may, for example, have an allergic reaction to the chemotherapy drug that has never been encountered before • June may be "lucky" in that a "miracle" cure for Stage IV ovarian cancer is discovered in time
Non-Clinical Uncertainty	<u>Known Knowns</u>	<ul style="list-style-type: none"> • June is a 46-year-old woman with two children • June is mortal and will die eventually (although perhaps not from ovarian cancer) • June's insurance coverage contains limitations that will cause her to accrue uncovered medical costs which she will find difficult to afford

did not improve quality of life near death for patients with moderate and poor performance status and actually worsened quality of life near death for patients with good performance status).

	<u>Known Unknowns</u>	<ul style="list-style-type: none"> • June's physician may be unduly optimistic about treatment efficacy • June herself may be unduly optimistic about her tolerance of treatment complications and adverse effects • June's physician may have a financial conflict of interest in recommending the immunotherapy clinical trial
	<u>Unknown Unknowns</u>	<ul style="list-style-type: none"> • June may die of something entirely unforeseeable and unrelated during treatment (e.g., being hit by a bus) • June may (temporarily) lose decisional capacity in a manner not related to her treatment • June may become unable to comply with her treatment regime because she is grieving the sudden loss of a loved one, loses her ability to drive herself to her treatment appointments, or is simply "giving up on herself"

3. Bayesian and Non-Bayesian Updating

The field of behavioral economics has critiqued the idealistic, utopian oversimplification of the Williamsonian-world rational choice model and has demonstrated how rational errors and cognitive flaws further affect and constrain—even within the bounds of bounded rationality and opportunism—rationally optimal human decision-making with principled and predictable regularity. Unlike bounded rationality and opportunism, these errors and flaws (heuristics and biases)¹⁵⁷ are alterable constraints to ultra-rational decision-making and therefore, in principle, can be remedied through more skilled, careful, and conscientious decision-making processes. In real life, however, decisional agents are, for good reason, path-dependent¹⁵⁸ and derive, from the vast, homogenized totality of all decisions

¹⁵⁷ See, e.g., Thomas Gilovich & Dale Griffin, *Introduction—Heuristics and Biases: Then and Now*, in *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT 1* (Thomas Gilovich et al. eds., Cambridge University Press 2002); Kahneman & Tversky, *supra* note 119. As used throughout this Article, the terminology of "heuristics and biases" is meant to include not only insights developed in behavioral economics as to alterable cognitive shortcuts and constraints to ultra-rational decision-making, but to also comprise other decisional constraints beyond bounded rationality and opportunism as pervasively discussed in non-traditional decision research, for example, the role of affect, emotion, motivation, and risk perception on decisional behavior and the function of naturalistic expert decision-making in dynamic, evolving choice environments. See generally Vimla L. Patel et al., *Emerging Paradigms of Cognition in Medical Decision-Making*, 35 *J. BIOMEDICAL INFORMATICS* 52 (2002).

¹⁵⁸ "Path-dependency" is understood here in a non-pejorative, purely descriptive manner. The same is true for "rational errors" and "cognitive flaws." Cf. Mousavi & Gigerenzer, *supra* note 79, at 367 ("Heuristics per se are neither good nor bad."); Odette Wegwarth, *Smart Strategies for Doctors and Doctors-in-Training: Heuristics in Medicine*, 43 *MED. EDUC.* 721, 727 (2009) ("Today's medical students should learn and understand that heuristics are neither good nor bad *per se*, but that their reliability and usefulness interplays with environmental circumstances, such as the inherent uncertainty of a specific situation."). There is an entire spectrum of automatized and semi-automatized human behavior that has genetically evolved

made during their respective prior lifespans, some relatively accurate predictive utility—and, with it the meta-utility of an efficient orientation towards the future—by sticking to their learned “fast-and-frugal”¹⁵⁹ aversions, biases and similar heuristic decisional devices. In short, as *homo mortalis*, June is “*homo heuristicus*.”¹⁶⁰

Accordingly, in addition to necessary fallibility, patients and physicians also turn out to be bad Bayesians.¹⁶¹ Their ability to investigate, evaluate courses of action, and properly calculate for purposes of informed, ultra-rational decision-making about complex medical care is limited by heuristic flaws in collecting and processing information.¹⁶² In other words, these regularly employed biases and heuristic shortcuts further interfere with

over time as well as been honed through adaptive behavior in each human lifetime which, on aggregate, will serve human decision-making under conditions of scarcity and Knightian uncertainty in the vast majority of cases much better than prolonged information gathering, rational deliberation, evaluation and ranking of behavioral proposals and, finally, selection and ratification of a highest-utility behavioral mode. In this regard, reflexes (as, for example, the flight reflex) constitute automatized, involuntary human behavior that overrides rational decision-making and increases the survival rate of the human in question (in case of a real threat to survival) almost every time. Similarly, instincts qualify as semi-automatic behavior (as, for example, the instinct of being in danger triggered by a sudden release of adrenalin into the bloodstream which *may* lead to controlled, somewhat voluntary, thus, non-reflexive flight behavior) but a carefully self-aware rational decision-maker can, as part of information-gathering and -processing, realize that the instinct has been triggered “accidentally” (i.e., objectively, there is no lurking danger to the decision-maker), to the effect that the rational decisional behavior will override the instinctive behavioral mode. Still, instincts short-cut aspects of cognitive decision-making because they alert a rational decision-maker of an existing (and often pressing) choice situation *before* the rational decision-maker will have had enough time and will have mustered enough attention to fully and rationally apprehend the choice situation through rationally diligent and competent information-gathering and -processing. Accordingly, there may be many situations where reflexes and instincts (or, for that matter, aversions, biases, and similar heuristic “decisional shortcuts” described in behavioral economics) make human decision-makers choose less efficient options among those available in a given choice situation. When, however, fully aggregated over the statistical length of a human lifespan, they are highly efficient means of adaptive behavior in order to secure the *baselines* of human existence (i.e., continued survival, physical and emotional wellbeing, flourishing). Cf. Mousavi & Gigerenzer, *supra* note 79, at 368 (“Heuristics are adaptive tools that ignore information to make fast and frugal decisions that are accurate and robust under conditions of uncertainty. A heuristic is considered *ecologically rational* when it functionally matches the structure of environment.”). See also Butkus, *supra* note 65, at 80 (“Automaticity is a significant element of cognition—a variety of processes simply occur without volitional cueing.”).

¹⁵⁹ Mousavi & Gigerenzer, *supra* note 79, at 364.

¹⁶⁰ See, e.g., Gerd Gigerenzer & Henry Brighton, *Homo Heuristicus: Why Biased Minds Make Better Inferences*, 1 TOPICS COGNITIVE SCI. 107 (2009).

¹⁶¹ See *infra* notes 168–176 and accompanying text; cf. Zechhauser, *supra* note 97, at xviii (“Unfortunately, the way most [economists and decision theorists] would counsel people to make choices is not the way most individuals do make choices.”). Throughout this Article, we also use the term “bad Bayesian” only in a descriptive rather than a normative manner.

¹⁶² Cf. Ubel, *supra* note 29, at 8 (“When people receive information about cancer risks, they do not simply encode the numbers into a mathematical algorithm.”).

boundedly-rational informed decision-making—rendering choices imperfectly irrational.¹⁶³ As mentioned earlier,¹⁶⁴ optimism bias constitutes one example of this class of alterable rational constraints within the context of decisions about treatment and life-prolonging technologies for those with life-threatening illness. Patients tend to think they will be among the fortunate 1% who greatly outlive the statistical prognosis for their disease or who respond unusually well to an otherwise non-curative therapy.¹⁶⁵ Understanding statistical predictions of survival time is challenging, even for physicians.¹⁶⁶ Similarly, physicians have difficulty discussing uncertainty with patients.¹⁶⁷ In June’s situation, it is almost inevitable that her optimistic outlook before commencing chemotherapy—considering herself a “fighter,” believing that her cancer will respond well to chemotherapy, and that because of her prior good health, the side effects will be manageable—will make her not only count herself, *ex ante*, among the 60% chance-of-success cohort but will also cause her to unconsciously discount to zero the likelihood of any “mixed” relative outcomes (i.e., partial success/partial failure, or less success/more failure), which are statistically left entirely unaccounted for within this absolute, dyadic 60-40 success-failure classification.

Bayesian updating, as a concept, originated in probability theory, which itself is “the fundamental mathematical tool to quantify uncertainty.”¹⁶⁸ Thus, as a statistical device, Bayes’ Theorem¹⁶⁹ lies at the heart of a rational human belief updating process where beliefs (about what is “certain” in the world around us and within us) are continually confirmed or revised based

¹⁶³ See *supra* Figure 1. Cf. Daniel Kahneman & Amos Tversky, *Subjective Probability: A Judgment of Representativeness*, 3 COGNITIVE PSYCHOL. 430, 450 (1972) (“In his evaluation of evidence, man is apparently not a conservative Bayesian: he is not Bayesian at all.”).

¹⁶⁴ See *supra* note 120.

¹⁶⁵ See Lynn A. Jansen et al., *Unrealistic Optimism in Early-Phase Oncology Trials*, 33 IRB: ETHICS & HUMAN RES. 1 (2011) (finding that, although participants in an early phase trial understood that the treatment would not cure their cancer, a majority of those surveyed nevertheless exhibited an optimism bias in believing that the experimental drug would control their disease and that they would experience only benefits from the drug and no side effects).

¹⁶⁶ See Philip Sedgwick & Katherine Joekes, *Survival (Time to Event) Data: Median Survival Times*, 343 BRIT. MED. J. d4890 (2011) (providing data on median survival times for patients with advanced colon cancer and posing a multiple-choice question about accurate characterization of the median survival time data, and concluding that “[i]t may be hard to find the balance between explaining statistical information accurately and using words or concepts that are unambiguous to the patient”). For a rare example of a patient with an excellent understanding of his own statistical prognosis, see Stephen Jay Gould, *The Median Isn’t the Message*, CANCERGUIDE https://www.cancerguide.org/median_not_msg.html (last visited July 28, 2018).

¹⁶⁷ See James A. Tulsky et al., *Opening the Black Box: How Do Physicians Communicate about Advance Directives?*, 129 ANNALS INTERNAL MED. 441, 446 (1998).

¹⁶⁸ LAURENT CONDAMIN ET AL., RISK QUANTIFICATION—MANAGEMENT, DIAGNOSIS AND HEDGING 43 (Wiley 2006).

¹⁶⁹ Or Bayes’ Law as it is sometimes also called.

on new pieces of information received. Often, a proper calculation of Bayesian probability will lead to counterintuitive statistical outcomes—i.e., ones that do not match or, at least, substantially confirm prior beliefs. Hence, ultra-rational, good-Bayesian decision-makers would revise their prior beliefs into more (statistically) accurate posterior beliefs.¹⁷⁰ Unfortunately, however, humans often fail to apply Bayes' Theorem correctly so that proper Bayesian updating to account for new evidence rarely happens in a consistent manner.¹⁷¹ But notwithstanding the fact that humans are regularly bad at Bayesian updating, i.e., they are bad Bayesians, a minimally-rational version of updating of beliefs in the face of new information constantly and ineluctably happens. Here, humans engage in non-Bayesian (or biased) updating because it still provides probabilistic utility: as bad Bayesians, they “do not rely on precise calculations . . . [but] on the direction in which beliefs are updated [so that as] long as bad news shifts beliefs about ability downward and good news shifts them up, . . . the *spirit* of [their non-Bayesian calculative] models is preserved.”¹⁷² In other words, non-Bayesian updating persists in human decision-making because, on a meta-probability level, it autopoietically confirms and thus validates its own utility as a prediction (and psychological sense-making) tool. When fully aggregated and correlated with recognized outcomes over the course of their respective entire cognitive lives, all new decision-making by humans updates their prior beliefs about the validity and utility of their non-Bayesian updating—i.e., how they think about probability and make probability judgments even though such “thinking” may not be a conscious process.¹⁷³ This updating, however, occurs *in only one direction*, namely, to formulate their posterior beliefs in only a non-revisionist manner so that the world around them

¹⁷⁰ See, e.g., Benjamin E. Hermalin & Michael S. Weisbach, *Assessing Managerial Ability: Implications for Corporate Governance*, in 1 THE HANDBOOK OF THE ECONOMICS OF CORPORATE GOVERNANCE 93, 153 (Benjamin E. Hermalin & Michael S. Weisbach eds., 2017) (“A maintained assumption of most learning models is that individual incorporate new information rationally; that is, they update their beliefs according to Bayes Law.”).

¹⁷¹ *Id.* (stating that humans “often hold beliefs or take actions that are inconsistent with their having properly employed Bayes Law to account for new evidence”); see also Simon, *supra* note 38, at 9 (commenting on behavioral-economics research by Ward Edwards, Daniel Kahneman and Amos Tversky on anchoring and adjustment heuristics and availability biases as follows: “They describe experimental situations in which estimates formed [by human decision-makers] on the basis of initial information are not revised nearly as much by subsequent information as would be required by Bayes’ Theorem”).

¹⁷² Hermalin & Weisbach, *supra* note 170, at 154 (emphasis added); cf. Kevin D. McCaul et al., *Linking Decision-Making Research and Cancer Prevention and Control: Important Themes*, 24(4) HEALTH PSYCHOL. S106, S107 (Supp. 2005) (stating that the “direction of [predictive] mistakes is also biased; in particular, people underestimate their likely happiness when confronted with negative life conditions”).

¹⁷³ Cf. Butkus, *supra* note 65, at 83 (“The cognitive processes of which we *are* aware are surface phenomena, and merely a subset of all the phenomena occurring when we consider choices and options.”).

remains moderately coherent, explainable, and predictable. Given this unidirectional, autopoietic tendency of non-Bayesian updating, humans also often tend to over-react to current, new information.¹⁷⁴ Any new information, by definition, has the potential to challenge (rather than confirm) the validity and value of prior beliefs—including the meta-belief that non-Bayesian updating provides predictive benefit. It may, therefore, trigger an unavoidable revision and updating of prior beliefs to such an extent that humans could (temporarily) no longer be able to form coherent posterior beliefs.¹⁷⁵ In this scenario, a severely reduced predictability of future events would ensue and immediately lead to an existential level of disorientation.¹⁷⁶ Accordingly, humans operate with a constant, heightened vigilance with regard to new information that disturbs prior-belief equilibria—irrespective of whether the news is good or bad.

To give a factually simplified and hypothetical example of Bayesian and non-Bayesian updating in this regard, Bayes' Theorem allows one to answer a question like this: *What is the probability that June is among the 60% chance-of-success cohort (rather than the 40% chance-of-no-success cohort) given that she has had one of her ovarian tumors biopsied, and that the biopsy result is positive for the types of ovarian cancer that occur predominantly in the 60% responder cohort, so that she also will likely respond to the proposed chemotherapy (assuming that such a predictive-response test were to exist)?* As a mathematical formula, Bayes' Theorem can be expressed as follows:

$$P(R | S) = \frac{P(S | R)P(R)}{P(S | R)P(R) + P(S | \sim R)P(\sim R)}$$

In June's example, P stands for probability, R for the result of being among the 60% cohort, S for testing positive, and $\sim R$ for the mutually exclusive, other result of being among the 40% cohort (i.e., not being among the 60% cohort), while the vertical line symbol ($|$) is simply read as "given

¹⁷⁴ Hermalin & Weisbach, *supra* note 170, at 154 (stating that "people are likely reacting to current signals more than rational Bayesian updating would imply").

¹⁷⁵ In other words, new information could shock and disrupt the entire learning and system of prediction.

¹⁷⁶ Cf. 2 G. STANLEY HALL, *ADOLESCENCE: ITS PSYCHOLOGY AND ITS RELATIONS TO PHYSIOLOGY, ANTHROPOLOGY, SOCIOLOGY, SEX, CRIME, RELIGION AND EDUCATION* 562 (1904) ("She works by intuition and feeling; fear, anger, pity, love, and most of the emotions have a wider range and greater intensity. If she abandons her natural naïveté and takes up the burden of guiding and accounting for her life by consciousness, she is likely to lose more than she gains, according to the old saw that she who deliberates is lost."); *see also* Luhmann, *supra* note 126, at 97 ("You cannot live without forming expectations with respect to contingent events and you have to neglect . . . the possibility of disappointment . . . because it is a very rare possibility, but also because you do not know what else to do. The alternative is to live in a state of permanent uncertainty.").

that.” Hence, in answering the above question, the formula now reads out as “the probability of being among the 60% cohort given that June tested positive equals the probability of testing positive given that the patient is among the 60% cohort times the probability of being among the 60% cohort, divided by that very same quantity plus the probability of testing positive given that the patient is not among the 60% cohort (i.e., that she rather is among the 40% cohort) times the probability that she is not among the 60% cohort (i.e., that she is rather among the 40% cohort).” Bayesian updating is, thus, premised on two “mutually exclusive and exhaustive”¹⁷⁷ sets of patients to whom the new information (i.e., the positive test result) applies: those who, indeed, turn out to be among the 60% cohort (after going through treatment) and those who turn out to be *false positives*, thus, who are not among the 60% cohort of treatment success (but, given the positive test, *ex ante* look as if they would be).¹⁷⁸

In June’s example, we know that out of every 100 women with her type of Stage IV ovarian cancer, sixty react “successfully”¹⁷⁹ to chemotherapy. Let’s further assume that, based on biopsy samples of patients’ tumors, a predictive response test were available that would be 80% accurate among the 60% cohort. In other words, eight out of every ten (or forty-eight out of sixty) patients would accurately test positive as likely chemo responders prior to chemotherapy treatment. The test, however, is problematic in that it (for some yet unknown reason) is less accurate among the 40% cohort of patients who do not react successfully to chemotherapy treatment. Let’s assume here that, out of those forty patients, 55% (or twenty-two patients) also test positive (i.e., falsely as being among the 60% cohort). Finally, let’s assume that June’s biopsy sample has tested positive. Accordingly, *what is the probability that June will respond successfully to her future chemotherapy treatment?* If you ask June, her intuitive non-Bayesian probability judgment will likely tell her that 80% of correct results as being among the 60% cohort “sounds really promising” and, assuming she literally calculates in this regard, that her original 1.5-to-1 odds (sixty over forty) of treatment success (her prior belief) have now significantly improved to 4 to 1 (eighty over twenty) in favor of chemotherapy success (her posterior belief). It is, indeed, correct that June has a bit of reason for statistically-

¹⁷⁷ Gerd Gigerenzer & Ulrich Hoffrage, *How to Improve Bayesian Reasoning Without Instruction: Frequency Formats*, 102 *PSYCHOL. REV.* 684, 685 (1995).

¹⁷⁸ See generally David M. Eddy, *Probabilistic Reasoning in Clinical Medicine: Problems and Opportunities*, in *JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES* 249, 253–54 (Daniel Kahneman, Paul Slovic & Amos Tversky eds., Cambridge University Press 1982); Gigerenzer & Hoffrage, *supra* note 177, at 685–86; Patel et al., *supra* note 157, at 56.

¹⁷⁹ Again, “success” in this context is simply defined as killing a significant number of cancer cells and, thus, *theoretically* contributing significantly to the prolongation of the patient’s life. It does not take into account the potential magnitude of adverse effects and their consequent impact on the patient’s quality of life.

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RATIONAL PATIENT APATHY

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driven optimism. Nevertheless, only about *half* the amount of improved odds which June may have intuitively calculated in her non-Bayesian way have actually occurred as a result of her positive test. By ignoring false positives among the 40% cohort, June is almost 100% more optimistic in her probability judgment and in updating her belief of treatment odds than, mathematically, she has reason for. Here is Bayes' Theorem applied to the above facts:

$$\begin{aligned} P(R | S) &= \frac{P(S | R)P(R)}{P(S | R)P(R) + P(S | \sim R)P(\sim R)} = \frac{\left(\frac{48}{60}\right)\left(\frac{60}{100}\right)}{\left(\frac{48}{60}\right)\left(\frac{60}{100}\right) + \left(\frac{22}{40}\right)\left(\frac{40}{100}\right)} \\ &= \frac{(.8)(.6)}{(.8)(.6) + (.55)(.4)} = \frac{.48}{.7} \approx 68.6\% \end{aligned}$$

The probability of being among the 60% cohort given that June tested positive rounds out to 68.6%.¹⁸⁰ Hence, the positive test result has, indeed, improved June's originally known (statistical) odds that she will turn out to be among the 60% cohort after her chemotherapy treatment. Nonetheless, what she believed to be her prior odds (1.5 to 1) only improved statistically to approximately 2.18 to 1 (.48/.7 over .22/.7), not even close to the over-optimistic, false-positives-ignoring odds of 4 to 1. Rather, when confronted with the new evidence and current signal of an 80% accurate positive test, June may prefer, in a typical bad-Bayesian manner, to rely on the more optimistic direction in which her treatment-success beliefs are updating (80% accurate of 60% success, i.e., being among the forty-eight out of sixty women with true-positive tests) instead of also properly accounting for the less optimistic direction (55% inaccurate of 40% non-success, i.e., being among the twenty-two out of forty women with false-positive tests). Indeed, for purposes of psychological comfort (i.e., sustained bad-Bayesian meta-utility), she may additionally engage in confirmation-bias behavior¹⁸¹ and

¹⁸⁰ In order to proof this number, Bayes' Theorem can also be run in the opposite direction by answering the question: *What is the probability that June will, unfortunately, not respond successfully to her future chemotherapy treatment (i.e., be among the 40% cohort), notwithstanding the fact that she has tested positive for the 60% cohort?* Accordingly:

$$\begin{aligned} P(\sim R | S) &= \frac{P(S | \sim R)P(\sim R)}{P(S | \sim R)P(\sim R) + P(S | R)P(R)} = \frac{\left(\frac{22}{40}\right)\left(\frac{40}{100}\right)}{\left(\frac{22}{40}\right)\left(\frac{40}{100}\right) + \left(\frac{48}{60}\right)\left(\frac{60}{100}\right)} \\ &= \frac{(.55)(.4)}{(.55)(.4) + (.8)(.6)} = \frac{.22}{.7} \approx 31.4\% \end{aligned}$$

Thus, June's probability of being among the 40% cohort notwithstanding that June tested positive for the 60% cohort rounds out to 31.4%. In other words, if June were among 100 similarly situated women who *all* tested positive, statistically, close to a third of those 100 women would still *not* react "successfully" to chemotherapy.

¹⁸¹ See *supra* note 121.

“round up” her positive test that comes with an 80% accuracy¹⁸² to *near certainty* (i.e., 100% predictive test accuracy)¹⁸³ of future successful chemotherapy treatment, thus, crowding out all other possible (and, ultra-rationally and wholistically, perhaps more beneficial) treatment options. As a result and by means of this calculative example only, June (and, to an empirically proven extent, also her attending oncologist)¹⁸⁴ can be expected to short-circuit her informed-consent decision in a bad-Bayesian manner because, in full alignment with her preferences, non-Bayesian updating allows her to (more) confidently believe that the immediate commencement of chemotherapy treatment, as urged by Dr. Savoy, is now a no-brainer and almost surefire solution given her positive predictive test result.¹⁸⁵

III. INFORMED CONSENT AND RATIONAL PATIENT APATHY

Up to this point in the Article, we have mapped out how uncertainty implicates complex medical and end-of-life decision-making. We now turn in this part to how the aspirational world of law, specifically the law of informed consent, and the real world of actual patient and physician

¹⁸² But only among the 60% responder cohort.

¹⁸³ For example, June may also “add” the twelve patients with false-negative test results to her optimistic “calculus” by telling herself that there are even more women who will respond “successfully” to chemotherapy treatment in the 60% cohort than the test accurately predicts, namely, the women with false-negative test results. Statistically, however, there is not a single additional woman in June’s predictive-test cohort, namely, a woman with a correct true-positive test result, that could also be among the twelve patients with an incorrect false-negative test result within the 60% cohort. In other words, June may intuitively add the twelve false-negatives to the original total of sixty women who react “successfully” to chemotherapy, now arriving at seventy-two women overall, rather than correctly adding the twelve false negatives only to the forty-eight true positives within the 60% cohort. In other words, June will not understand that the forty-eight correct true-positive test results and the twelve incorrect false-negative ones are mutually exclusive.

¹⁸⁴ See, e.g., Gerd Gigerenzer & Adrian Edwards, *Simple Tools for Understanding Risks: From Innumeracy to Insight*, 327 BRIT. MED. J. 741, 741 (2003) (“If patients knew about th[e] degree of variability and statistical innumeracy [of their attending doctors] they would be justly alarmed.”); Patel et al., *supra* note 157, at 56 (“Clinicians often overestimate the impact of a positive test, failing to appreciate the importance of the base rate (prevalence) of the disease they are considering.”); see also Eddy, *supra* note 178, at 253–59; Mirjam Annina Jenny, Niklas Keller & Gerd Gigerenzer, *Assessing Minimal Medical Statistical Literacy Using the Quick Risk Test: A Prospective Observational Study in Germany*, 8 BRIT. MED. J. OPEN (2018), <https://bmjopen.bmj.com/content/bmjopen/8/8/e020847.full.pdf>.

¹⁸⁵ As a reminder, all of June’s (and, likely, Dr. Savoy’s) non-Bayesian updating also takes place in the larger context of Knightian uncertainty that is fully, irrationally discounted. An ultra-rational, good-Bayesian decision-maker would be aware and would take into account that, when non-discounting, Knightian uncertainty could mean that there is some unknown unknown characteristic, unique to June, which renders her predictive response test results entirely false. Since the probability of this unknown unknown characteristic (or of any other Knightian uncertain clinical condition) remains immeasurable under all circumstances and therefore cannot be specified and inserted into a Bayesian formula, an even larger calculative dilemma would ensue. See *infra* text accompanying notes 207–210.

decision-making, specifically the phenomenon of rational apathy, react to uncertainty. It is well- covered ground that informed consent law on the books compared to informed consent as it is actually practiced are very different—that the real life implementation of informed consent law is largely inefficient, disjunctive with reality, and even potentially harmful. As we will explain, the largest, common-denominator driver behind these suboptimal outcomes in real-world complex medical decision-making is rational patient (and, relatedly, rational physician) apathy. Decisional apathy as the default,¹⁸⁶ “satisficing”¹⁸⁷ herd-behavior of patients and health care professionals alike, relegates informed consent law to an ineffectual doctrine that deceptively signals an illusion of autonomy where there is little to none.

A. *Informed Consent as Utopian Ideal*

In the United States, according to both legal and ethical principles, medical care should accord with the individual patient’s values and preferences. Patient autonomy, as implemented in law via the doctrines of informed consent and substituted judgment, is the primary principle that governs medical decisions, including those made on behalf of patients who have lost decisional capacity.¹⁸⁸ In ideal circumstances, patients can express their preferences directly to their physicians at the appropriate time. When a patient retains decisional capacity, the patient’s choice may be irrational, unreasonable, or unwise, but the principle of autonomy, with limited exceptions, protects these choices.

Ideally, the law of informed consent would always ensure that patients’ decisions reflect their known individual preferences at the time of decision-making. Informed consent is ethically and legally required for virtually all medical procedures and treatment relationships. As to the information disclosed, in general, informed consent requires a discussion of the risks,¹⁸⁹

¹⁸⁶ See, e.g., Eric J. Johnson et al., *Making Better Decisions: From Measuring to Constructing Preferences*, 24(4) HEALTH PSYCHOL. S17, S18 (Supp. 2005) (defining default as “the option selected if no active decision is made”).

¹⁸⁷ Herbert A. Simon, *Rational Choice and the Structure of the Environment*, 63 PSYCHOL. REV. 129, 136 (1956) (introducing and explaining the concept of “satisficing”).

¹⁸⁸ See Alan Meisel, *End-of-Life Care*, in FROM BIRTH TO DEATH AND BENCH TO CLINIC: THE HASTINGS CENTER BIOETHICS BRIEFING BOOK FOR JOURNALISTS, POLICYMAKERS, AND CAMPAIGNS 51, 51–52 (Mary Crowley ed., 2008) (“Autonomy is paramount for patients who possess decision making capacity, but it is also a major consideration for patients who lack this capacity. Their wishes must be respected by the relatives or other health care proxies who make decisions on their behalf.”) The American Medical Association (AMA) has acknowledged that patients have a right of self-determination that includes the right to refuse unwanted medical treatment, and that this right is not lost when a patient loses decisional capacity. See Council on Ethical and Judicial Affairs, AMA, *Decisions Near the End of Life*, 267 JAMA 2229, 2229–33 (1992).

¹⁸⁹ As commentators on medical consent have explained, “[t]he magnitude of the risks and their frequency should receive special emphasis. Also considered are alternative treatments and their benefits, risks, and measured utility, the likely results of no treatment; and the

benefits, and alternatives to the proposed medical intervention, including the option of doing nothing, or withholding or withdrawing care.¹⁹⁰ The protection of patient autonomy that informed consent law provides is, as we have seen, only as good as the quality and accuracy of the information on which the consent is based and the individual decision-maker's ability to comprehend and process that information.

Numerous commentators have observed that this view of informed consent is, in fact, utopian or illusory.¹⁹¹ As George Annas has observed, informed consent is "more accurately termed informed choice,"¹⁹² and because of the doctrine's "implications for power and accountability"¹⁹³ critical evaluation of its limitations is essential. Annas argues that courts have not gone far enough in requiring physicians to discuss relevant information with patients.¹⁹⁴ And Peter Schuck, in discussing the "informed consent gap" between what idealists such as judges and medical ethicists

probability of a good outcome with the proposed strategy." See Timothy J. Paterick et al., *Medical Informed Consent: General Considerations for Physicians*, 83 MAYO CLINIC PROC. 313, 316 (2008).

¹⁹⁰ See generally BARRY R. FURROW ET AL., HEALTH LAW § 3-11 (3d ed. 2015) (explaining that factors to be disclosed include diagnosis, nature and purpose of treatment, risks of treatment and, in some circumstances comparative data on the treating physician's skills, alternatives to the proposed treatment, prognosis with and without the treatment, and conflicts of interest). The scope of required disclosure varies by jurisdiction, but typically follows one of two models, with states about evenly divided between the two. See BARRY R. FURROW ET AL., LAW AND HEALTH CARE QUALITY, PATIENT SAFETY, AND MEDICAL LIABILITY 195 (7th ed. 2013). In states that have adopted the *professional* standard of disclosure, physicians must disclose all information that a reasonable physician would disclose under the circumstances. See, e.g., *Tashman v. Gibbs*, 556 S.E.2d 772, 777 (Va. 2002) ("A physician has a duty in the exercise of ordinary care to inform a patient of the dangers of, possible negative consequences of, and alternatives to a proposed medical treatment or procedure. To recover against a physician for failure to provide such information, the patient generally is required to establish by expert testimony whether and to what extent any information should have been disclosed."); see also FURROW ET AL., *supra*, at § 3-10(a) (describing the physician-based standard of disclosure). In jurisdictions that follow the *patient-oriented* standard, the physician must disclose what a reasonable patient would want to know under the circumstances. See, e.g., *Canterbury v. Spence*, 464 F.2d 772, 787 (D.C. Cir. 1972); *Cobbs v. Grant*, 502 P.2d 1 (Cal. 1972); see also FURROW ET AL., *supra*, at § 3-10(b) (describing the reasonable patient standard of disclosure).

¹⁹¹ See generally CARL E. SCHNEIDER, THE PRACTICE OF AUTONOMY: PATIENTS, DOCTORS, AND MEDICAL DECISIONS (1998) (critiquing the operation of informed consent in practice but not advocating that it be abandoned); Carl E. Schneider, *After Autonomy*, 41 WAKE FOREST L. REV. 411 (2006); Peter H. Schuck, *Rethinking Informed Consent*, 103 YALE L.J. 899 (1994); Angela Fagerlin et al., *An Informed Decision? Breast Cancer Patients and Their Knowledge About Treatment*, 64 PATIENT EDUC. & COUNSELING 303-12 (2006).

¹⁹² GEORGE J. ANNAS, THE RIGHTS OF PATIENTS: THE AUTHORITATIVE ACLU GUIDE TO THE RIGHTS OF PATIENTS 113 (2004).

¹⁹³ *Id.* at 113.

¹⁹⁴ *Id.* at 119 (noting that most courts, for example, do not require that a physician disclose the patient's prognosis unless the patient asks and conclude that prognosis need only be disclosed if it was material in the patient's particular case).

envison and what realists such as physicians know to be true, argues that the gap is essentially structural and “reflects the constraints imposed by human psychology, the physician-patient relationship, the tort law system, and an increasingly cost conscious health care delivery system.”¹⁹⁵ He concludes that informed consent as envisioned by the idealists is mostly unachievable and that attempting to close the consent gap by imposing more onerous obligations via tort law would fail and might further widen the gap.¹⁹⁶ Most of the critiques of informed consent doctrine agree that there is no practical, cost-effective way to narrow the gap between the ideal of disclosure, comprehension, and fully-informed, authentic choice and the actual practice of consent between physicians and patients.

When a patient is asked to make an informed decision to consent to, for example, a surgical procedure to remove his gall bladder, the physician will describe the purpose of the surgery, its risks and benefits, and alternatives to the procedure, if any, and the patient then will sign a consent form indicating a willingness to undergo the surgery. Assuming that the surgery is successful, the patient anticipates that he will return to his previous, healthy life. In the context of decisions about whether to consent to a potentially debilitating chemotherapeutic regime with limited likelihood of effectiveness for patients in general and for any one patient in particular however, the consent process becomes more complicated because of various aspects of bounded rationality, including clinical uncertainty as to prognosis and response to treatment. In the face of this clinical uncertainty (and the unknown impact of various forms of non-clinical uncertainty), June may rationally abandon the attempt to balance risks, benefits, and alternatives and simply consent to the proposed treatment. To decline treatment in these circumstances is to leave a potential path to cure or at least life-prolongation untaken; despite inherent uncertainty, June may—almost unavoidably must—consent.

This sort of “informed consent” which often results in provision of what turns out *ex post* to be unsuccessful treatment (and also in utilization of life-prolonging technologies at the end of life in ways that may be inconsistent with patient preferences), may seem to follow from the autonomy principle, but in fact it results from an overly mechanistic view of the physician’s role in guiding end-of-life decision-making. Physicians are rarely called upon to make the actual decision about whether to withdraw life-sustaining medical treatment and, even when the patient or surrogate requests that the physician decide,¹⁹⁷ the physician has an ethical obligation

¹⁹⁵ See Schuck, *supra* note 191, at 905.

¹⁹⁶ *Id.* at 938–39.

¹⁹⁷ See generally Arthur S. Elstein, Gretchen B. Chatman & Sara J. Knight, *Patients’ Values and Clinical Substituted Judgments: The Case of Localized Prostate Cancer*, 24(4) HEALTH PSYCHOL. S85 (Supp. 2005).

to do so based on an understanding of the particular patient's values and goals of care.¹⁹⁸ Physicians instead usually are asked to implement decisions made by patients (or their agents), after offering one or more treatment options. Because the autonomy principle focuses on the patient's preferences, the physician can, if she chooses, avoid the more complex discussion of whether initiating or continuing treatment serves the patient's best interests as a medical matter, even if the patient consents to that treatment.

Consider, in this context, the advance-directive question regarding preferences for cardiopulmonary resuscitation in the case of cardiac arrest in terminally-ill patients such as June. There are at least three scenarios in which a decision may occur, including a decision to postpone the decision. First, a patient may be asked, "Would you like to fill out a DNR form?" Second, the patient may be presented with the form and asked whether she would like the health care team to attempt resuscitation or not, and the patient may make a choice. Finally, the patient may say that she prefers to answer this question later (because, in her mind, the question is not "ripe") and may therefore, by default, leave the question to her physician or family because she may experience cardiac arrest without having confronted and answered the question. Studies indicate that many patients prefer to leave the resuscitation question open and let their physicians or family members decide, should the occasion arise.¹⁹⁹

More generally, the implications of the informed consent doctrine's limitations for June are now obvious and, in some dimensions, unavoidable. June's "informed" consent to the various steps in her treatment and life prolongation (debulking surgery with intraperitoneal chemotherapy, post-surgery chemotherapy, ventilation and feeding tube) was never, except in the most limited sense, informed. At the outset, her oncologist withheld detailed

¹⁹⁸ For an interesting case study of a situation in which the patient delegated the decision about whether to have coronary artery bypass graft (CABG) surgery to his physician, see Alan W. Cross & Larry R. Churchill, *Ethical and Cultural Dimensions of Informed Consent: A Case Study and Analysis*, 96 ANNALS INTERNAL MED. 110, 110–12 (1982) (explaining that in this "paternalism with permission" situation, consent is not invalidated but rather requires the physician to "gain as complete an understanding as possible of the patient's values, culture, and life-style . . . [to] appreciate the larger significance of the treatment choice for the patient"). On general choice delegation behavior, i.e., deciding "whether to make a choice on [one's] own or to delegate choice-making authority to someone else," see, for example, Sebastian Bobadilla-Suarez et al., *The Intrinsic Value of Choice: The Propensity to Under-Delegate in the Face of Potential Gains and Losses*, 54 J. RISK UNCERTAINTY 187, 188 (2017).

¹⁹⁹ Evidence also suggests that patients regularly delegate the particular decision about whether to attempt resuscitation in the case of cardiac arrest to their physicians or family members. See C. Puchalski et al., *Patients Who Want Their Family and Physician to Make Resuscitation Decisions for Them: Observations from SUPPORT and HELP*, 48 J. AM. GERIATRICS SOC'Y S84–S90 (Supp. 2000) (concluding that most patients prefer to leave resuscitation decisions to their family and physicians rather than asserting their own preferences—70.8% in HELP and 78% in SUPPORT).

information about her prognosis, which meant that even the very first step of consent to surgery was made by June without any real understanding of her statistical life expectancy with and without surgery, the details of risks versus benefits to surgery, and the overall impact of surgery on her short-term health and well-being. If she had received and ultra-rationally understood more detailed statistical information about prognosis with and without surgery, it is possible that she might have elected to forego surgery, or follow-up chemotherapy and focus on palliation of her symptoms. She might have chosen thriving over surviving. Of course, it is impossible to know whether, in one of these latter scenarios, she would have lived longer overall, or for less time, and with what extent of avoidable treatment side effects compared with the effects of the disease process itself on her quality of life.

Finally, there is an additional layer of decisional complexity that, for purposes of keeping this discussion relatively simple, we exclude. One estimate suggests that, in the final weeks of life, approximately 42% of dying patients aged sixty or older require assistance with decision-making and, of that 42%, about 70% of these patients eventually lose decisional capacity entirely.²⁰⁰ Another couple of studies place these numbers even higher in the context of decisions about life-sustaining treatment, concluding that 75% of patients with life-threatening illnesses and 96% of patients in intensive care units have lost decisional capacity at the point of decision.²⁰¹ For these individuals, a surrogate decision-maker, typically a family member or a legally-appointed proxy who often also is a family member, must make difficult choices on behalf of the patient about how much therapeutic and life-prolonging medical care to request or accept. For patients who have lost decisional capacity, an autonomy-based model of medical decision-making does not work well unless the patients were previously willing to discuss their preferences with family and physicians in advance. Often, however, when a patient loses decisional capacity, insufficient evidence of the patient's wishes will leave physicians and family members in a dilemma as to whether to implement, or to continue, providing therapeutic treatment or life-sustaining care. Uncertainty about prognosis in the case of terminal illness adds to the complexity of decisions about withholding or withdrawing treatment or life-supportive measures.²⁰²

²⁰⁰ See Maria J. Silveira et al., *Advance Directives and Outcomes of Surrogate Decision Making Before Death*, 362 *NEW ENG. J. MED.* 1211–18 (2010).

²⁰¹ See N.G. Smedira et al., *Withholding and Withdrawal of Life Support from the Critically Ill*, 322 *NEW ENG. J. MED.* 309–15 (1990); Annette Rid & David Wendler, *Can We Improve Treatment Decision-Making for Incapacitated Patients?*, 40(5) *HASTINGS CTR. REP.* 36–45 (2010).

²⁰² For a more detailed discussion of how surrogate decision-making adds complexity to end-of-life choices, see Noah & Feigenson, *supra* note 3, at 758–66.

B. *Rational Apathy in General*

In addition to the fact that most physicians are not trained in discussing end-of-life decision-making,²⁰³ and therefore may avoid the discussion or even misrepresent facts in order to dampen the emotional impact of what they believe to be the clinical reality, informed consent as a process also fails because of the limiting effects of bounded rationality, opportunism, Knightian uncertainty and non-Bayesian updating. Although the ideal of informed consent suggests that June, even though in real life she is not an ultra-rationalist, will receive and be able to “correctly” process at the best of her abilities the latest evidence-based information and counseling about the relative merits of choosing among different therapeutic options, the reality is that this course of joint action is highly unlikely. Based on the data and trends described above, it is more likely that June will sign badly drafted consent forms after lack of adequate explanation from her physicians who, like her, have multiple incentives to avoid thorough and careful discussion and to allow the default mechanism of maximal care utilization to drive her future treatment. Accordingly, the current law and resultant practice of informed consent are likely to fail June on multiple levels and at multiple decision points during her illness because the ideal of informed consent—an ultra-rational, “hyper-autonomous”²⁰⁴ decision based solely on scientific evidence and evaluation of risks, benefits, alternatives, best practices, and personal preferences—remains both illusive and elusive in end-of-life medical practice.

Moreover, the underlying causes that drive systemically suboptimal complex medical decision-making go much deeper: The logical result of ambivalence²⁰⁵ and ambiguity²⁰⁶ affecting the rationality of *all* human decision-making is an infinite regression dilemma, i.e., an infinite calculative quest for a confident utility equilibrium.²⁰⁷ What starts out in the Williamsonian formula²⁰⁸ as confident calculation, upon introduction of

²⁰³ See Shannon Griffin et al., *JAMA Infographic Visualizing Health Policy: Medicare and End-of-Life Care*, 316 JAMA 1754 (2016) (illustrating that, in 2016, 68% of physicians reported not being trained to discuss end-of-life care).

²⁰⁴ See *infra* Part IV.B.1.

²⁰⁵ As accompanied by the opportunistic dissonance of the patient- and/or physician-decisionmaker; see Cooper, *supra* note 75 and accompanying text.

²⁰⁶ Similarly accompanied by rational vacuity. See Reich-Graefe, *supra* note 32, at 69, and text accompanying note 82.

²⁰⁷ See *supra* notes 116–118 and accompanying text. Cf. LEONARD J. SAVAGE, *THE FOUNDATIONS OF STATISTICS* 3 (2d rev. ed. 1972) (“Personalistic views [of probability] hold that probability measures the confidence that a particular individual has in the truth of a particular proposition, for example, the proposition that it will rain tomorrow. These views postulate that the individual concerned is in some ways ‘reasonable,’ but they do not deny the possibility that two reasonable individuals faced with the same evidence may have different degrees of confidence in the truth of the same proposition.”).

²⁰⁸ See Williamson, *supra* note 47, at 467, and text accompanying note 59.

Knightian uncertainty and decisional ultra-rationality, becomes complete, unsuppressed awareness that there always remains an unknown and rationally unknowable probability²⁰⁹ that estimated utility projections may turn out to be 100% incorrect. In other words, human decision-makers may be completely misled by their own ultra-rational calculations. Any consciously known lack of knowledge in relative terms (i.e., known and knowable unknowns) affirms the impact of *strategic* uncertainty on rational decision-making. Any consciously known lack of knowledge in absolute terms (i.e., unknown and unknowable unknowns) affirms the impact of *Knightian* uncertainty on rational decision-making. In addition, the degree of both impacts on any decision to be made is—at least, *ex ante*—also unknowable in absolute, calculatively immutable terms.

Furthermore, when both strategic and Knightian uncertainty are fully aggregated over all past and future decisions during an entire human lifespan, there is now 100% certainty—and a concomitant 100% cognitive awareness—of zero ultra-rational *confidence* for any prospective decisions aimed at positioning oneself towards a Knightian uncertain (and therefore possibly unattainable) future. As a logical endpoint, ultra-rational human decision-makers would now have to remain in a state of rational stasis—not mere rational apathy with regard to some aspects of their utility calculations and decision-making, but broad, all-encompassing paralysis given their inability to confidently calculate and predict any and all future events and their accompanying hypothetical utility effects. Accordingly, it may be posited that an ultra-rational person, consciously and completely aware of this constantly recurring and inescapable choice situation, would make only one rational decision over and over again—namely, to rationally resign herself from making any decision, i.e., to not just wait things out, but to *never decide anything ever again* (other than to reiteratively “decide” to never change her only safe-haven and zero-cognitive-load default of not deciding anything on its merits).²¹⁰ In other words, a fully ultra-rational person would decide, once and for all, to never opt out of perfect irrationality.²¹¹

²⁰⁹ Based on the limited aspects of human existence positively known and knowable to human actors, for example, in June’s scenario, the limited prospective knowability of both clinically and non-clinically uncertain variables unique to her personal situation.

²¹⁰ The quotation marks on “decide” indicate that this “decision”—similar to decision-making in the Coasean world, but this time on the opposite end of the decisional spectrum—is not a genuine decision. See *supra* notes 36–37 and accompanying text.

²¹¹ See *supra* Figure 1. Taken to its logical extreme, an alternative in this realm of perfectly irrational decision-making, without the constraints of time, space and therefore, mortality, would be to only make completely random decisions for eternity, that is, to rationally resign from predicting future outcomes, calculating utilities and monitoring performance (as rational decision-making preparation and validation modes) but to still ratify and implement choices, albeit *entirely random* ones. In eternity, all choices are equal in that they are of identical utility in terms of substantive rationality given the logical absence of any scarcity-induced need for value judgments. Arguably then, choosing randomly always carries the lowest

In “a real world that is both bounded and perceptually laden”²¹² and that introduces the certainty of human mortality into all human decision-making processes aimed at orienting time-limited human lives towards a scarce future, neither decisional paralysis nor complete decisional randomness is genuinely available to humans endowed with some rationality. As sentient beings, humans always have some self-awareness and capability to reflect on their mortality, and so recognize their captivity in a relentlessly progressing linear time and space continuum that constantly reduces their individual future lives. In this real world of constant opportunity cost, it may be posited that most people ultimately will rationally resign from attempting to make as informed a decision as possible—given its impossibility due to the impacts of strategic and Knightian uncertainty, fully aggregated. In other words, people will opt for the minimally-rational choice to remain rationally apathetic—to not acknowledge and therefore to not know what is otherwise positively knowable within the realm of their bounded rationality. Rational apathy, as another rationally delusional form of blinding oneself against what otherwise one could know, often, but not always, turns out to be the decision-making mode with the highest remaining utility, including the lowest cognitive load. People will “not be induced to take action . . . because [they] do[] not know *ex ante* whether investigating any particular proposed . . . action will pay off.”²¹³

A starting point for purposes of describing rational apathy globally—in terms that apply to all subject-matter contexts of human rational decision-making—is to organize decision-making into separate, consecutive parts. “In broad terms,”²¹⁴ four sequential segments of decision-making can be distinguished:

1. *initiation*—generation of proposals for resource utilization and structuring of contracts;
2. *ratification*—choice of the decision initiatives to be implemented;
3. *implementation*—execution of ratified decisions; and
4. *monitoring*—measurement of the performance of decision agents and implementation of rewards.²¹⁵

Rational apathy particularly applies to the contemplative stages of decision-making (initiation, ratification, and monitoring). First, it deliberately reduces the rational “payload” that good Bayesians would have to carry in order to arrive at a highest-utility choice during the ratification

decisional cost—but only in terms of procedural rationality (the need for which does also not exist in eternity).

²¹² MATTHEW B. MILES, MICHAEL A. HUBERMAN & JOHNNY SALDAÑA, *QUALITATIVE DATA ANALYSIS: A METHODS SOURCEBOOK* 7 (3d ed. 2014).

²¹³ Clark, *supra* note 68, at 782.

²¹⁴ Fama & Jensen, *supra* note 36, at 303.

²¹⁵ *Id.*

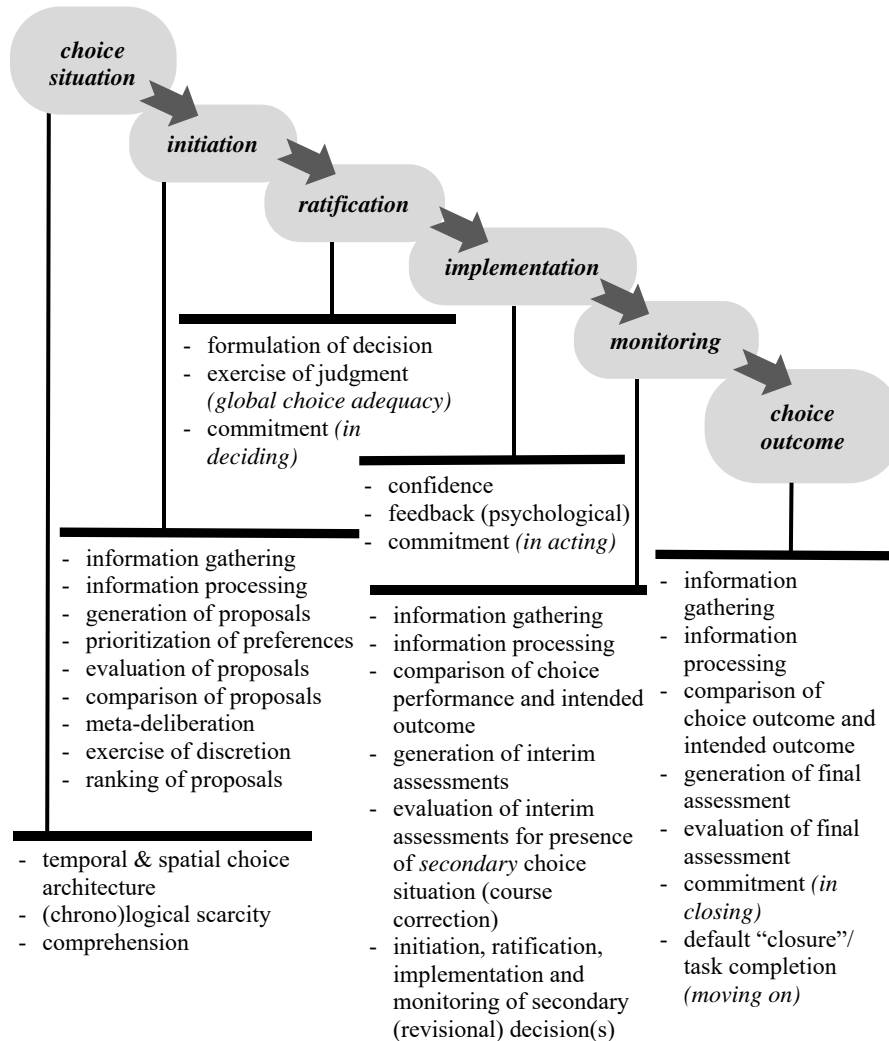
stage. Second, it also reduces rational payload otherwise necessary to achieve a highest-utility outcome at the ultimate conclusion of the decisional process by refusing to acknowledge that this outcome may require further decisional revision and course correction during the implementation and monitoring stages. Without rational apathy, the procedural rationality of decision-making alone will regularly constitute a daunting task for any good Bayesian.²¹⁶ If one adds both start and end points to the above four-stage procedural sequence of initiation, ratification, implementation and monitoring,²¹⁷ there is now a plethora of procedural challenges and constraints, which June as a good-Bayesian, ultra-rational decision-maker²¹⁸ would have to acknowledge and diligently overcome in order to arrive at both an optimal decision *and* an optimal decisional outcome. A good-Bayesian, ultra-rational decision-making process can be summarized as follows:²¹⁹

²¹⁶ See *infra* Figure 2.

²¹⁷ I.e., the initial choice situation necessitating the decision-making process as well as the eventual choice outcome once a decision made has been fully implemented (and is therefore, chronologically speaking, no longer subject to revision or correction).

²¹⁸ Cf. BRUNO DE FINETTI, *THEORY OF PROBABILITY: A CRITICAL INTRODUCTORY TREATMENT* 470–71 (Wiley 2017) (1974) (“A decision must . . . be based on probabilities; that is the posterior probabilities as evaluated on the basis of all information so far available. This is the main point to note. In order to make decisions, we first require a statistical theory which provides conclusions in the form of posterior probabilities. The Bayesian approach does this: other approaches explicitly refuse to do this.”).

²¹⁹ See *generally* THOMAS GRISSO & PAUL S. APPELBAUM, *ASSESSING COMPETENCE TO CONSENT TO TREATMENT: A GUIDE FOR PHYSICIANS AND OTHER HEALTH PROFESSIONALS* (1998); Baruch Fischhoff, *Decision Research Strategies*, 24(4) *HEALTH PSYCHOL.* S9 (Supp. 2005). See also Butkus, *supra* note 65, at 93 (“First, it is necessary that the moral agent be able to express a choice—this is not tied to any particular medium of communication (for example, the patient does not need to be able to speak to do so), but rather, the patient must possess the ability to make his or her choices known. Second, the patient must be able to understand the information germane to the health care decision. If the patient cannot understand the information at hand, there is no way to act upon it or to voice a preference for one intervention over another. Third, the patient must appreciate the significance of the information and the expected outcomes. If there is no way for the patient to gauge risk or to weigh outcomes, there is no way for the patient to take ownership of the decision—there is a fundamental disconnect between the decision and the outcome. Fourth, the patient must be able to reason with the germane information in a manner that allows him or her to logically weigh treatment options.”).

*Figure 2**Decisional Stages and Procedural Rationality*

Accordingly, rational apathy behavior directly correlates with and reduces or even eliminates the information, evaluation and monitoring work to be done during the process of decision-making as outlined in Figure 2 above. As a behavioral default of decisional "laziness," rational apathy either refuses to perform this choice work at all or performs the task in only a perfunctory fashion. Rational apathy may therefore be defined globally as the iterative rational decision (i) to not become (fully) informed within the objectively available and subjectively reachable bounds of uncertainty and scarcity; (ii) to not (fully) evaluate the current choice situation in the

present;²²⁰ (iii) to not (fully) formulate utility judgments on the merits (other than the reiterative utility judgment that engagement in judging matters on their respective merits is suboptimal behavior compared to not making utility judgments);²²¹ and (iv) to not (fully) monitor and, where necessary, initiate, ratify and implement revisional decisions with regard to the utility of actual outcomes resulting from the refusal decisions made in steps (i) through (iii).²²² As a result, a rationally-apatetic decision-maker will arrive at a current-low-cost²²³ default decision that is a negative decision²²⁴ as well as a non-active decision.²²⁵ Prior to being confronted with complex and time-sensitive medical decision-making, rational apathy will discourage decision-makers from even attempting actively-involved, contemplative decisions. Rather, with minimal decisional effort, the decision-maker opts into the default: to “stay the course,” to not make a change in position as regards the status quo and its trajectory, to wait and *not* see,²²⁶ and to only revisit the issue in the future when unavoidably dire or noticeably fortunate circumstances will pierce through the rationally-apatetic “default armor.”²²⁷

²²⁰ Thus, aspects (i) and (ii) of rational apathy relate to the initiation stage of rational decision-making.

²²¹ Accordingly, this aspect (iii) of rational apathy relates to the decisional ratification stage.

²²² Correspondingly, this aspect (iv) of rational apathy relates to the implementation and monitoring stages of rational decision-making.

²²³ As distinguished from the long-term, “existentially-heavy” costs accruing from rationally-apatetic choice behavior. See *infra* notes 282–289 and accompanying text.

²²⁴ Namely, a decision not to decide on the merits.

²²⁵ Since the default decision is to remain passive and to not cognitively engage with the merits. See, e.g., Johnson et al., *supra* note 186, at S19.

²²⁶ Wait-and-see decisional behavior requires a contemplative, engaged-with-the-merits decisional stance because it involves a low-payload judgment that the time is not yet ripe for making a final decision on the merits. As a result, this decisional behavior will continue to monitor the evolving choice situation. Rationally-apatetic wait-and-not-see behavior is decisional *avoidance* behavior aimed at not having to confront the same, modified or worse choice situation ever again. Its goal is to permanently (if only, reiteratively) disengage with having to make any (final) decision on *any* merits.

²²⁷ Such point in time will arrive when the decisional *laziness* and *lethargy* induced by rational apathy loses the meta-utility of non-Bayesian updating. At that time, the strategy of “staying the course” and following the same procedure of yesterdays and yesteryears (which helped insulate and sustain one’s belief system as a bad Bayesian) will come to an abrupt end. For example, a diagnosis of terminal illness will bring to an end the non-Bayesian utility of a lifelong denial of mortality—as in the general belief (or attitude) that there will always be more time later to do something that one actually wants or needs to do now (but does not feel “ready” to make an affirmative decision on now).

C. *Rational Patient Apathy*

If you do not know where you are going, it does not matter how you get there.—Anonymous²²⁸

Separate from the description of rational apathy as a general decisional phenomenon, rational apathy theory, “of critical importance in corporate law analysis . . . and corporate governance,”²²⁹ also can be utilized in the current context to discuss more specifically (i) the behavior of rationally-apatetic patients in their individual, bad-Bayesian decision-making and (ii) the collective impact of this behavior—when fully aggregated among the totality of rationally-apatetic patient decision-making—on the delivery of health care, particularly at the end of life. In the broader sense, rational patient apathy applies (and is generated and reinforced) within four discrete dimensions:

1. the default, minimally-rational informed-consent decision-making of individual patients (*rational patient apathy* in the narrower sense);
2. the minimally-rational decisional support of, and influence over,²³⁰ patient decision-making by individual doctors (*rational physician apathy*);

²²⁸ See ASWATH DAMODARAN, *APPLIED CORPORATE FINANCE* 9 (4th ed. 2014).

²²⁹ Ige Omotayo Bolodeoku, *Corporate Governance in the New Information and Communication Age: An Interrogation of Rational Apathy Theory*, 7 J. CORP. L. STUD. 109, 109 (2007). See also ADOLF A. BERLE, JR. & GARDINER C. MEANS, *THE MODERN CORPORATION AND PRIVATE PROPERTY* 81 (1933) (being the first to describe rational shareholder apathy as “the normal apathy of the small stockholder . . . such that he will either fail to return his proxy vote, or will sign on the dotted line, returning his proxy to the [managers] of the corporation”); ROBERT CHARLES CLARK, *CORPORATE LAW* 390–400 (1986); Clark, *supra* note 68, at 779–80; Frank H. Easterbrook & Daniel R. Fischel, *Voting in Corporate Law*, 26 J.L. & ECON. 395 (1983).

²³⁰ Even though the legally-relevant decision-making, i.e., the act of consenting, is performed by the patient, the patient’s treatment choice, in most situations, is ultimately as much causally connected with the physician’s decision-making as it is with the patient’s. See, e.g., Richard G. Frank, *Behavioral Economics and Health Economics* 19 (NBER, Working Paper No. 10881, 2004) (“Physicians commonly must choose from among many competing approaches to treating a particular condition and trusting patients rely centrally on the recommendations of the physician. This makes the physician largely responsible for the consequences of the complex choice.”). Accordingly, from a social-ontology perspective, informed consent is not the individual act of a patient at all; it is an instance of “joint agency,” i.e., “a single action performed by many individuals,” namely, patient, physician and, possibly, additional health-services providers. Philip Pettit, *Corporate Agency: The Lesson of the Discursive Dilemma*, in *THE ROUTLEDGE HANDBOOK OF COLLECTIVE INTENTIONALITY* 249, 249 (Marija Jankovic & Kirk Ludwig eds., 2018); see also Wendy Nelson et al., *Basic and Applied Decision Making in Cancer Control*, 24(4) HEALTH PSYCHOL. S3, S8 (Supp. 2005) (“In theory, the physician and patient construct the decision tree together, thereby making it a shared decision process.”).

3. in terms of agency costs,²³¹ the merger and mutual enforcement of rational patient apathy and rational physician apathy within the patient-physician relationship (*vertical rational patient-physician apathy*); and
4. in terms of social costs,²³² the un(der)informed overutilization of medical care across the entire health care delivery system as a result of the totality of vertical rational patient-physician apathy occurring system-wide in a large majority of all patient-physician relationships (*horizontal rational patient-physician apathy*).

In the individual-efficiency dimension of single-patient decision-making, rational apathy theory models and predicts that patients will not attempt to fully inform themselves of all material, reasonably available information regarding their prospective medical treatment requiring consent—because the opportunity cost of good-Bayesian information gathering and processing will substantially outweigh the default-choice expected utility of rational patient apathy.²³³ In other words, personal investments (of time, physical and emotional energy, and money) in diligently and systematically comprehending, selecting and monitoring options and courses of medical treatment are deemed *irrational*. As a default, the minimally-rational patient will want to stay away as much as feasible from the costly, never-ending calculative morass of applied procedural rationality²³⁴ and non-biased, ultra-rational Bayesian updating. Rational patient apathy, on an individual patient basis, is therefore efficient—most of the time—for both decisional utility (by making cheap decisions in terms of transaction costs) and overall welfare utility (by arriving at a large majority of beneficial outcomes over the fully aggregated number of rationally-apathetic medical decisions).²³⁵ Rational apathy,

²³¹ I.e., as transaction costs that (i) are opportunistically caused by the physician and materialize in the patient's suboptimal decision-making, and (ii) are opportunistically caused by the patient and materialize in the physician's suboptimal support of the patient's decision-making.

²³² I.e., as negative externalities borne by the overall health care delivery system and by the totality of patients and physicians in it, caused by both patients and physicians as a result of their suboptimal, opportunistic decision-making and decisional support, respectively.

²³³ Cf. Johnson et al., *supra* note 186, at S18 (stating that “people may wish to avoid the effort and cost of changing from a default, preferring to accept a default to making an active, effortful choice”).

²³⁴ As outlined in Figure 2, *supra*.

²³⁵ As discussed below (*see infra* Part IV.A), this efficiency clearly ends at the end of life and the decisional costs of a lifetime of rationally-apathetic decision-making will then become payable. Additionally, not every rationally-apathetic decision during one's lifetime is efficient in terms of its own overall utility. Thus, more activist patients can be expected to be better in “selective bad-Bayesian” choice behavior (*see infra* note 293 and accompanying text)—namely, to be able to discriminate more competently between choice situations that warrant rationally-apathetic responses and those that require more ultra-rational choice

however, inevitably inhibits *individual* decisional systematicity as well as any future preference for systematic decision-making.

Rational patient apathy is also supported by *rational patient ignorance*. In general, the notion of “rational ignorance,” introduced in the social sciences by Anthony Downs,²³⁶ posits that “when the expected benefits of information are small . . . people buy little information.”²³⁷ As an active and deliberate form of ignorance, rational patient ignorance will, accordingly, deny that a choice situation requiring rational engagement on the merits and triggering a need for information gathering even exists. Rational ignorance prescribes the decisional and tactical default that the “same procedure as last time” (i.e., not affirmatively deciding or even investigating anything) is sufficient absent clear new evidence to the contrary. Rational ignorance, therefore, shuts down any inquiry into the evidence presented by the choice situation so that, in principle, “clear new evidence to the contrary” never reaches the decision-maker’s unobstructed awareness.²³⁸ Accordingly, the rationally-ignorant patient embraces whatever is offered as the default (in June’s example, even “urgently” offered by Dr. Savoy) and will actively refrain from ever (i) becoming genuinely (partially) informed with regard to the original choice situation, (ii) genuinely monitoring (at least, not routinely) the performance of her default choice vis-à-vis expected utility, and, thus, (iii) becoming genuinely informed with regard to any subsequent choice situation(s) that would allow her to revise and perhaps improve the performance of her original default choice. Yesterday’s default decision to choose rational apathy over any and all other decisional courses of action will, ideally, never have to be monitored or revised. Rational patient ignorance is, therefore, the deliberate non-generation of plausible bad-outcome probabilities and expectations.²³⁹ In effect, it is the convenient denial of statistically possible, but personally non-preferred rival futures.²⁴⁰

behavior for purposes of maximizing outcome utility. In other words, rational patient apathy is never efficient all of the time on a per-decision basis and is always inefficient on an aggregated-decision basis.

²³⁶ ANTHONY DOWNS, AN ECONOMIC THEORY OF DEMOCRACY 244–46, 266–71 (1957). See, e.g., Peter H. Aranson, *Rational Ignorance in Politics, Economics and Law*, 1 J. DES ÉCONOMISTES ET DES ÉTUDES HUMAINES 25, 25 (1990).

²³⁷ Bryan Caplan, *Rational Ignorance Versus Rational Irrationality*, 54 KYKLOS 3, 3 (2001). Cf. Zeckhauser, *supra* note 97, at xxi–xxii (“Ignorance arises in a situation where some potential states of the world cannot be identified.”).

²³⁸ As a result, the choice situation and its merits, at best, remain “hovering on the fringes of . . . consciousness.” SOLOMON ET AL., *supra* note 6, at 34.

²³⁹ The rationally-ignorant decision-maker selectively decides to look the other way. Even as learned behavior, conducted on auto-pilot and reflexively, it requires the decision-maker to take active evasive measures in order to avoid fuller confrontation with the merits of the choice situation.

²⁴⁰ Cf. C. NORTHCOTE PARKINSON, PARKINSON’S LAW OR THE PURSUIT OF PROGRESS 96 (1958) (“To travel hopefully is better than to arrive.”); Carol Blue, *Afterword*, in CHRISTOPHER

In the collective-efficiency dimension—constituting the largest possible,²⁴¹ “latent group”²⁴² of patient-decisionmakers—rational apathy theory models and predicts that the benefits of rationally non-apathetic patients (or *activist patients*)²⁴³ will create social benefits (i.e., collective/public goods) for all patients, including all *passivist patients*,²⁴⁴ in terms of incrementally yet globally optimizing the provision of medical care. In other words, when assuming that (i) activist patients challenge and improve the decision-support performance of medical providers generally, (ii) those providers are long-term repeat players, and (iii) they train next-generation providers based on their experience and improved decisional competence, activist patients will, through their rationally non-apathetic individual decision-making, generate positive spillover effects (or positive externalities) for complex medical and end-of-life care globally—namely, by improving care on a per-patient level and across all present and future patients.²⁴⁵ Only activist patients, however, will bear the private costs²⁴⁶ of this generation of social benefits.²⁴⁷ Therefore, since these “benefits are non-excludable group goods, most [patients]²⁴⁸ will see free-riding as the best

HITCHENS, MORTALITY 95, 103–04 (2012) (“When he was admitted to the hospital for the last time, we thought it would be for a brief stay . . . The end was unexpected.”).

²⁴¹ Namely, *all* humans at the respective ends of their lives to the extent that (i) they receive medical care prior to death and (ii) they can consent to such care.

²⁴² MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS 50–51 (2d ed. 1971). “Large groups are . . . called ‘latent’ groups because they have a latent power or capacity for action, but that potential power can be realized or ‘mobilized’ only with the aid of ‘selective incentives.’” *Id.* at 51.

²⁴³ Those patients making (or attempting to make) boundedly-rational, yet more ultra-rational, good-Bayesian personal investments in comprehending, selecting, monitoring and, therefore, optimizing their respective medical decisions, treatments and outcomes.

²⁴⁴ Those patients remaining rationally apathetic to protect their prior beliefs and the meta-utility of their non-Bayesian updating.

²⁴⁵ In other words, rational apathy theory here predicts that the totality of suboptimal, intrasystem decision-making by individual patients will translate negatively into the overall performance and efficiency of the system (and vice versa).

²⁴⁶ In particular, ultimately, the cost of facing mortality and of recognizing the futility of all end-of-life care in fending off death, and to rationally account for the certainty of their impending death in their informed-consent decision-making.

²⁴⁷ *Cf.* Clark, *supra* note 68, at 779 (“Whenever shareholders of a publicly held company vote upon matters affecting the corporation, they engage in a collective action that suffers from many systemic difficulties. Such difficulties include ‘rational apathy’ of shareholders, the temptation of individual shareholders to take a ‘free ride,’ and unfairness to certain shareholders even where collective action is successful Often the aggregate cost to shareholders of informing themselves of potential corporate actions, independently assessing the wisdom of such actions, and casting their votes will greatly exceed the expected or actual benefits garnered from informed voting.”).

²⁴⁸ Who are already heavily disinclined to reverse their rational-apathy defaults in order to avoid private bads, namely, costly activist, yet, ultimately inefficient decision-making, particularly, at the end of life (i.e., with no or not much difference to the outcome, namely death).

strategic behaviour.”²⁴⁹ “By doing so, [passivist patients] can reap all of the benefits of [more activist] decision [behavior] without sharing in any of the costs.”²⁵⁰ In the collective realm, rational apathy theory therefore also models and predicts that “no collective action [will] be taken, and everyone [will] lose the chance of reaping [any] benefits”²⁵¹ from the spillover effects of more ultra-rational, good-Bayesian end-of-life decisional behavior.²⁵² Accordingly, passivist patients, preferring to maximize short-term utility, can be expected to default even further towards suboptimal but “satisficing”²⁵³ rational apathy given that passivists regard the returns that accrue from costly activist decisional investment in the collective realm as the generation of team-production assets²⁵⁴ and public goods.²⁵⁵ In their view, those returns can never be specifically identified and paired only with their individual (more activist) investment, (cheaply) separated from the benefits that will accrue to all other patients (and the system as a whole)²⁵⁶ and, therefore, made to exclusively benefit only their own decisional investment and private wealth-generation.²⁵⁷ Accordingly, rational apathy inevitably inhibits *collective* decisional systematicity as well as any future preferences for systematic decision-making.

As a result, rational patient apathy, even when efficient (some of the time) on an individual-patient basis, is never costless (or efficient) for society as a whole. In the collective realm, rational patient apathy practiced by

²⁴⁹ Bolodeoku, *supra* note 229, at 110.

²⁵⁰ Jonathan J. Katz, *Barbarians at the Ballot Box: The Use of Hedging to Acquire Low Cost Corporate Influence and Its Effect on Shareholder Apathy*, 28 CARDOZO L. REV. 1483, 1491 (2006).

²⁵¹ ROBERT CHARLES CLARK, CORPORATE LAW 392 (1986).

²⁵² In other words, passivists would only become more activist if they were to “be compensated for the risk of engaging in such behavior”; see Clark, *supra* note 68, at 779, 882.

²⁵³ Simon, *supra* note 187, at 136.

²⁵⁴ See, e.g., Armen A. Alchian & Harold Demsetz, *Production, Information Costs, and Economic Organization*, 62 AM. ECON. REV. 777, 779–81, 794–95 (1972) (describing team production and intrafirm competition as characteristics of specific investment).

²⁵⁵ See, e.g., Paul A. Samuelson, *The Pure Theory of Public Expenditure*, 36 REV. ECON. & STAT. 387 (1954) (describing public, i.e., “collective consumption goods” as those “which all enjoy in common in the sense that each individual’s consumption of such a good leads to no subtraction from any other individual’s consumption of that good”).

²⁵⁶ See, e.g., Katz, *supra* note 250, at 1490–91 (“The division of benefits problem stands for the proposition that voters in the corporate context will reap only a small percentage of the benefit of their vote to influence the corporation.”). Arguably, in many situations there is no percentage of benefit since their individual vote does not influence the outcome at all (i.e., without counting their vote, the majority-vote outcome is still identical in result). See, e.g., Easterbrook & Fischel, *supra* note 229, at 395 (stating that “[s]hareholders are apathetic in the best of times because it is so unlikely that their votes would make a difference”); *id.* at 397 (“No shareholder has the right incentives to participate in governance, because none could influence the outcome of the election.”).

²⁵⁷ In other words, the collective goods generated by the activists cannot be manipulated into private goods that only accrue to the activists’ welfare.

passivist patients and physicians wrongly assumes “that if our actions are individually blameless, then the sum of our actions will be good for society.”²⁵⁸ Accordingly, when aggregating the modelling and prediction of rational apathy theory in both its individual and collective patient dimensions, rationally-apatetic patients and physicians incentivize a health care system to feature the following trends (as negative spillover effects of their suboptimal complex medical and end-of-life decisional behavior):

1. to further orient the provision of medical care towards unmitigated overutilization of care that may be either medically inappropriate, or contrary to patient wishes if better informed, or both;
2. to further increase the complexity and transaction costs of future activist-patient investments in rationally optimal health care decision-making;
3. to further amplify the transaction-cost-avoiding value of rational apathy and the decisional efficiency of rational ignorance in an autopoietic manner;
4. to reinforce the isolation and atomistic competition²⁵⁹ prevalent in the market for rational-patient decision-making (often under the guise of patient autonomy) for purposes of inhibiting the formation of patient coalitions

²⁵⁸ Matthew Stewart, *The Birth of a New American Aristocracy*, ATLANTIC, June 2018, at 48, 53. Cf. Katz, *supra* note 250, at 1491 (“The free rider problem causes a shareholder to ‘sit back’ and let his fellow shareholders invest the time and energy in casting ballots.”).

²⁵⁹ Atomistic competition prevails in “a market characterized by numerous individual actors on both sides, all without market power.” DICTIONARY OF SOCIAL SCIENCES (Craig Calhoun ed., 2002). In the current context, atomistic competition means that the prevailing number of passivist patients, through an enormous daily multitude of individual patient-physician “transactions,” co-generate rational patient apathy (in the broad sense) and, with it, suboptimal medical decision-making considerably below total (agency and social) costs—all without much or any power held by individual (and more activist) patients to change these “market” conditions. Thus, due to atomistic competition, the activist patient competes independently (for less apathetic decision-making) and without much, if any, ability to distinguish herself from the passivists or to offer physicians a better “product” (i.e., joint informed-consent outcome). As a highly sporadic and irregular informed consentor, she cannot reach economies of scale in terms of setting good-Bayesian updating as a more prevalent condition in the marketplace for informed consent. Thus, her share of this market is so small that in practice she cannot, by changing her decisional output to more good-Bayesian, less rationally-apatetic choice behavior, influence the market share or “income” derived from sub-optimal medical decision-making by passivist patients. To counteract these system-wide distortions of the atomistic competitive process on patients themselves and to incentivize “better bad-Bayesian” medical decision-making overall, cooperation (if not, cooperatives) among activist patients, as well as between activist patients and activist doctors, would be necessary. This would allow activist patients to formulate and bundle their patient interests in matters of informed consent and, thus, as collective “buyers” of informed consent, to bring rational patient apathy into conformity with actual supply- and demand-side preferences for informed consent.

and the collective-activist participation of patients in a more global, patient-oriented optimization of health care (decisional) systems;²⁶⁰ and

5. to further aggravate, rather than mitigate, the average vertical agency costs²⁶¹ and horizontal social costs²⁶² generated within the physician-patient relationship, especially in complex medical and end-of-life care.

In other words, the aggregate result of this cascade of effects of rational patient apathy perpetuates a race to the bottom with respect to making “best” choices for therapeutic and end-of-life care of seriously ill patients. The vicious cycle of rational apathy and rational ignorance—coupled with the various internal and external incentives that physicians have to minimize and avoid robust, time-consuming decisional support as to treatment options, individual patient preferences and the potential benefits of less care—will be difficult to disrupt and to partially reverse for those individual patients and physicians with activist decisional preferences.

IV. PRACTICAL AND LEGAL EFFECTS

The practical and legal effects of rational patient and physician apathy, fully-aggregated, on the experience of health care and informed consent for seriously ill and terminally ill patients are both insidious in process and deleterious in result. Together, they operate as a massive obstacle to activist patient and physician participation in and improvement to the delivery of complex medical care and its system-wide decisional governance.²⁶³

A. *Practical Effects: The Death of Rational Patient Apathy*

In each of its four dimensions,²⁶⁴ rational patient apathy reinforces four fundamental fallacies and majoritarian beliefs shared among large parts of U.S. end-of-life care stakeholders (patients, doctors, hospitals, insurers, long-term care facilities, etc.)—namely:

1. the fallacy that, on an individual-patient basis, optimal medical treatment is, or (with sufficient effort and evidence base) should be, *identifiable* and therefore that optimal medical decision-making is possible in absolute terms

²⁶⁰ The collective-action problem for patients, in particular, end-of-life patients makes it hard, if not impossible, for patients to comprehend, select and monitor the quality of their care specifically, and the quality of their overall health care access globally.

²⁶¹ I.e., as between patient-beneficiary-principal and physician-fiduciary-agent.

²⁶² I.e., as among all patients.

²⁶³ Cf. Katz, *supra* note 250, at 1492.

²⁶⁴ See *supra* notes 230–232 and accompanying text.

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- through prospective knowledge since outcomes are sufficiently predictable;²⁶⁵
2. the fallacy that, on an individual-patient basis, optimal medical treatment is, or (with sufficient effort and evidence base) should be, *verifiable* and therefore that optimal medical decision-making can be validated in absolute terms through retrospective knowledge since outcomes are sufficiently ascertainable;²⁶⁶
 3. the fallacy that medical decision-making (informed or otherwise), on an individual-patient basis, is wholistically optimal *only* when choosing prospectively-identified optimal medical treatment;²⁶⁷ and
 4. the fallacy that suboptimal medical decision-making (informed or otherwise) can, on a system-wide basis, be “nudged”²⁶⁸ prospectively into optimal medical treatment

²⁶⁵ Cf. Stiles & So, *supra* note 34, at 284 (discussing, as a first general assumption in the context for health care delivery, “that for any care-giving scenario, there exists the equivalent of a medical bull’s eye, a scientifically ideal treatment known to yield the best clinical outcome”).

²⁶⁶ *Id.* (discussing, as a second general assumption in the context for health care delivery, “that the treatment administered, whatever form it takes (e.g., medication, procedure or device) causes specific outcomes [obviating] the need to consider variations in outcomes introduced by events occurring beyond the confines of the healthcare system and leav[ing] the decision-maker with a far more computable problem”).

²⁶⁷ *Id.* (discussing how the “analytic power gained from this [second] assumption is the ability to model the care-giving process such that the scientifically ideal treatment yields the optimum clinical outcome and anything other than the scientific ideal produces a suboptimal result”). See also Schlesinger, *supra* note 28, at 369 (discussing how “most choice-enhancing policies are predicated on a simple, but intuitive, model of decision-making [which] presumes that (a) consumers have well defined expectations (i.e. they know what they want from their medical care or health insurance), (b) they can coherently evaluate their current health care experiences in light of these expectations and (c) if dissatisfied, will learn about alternatives to their current circumstances”).

²⁶⁸ See, e.g., RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* (2009); *NUDGING HEALTH: HEALTH LAW AND BEHAVIORAL ECONOMICS* (I. Glenn Cohen et al. eds., 2016); Epstein, *supra* note 133; Megan S. Wright, *End of Life and Autonomy: The Case for Relational Nudges in End-of-Life Decision-Making Law and Policy*, 77 MD. L. REV. 1062 (2018). At heart, nudging inescapably counts on rational inertia (*see infra* note 289). Accordingly, nudging takes advantage of and encourages rationally-apatetic decisional behavior rather than to promote less apathetic decision-making on both an individual and a collective basis. Nudging is about changing defaults and herding people into more “correct” decisional *outcomes* (with the “correctness” of outcomes being determined by some objective, inevitably normative and, usually, benign paternalistic standard) rather than allowing people to make decisions more “correctly” based on their subjective preferences. “Correctness” here only means that patients choose with more procedural rationality (i.e., as “better bad-Bayesians;” *see infra* note 291 and accompanying text) at their respective, personal level of decisional ability, guided by their own values and preferences.

decisions and outcomes—both system-wide and on an individual-patient basis.

As a result, all medical decision-making subject to rational patient apathy is rationally suboptimal given apathy's deleterious effects. Unfortunately, the end-of-life decision-making context further aggravates this suboptimality. In general, rational patient apathy suppresses rational awareness of mortality (and with it, Knightian uncertainty of the conditions of one's future) in order to make an uncertain future imaginable, expectable, and predictable.²⁶⁹ It is the cognitively convenient, apathetic decision to not decide—not at this time, maybe later, if ever—and to create an existentially necessary illusion of a foreseeably unlimited remainder of life. At the end of life,²⁷⁰ however, this meta-utility abruptly ceases.²⁷¹ And because of its insidious nature, the meta-utility of rational apathy ceases without forewarning. Now, there is suddenly and unexpectedly little quantity and livable quality of future left. Now, mortality becomes virtually impossible to suppress rationally via decisional apathy. “Later, if ever” morphs “forever” into “now, or never.” In other words, the meta-utility of rational patient apathy as an “affect meta-heuristic”²⁷² is what expires and “dies” first

²⁶⁹ Cf. SOLOMON ET AL., *supra* note 6, at 66 (“[Modern humans'] capacity to strategize, to make decisions, to design and to plan based on an imagined future represented by words and symbols, is something no other creature on earth was then, or is now, able to do.”). The imagination of one's personal future, therefore, requires awareness of a different future than may be preferred, including, a non-future for the one doing the imagining.

²⁷⁰ “End of life” can mean different things in different contexts. Here, we use it to refer to that point where the patient understands that she will eventually die from her disease no matter what additional medical interventions she accepts in the meantime.

²⁷¹ Compare Easterbrook & Fischel, *supra* note 229, at 420 (“Because of the easy availability of the exit option through the stock market, the rational strategy for dissatisfied shareholders in most cases, given the collective action problem, is to disinvest rather than incur costs in attempting to bring about change through the voting process.”), with Arthur R. Pinto, *Corporate Governance: Monitoring the Board of Directors in American Corporations*, 46 AM. J. COMP. L. 317, 326 (1998) (pointing out that “shareholders in publicly traded corporations are viewed as passive with a preference to exit by selling rather than using their voice to challenge management”). Passivist patients cannot exit and rectify their prior investment in bad-Bayesian decision-making. Similarly, they have not practiced earlier the use of their voice to challenge their own bad-Bayesian life management for purposes of “better bad-Bayesian” decision-making and control. Now that their investment is sunk, i.e., irretrievable, in absolute terms, their rationally-apatetic/ignorant investment horizon arrives at its inevitable and final end point. While Easterbrook and Fischel find it “difficult to imagine a more effective exit option than the market in shares,” passivist patients find it difficult to imagine a less effective exit option than the death that is staring them into the face. Easterbrook & Fischel, *supra* note 229, at 420 n.70.

²⁷² Whereas an “affect heuristic” (McCaul et al., *supra* note 172, at S107) constitutes a “decision-making strategy that bases decisions on the rapidly experienced good and bad feelings attached to decision alternatives” (Slovic et al., *supra* note 29), i.e., in terms of substantive, on-the-merits rationality, rational patient apathy is what we call an “affect meta-heuristic” in that it is a decision-making strategy that bases and reiterates substantive non-decision on the rapidly experienced bad feeling of engaging in the procedurally-rational

at the end of life (assuming a patient like June with, at least, some sentient awareness of her situation). Like overall human mortality, this eventual termination of rational patient apathy is logically predictable because it is always certain.²⁷³

Since apathy no longer “buys” the patient anything²⁷⁴ in terms of a long-term future outlook at the end of life (and therefore, is no longer minimally rational),²⁷⁵ all of the patient’s earlier, life-long utility “purchases” via the “currency” of rational apathy also, retrospectively, become suspect as to their true overall value.²⁷⁶ The added burden of this suspicion may, in general, make dying even more difficult from an emotional and cognitive-load perspective. As brutal as it may sound, we would expect and posit that those more activist patients who can look back over their lives and can recognize and abandon their prior apathetic decision-making (not only with regard to health care but also other major life decisions) and become more ultra-rational with their choice behavior going forward, even for the bit of time left at the end of their respective lives, will be “better off” as they

decision alternative of more ultra-rational, good-Bayesian updating (and of the resultant loss of apathetic meta-utility).

²⁷³ End-of-life patients can, of course, pretend to remain outwardly apathetic and ignorant. We posit, however, that in an at least minimally-rational sphere of decisional awareness, *timor mortis* will always “pierce through” any such pretense. Thus, no further utility derives from the prior belief that rational apathy pays better. Accordingly, any continued bad-Bayesian updating of this prior belief is now perfectly-irrational calculative behavior.

²⁷⁴ If rational apathy is part of the human condition and can be regarded as either (i) a terror management strategy or (ii) an “adaptive toolbox” coping-with-uncertainty strategy, it is a terribly inefficient strategy in either case: in any life-long “battle” of apathy versus *timor mortis*, we posit that the latter will always win. See SOLOMON ET AL., *supra* note 6, at 210–15 (discussing terror management theory); see also Gerd Gigerenzer, *The Adaptive Toolbox*, in BOUNDED RATIONALITY: THE ADAPTIVE TOOLBOX 37 (Gerd Gigerenzer & Reinhard Selten eds., 2001).

²⁷⁵ Rational apathy is a long-term strategic tool aimed at attaining life-long decisional utility through the cumulative effect of small everyday decisional increments and accretions of apathy. At the doorstep of nonexistence, any long-term strategic decision-making for one’s own future ends.

²⁷⁶ In other words, we hypothesize that the certitude of a given patient’s convictions vis-à-vis the general utility of rational apathy may be severely waning at the end of life. Indeed, the patient might recognize her life-long, ultimately futile investment in what Bryan Caplan has modelled as “rational irrationality”: “If the most pleasant belief for an individual differs from the belief dictated by [more ultra-]rational expectations, agents implicitly weigh the hedonic benefits of deviating from [more ultra-]rational expectations against the expected material costs of self-delusion [assuming that these] kinds of errors are privately costless.” Caplan, *supra* note 237, at 4. Accordingly, the end-of-life patient may now not only realize the social inefficiency of rational patient apathy across the entire health care delivery system caused by prior “private irrationality,” *id.*, of both herself and similar passivist patients, but she may also begin to question the assumed costlessness to herself of her private-irrationality decision-making and thus begin to painfully ascertain the compounded personal opportunity costs of having forgone the benefits of second-best, “better bad-Bayesian” choice behavior for most of her adult life.

prepare to die. Accordingly, we hypothesize that rational patient apathy has to “die” first, be abandoned, or otherwise not be present at the very end of life in order for the individual rationally-apatetic patient to “die well.”

Unfortunately, when already *in extremis* or close to it, good-Bayesian decision-making constitutes an impossibly tall order—psychologically, emotionally, and cognitively.²⁷⁷ Even worse, there is one’s life-long decisional momentum against good-Bayesian decision-making. First, any awareness of the private costs of Bayesian error—i.e., the cumulative decisional-utility costs of rational apathy and rational ignorance practiced over the course of an entire lifetime—is virtually non-existent in a mindset that conveniently discounts these costs by “counting” on a continued life of indeterminable duration (and, with it, costless course correction, if absolutely necessary). Second, discounting does not mean that rational apathy is indeed costless. Any exercise of decisional apathy creates more personal preference and moral hazard for additional minimally-rational decision-making in a future deemed open-ended and foreseeably never-ending.²⁷⁸ When the actual future becomes tangibly scarce at the end of life, the “intangible loss-producing propensities of the [rationally-apatetic] individual”²⁷⁹ over the course of her lifetime will suddenly materialize and reveal themselves. In this regard, we also hypothesize that—not only system-wide but also on an individual-patient basis—the decisional-utility cost of rational apathy and ignorance compounds over time, namely, in tiny sediments and accretions of per-decision “apathy fees,”²⁸⁰ and that the deferred payments of those apathy fees, fully compounded, will become due on demand in a sudden “balloon payment” at the end of life. Thus, not only does prospective meta-utility “unexpectedly” end towards the end of life, but the total trading costs of one’s prior apathy-financed meta-utility become “unexpectedly” due.²⁸¹

²⁷⁷ Cf. Schlesinger, *supra* note 28, at 367 (“[C]hoice itself is never simple from the patient’s perspective. The stakes are too high, making the choices fraught with anxiety. The consequences are impossible to fully anticipate, rendering judgments at best semi-informed guesses. And the circumstances are never really amenable: either the patients are healthy—and therefore cannot be bothered to dwell much on medical matters—or they are sick, which often limits their capacity to process a lot of complicated information.”).

²⁷⁸ Cf. Pauly, *supra* note 58, at 535.

²⁷⁹ *Id.* at 535 (quoting OLIVER D. DICKERSON, HEALTH INSURANCE 463 (rev. ed. 1963)).

²⁸⁰ Each fee equals the utility cost savings generated in a single decision produced through heuristic, rationally-apatetic behavior as compared to a single decision produced through algorithmic, Bayesian behavior. Research suggests that even moderate attempts at the latter decisional mode may lead to reductions in post-choice satisfaction—a type of decisional cost saved, on a single-decision basis, through rationally-apatetic behavior. See, e.g., Timothy D. Wilson et al., *Introspecting About Reasons Can Reduce Post-Choice Satisfaction*, 19 PERSONALITY & SOC. PSYCHOL. BULL. 331 (1993).

²⁸¹ In other words, life-long engagements in rational patient apathy are “buy-now-pay-later” transactions gone wrong. Passivist patients “finance” the cost of ultra-rationality through apathy (thus, every time they “finance,” they avoid the personal expense of producing by

And we are talking existentially heavy apathy costs materializing and revealing themselves here: assuming, at the end of life, that (i) patients have self-awareness of prior suboptimal choices—which with the benefit of hindsight can be recognized as suboptimal²⁸² and therefore will lead to the awareness of regret,²⁸³ and (ii) patients have self-awareness of suboptimal prior decisional task completion²⁸⁴—which with the benefit of hindsight can be recognized as suboptimally done and will lead to the awareness of unfulfilled decisional potential,²⁸⁵ patients are now openly burdened with the following costs:

1. the compounded opportunity cost of all rationally-apathetic and regret-inducing choices made over their entire cognitive lives (in terms of current awareness of once available but now permanently lost choice opportunities—*apathy costs of earlier choice-initiation avoidance*),
2. the psychological cost of facing an absolute bar to complete all earlier decisional tasks that were accomplished suboptimally (in terms of current decisional impotence notwithstanding current awareness of what the better choices would have been—*apathy costs of earlier choice-ratification avoidance*),
3. the psychological cost of regret awareness itself as a result of the inability to revise prior suboptimal decisions (in terms of current disappointment with one's own past decisional performance—*apathy costs of earlier choice-monitoring avoidance*), and

themselves more ultra-rational decisional behavior and outcomes) and now, at the end of life, they lack both “revenues” and “savings” to repay earlier financings and, at the same time, produce “better bad-Bayesian” end-of-life choice behavior (*see infra* note 291 and accompanying text)—in particular, given that they never learned to produce their own ultra-rational decisional “income” and “resilience.”

²⁸² “Suboptimal” here means not achieving “subjective ultra-rationality”—that is, the maximum of “better bad-Bayesian” choice (*see infra* note 291 and accompanying text) at the maximum of a given human's current rational capabilities at the respective time(s) of her choice.

²⁸³ *See generally* David E. Bell, *Regret in Decision Making Under Uncertainty*, 30 OPERATIONS RES. 961 (1982); Terry Connolly & Jochen Reb, *Regret in Cancer-Related Decisions*, 24(4) HEALTH PSYCHOL. S29 (Supp. 2005); Benjamin Djulbegovic et al., *Eliciting Regret Improves Decision Making at the End of Life*, 68 EUR. J. CANCER 27 (2016); Athanasios Tsalatsanis et al., *Extensions to Regret-Based Decision Curve Analysis: An Application to Hospice Referral for Terminal Patients*, 11 BMC MED. INFORMATICS & DECISION MAKING 77 (2011).

²⁸⁴ The task here being the ratification, implementation and completion of “better bad-Bayesian” choice (*see infra* note 291 and accompanying text) at the maximum of their current rational abilities at the respective time(s) of choice.

²⁸⁵ I.e., awareness of lost-opportunity cost.

4. the psychological cost of completing one outstanding and specific decisional task which is both unwanted and unreceptive to rationally-apatetic behavior (in terms of attempting, through a few remaining, time-sensitive choices, to “die well”—*apathy costs of earlier better-bad-choice-rehearsal avoidance*).²⁸⁶

In other words, all of the dying patient’s earlier-life apathy utility in terms of “hedonic tax”²⁸⁷ avoidance and “regret avoidance”²⁸⁸ comes to an abrupt and complete end in end-of-life decision-making. Fully aggregated, we therefore also posit that there is no such thing as “rational inertia.”²⁸⁹ Eventually, every human life runs out of time. Accordingly, decisional inertia—as the meta-utility and sum total of all rationally-apatetic and rationally-ignorant choice behavior accruing over one’s entire decisional lifetime—is never costless, nor optimally cost-reducing, nor even minimally-rational in the long-term view of human life. At the end, the “meta-utility balance” of costs and benefits of decisional inertia is always a negative sum. Decisional intuition will always evaporate into thin air as any remaining time for decisional systematicity rapidly disappears.

As with every human endeavor and skill, there seems to be at least one clear solution for making better choices: practice makes perfect.²⁹⁰ Good decisions in dying are practiced and modelled by good decisions in living. Patients, before becoming patients, while still in good health, should work to robustly develop, through life-long practice, two fundamental qualities of their complex medical and non-medical decision-making:

1. the quality of “*better bad-Bayesian*” choice behavior—
i.e., patients should develop good habits of more ultra-

²⁸⁶ See also *infra* notes 348–349 and accompanying text. The costs under 1. through 4. can also be aggregated into the apathy cost of decisional-systematicity avoidance.

²⁸⁷ Bobadilla-Suarez et al., *supra* note 198, at 188.

²⁸⁸ *Id.* at 189.

²⁸⁹ See, e.g., Hugh H. Kim et al., *Time is Money: Life Cycle Rational Inertia and Delegation of Investment Management* 1 (Pension Res. Council, Working Paper No. WP2013-33, 2013) (describing “[i]ndividuals’ tendency to maintain their [financial] portfolio allocations for long periods of time [as] investor inertia” and demonstrating that by “incorporat[ing] time costs associated with investment management . . . such inertia can be consistent with optimal behavior”). Alas, if one incorporates time cost in one direction (i.e., in terms of savings of current time not spent for purposes of short-term optimal, rationally-apatetic behavior), one also needs to incorporate time cost in the other direction (i.e., in terms of losses of later time spent as a result of prior rationally-apatetic behavior). We posit that the long-term cost of time losses eventually always catches up with the short-term benefit of time savings. In short, time always catches up *as lost*—it can never be saved.

²⁹⁰ “Good decisions come from experience. Experience comes from making bad decisions.” Schlesinger et al., *supra* note 83, at 38S (quoting Mark Twain); see also REID HASTIE & ROBYN M. DAWES, *RATIONAL CHOICE IN AN UNCERTAIN WORLD: THE PSYCHOLOGY OF JUDGEMENT AND DECISION MAKING* 2 (2d ed. 2010) (“Choosing wisely is a learned *skill*, which, like any other skill, can be improved with experience.”) (emphasis in original).

- rational and less biased choice behavior in order to maximize their utility of decisional outcomes,²⁹¹ and
2. the quality of “*selective bad-Bayesian*” choice behavior—i.e., patients should develop an activist decisional ability to discriminate between choice situations warranting only default rational apathy²⁹² and choice situations requiring “better bad-Bayesian” choice behavior.²⁹³

B. *Legal Effects: The Infra-Marginality of Informed Consent*

Informed consent law is idealistic and flawed because it assumes the prevalence of Williamsonian ultra-rationality where (i) patients and physicians make decisions with only bounded rationality and opportunism

²⁹¹ What we call “better bad-Bayesianism” is not a *normative* decisional theory. It is neither aimed at making correct decisions nor at making decisions correctly. Cf. Beach & Lipshitz, *supra* note 38, at 28 (“[C]lassical decision theory does not address the question of making correct decisions, it merely addresses the question of making decisions correctly.”). And it is only a *prescriptive* decisional theory to the extent that it assumes humans to be capable of decisional systematicity as a result of which they strive to optimize the value of their choices. Accordingly, “better bad-Bayesianism” accepts a given patient’s ability to strive for a less-minimally-rational decisional process and outcome, therefore, to attempt attaining a personal decisional optimum. This optimum will rarely, if ever, be perfect, will often be less “better bad-Bayesian” than would be possible for similarly-situated others or even possible for the patient herself at a different time of deciding, but the “best bad-Bayesian” choice that this particular patient in her particular choice situation and under the particular conditions of the overall choice architecture at the time of deciding is personally capable of.

²⁹² Or other cognitive heuristics and biases.

²⁹³ Accordingly, what we call “selective bad-Bayesianism” applies to the threshold decision of whether or not to engage in “better bad-Bayesian” choice behavior. Thus, overall, “selective bad-Bayesianism” is a procedural-rationality subset of “better bad-Bayesianism.” Cf. SOLOMON ET AL., *supra* note 6, at 53 (“Navigating through the ups and downs of life requires a delicate balance between self-deception and honest objectivity.”). We all, at least intuitively, understand the prevalence and efficiency of “selective forgetfulness” in order to avoid cognitive overload. In terms of learning, the ease of short-term memory loss (as the default) and the difficulty of long-term memory gain (as a learned behavior, either by choice or circumstance) are, depending on task environment and utility preferences, either a benefit or a detriment. Thus, if rational apathy (as the default) is an autopoietic decisional behavior aimed at the ex-post suppression of cognitive awareness and current memory of earlier choice situations (in terms of “deciding not to decide and then forgetting” or “waiting to decide and then not seeing”), we also must, at least intuitively, understand that, as learned behavior, we need to exert more effort to overcome the default (short-term memory loss/rational apathy) and opt into the exception (long-term memory gain/“better bad-Bayesian” choice behavior). In terms of rational apathy, this opt-in behavior is, by necessity, both decisional and active—i.e., there is no secondary passivist default overwriting and correcting the primary passivist default of apathy in case the primary default choice would lead to the prediction of suboptimal choice outcomes. Hence, “selective bad-Bayesian” choice behavior is a probabilistic utility judgment and, as with all decisional judgment, can be learned, regularly practiced (to avoid loss of “selective bad-Bayesian” memory and technique) and, accordingly, optimized. Good habits of decision-making are, in and of themselves, of immense (meta-)value and (meta-)utility.

as constraints, (ii) Knightian uncertainty is either absent or can be overcome by confident calculation, (iii) cognitive heuristics and biases are inapplicable, and (iv) “ultra-autonomy”²⁹⁴ prevails across a vast spectrum of end-of-life patient populations.²⁹⁵ In short, informed consent law “has substituted an ideal moral agent for a practical one.”²⁹⁶ Dying patients, however, are rarely superheroes.²⁹⁷ Recent developments such as decision-support aids, shared decision-making and nudging²⁹⁸ may help improve the quality of end-of-life decision-making so that it comports somewhat more with the utopian ideal of informed consent.²⁹⁹ Physicians and ethicists are now more actively advocating strategies for responding to requests for potentially inappropriate medical care.³⁰⁰ These functional and legal rationality augmentations³⁰¹ and palliatives,³⁰² can, however, only make a small dent in rational patient apathy because of (i) the inherent limiting effects of various types of clinical uncertainty, including Knightian uncertainty, on an individual-patient basis, and (ii) the limitation of those mechanisms to point-of-care improvements only (i.e., when serious illness already has arisen and complex medical decisions have to be made).³⁰³ Although commentators have recognized that classical theories of decision-making do not adequately describe the realities of the process, they

²⁹⁴ See *infra* Part IV.B.1.

²⁹⁵ I.e., excluding only patients without current decisional capacity irrespective of the cause(s) thereof.

²⁹⁶ Butkus, *supra* note 65, at 76.

²⁹⁷ As in all human affairs, there are notable exceptions. See, e.g., SOLOMON ET AL., *supra* note 6, at vii–viii (“On a rainy, gray day in December 1973, philosopher Sam Keen, writing for *Psychology Today*, trundled down the halls of a hospital in Burnaby, British Columbia, to interview a terminally ill cancer patient who doctors said had just days to live. When Keen entered the room, the dying man told him, with a touch of mortal irony: ‘You are catching me *in extremis*. This is a test of everything I’ve written about death. And I’ve got a chance to show how one dies . . . how one accepts his death.’ The man in the hospital bed was cultural anthropologist Ernest Becker . . . Ernest Becker died on March 6, 1974, at the age of forty-nine.”). Becker’s *magnum opus* is ERNEST BECKER, *THE DENIAL OF DEATH* (1973).

²⁹⁸ See, e.g., Epstein, *supra* note 133; Wright, *supra* note 268.

²⁹⁹ See generally Noah & Feigenson, *supra* note 3.

³⁰⁰ See, e.g., Gabriel T. Bosslet et al., *Responding to Requests for Potentially Inappropriate Treatments in Intensive Care Units*, 191 AM. J. RESPIRATORY & CRITICAL CARE MED. 1318, 1319–28 (2015) (recommending use of the term “potentially inappropriate” rather than “futile” in these situations and suggesting that physicians should seek dispute resolution and, if necessary, decline to provide the requested care).

³⁰¹ Cf. Patel et al., *supra* note 157, at 66–68.

³⁰² Cf. Clark, *supra* note 68, at 779; Easterbrook & Fischel, *supra* note 229, at 396–97.

³⁰³ Either in actuality (i.e., the patient has been diagnosed with a serious illness) or hypothetically (i.e., the patient engages in advance planning for possible future situations of serious illness).

nevertheless assume that a “best” decision is achievable under the right circumstances.³⁰⁴

Ideally, an ultra-rational patient would not only have a deep awareness and appreciation of the impact of uncertainty on all aspects of her life (including, but not limited to, her health and mortality), but would also have practiced rational choice, with full awareness and appreciation of these limiting conditions, through a multitude of different choice contexts and iterations of similar choice situations during most of her adult life.³⁰⁵ In other words, the ultra-rational patient would be good at making rationally competent, “better bad-Bayesian” decisions.³⁰⁶ She would also be good at spotting her individual inclinations towards rational apathy and, in each instance, at making good, “selective bad-Bayesian” meta-utility judgments between either avoiding or engaging with apathy. Furthermore, as a highly-skilled repeat player, she would fully appreciate the cognitive “bandwidth tax” which every engagement with serious illness and the resultant involuntary exposure to a complex health care system will bring.³⁰⁷ As a result, any treatment decision would normally come with such a high burden of calculative complexity and uncertainty that the good-Bayesian patient would simply not be able, and so would rationally refuse, to resolve and reduce the complexity and uncertainty at the point of care.³⁰⁸

Notwithstanding its idealistic conception, in the context of rational patient apathy, informed consent law principally operates within the individual realm (between individual doctors and patients) as a means of avoiding litigation risk.³⁰⁹ In the collective realm, the superficial compliance with the legal requirements of informed-consent process among doctors and patients as a group has the effect of cementing suboptimal consent outcomes.

³⁰⁴ See, e.g., McCaul et al., *supra* note 172, at S106 (noting the effects of bounded rationality and heuristics on patient decision-making but suggesting that, when decision-makers consider the probability of various outcomes for each possible choice, it is still possible to select the “best” option).

³⁰⁵ Cf. Schlesinger, *supra* note 28, at 380 (“[M]uch health care involves repeat business.”).

³⁰⁶ Cf. John Harris, *Consent and End of Life Decisions*, 29 J. MED. ETHICS 10, 12 (2003) (“It is not people who are competent but decisions.”).

³⁰⁷ See, e.g., Ada C. Stefanescu Schmidt et al., *Boundedly Rational Patients? Part 2: Health and Patient Mistakes in a Behavioral Framework*, 1 J. BEHAV. ECON. POL’Y. 17, 19–20 (2017).

³⁰⁸ I.e., while still at the hospital or in the doctor’s office or in any other circumstance of temporarily reduced cognitive bandwidth. Accordingly, and unless it were a situation of dire emergency, she would impose on herself a “cooling-off period” after which she would be able to reflect and decide (more) ultra-rationally. Cf. *id.* at 21.

³⁰⁹ See generally RUTH R. FADEN & TOM L. BEAUCHAMP, *A HISTORY AND THEORY OF INFORMED CONSENT* (1986). In this regard, rational patient apathy has a meta-utility similar to malpractice insurance. Insurance allows both patient and physician to minimize (if not, avoid) complementary financial risk—thus, to “un-bear” and (mostly) forget the residual risk of suboptimal choice. Unlike the patient, however, the physician will continue to bear reputational risk of malpractice (litigation).

Large numbers of passivist patients working on an iterative basis with large numbers of passivist physicians reinforce mediocrity in complex medical and end-of-life decision-making. Because suboptimal but superficially-acceptable informed-consent practices usually “work” to protect (i) the patient against rational-apaty meta-utility losses and (ii) the physician against potential legal liability, there is no urgent incentive for the collective of patients and health care providers to do better. Superficial compliance with informed consent law allows the passivists to free-ride on the *en banc* legal compliance of the “herd” with little to no incentive to attempt a discussion that aims higher—namely, to a level of ultra-rational understanding and decisional autonomy that would be achievable within the limits of bounded rationality, residual opportunism and Knightian uncertainty.

To be clear, we are by no means advocating the abandonment of informed consent law or a return to the “bad old days” of physician paternalism. At a minimum, the law still serves a hortatory function within every physician-patient relationship. For those activist patients and physicians who wish to optimize the quality of decision-making, informed consent law can still provide the legal framework in which to evaluate what information to provide and discuss.³¹⁰ If informed consent law, however, were more than just half-heartedly idealistic and utopian, it would also prescribe an understanding that “reasonable” scope of disclosure would mean “reasonable to a good Bayesian.” Accordingly, genuinely utopian law would further require that competent medical decision-making, particularly at the end of life, would be a collective, shared agency³¹¹ and responsibility of patient *and* doctor³¹² and that it should be guided by algorithmic rather than heuristic thinking and deciding, unaffected by either rational patient apathy or rational physician apathy. In contrast, pursuant to the prevalence and exploitation of rational apathy in non-utopian decision-making, actual informed consent law, both on the books and in application, is not about “obtaining consent or respecting [patient] autonomy [but rather about] securing acquiescence—quite another thing.”³¹³

³¹⁰ I.e., depending on jurisdiction, what a reasonable physician would disclose or what a reasonable patient would find material. *See supra* note 190.

³¹¹ *See supra* note 230.

³¹² I.e., not simply a shared responsibility for complementary decisional components (e.g., physician provides the information, patient ratifies the choice), but a “joint and several” responsibility for an indivisible, team-produced outcome which would be the ultimate shared choice and understanding between patient and physician, only memorialized in terms of an actual informed consent.

³¹³ Harris, *supra* note 306, at 12.

1. Patient Infra-Marginality

Autonomy, in the context of informed consent, is “the value expressed as the ability to choose and have the freedom to choose between competing conceptions of how to live and indeed of why we do so.”³¹⁴ In order to competently choose between those rival conceptions and to single out and consent to a single ‘best’ conception on an informed basis, patient autonomy and the law of informed consent assume that patients are what we call “ultra-autonomous” decisional experts. They enjoy “freedom from [all] controlling influences.”³¹⁵

In a Coasean utopia of hyper-rationality, patients would also be “hyper-autonomous” informational and decisional experts—with regard to every one of the above competing conceptions. They would require no input from medical experts or other forms of (informational) assistance by anyone in making perfectly autonomous decisions. They would have absolute freedom (and subject-matter competence) to choose because, as perfectly independent agents, they would know everything there is to know (including all of their future utility preferences) and would rely on no one other than themselves in order to make a perfect choice—which, while still giving the inevitable nod to their mortality, would pair the exact maximum of surviving with the exact maximum of thriving available under the circumstances.

Notwithstanding its idealistic conception, the law of informed consent rejects the utopia of hyper-autonomy. But it still erroneously embraces *ultra*-autonomy in that it presumes that patients are not only aware of, and can factor into their decision-making, the rationality limitations of the Knightian world³¹⁶ in order to provide informed consent, but are also always able to autonomously factor the autonomy limitations of the real world into their decision-making.³¹⁷ It is true that humans, in general, can ultra-autonomously breathe and supply oxygen to their bodies because (i) air is usually freely available; (ii) their bodies can usually process air perfectly; and (iii) they are generally aware of both their need for air and their ability to meet that need because they can test for both of these attributes by simply holding their breath for a short period of time. Patients, however, unless they are physicians and have the relevant specialty expertise, can *never* ultra-autonomously choose and consent to complex medical treatment because (i) knowledge is not freely available; (ii) they cannot perfectly find, filter and process relevant knowledge by themselves; and (iii) they are generally unaware of their need for more relevant knowledge and of their inability to

³¹⁴ *Id.* at 10–11.

³¹⁵ George, *supra* note 60, at 140.

³¹⁶ *See supra* Figure 1.

³¹⁷ For example, they would be aware of any and all “decision frames” impacting their choices, thus, unavoidably limiting their ability to “mak[e] truly autonomous decisions in the sense of effectuating their own preferences.” Epstein, *supra* note 133, at 1286.

meet that need because they have no means to test for this dual lack of awareness. Accordingly, an ultra-autonomous patient would, through logical reasoning, “know[] one thing, that he knows nothing.”³¹⁸

Again, rational patient apathy here works as a principal mechanism to shield passivist patients’ awareness of their lack of ultra-autonomy and decisional control. This rational-apaty shield allows for minimally-autonomous decision-making but without even the awareness that the minimally-autonomous choice is, at best, limited to a better bad choice. As a result, the vast majority of patients is *infra-marginal* to improvements in informed consent law, particularly at the end of life, when whatever one is consenting to is not going to be preferred and can never amount to a “best” or even a “good” choice. Patients simply do not know—and usually do not want to know—what they are missing. Thus, whatever we do in terms of improving informed consent law in order to nudge and engage passivists at the point of contact with serious illness and the health care system, it does not matter—not even *marginally*. The majoritarian apathetic default set by *infra-marginal*, passivist patients means that overall decisional behavior is normally beyond the reach of any improvement in the rules. *Infra-marginal* apathetic patients are *excellent Bayesian* updaters in terms of protecting prior beliefs of rational apathy and its utility. Accordingly, the design and provision of more and better decisional aids, more and better advance-care planning tools, etc.—all aimed at improving the experience of patients as well as the quality of clinical outcomes—only marginally increase patients’ cognitive payloads for rationally-apatetic and ignorant non-Bayesian updating. In fact, these efforts at improvement will continue to allow passivist patients to escape any awareness of self-deception in terms of their imagined decisional ultra-autonomy and rationality.

To be clear, we do not in any way criticize passivist patients for their rational apathy. *All* of us are passivist patients and decision-makers at least *some* of the time.³¹⁹ *All* of us “have neither the willingness nor the ability to [rationally] manage”³²⁰ our lives *all* of the time. Being decisionally-apatetic is a reasonable option when well-chosen (i.e., in a “selective bad-Bayesian” manner).³²¹ We only here posit that patients who, irrespective of

³¹⁸ See *supra* note 2 and accompanying text. See also Wright, *supra* note 268, at 1093 (discussing how patients “understand the exercise of autonomy to be relational in two distinct dimensions: deciding with others and deciding, in part, based on others’ interests”).

³¹⁹ Given that (i) Bayesian updating is always immediately (i.e., non-deferred) costly and often inefficient and (ii) non-Bayesian updating is often only costly on a deferred (thus, not immediate) basis and often works well (enough), we all, over a lifetime of “experiential learning,” have developed a “meta-preference” for non-Bayesian updating and with it, for passivist decision-making.

³²⁰ Easterbrook & Fischel, *supra* note 229, at 397.

³²¹ Thus, “ecologically rational.” See, e.g., Mousavi & Gigerenzer, *supra* note 79, at 368. (“A heuristic is considered *ecologically rational* when it functionally matches the structure of environment.”); see also Revenson & Pranicoff, *supra* note 107.

preset legal structures and choice architectures, prefer to be more activist—cognitively, emotionally, and with a willingness to embrace uncertainty—could have better tools for doing so, particularly at the end of life. Accordingly, the “legal approach toward improving the efficiency of collective [patient] action [should be] to make it cheaper for each [activist patient] to act in an informed way.”³²² At present, however, activist patients fend for themselves. They are functionally orphaned by the scope and practice of informed consent law.³²³

2. Physician Infra-Marginality

Rational physician apathy, i.e., the minimally-rational decisional support of, and influence over, patient decision-making by individual doctors, is similarly infra-marginal to improvements in informed consent law. In the individual physician-patient realm, the practical application of informed consent law is more about avoiding litigation risk than about supporting patients in making robust, high-quality health decisions. Thus, in the limited context of informed consent law compliance, an efficient passivist physician can be rationally apathetic to all outcomes of patient choice other than the reduction of litigation risk. As explained above, “[p]hysicians are [also] imperfect agents in that they will recommend treatment beyond the ‘patient’s optimum level’ in order to gain income.”³²⁴ In the current context, this income includes both financial gains and meta-utility gains. There is strong evidence of this meta-utility: “Physicians have been shown to be creatures of habit in making medical choices, and are slow to adopt new practices and technologies that would improve the quality of care and in turn their patients’ health.”³²⁵ Again, to be clear, there are many activist physicians who seek to help their patients make good choices and so optimize care at the end of life, to the benefit of the individual patient and the collective. And even passivist physicians no doubt care about achieving good health outcomes. Even the best activist physician, however, will be a bad Bayesian at least some of the time, and activist physicians will always constitute a minority of “better bad-Bayesians” in a system skewed towards passivist apathy.

Within the collective realm of informed consent law as lived by patients and doctors, the baseline legal process of simply providing the patient with required material information and asking the patient to agree or “choose” constitutes the most competitive transaction with the lowest

³²² Clark, *supra* note 68, at 783.

³²³ Thus, at a minimum, raising “an issue of fairness;” *cf.* Pinto, *supra* note 271, at 326. *See also* Butkus, *supra* note 65, at 77 (“If we genuinely care for our patients, we ought to help them reach meaningful choices, instead of fiat[ing] an empty and ill-defined autonomy.”).

³²⁴ Frank, *supra* note 230, at 7.

³²⁵ *Id.* at 8.

transaction cost. Those physicians who adopt this *pro forma* approach to the legal duty of informed consent are free-riding on activist physicians' efforts to make consent more robust. Fully aggregated, they negatively affect patients' overall quality of life but win the race to the bottom in terms of physician labor-cost savings and meta-utility benefits. All of their supply-side actions are in concordance with the demand-side behavior for rational apathy by infra-marginal passivist patients. Thus, the demand from passivist patients and supply from passivist physicians for rational-apathy utility meet and control the market for suboptimal end-of-life decision-making.

Finally, the limitations on physicians' time and the impact of payment structures play a role here. In light of the general assumption made by health economists and health care market participants that patient "outcomes are 'non-contractible', that is it is impractical to pay doctors on outcome" and, instead, that doctors paid on a fee-for-service basis should be "rewarded for having a higher volume of patients seeking his or her services,"³²⁶ how would we expect passivist doctors to respond to marginal legal or financial incentives aimed at improving informed consent?³²⁷ Given that (i) the incentive (i.e., price change) will increase physician labor; (ii) physician labor is a scarce resource; (iii) physician labor will generally have higher-priced uses (in terms of serving other patients at higher fees for service than spending the same physician labor on lower-fee informed-consent services); and (iv) more physician labor spent on "better bad-Bayesianism" will decrease the utility of rational physician apathy, the marginal cost of physician labor will be significantly higher for "better bad-Bayesian" informed consent labor than for bad-Bayesian informed consent labor. As a result, the passivist default for many physicians will be to remain infra-marginal, to consistently offer subpar quality on all aspects of informed consent, and to be rewarded by "[b]ecoming a bad doctor."³²⁸ Moreover, as this passivist physician behavior also promotes horizontal rational patient-physician apathy, it will help turn the information-asymmetric market for complex medical decision-making into a "market for lemons."³²⁹

³²⁶ *Id.* at 10.

³²⁷ For example, in the form of a Medicare reimbursement rule change that allows doctors to earn an extra fee for the service of having an advance-planning conversation with a Medicare patient. See *supra* notes 152–153 and accompanying text (discussing this rule).

³²⁸ Szech, *supra* note 90, at 244.

³²⁹ Akerlof, *supra* note 54.

V. CONCLUSION AND FUTURE RESEARCH IMPLICATIONS

If the disease does not respond to the medicine, the explanation lies not in flaws in the medicament but in insufficient dosage, in want of time, in want of “commitment” to the treatment.—Frank Easterbrook & Daniel Fischel³³⁰

Start where you are.—Pema Chödrön³³¹

Rational patient apathy refuses to formulate concrete and realistic patient-outcome preferences. It refuses to decide on the merits of an optimal “pathway” between the patient’s decisional situation and her most-preferred health outcome. Rational patient ignorance refuses to recognize that a particular choice situation may have arisen, i.e., that choice uncertainty and a need for evidence even exist. In combination, rational patient apathy and ignorance refuse to recognize that anything has to be decided which may have a bearing on a patient’s outcome preferences and their attendant probabilities—other than, by reiterative default, to “decide not to decide.” As a result, and assuming that we want to improve both patient experiences within the informed-consent system and wholistic clinical outcomes for patients based on better informed-consent practice, we need to develop concrete, intervening methods and practices that educate patients and physicians to bypass the non-outcome centeredness that rational patient apathy promotes.

This reform process should include what we call “non-utopian practical pathways” aimed at developing viable incentives and solutions for improved choice behavior at the end of life. Put simply, we have to design meaningful ways for current and future patients to learn to actively participate in their complex medical treatment decisions.³³² As mentioned above,³³³ the focus here is to develop no-nonsense, cost-effective and otherwise sufficiently “appealing” avenues to support and nurture “better bad-Bayesian” and “selective bad-Bayesian” choice behavior—both on a per-patient/per-physician basis and systemically. In the individual realm, the objective is to move beyond the atomistic competition³³⁴ faced by two groups of

³³⁰ Easterbrook & Fischel, *supra* note 229, at 396.

³³¹ PEMA CHÖDRÖN, *START WHERE YOU ARE—A GUIDE TO COMPASSIONATE LIVING* (2001).

³³² In other words, if rationally-apathectic indifference towards informed consent is attributable to a lack of meaningful ways for patients to participate more actively in their complex medical treatment decisions, it is a self-reinforcing frustration given the relative powerlessness encountered in end-of-life decision-making. This frustration could be somewhat overcome if patients believed and understood that their decisions, passive or active, will inevitably have some direct effect on, and correlation with, treatment outcomes and the generation of individual and collective welfare benefits.

³³³ See *supra* notes 292–293 and accompanying text.

³³⁴ See *supra* note 259.

participants in the “market for rational apathy:” (i) patients and doctors who are already activist-inclined; and (ii) passivist patients and doctors who are at least minimally inclined to question the one-size-fits-all meta-utility of their respective rational-apathy defenses. In other words, we are realists who do not presume that even a majority of passivist patients and physicians would want to become more rationally activist. We also fully acknowledge that a large majority of complex medical decisions at the end of life can never be made in a good-Bayesian, ultra-rational manner. Rather, in the individual realm, practical pathways should be designed to provide opportunities to *all* end-of-life patients—which most of us will eventually become—to be less bad-Bayesian in their decision-making *some* of the time. Accordingly, the teleological design of pathways should not be remedial and normativistic—i.e., in terms of busting or solving rational patient apathy and returning or nudging patient decision-making to where it should be in the first place.³³⁵ As we hope our discussion has made clear, rational patient apathy and ignorance are both “rational” in that they serve valid, efficient and important private and public goals³³⁶—but never indiscriminately across the entire board of all possible choice behavior, never all of the time, and certainly rarely, if ever,³³⁷ at the end of life. As a result, the design of individual pathways should be supportive and, at most, prescriptive. The design should provide enabling mechanisms and structures aimed at helping interested patients and physicians to improve their individual choice behavior.³³⁸

In the collective realm of patients and medical providers, similar enabling mechanisms and structures should support the totality of their choice behavior. In other words, here we should try to bring patients and physicians together—ideally, outside of their actual point-of-care interactions—in order to collaboratively improve their team-produced³³⁹ choice behavior at the end of life. The objective here is to move beyond the rational-apathy-inducing free-rider problem³⁴⁰ of latent-group patient-decisionmakers and physician-decisionmakers. Each of these two large groups has “latent power or capacity for action, but that potential power can

³³⁵ See, e.g., Benjamin Djulbegovic et al., *Rational Decision Making in Medicine: Implications for Overuse and Underuse*, 24 J. EVALUATION CLINICAL PRAC. 655, 656 (2018) (discussing differences between descriptive, normative and prescriptive theories of normativity).

³³⁶ In addition, we would also claim that humans are unable to ever entirely transcend the rational-apathy boundary shown in Figure 1, and, thus, to transfer their complex medical decision-making completely from a bad-Bayesian into a good-Bayesian choice architecture. Hence, our focus on “*better* bad-Bayesian” choice behavior.

³³⁷ Particularly, for the reasons discussed in Part IV.A *supra*.

³³⁸ Cf. Pauly, *supra* note 58, at 537 (“No single . . . policy is ‘best’ or ‘most efficient’ for a whole population of diverse tastes.”).

³³⁹ See *supra* note 312.

³⁴⁰ See *supra* notes 242–251 and accompanying text.

be realized or ‘mobilized’ only with the aid of ‘selective incentives.’³⁴¹ In addition, the latent group of physician-decisionmakers must largely overlap with the latent group of patient-decisionmakers given that most physicians will also become end-of-life patients at some time. This presents an opportunity to capitalize on the concordance³⁴² that already functionally exists between patients and physicians as part of their joint decision-making as well as on the empathy-based concordance that should accrue from the fact that physicians are also future patients.³⁴³ Therefore, in the collective realm, we should attempt to design pathways to move far beyond the standard response for improving or remedying the quality of complex medical decision-making such as calls to improve medical training of physicians for better point-of-care patient interaction.³⁴⁴

Instead, we should consider two very different changes: first, because the race to the bottom is produced through the joint agency of physicians and patients, practical pathways should attempt to selectively slow down and possibly reverse the race by bridging the relational distance that commonly exists between patient and physician cohorts. The practical implications of rational patient apathy and its effects on the delivery of health care for seriously ill and dying patients require not only education of the stakeholders, but also ways for patients and physicians to jointly and systematically disrupt some of their co-generated rational apathy and its consequent effects. These efforts can realistically focus only on those physicians and patients (in our opinion, a minority of both populations) who are open to change and not already rationally apathetic towards rational apathy. Accordingly, we are fully aware that these “concordance” approaches based on commonality, affinity and joint responsibility will at best appeal to only *some* patients and doctors *some* of the time.

Second, because most of the race to the bottom is the result of only structurally-limited point-of-care engagements between patients and physicians, namely, where a diagnosis of serious illness triggers complex choices for wholistically optimal health care delivery, collective pathways should provide supports for complex medical decision-making *well before* end-of-life points of care. In other words, we believe that, collectively,

³⁴¹ OLSON, *supra* note 242, at 51.

³⁴² See, e.g., Schmidt et al., *supra* note 307, at 20 (discussing “a concordance between frame of mind of the physician and patient”); see also Harris, *supra* note 306, at 11 (“Informed consent is a dimension of respect for persons in that it is through consenting to things that affect us that we make those things consistent with our own values. When we consent to what others propose we make their ends and objectives part of our own plans . . .”).

³⁴³ See *supra* note 142 and accompanying text (discussing physicians’ preferences respecting their own end-of-life care).

³⁴⁴ For a critical assessment of those standard calls, see, for example, Hall, *supra* note 69, at 1135–36 (“In the inner sanctum of the treatment relationship, the concern is that trust may be too high, not too low, creating impossible demands on physicians and institutions to meet such unrealistic expectations.”).

patients cannot wait until a diagnosis of serious illness “eats up” even more bandwidth than they will normally have and be willing to commit in order to critically engage with rational patient apathy and “better bad-Bayesian” updating. Optimizing end-of-life decision-making needs to be practiced well before the crisis eventually occurs, namely much earlier in life and much more pervasively.³⁴⁵ As a result, the design of collective pathways should aim to increase both awareness and practice of better choice behavior, including in end-of-life decision-making. Being realists, we acknowledge that practical pathways must be feasible and effective notwithstanding the large burden of external pressures on physicians (such as fear about liability, payment-system incentives to provide more than necessary care, and the broader challenges of the complex, multi-institutional payor/provider system of health care finance and delivery in the United States) which will always limit their potential efficacy.

Finally, we acknowledge that less-apathectic, more ultra-rational decision-making, to the extent that it is feasible in a given choice situation, always remains unalterably constrained by Knightian uncertainty, bounded rationality and opportunism.³⁴⁶ The value of transcending the rational-apathectic boundary in a single choice “transaction” may be minimal-to-nonexistent in terms of concrete benefits (i.e., marginal costs of bad-Bayesian decision-making compared to those of “better bad-Bayesian” decision-making on a per-choice basis).³⁴⁷ We suggest, however, that (i) *similar to* the meta-utility of rational patient apathy, “better bad-Bayesian” decision-making, practiced over the long-term, also offers compounding meta-utility returns—but in terms of more competent and confident decision-

³⁴⁵ Cf. SOLOMON ET AL., *supra* note 6, at 7 (“And here’s the really tragic part of our condition: only we humans, due to our enlarged and sophisticated neocortex, can experience [the] terror [of feeling mortally threatened] in the *absence* of looming danger.”) (emphasis in original); *id.* at 10 (“Socrates defined the task of philosophy as ‘learning how to die.’”). For a perhaps mundane but certainly outside-of-the-box practical “tool” to promote this practice, see, for example, Bianca Bosker, *The App That Reminds You You’re Going to Die*, ATLANTIC (Jan./Feb. 2018), <https://www.theatlantic.com/magazine/archive/2018/01/when-death-pings/546587/> (describing an App called “WeCroak” which sends five daily reminders, at random times, that users of the app are mortal, based on a Bhutanese folk saying that “to be a truly happy person, one must contemplate death five times daily”).

³⁴⁶ See *supra* Figure 1.

³⁴⁷ Particularly, given the existence of uncertainties that cannot be quantified probabilistically. See, e.g., ITZHAK GILBOA, THEORY OF DECISION UNDER UNCERTAINTY 130–31 (2009) (“The main difficulty with . . . the entire Bayesian approach is, in my mind, the following: for many problems of interest, there is no sufficient information based on which one can define probabilities. Referring to probabilities as subjective rather than objective is another symptom of the problem, not a solution thereof. It is a symptom, because, were one capable of reasoning one’s way to probabilistic assessments, one could have also convinced others of that reasoning and result in a more objective notion of probability. Subjective probabilities are not a solution to the problem: subjectivity . . . does not give us a reason to choose one probability over another.”).

making rather than decision-avoidance; and (ii) *unlike* the meta-utility of rational patient apathy, this “better bad-Bayesian meta-utility” will generate significantly better psychosocial and medical dividends over the long run and, in particular, at the end of life. Patients and physicians who have a preference to systematically practice more ultra-rational and wholistically authentic decision-making, in principle, will reap significant “utility rewards” at the end of life:

1. reduced opportunity cost as well as increased psychological benefit—because of their past choice behavior that resulted in improved completion of important decisional tasks and their current awareness thereof;
2. reduced psychological cost—because of their past ability to avoid regret through more competent decision-making generally³⁴⁸—as well as further increased psychological benefit—because of their current “awareness of regret-avoidance;”
3. further reduced psychological cost—because, in now attempting, through a few remaining choices, to “die well,” they have long learned to accept and embrace limited choice and limited autonomy; and
4. the eventual psychological benefit of dying with less fear and being more at peace.³⁴⁹

Accordingly, it seems reasonable to expect that, on average, these patients will also be more likely to refuse highly-invasive, life-prolonging technologies at the end of life because they are more content with their earlier decisions. They may more easily accept impending death as they look back over their lives as decision-makers who opted to step away from rational apathy and practiced better rational choice at key points throughout life.

The overall practical impact of rational patient and physician apathy on informed consent law and the delivery of end-of-life care also prompts a need for further theoretical and empirical study and testing. As examples, areas for further research should include the following:

1. basic and applied decision research³⁵⁰ of rational patient apathy in each of its four dimensions as well as in various combinations—for example, co-individual intersections of rational patient apathy and rational physician apathy, co-collective intersections of vertical and horizontal rational patient-physician apathy,³⁵¹ intersections of individual and

³⁴⁸ Frank, *supra* note 230, at 7.

³⁴⁹ See also *supra* notes 282–289 and accompanying text.

³⁵⁰ See, e.g., Nelson et al., *supra* note 230, at S3.

³⁵¹ For example, the specialization and resultant fragmentation of health care service providers and patients’ reliance on multiple medical experts as part of a “single” treatment (as over the course of June’s treatment for Stage IV ovarian cancer) should normally bring with it a

- collective realms, and interdependencies among all four realms;
2. theoretical and empirical research situating rational patient apathy, similar to other heuristics, within “ecological rationality”³⁵²—for example, if “selective bad-Bayesianism” may be understood as decision-making which adheres to “an ecological notion of rationality that is achieved through a functional match between the heuristic strategy and the task environment,”³⁵³ how does this environment fundamentally change at the end of life and what are the consequences of this change on the meta-utility of rational patient apathy on the one hand and the meta-utility of “better bad-Bayesian” patient choice on the other hand;
 3. theoretical research on the presumed meta-utility of ultra-rational decision-making—for example, to what extent may a reduction of rational patient apathy have unintended consequences for the overall system;³⁵⁴
 4. empirical research on the role of physicians as “better bad-Bayesian decisional intermediaries”—for example, given that physicians have a competitive advantage as repeat players with more experience in complex medical decision-making under uncertainty, qualitative research interviewing physicians in relevant specialties (such as oncology, cardiology, critical care medicine, and palliative care) could provide better insight on rational patient apathy and its implications for informed medical decision-making as well as on how physicians would, if freed from external pressures, envision a better informed-consent process, including practical pathways in promoting that process;

diverse network of rational patient apathy because (i) the same patient will interact with differently-positioned physicians in terms of rational physician apathy and (ii) those differently-positioned physicians also have to coordinate the patient’s diagnosis and treatment amongst themselves. Thus, in both these realms, there could be “rational apathy asymmetry,” “rational apathy noise” and other “rational apathy distortions” observable within these collective point-of-care interactions.

³⁵² Mousavi & Gigerenzer, *supra* note 79, at 368 (“Heuristics are adaptive tools that ignore information to make fast and frugal decisions that are accurate and robust under conditions of uncertainty. A heuristic is considered *ecologically rational* when it functionally matches the structure of environment.”) (emphasis in original).

³⁵³ Mousavi & Gigerenzer, *supra* note 79, at 367.

³⁵⁴ Cf. DAVID COLANDER, BEYOND MICROFOUNDATIONS: POST WALRASIAN ECONOMICS 116 (1996) (“In the Walrasian conception the ultra-rational economic actor drives the system to equilibrium and serves a useful purpose. In the Marshallian system such ultra-rational economic actors can destroy the system by destroying the institutions that give it stability.”).

5. “translational research”³⁵⁵ of patient infra-marginality and its impact on specific reform measures within informed consent law—for example, empirical correlation studies on the utilization of specific decisional aids, tracking utilization distribution between activist and passivist physicians, and patient treatment choices;
6. theoretical institutional research on collectivized modes of activist patient and physician organization and team decision-making—for example, to what extent might “activist-patient cooperatives” allow the bundling of patient interests in matters of informed consent and, thus, counteract the atomistic competition³⁵⁶ in the market for informed consent;
7. theoretical and empirical research on the impact of rational apathy on health care agents (what we call “rational agent apathy”)³⁵⁷—for example, qualitative empirical research as to how rational apathy affects the procedural and substantive rationality of surrogate decision-making given that agents frequently must decide for incapacitated patients while under the burden of extra levels of non-clinical uncertainty;
8. theoretical and empirical studies on the intersection of rational patient apathy, physician-patient trust and end-of-life care—for example, does a reduction of rationally-apatetic patient behavior also correlate with either reduction or increase of physician-patient trust, particularly, when the credence good of health care is “buying” the patient “relatively little” at the end of life, thus, when continued “credence” and “apatetic belief” in

³⁵⁵ Nelson et al., *supra* note 230, at S4 (“[T]ranslational research is a reciprocal process whereby basic scientists provide applied/clinical researchers with new tools to test and potentially use in the clinical arena, and applied/clinical researchers make observations about patients and diseases that stimulate basic investigations.”).

³⁵⁶ See *supra* note 259.

³⁵⁷ As explained above, many seriously ill patients lose decisional capacity at the end of life and so must rely on health care agents (often family members) to make decisions on their behalf. Agents are tasked with choosing what the patient would choose if able to decide herself. See *supra* notes 200–202 and accompanying text (briefly describing the common need for surrogate decision-making when patients lose decisional capacity). All of the arguments concerning the effects of rational patient apathy on patients similarly apply to the health care agents of incapacitated patients. In fact, agents often labor under the additional burden of extra levels of non-clinical uncertainty, including questions about how family members might react to their choices, whether they are “doing the right thing” in consenting to or declining additional care, and whether declining additional care makes them somehow responsible for the patient’s death.

- the value and “success” of any medical interventions may be seen as no longer warranted by (passivist) patients; and
9. applied research on physician-apology laws and the empirical distribution of activist versus passivist patients³⁵⁸—for example, foundational observational inquiry into the question of whether physicians who wish to apologize and patients who derive benefit from apologies are more likely to be ultra-rational actors or rationally-apathetic ones.

The deficiencies of informed consent law are well-documented and understood. The phenomenon of rational patient apathy—and its dynamic, deleterious effect on the law, application and practice of informed consent—is neither. This Article has merely corroborated a direct behavioral link between rational patient apathy and the deficiencies of informed consent law.³⁵⁹ Without a more profound and better-researched understanding of rational patient apathy and corresponding legal reform, informed consent practice will continue to be static, ineffectual, and regulatorily sidetracked by its own utopian vacuum—at tremendous and avoidable cost for all.³⁶⁰

³⁵⁸ In recent years, a number of states have enacted so-called “apology laws” which attempt to avoid or reduce liability in malpractice litigation by rendering physician apologies for medical error inadmissible in court. See Nicole Saitta & Samuel D. Hodge, Jr., *Efficacy of a Physician’s Words of Empathy: An Overview of State Apology Laws*, 112 J. AM. OSTEOPATHIC ASS’N 302 (2012) (explaining that apology laws “have been shown to reduce the financial consequences of a medical malpractice lawsuit”). The rationale behind these laws is two-fold: many physicians wish to apologize for errors that harm patients but are advised by risk managers and other attorneys to remain silent and to refrain from speaking with patients and families. At the same time, patients and families often state that their primary reason for filing a malpractice suit is to “find out what happened” after receiving only limited information from the relevant health care institution about the events. Research suggests that when physicians apologize and admit fault, those receiving the apology appreciate and respect the physician’s honesty and are more likely to settle claims or to reduce the amount of damages requested. See Jennifer K. Robbennolt, *Apologies and Settlement*, 45 COURT REV. 90 (2009); Jonathan R. Cohen, *Apology and Organizations: Exploring an Example from Medical Practice*, 27 FORDHAM URB. L.J. 1447 (2000).

³⁵⁹ Cf. Beach & Lipshitz, *supra* note 38, at 28 (“[C]lassical decision theory does not address the question of making correct decisions, it merely addresses the question of making decisions correctly.”); McCaul et al., *supra* note 172, at S107 (“It is important to recognize that normative decision models were not intended to describe how decision making actually occurs but rather to describe how decisions ought to be made.”).

³⁶⁰ Cf. Djulbegovic et al., *supra* note 335, at 655 (stating that “suboptimal [medical] decision making is considered a leading cause of death and is responsible for more than 80% of health expenses”).