von Kodolitsch et al., *Cogent Medicine* (2015), 2: 1109742
http://dx.doi.org/10.1080/2331205X.2015.1109742

cogent medicine

EVIDENCE-BASED MEDICINE & MEDICAL INFORMATICS | RESEARCH ARTICLE

Maximizing therapeutic success: The key concepts of individualized medical strategy (IMS)

Yskert von Kodolitsch[1]*, Alexander M. Bernhardt[1], Tilo Kölbel[1], Christian Detter[1], Hermann Reichenspurner[1] and Eike Sebastian Debus[1]

Received: 03 July 2015
Accepted: 06 October 2015
Published: 13 November 2015

*Corresponding author: Yskert von Kodolitsch, Centre of Cardiology and Cardiovascular Surgery, German Aortic Center Hamburg, University Heart Center, University Medical Centre Hamburg-Eppendorf, Martinistrasse 52, Hamburg 20246, Germany
E-mail: kodolitsch@uke.de

Reviewing editor:
Udo Schumacher, University Medical Center Hamburg-Eppendorf, Germany

Additional information is available at the end of the article

Abstract: Individualised medical strategy (IMS) seeks therapeutic success in the following three dimensions: (1) biology, (2) sociology, and (3) psychology. IMS addresses these dimensions of success (1) as efficiency by achieving biological goals such as medication that normalizes blood pressure or surgery that completely eradicates cancer; (2) as effectiveness by achieving social goals such as satisfying guidelines, patients' purposes, and ethical demands; and (3) as motivation by achieving psychological goals such emotional support and identification of patients with therapy. IMS designs patients as principals of care, with utility-driven action style, physicians as agents of medical rationality with duty-driven action style, and strategy as primer for cooperation between patients and physicians. Dialog is central to maximize success through (1) informing patients about their pathologic conditions, options, and risks of treatment, (2) negotiating patients' needs, and (3) motivating patients to support therapy. IMS understands therapy as open-ended process where one-sided views of what is to be considered as "best medicine" is not appropriate, and where physicians integrate normative and emotional dimensions of patients into therapy. In conclusion, we suggest IMS as a highly useful concept of medical action, where physicians integrate patients' individual utilities, ethical principles, and emotions to maximize therapeutic success.

Subjects: Biology; Cardiology; Critical Thinking; Economics, Finance, Business & Industry; Education; General Medicine; Medical Ethics; Philosophy of Human Nature; Philosophy of Psychology; Social Sciences

Keywords: strategy; medical decision-making; shared decision-making; evidence-based medicine; medical ethics; individualized medicine; patient-centered care; narrative medicine; goals of medicine

Yskert von Kodolitsch

ABOUT THE AUTHOR

The corresponding author (Yskert von Kodolitsch) has a long-standing interest in strategy and in the theory of medical action. He is coordinator of the theory cluster of the Clausewitz network of strategic studies located at the General Staff College of the German armed forces. The authors of this paper together form a team of physicians who jointly treat patients at the German Aortic Center Hamburg. The members of this center shaped the term "individualized medical strategy" (IMS) to describe their approach to medical action and decision-making. In this paper, the authors present key concepts of IMS.

PUBLIC INTEREST STATEMENT

Modern medicine focuses on disease, but it tends to ignore the patient as human being. Physicians from the German Aortic Center Hamburg present their key concepts of individualized medical strategy (IMS). IMS integrates biology, sociology, and psychology to maximize the success of therapy. Their holistic approach aims at putting the patient at the center of care where physicians place dialog with their patients first, and science and technology second. The authors have made the experience that medicine maximizes success of modern therapy with physicians who treat their patients individually and who approach each patient as a person rather than as organ disease.

1. Introduction

There is no doubt that patients must be at the center of medical care (Maio, 2012). However, medical care has grown into a business full of complexity and conflict. We are reminded only by history books of the past time when patient physician relationships were privy encounters of human beings. Today, all kinds of groups struggle to redefine physicians' tasks and duties: Biologists, epidemiologists, technicians, business executives, ethical committee members, hospital owners, sponsors, insurance clerks, pharmaceutical representatives, bioethicists, quality auditors, health authorities, lawyers, politicians, and many more (Maio, 2008). On the one hand, society is changing and physicians must take change into account. On the other hand, societies may change but the need to treat diseases remains the same. Evidence-based medicine (EBM) as ruling "philosophy" of medicine focuses on purifying the medical knowledge base and therefore it is too limited in its scope to address the problem (Greenhalgh, Howick, & Maskrey, 2014; Straus, Haynes, Glasziou, Dickersin, & Guyatt, 2007). Here we formulate concepts of individualized medical strategy (IMS) that connect these two demands: first, to treat diseases successfully and second, to account for multicultural society's changing claims. IMS does not provide new knowledge as it merely organizes existing knowledge allowing the understanding how to handle complexity and conflict in an attempt to maximize therapeutic success.

1.1. Biomedicine can only address disease

"Putting the patient at the centre of care" appears to be a platitude since nobody would agree on the opposite of this claim, such as "put the patient at the periphery of care" or "put science or technology or money-making at the centre of care" (Dunn, 2003; Miles, 1997). However, biomedicine has its focus on disease and not on the patient as human being (Brooks & Buchanan, 1988; Kleinman, 2008; Morrison & Wood, 2004; Shorter, 1991). The founding science of medicine is biology that unravels the mechanisms of pathologic conditions, and that allows for diagnosing and treating diseases almost independently of what the patient says or feels (Kleinman, 2008; Marcum, 2008; Shorter, 1991). Similarly, biotechnology provides diagnostic and therapeutic tools designed to target organic pathology regardless of the person who harbors such target. Finally, economy lowers costs to make biomedicine available to broad patient populations. To this end, however, economy standardizes biomedical processes for patients as large populations, but at the same time it seeks to reduce the effects of individuality that increase costs of medical service. In short, biomedical sciences, biotechnology, and health economy address diseases and count number of cases, but they ignore the patient as a human being.

1.2. Physicians can address patients

Patients ask their physicians for diagnosis and treatment of disease. To this end, they explain to them their complaints, anxieties, and expectations. In contrast, physicians tend to rely on technology to diagnose and treat patients, and some narrow their focus on bio-pathology. However, physicians can use bioscience, biotechnology, and economy only as instruments to treat patients, and they need to address patients as human beings to learn about their complaints, to convince them to undergo diagnostic procedures, to give consent for intervention, or to support therapy after dismissal. Therefore, if physicians want to maximize therapeutic success, they should have an interest to know what patients think, feel, say, want, or decide. Whereas bioscience and technology only can address bio-pathology, physicians can choose, whether they limit their focus exclusively on pathology, or whether they consider the patient as human being (Scholl, Zill, Haerter, & Dirmaier, 2014). Physicians, and not science, technology or economy can put patients at the center of care. Therefore, patients claim from their physicians a proper place at the center of care, and web-based information resources, patient organizations, politics, and law help them to enforce their claims (Fox, Ward, & O'Rourke, 2005; Huckman & Kelley, 2013).

1.3. Physicians can acknowledge individuality

Physicians can choose between numerous ways of interacting with patients. Some authors suggest that physicians act as engineers, priests, good colleagues, or contractual partners (Veatch, 1972), or as physicians who let their patients play an active, collaborative, or passive role in their decision-making process (Degner & Sloan, 1992), or as physicians with a paternalistic, informative, interpretative, or

deliberative style of interaction (Charles, Gafni, & Whelan, 1999; Emanuel & Emanuel, 1992). These authors seem to frame their task as a quest for the single best role of how physicians should interact with patients (Clarke, Hall, & Rosencrance, 2004). However, defining ideal physician roles excludes the possibility to integrate patients as active counterparts in the physician–patient interaction. Empirical data suggest that patients have individual abilities and values, and that they have different preferences of how they want to interact with their physicians to make decisions (Clarke et al., 2004). The medical literature is full of patient typologies that all seem to underpin the requirement of a broad spectrum of different types of interaction. Since the days of Hippocrates, physicians classified patients according to personality types as melancholic, choleric, sanguine, or phlegmatic (Gallagher, 2007), or more recently as type A, B, C, or D personalities (Wikipedia-Contributors, 2015c, 2015d). Today typologies exist for different contexts that classify patients according to maladaptive coping styles as dependent clingers, entitled demanders, manipulative help-rejecting complainers, and self-destructive deniers (Groves, 1978), according to complexity of medical problems as types of complex patients (Loeb, Binswanger, Candrian, & Bayliss, 2015), according to their preferences for participation in decision-making as autonomists and delegators (Flynn, Smith, & Vanness, 2006), or according to their health care consuming behavior as "content and compliant" type with passive and patient-like behavior or as "shop and save" type, with active search for options and providers (Coughlin, Wordham, & Jonash, 2015).

Accordingly, IMS rejects the idea of a "one style fits all" approach to physician–patient interaction, and instead advocates the idea of individuality. Individuality has two fundamental aspects: first, normative individuality, which refers to individual values, norms, and attitudes of patients. Second, empirical individuality must be taken into account, which refers to the individual (1) physical, (2) social, and (3) psychological conditions of each patient. IMS addresses both normative individuality of a person, and the empirical individuality as conditional individuality. As a result, IMS understands the directive to "put the patient at the centre of care" as the task of physicians to respect and to account for both forms of patients' individuality.

2. Basic assumptions

IMS makes three basic assumptions about patients and physicians: individuality of patients, interaction between patients and physicians, and conflict between patients and physicians. IMS uses these three assumptions to maximize therapeutic success.

2.1. Individuality

IMS assumes that an optimal fit of medical standards including evidence base knowledge and guidelines to patients' normative and conditional individuality is necessary to maximize therapeutic success. As an example, we consider a 53-year-old male who experiences typical angina pectoris the first time in his life, with typical ST segment depressions on tread mill examination: according to medical standards, we would recommend coronary angiography. But consider the patients' conditional individuality: first, the patient may exhibit (1) individual physical conditions such as end-stage cancer with only a few months of life expectancy, where invasive treatment of coronary artery disease (CAD) may be too risky and not justified in terms of prognosis, or he may have pre-dialysis kidney disease, where angiography with contrast agents may carry the risk of lifelong dialysis. Second, imagine our patient with (2) individual social conditions, such as homelessness, or third, with (3) individual psychologic conditions such as uncontrolled alcoholism or schizophrenia: these individual conditions may hinder the patient to maintain regular medications required after invasive treatment of CAD. Therefore, we should carry out angiography only if medication adherence thereafter is guaranteed or we should consider alternative concepts without the need of angiography such as antianginal medication. These examples illustrate that we need to consider patients' conditional individuality to establish technical success of therapy (Hegglin & Seeber, 2012).

Now we consider the same, 53-year-old male with typical angina again to illustrate the impact of patients' normative individuality on the success of therapy: imagine the patient to be an esoteric who strictly refuses angiography as violation of his personal cosmovision, or a top manager who has currently no time for angiography because he is fighting bankruptcy of his firm, or a husband who

feels obliged to help his wife who is hospitalized for major stroke. We consider the failure to consider patients' individual values, wills and agendas as a normative failure of therapy, and the demand to consider normative individuality for therapy as an ethical demand. Therefore, consideration of normative individuality is prerequisite for technical success, and consideration of normative individuality is prerequisite for normative success of therapy.

2.2. Cooperation

IMS' second assumption is that maximizing therapeutic success requires cooperation between physicians and patients. Decision theory identifies classical decisions as decisions of individuals who make choices independently of decisions of other individuals. In contrast, it identifies decisions that depend on decisions of other individuals as strategic decisions (Table 1, Amann, 2012). To illustrate the relevance of IMS' second assumption, we model therapeutic success according to the framework of game theory (Amann, 2012), where physicians and patients need each other to maximize therapeutic success. Patients must fully enable physicians to provide therapy, which requires them to provide both complete and truthful information on complaints, attitudes, values, and actions. Similarly, physicians need to provide patients with full information on diagnosis, treatment options, and on their own attitudes, estimates, beliefs, and conflicts to enable them to support therapy. According to presence or absence of cooperation, IMS identifies four patterns of physician–patient interaction that impact therapeutic success: collaboration-centered interaction, with physicians and patients acting cooperatively; disease-centered interaction, where physicians and patients both do

Table 1. IMS as overarching approach to medical action

Purpose of IMS	Maximize therapeutic success	
Goal of IMS	Individualized therapeutic success in three dimensions (biology, sociology, psychology)	
Means of IMS	IMS as specific premises (1), model of decision-making (2), mediator (3), understanding (4), options (5), planning (6), strategy versus tactics (7), and as action (8)	
Aspects of IMS	**Explanation**	**Key concepts**
Premises of IMS (1)	Basic assumptions that are considered prerequisite for therapeutic success	Consideration of patients' individuality, dependency of patients and physicians, and conflict between patients and physicians as prerequisite for therapeutic success
IMS as model of decision-making (2)	Strategic decision-making in contrast to classical decision-making models	In contrast to classical decision, therapeutic success depends on decisions and interactions of physicians and patients
IMS as primer for cooperation (3)	IMS integrates external demands into medical rationality	External demands are:
		Principles of ethics including autonomy, non-maleficence, beneficence, justice;
		Patients' objectives,
		Patients' emotions,
		Demands of stakeholders of medicine
IMS as understanding (4)	IMS requires diagnostics of patients' pathology and understanding of patients as persons	Interpretation of patients' pathology and patients' coping capacities as opportunities and threats for therapy
IMS as options (5)	Physicians identify individualized options of therapy	I-SWOT formulates four distinct types of strategy as options for therapy
IMS as planning (6)	Planning for optimal matching of standards of medical rationality to patients' conditional and normative individuality	Patient–doctors' dialog as information, as negotiation, and as motivation,
		Moral reasoning,
		Alignment of interventions for therapy
IMS versus tactics (7)	Definition of strategy and tactics in relation to purpose, goals, and means	Strategy as the use of interventions for the overall therapeutic success;
		Tactics as the use of intervention for the goals of treatment; intervention as the exclusive means of medicine
IMS as action (8)	Medical action as dynamic interplay of strategy and tactics	Strategy prepares for successful intervention, it is present during intervention (tactics), and it exploits success after intervention

Notes: IMS identifies individualized medical strategy.

Physician-patient interaction as decision dilemma

Physician \ Patient		Degree at which patient enables physician: Maximum	Degree at which patient enables physician: Minimum
Degree at which physician enables patient	Maximum	Cooperation-centred interaction	Patient-dominated interaction
	Minimum	Physician-centred interaction	Diseases-centred interaction

Figure 1. Maximizing therapeutic success requires physicians and patients to cooperate.

Notes: According to presence or absence of cooperation, IMS identifies four patterns of physician–patient interaction that impact therapeutic success. The (1) collaboration-centered type of interaction may gain optimal results of therapy. The (2) disease-centered type may dominate in acute emergencies with unconscious patients, and no possibility of patient–physician communication. In (3) patient-dominated interaction, only physicians can practice cooperation, which may be the case when physicians adhere to their duty-driven action design while patients maximize their own utilities by concealing some facts about their disease or behavior. In (4) physician-dominated interaction, only patients cooperate, which may happen in patients who prefer to subject their own judgment to physicians' authority.

not cooperate; patient-dominated interaction, where only physicians act cooperatively; and physician-dominated interaction, where only patients act cooperatively (Figure 1).

2.3. Conflict

IMS' third assumption is that conflict is a major determinant of patient–physician relationship. These three examples illustrate conflict: a 47-year-old woman with exclusion of coronary heart disease requests a fifth coronary angiography within three years for recurrent heart complaints, but she refuses treatment for heart neurosis as exclusive measure to free her from complaints; a 35-year-old man with BMI 35 wants his physician to free him from exertional dyspnoea but he rejects to reduce weight as the only efficient measure to free him from dyspnoea; a 54-year-old patient experiences severe angina on the catheter table and demands to stop intervention immediately while his physician is about to stent a coronary dissection that developed after balloon dilatation, which is the only effective measure to prevent immediate myocardial infarction. Hence, IMS assumes that physicians can maximize success only if they handle conflicts productively, where dialog, communication, and understanding between patients and physicians is central. IMS describes patient–physician relationship as an agonist–antagonist relationship, that forms a "unity of opposites" (Egri & Miller, 2007): unity results from the common goal to maximize therapeutic success and the fact that both need each other to get that success. Opposition results from differences in their roles as patients and as physicians along with their different relationship to pathology, access to knowledge and biotechnology, and different options of action. The coexistence of interdependence and opposition fuels conflict between patients and physicians. Conflict calls for individualized solutions where unilateral and fixed expectations on final choices and outcomes are not appropriate. Therefore, IMS understands therapy as open-ended process (Figure 1).

3. Three misconceptions

3.1. Medicine as war and strategy as unmoral offer

Strategy is often translated as "leading an army." Indeed, classics of strategy such as the Prussian general and military theorist Carl von Clausewitz (1780–1831) focused on military action. IMS applies some ideas of strategic thought to medical action. However, we sharply contradict authors who misconceive biomedicine as war. The German physician and pioneering microbiologist Robert Koch (1843–1910) proclaimed "war against bacteria" to motivate his militarized contemporaries to pay grants for his research (Bennemann, 2011). Similarly, today some authors declare "war against cancer" or "war against dementia" (Hanahan, 2014; Lane, McLachlan, & Philip, 2013; Oronsky et al., 2014). Such arguments ignore the difference between biology and person. Clausewitz explains that war is "not an exercise of the will against inanimate matter," but an exercise of human will against human will equipped with the ability to react (von Clausewitz, Howard, & Paret, 1989). Accordingly, there is no war against mindless, non-intelligent bacteria, cancer, or dementia. Physicians could only be at war against people having infection, cancer, or dementia. But this also makes no sense.

Similarly, some people feel that strategy is unmoral by nature (Allen, 1963). Indeed, strategy tells how to use means to reach ends in settings where decisions of humans depend on decisions of other humans. Unfortunately, some popular authors discuss strategy without considering morality, and some of them indeed appear to encourage their readers to employ human beings as pure instruments (Wikipedia-Contributors, 2015e). However, scientific literature analyses strategy in all kinds of settings, including egoistic, altruistic, competitive, and cooperative environments (Wikipedia-Contributors, 2015f). In sum, strategy as using means to reach ends is morally neutral, and decision-makers choose to use strategy in a moral or unmoral way. IMS specifies strategy by linking it to cultural and moral demands. First, IMS considers patients and physicians as members of a multicultural society where the state has to provide both with a wide frame of freedom to act according to diverse cultures and morals. Second, IMS actively restricts cultural and moral freedom only for physicians whom it demands to accept medical rationality. Such rationality includes the acceptance of a culture of enlightenment, and it precludes practicing voodoo, shamanism, witch-crafting, and the like. IMS also bases physicians' actions on ethical principles and basically precludes violation of these principles. Such restrictions effect patients, because IMS precludes physicians from uncontrolled opportunism to patients' desires and requests (Figure 2).

3.2. Medicine as determinism

The second distinction may be even more important: ethical behavior is possible only on the basic assumption of a free human will (Frankfurt, 1971). However, scientists tend to model the human condition, where one model merges all: biology, sociology, and psychology (Engel, 1977; von Uexküll & Wesiack, 1998). They explain entire humanity through unifying determinism, but they seem to forget to integrate the free human will that accounts for contingency of behavior and moral reasoning as powerful determinants of human behavior. We call this attitude "scientism." In contrast, IMS assumes centrality of a free human will and free human choices. Also, IMS accepts a multitude of different sciences, which all develop specific methods and models to appropriately address specific objectives. Such specific objectives are usually conflicting rather than complying with a "one model fits all" type of approach to science. The various insights from basic sciences such as biology, sociology, and psychology get transformed into concepts of action, and human action and decision is needed to integrate conflicting wills into successful therapy. Today medical students are getting drowned in a flood of details from numerous disciplines: Most of this knowledge they will never use because this knowledge is not essential to medical decision-making. In contrast, IMS draws upon only some essential pieces of knowledge from all kinds of sources including sciences and art such as narration, but it integrates this knowledge into clear concepts of action.

In conclusion, scientism understands biology, sociology, and psychology as the result of gapless causal relations, and "holism" as a task of science to understand these interactions. In contrast, IMS understands biology, sociology, and psychology as triad of separate dimensions, where causal interactions exist but which are too complex to be fully elucidated, and where the free human will has the

Figure 2. IMS basic design of cultural and moral diversity.

Notes: Only physicians face direct restrictions of their cultural and moral diversity. Conversely, patients face restrictions indirectly because they deal with physicians with limited diversity. In sum, IMS is an example for a strategy design that balances integration of cultural and moral diversity with insistence on essential cultural and moral principles.

IMS´s concept of cultural and moral diversity		
	Patients	Physicians
Cultural diversity	Patients practice cultural diversity, which IMS demands physicians to expect, to accept and to integrate	Physicians practice cultural diversity, but IMS demands acceptance of medical rationality as boundary of cultural diversity
Moral diversity	Patients practice moral diversity, which IMS demands physicians to expect, to accept and to integrate	Physicians practice moral diversity, but IMS demands duty-driven action style as boundary of moral diversity

power to override determinism. Accordingly, IMS understands "holism" as a task of physicians to actively integrate diverging demands of biology, sociology, and psychology into medical action and decision. IMS is the approach to accomplish this task of active integration, and we will argue that patient–doctors' dialog is the central arena where physicians accomplish this task. Finally, scientism tends to understand "holism" as a stable state of nature, but IMS understands "holism" as a fragile state of and between humans, where stability is the transient result of human will, action, and interaction.

3.3. Individuality as mere matter of biology

Finally, "individualization" is an important concept of modern medicine. The idea is to address individual genetic, metabolic, and anatomical features to tailor pharmacological or interventional technologies to individual features of human biology (Bassler, Busse, Karanicolas, & Guyatt, 2008; Jameson & Longo, 2015; Lazaridis et al., 2014). IMS integrates the idea to maximize therapeutic success by adjusting interventions to the highly individual conditions of patients. However, IMS pursues a broader concept of individuality. It comprises individuality as both the unique physical, sociologic, and psychological make-up of persons, and as the individuality of a person's values and beliefs. The reduction of human individuality only to conditional individuality hides the danger of reducing persons to "biological matter."

4. Design of roles

In terms of patients as human beings, IMS designs the two types of individuality, conditional and normative. In terms of patient–physician interaction, IMS designs their relationship as a unity of opposites. To specify the relationship of patients and physicians, we now specify their roles for strategy.

4.1. Patients as principal

Patients have the right to decide to see a physician, to accept or reject medical action, and to choose between medical options. Therefore, IMS designs patients as principals of medical action. Patients may want to understand their disease, prognosis, and effects on their personal life issues (Brody, 1998), get relief from pain and suffering (Callahan, 1996), avoid premature death (Callahan, 1996), or die with dignity and in peace (Brody, 1998). Therefore, patients have individual preferences, and they prioritize diverse objectives in their lives over health-related issues. For example, a diabetic continues working in shifts despite negative effects on his glucose levels because he needs the bonus money, a boxer wants to continue a title fight despite injury, or an elderly lady may accept intervention for an acute heart attack only after she has organized someone to take care of her dog. Research on individual quality of life currently identifies the many different domains that affect patients' quality of life where family, job, education, friends, and leisure time are most prominent. Such studies underpin that health is usually not a top priority in life, not even for patients with chronic disease (Moons et al., 2005). Rational choice theory addresses these individual preferences as "utility" (Morimoto & Fukui, 2002; Sox, Blatt, Higgins, & Marton, 2007; von Kodolitsch, 2010). Hence, IMS designs patients as principals of care, with utility-driven action style.

4.2. Physicians as agents of medical rationality

Physicians seek to maximize therapeutic success. This means primarily that physicians aim at the goal to "surmount" biological pathology. IMS divides the aim to surmount pathology into the three tasks; to diagnose (exclude or define), to cure (prevent, cure, or lower the course), and to palliate (enable the patient to adapt to or mitigate the effects of) pathologic conditions (Figure 3). IMS defines medical rationality as the adequate use of medical means to reach the aim of surmounting a pathologic condition, where physicians act as agents of this rationality. This design of physicians as agents of medical rationality has two important implications: first, we do not consider non-therapeutic activities of physicians such as abortion, esthetic surgery, or contraception. Second, IMS designs physicians as agents of *medical* rationality, not as agents of patients, insurance clerks, or other stakeholders of medicine. Agency of medical rationality identifies a firm standpoint from where physicians derive their orientation of action and decision while integrating

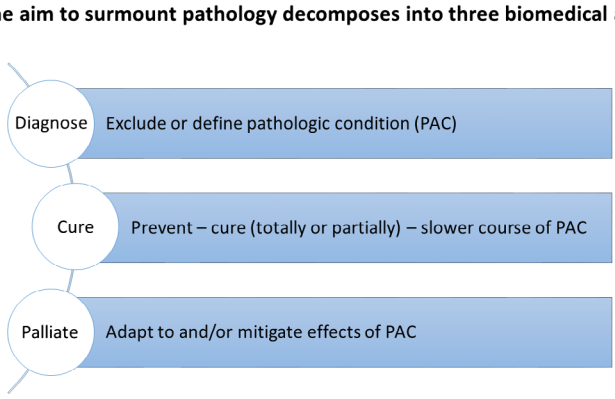

Figure 3. The aims of biomedical therapy are only few, they are uniform, and well defined.

patients' purpose or external demands of stakeholders of medicine. IMS will show later that medical rationality is part of duty-driven action style that is based on ethical principles.

4.3. Strategy as primer for cooperation

Strategy links individual purposes of patients to goals and interventions. For example, a patient experiences the sensation of thoracic stabbing and sees a physician with the purpose to "understand the disease" or to get reassurance of his "worried well" (Brody, 1998). The physician translates his purpose into the medical goal to "exclude or define" a pathologic condition and uses negative diagnostic findings to serve the patient's need for reassurance. Hence, strategy fits purposes to goals and identifies interventions to reach these goals, where the delivery of an intervention is an issue of tactics. In sum, IMS specifies the directive to "put the patient at the centre of care" as the task to identify an individualized strategy that fits and adjusts standardized medical aims and means to the individual objectives of patients. Only cooperation between patients and physicians allows optimal discussion and understanding of various means, aims, and objectives to set up as definitive strategy that maximizes therapeutic success.

5. Design of ethics

IMS recognizes ethics as constitutive for therapy, which means that medical action turns into therapy only through ethical purposes. The reason is clear: medical rationality comprises commands how to use means to reach aims. Immanuel Kant calls all commands hypothetical imperatives (HI) that have the form "if you want X, you have to do Y." Accordingly, medical rationality stores HIs having the form "if you want to surmount disease X, you have to take medical action Y." As a consequence, pure medical rationality is instrumental knowledge. Only when physicians use medical means for defined ends can we ascribe an ethical value to this action. For example, German law determines an identical intervention as state-of-the-art medical therapy or as bodily injury, depending on patients' consent or dissent.

For the sake of clarity, IMS refers to "aims," "means," and "medical rationality" as terms that are ethically neutral. In contrast, "purposes," "goals," "intervention," and "strategy" are terms with distinct ethical values (Figure 4). Some authors mix medical aims and patients' purposes to define "goals of medicine" that they suggest as foundations of medical morality (Brody, 1998; Callahan, 1996). These authors are criticized for propagating an internal morality of medicine that is disconnected from general ethics (Arras, 2001; Beauchamp, 2001; Veatch, 2001). We agree that "the ends of any practice such as medicine must come from outside the practice, that is, from the basic ends or purposes of human living" (Veatch, 2001). In sum, IMS specifies the demand of "putting the patient at the center of care" as the "pursuit of the aim to surmount disease for the purposes of individual patients."

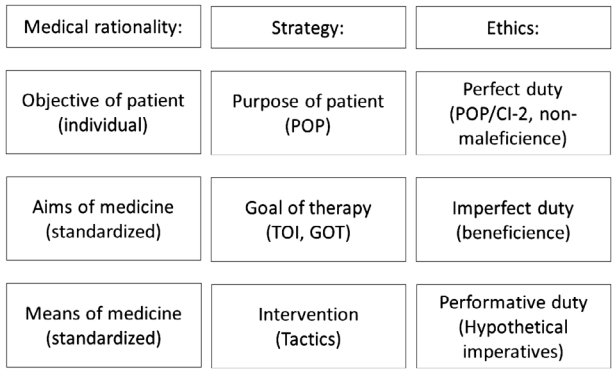

Figure 4. The nomenclature of medical rationality, strategy, and ethics.

Notes: POP identifies primacy of the patient; CI-2, Kant's second formulation of the categorical imperative; TOI, target of intervention; and GOT, goal of therapy.

5.1. Primacy of patients

IMS identifies the purposes of individual patients as primacy rather than external demands of stakeholders of medicine such as business executives or politics. In German history, for example, political demands on medicine were to keep people fit for military service, to keep them healthy for industrial production, or to sort out humans of unwanted race (Unschuld, 2009). IMS identifies the primacy of the patient (POP) as a demand that is equal to Immanuel Kant's categorical imperative (CI), as expressed in his second formulation (CI-2): "You use humanity, whether in your own persona or in the person of any other, always at the same time as an end, never merely as a means" (Wikipedia-Contributors, 2015a). In this sense, it is an absolute duty of physicians to respect humanity in each individual patient. IMS considers the prohibition to use patients merely as means authoritative for all external demands or "stakeholders" of medicine, including physicians, propagandists of any new spirit of age, changes of culture or desires of managers or politicians.

5.2. Other principles of ethics

POP as duty to respect patients' autonomy requires specification and balancing with other norms of ethics (Richardson, 2000). Here we focus on the need of balancing autonomy against other important general ethical principles. Principlism as medicine's "dominant way of doing ethics" (Pellegrino, 1993) identifies the following four principles as relevant: POP similar to what we discussed above, non-maleficence as the obligation to avoid causing harm, beneficence as obligations to provide benefits and to balance benefits against risks, and justice as obligations of fairness in the distribution of benefits and risks as additional (Beauchamp, 2003; Beauchamp & Childress, 2013). IMS agrees on the relevance of all four principles. However, principlism handles all principles as equal, whereas IMS assumes a hierarchy.

First, we identify POP and CI-2 as grounding principle of medical action. Second, we derive non-maleficence from Kant's first formulation of CI (CI-1) to "act only according to that maxim by whereby you can, at the same time, will that it should become a universal law" (Korsgaard, 1985): Universalization of a maxim that adopts maleficence in medical practice would lead to "contradiction of concepts" with destruction of both humanity and medicine. Hence, non-maleficence is an absolute duty which has equal strength as POP. However, prohibition of maleficence is second in hierarchy of norms because with violation of autonomy, medical action is maleficence already, whereas with acceptance of autonomy, maleficence is still possible.

Third, beneficence includes heterogeneous demands. The most important specification is the pursuit of the goal to surmount a disease for the purposes of individual patients. However, this is medical rationality plus POP, and hence it adds no additional contents. Similarly, the demand to balance benefits against risks only separates medical means that are likely to reach a medical aim from those which are likely to miss it. Hence, this is a technical demand or HI and as such it is part of medical rationality. A final other specification may be to provide beneficence beyond medical rationality. However, this is a difficult demand because today physicians quickly may make themselves guilty of

paternalism, patronization, and overprotection (Pellegrino & Thomasma, 1987). According to Kant, beneficence is a classic example of an imperfect duty. The duty is imperfect because it does not violate CI through contradiction in conception, but only through contradiction in the will: it is impossible to will that non-beneficence as a maxim should be raised to the universality of a law of nature because such a will would contradict itself (Korsgaard, 1985). Imperfect duties in contrast to perfect duties determine little about the extent of the actions themselves and leave a playroom for free choices (Hill, 1971). Consequently, beneficence ranges third in the IMS hierarchy of principles. IMS considers both, the demand of non-maleficence and the first two specifications of beneficence, as ethical duties integral to medical rationality. Clearly, the other absolute demands of Kantian ethics, such as truthfulness and the prohibition of lying, also belong to the IMS duties of physicians.

Fourth, in contrast to the first three principles, justice is a communitarian rather than an individualistic principle (Sprung, Eidelman, & Steinberg, 1995). A consequentialist ethicist ("the ends justify the means") can weigh the rights or lives of few people against the rights or lives of many people and therefore consider it ethical to sacrifice the few for the sake of the many (Nida-Rümelin, 1995; Wikipedia-Contributors, 2015b). In contrast, we accept consequentialism only when justice respects a human being as an end and never as a mere means. Hence justice as ethical principle has to accept CI and POP. Using Kant's CI, there is also no basis for justice to override the principle of "non-maleficence." However, justice clearly has the right to tighten the reins of imperfect duties such as beneficence. IMS sees the need to negotiate and weigh communitarian claims of society and the rather individualistic claims of medicine.

Finally, residents see between 1.06 and 1.41 patients per hour (Deveau, Lorenz, & Hughes, 2003), and primary care physicians see one patient every 20 min (Davidoff, 1997), or more. Therefore, strategy has to consider how physicians allocate their time and effort between patients, and we distinguish strategy as maximizing therapeutic success in an individual patient from strategy as maximizing therapeutic success on different communitarian or organizational levels, such as a defined medical unit, such as the ward, an intensive care unit, or a private practice, or larger levels such as a clinic or hospital, or the whole health care system. In this article, we focus on IMS, rather than on organizational medical strategy (OMS), which we delineate in a distinct future work.

5.3. Ethics guides strategy

First, concepts of medical ethics establish normative conflicts: physicians who have a duty-driven design of action versus patients who have a utility-driven design of action. Second, absolute duties mark the outer boundary of compromise that buttresses strategy against undue opportunism (von Kodolitsch et al., 2013). Finally, IMS asks physicians to perform moral reasoning and judgment (Paxton & Greene, 2010) for each patient to specify moral principles (Richardson, 2000). Only through moral reasoning can physicians resolve ethical conflicts and reconcile professional duties with normative individuality and utility of patients. Moral reasoning is especially important to negotiate demands of imperfect duties versus patients' utilities.

6. Design of the real world

Medical actions and decisions take place in a real world rather than in a scientific laboratory (Klein, Orasanu, Calderwood, & Zsambok, 1993). Every patient and every treatment situation is unique and hence there is never a full matching of pure concepts with real action in the material world (Echevarria, 2007a). It is a crucial challenge of daily practice to match standards and concepts of medical rationality to individual treatment. Every room has three dimensions: height, width, and depth. IMS describes three additional dimensions that are major determinants of action: biology, society, and emotions. These three dimensions of real world account for the individuality and uniqueness of each medical encounter.

6.1. Medicine

First, biological pathology has no will, intelligence, or emotion of its own. Nonetheless, it is a major determinant of medical action. Physicians may vainly seek for a biological substrate of symptoms,

pathology may progress, or regress, and physicians must account for these dynamics. Characteristics of pathology and its dynamics are a major driver of action that impact the speed, stakes, types, and magnitude of efforts.

Second, physicians follow social norms and demands. These comprise the need to comply with medical standards expressed as medical rationality such as evidence and guidelines, and ethical duties. At the same time, they need to consider social rules, organizational regulations, and laws, and demands of stakeholders, including patients' families, medical colleagues, members of other health professions, hospital administration and managers, or insurance clerks.

Third, emotions play an important role in medical action. Medicine deals with disease and its potential threat to human existence. Hence, basic emotions like anger, fear, joy, sadness, disgust, shame, and guilt occur both in patients and physicians. Emotions are high-intensity reactions that serve the adaptation to events with consequences for well-being: anger and fear can prepare to fight or to flight; joy can enhance motivation; and sadness can elicit social withdrawal (Ekman, 1992). Apart from these basic emotions, other important affective phenomena are involved in medical action, such as preferences, attitudes, moods, affect dispositions, and interpersonal stances (Scherer, 2005).

6.2. Human affairs

Authors from virtually all fields of human affairs acknowledge the dynamics of matter, biology, and body social factors, and affection as major dimensions. Some important examples may illustrate this argument (Table 2): For example, Lajos Egri (1888–1967) states in his seminal work on the art of dramatic writing that characters have three dimensions: physiology, sociology, and psychology. These three dimensions, Egri keeps emphasizing, fully account for all diversity and individuality of human character, and they explain each individual's motive of action (Egri & Miller, 2007). Similarly, Sigmund Freud (1856–1939) identified three dimensions in his structural model of the psyche, where

Table 2. Three-dimensional views on human affairs in narration, psychology, and social sciences

	Matter	Society	Psyche
General description of dimension	Properties and dynamics of matter that determine human interaction	Social determinants of human interaction	Affectual determinants of human interaction
Strategic thought in medical action	Biology of disease, no own will, intelligence or emotion, but crucial driver of medical action	Claims of society including stakeholders equipped with own will, values, and believes, and formal regulations, economic constraints, laws, social norms, and ethics	Effect of emotions comprise basic emotions (anger, fear, joy, sadness, disgust, shame, guilt), and other affective phenomena (preferences, attitudes, moods, affect dispositions, interpersonal stances)
Egri's narrative character (Egri & Miller, 2007)	Physiology	Sociology	Psychology
Freud's structural model of the psyche (Freud et al., 1989)	"Ego" acts according to the reality principle (reality), attempts to mediate between id and reality	"Superego" incorporates the morals of society, has two separate categories; the ideal self and the conscious	"Id" is part of the unconscious that seeks pleasure; human's most basic and primal instincts.
Weber's orientations of social action (Weber et al., 1978)	Instrumentally rational (zweck-rational)	Value-rational (wertrational)[a]	Affectual (especially emotional)
Flam's action model (Flam, 1990)	Rational man model (homo economicus), Utility-bound	Normative man model (homo sociologicus), Norm-bound	Emotional man model, Unbound
Engel's model of medical science (Engel, 1977)	Biology	Sociology	Psychology
Han's taxonomy of issues of uncertainty in health care (Han et al., 2011)	Scientific (data-centered): diagnosis, prognosis, causal explanations[b]	Practical (system-centered): structures of care, processes of care[b]	Personal (patient-centered): psycho-social, existential[b]

[a]Weber also identifies traditional orientation of action, that is determined by ingrained habituation.

[b]Han also identifies uncertainties according to their sources: probability, ambiguity, and complexity.

"id" is emotional dimension reflecting a persons' primal instincts, "superego" reflecting incorporation of social morals, and the bodily "ego" representing the reality principle (Freud, Strachey, & Gay, 1989). Interestingly Freud, like IMS, constructs conflict from the interaction of these three dimensions. Drawing on the classical work of Max Weber (1864–1920; Weber, Roth, & Wittich, 1978), current sociologists suggest homo economicus with utility-bound selfishness, homo sociologicus with social norm-driven action style, and emotional man model with emotion-driven action style (Flam, 1990). The American psychiatrist George L. Engel (1913–1999) proposed a medical model which included biology, sociology, and psychology (Engel, 1977), and in their taxonomy of uncertainty in health, Han et al. identified three sources of uncertainty that also correspond well to our three dimensions (Table 2, Han, Klein, & Arora, 2011; von Clausewitz et al., 1989).

7. Design of concepts

7.1. Concepts as guidance

Concepts provide powerful guidance to maximizing therapeutic success. However, concepts differ depending on basic assumptions and underlying values. Physicians who opt for concepts of IMS as guidance understand that they opt for maximizing therapeutic success in three distinct dimensions, biology, sociology, and psychology. Alternatively, physicians may adopt the concept of physicians as business clerks, where success may be making a good sale of medical service, or as agents of health insurance, where success may be to lower costs and to spare resources, or as agents of alternative medicine, where success may be to provide therapy without modern medication or technology, and so forth.

Concepts guide medical action. Medical diagnoses are good illustrations for basic medical concepts, where we take "rheumatoid arthritis" (RA) as an example to illustrate how concepts work to guide action: first, they reduce complexity of the real world and provide consistent explanation for medical tasks or phenomena. A set of signs, symptoms, and findings on laboratory and imaging diagnostics converge in the diagnosis of "RA" that provides a consistent explanation for their joint presentation. Second, concepts allow for orientation in a real world of ill-defined problems, friction, and probabilistic behavior. A patient with RA is worried about her/his fatigue until the symptom is explained as a manifestation of RA. Third, concepts provide instructive information for action and decision, where the concept of "RA" includes instructive knowledge on how to diagnose or treat this condition. Concepts of strategy work exactly the same way, as we show in our second example of the IMS concept of "success of treatment": The concept provides, first, criteria of how to define success, second, methods to identify options of success, and, third, instructions on how to obtain therapeutic success (see below).

Medical concepts are usually pure distillates of real-world phenomena: for example, the text-book criteria for the diagnosis "RA" are rarely complete in real-world patients, and the IMS concept of "maximizing therapeutic success" will rarely get a one hundred percent success in the real world.

Table 3. Matching concepts of IMS with the real world's three dimensions

Concept	Matter	Society	Psyche
Conditional individuality of a person	Physical make-up of a person	Social make-up of a person	Psychological make-up of a person
Therapeutic success	Technical success (Efficiency, performing treatment right)	Normative success (effectivity; choosing treatment right)	Emotional success (motivation, support of therapy)
Patients' coping capacities	Physical coping capacities	Social coping capacities	Psychological coping capacities
Physicians' capacities for treatment	Material capacities	Organizational capacities	Psychological capacities
Patients' center of personality (COP-2)	Physical COP-2	Social COP-2	Psychological COP-2
Patient–doctors' dialog	Informing patients about risks	Negotiating patients' objectives	Motivating patients to support therapy

Notes: IMS identifies individualized medical strategy.

Factors that modify pure concepts are the forces that originate from the three dimensions: biology, sociology, and psychology. Hence, matching pure concepts with forces that arise from biology, sociology, and psychology allows for estimating the individual modification of concepts in real-world scenarios (Table 3).

7.2. Concept of success

Medical therapy is the use of intervention to surmount pathologic conditions. To maximize therapeutic success, IMS applies the standards of biomedicine to individual patients. Success is maximal only with attaining a goal that satisfies demands in all the three dimensions, (1) physical, (2 sociological, and (3) psychological. Accordingly, IMS designs success as maximal with a therapy that is (1) efficient, (2) effective, and (3) motivated. All three dimensions of success are equally important, and failure in one dimension can jeopardize therapeutic success in its entirety (Table 4 and Figure 5):

First, an intervention is (1) efficient, when it attains the biomedical goal with technical success, such as appropriate exclusion of pathologic conditions, or appropriate cure or appropriate palliation

Table 4. Examples for failures of therapy per dimension of success

ID	Patient's medical synopsis	Technical success (efficiency, performing treatment right)	Normative success (effectivity; choosing treatment right)	Emotional success (motivation, gaining emotional support of treatment)
1	Mr. S, 34 yo, professional hunter, gets pacemaker for persistent AVB III° after myocarditis	Patient returns with dislocated leads after chucking wood. Failure: physicians did not provide inform on post-operative behavior	Patient returns after implantation because he worries that recoil of his rifle on the right side of his chest could damage the pacemaker. Failure: Surgeon performed implantation without informing himself about his patients' objectives as professional hunter	Patient returns with syncope 5 years after pacemaker implantation with depletion of the battery. He intentionally missed pacemaker check-ups because he was unable to accept his dependency on artificial devices. Failure: physicians did not obtain emotional support for treatment
2	Mrs. T, 25 yo, with atrial fibrillation and HCM gets primary prophylactic ICD for ventricular tachycardia	Patient returns with inappropriate ICD shock. Failure: Physicians forgot to activate ICD's SVT–VT discriminator stability function to protect patient against inappropriate shocks (Daubert et al., 2008)	Physicians implanted a high-end ICD with redundant software and telemetric functions that they switched off because they did not need for therapy. Failure: Therapy generated unnecessary costs and thereby violated the ethical principle of justice	The patient stops living her normal life because of anxiety to experience ventricular tachycardia or ICD shocks. Failure: Physicians ignored to consider patients' anxieties during decision-making for ICD implantation
3	Mr. T, 55 yo, with BAV receives mechanical AVR for severe valve regurgitation	Patient develops infective endocarditis following dental extraction 5 months after AVR. Failure: Physicians did not inform patient about need for endocarditis prophylaxis	Patient shows up after post-operative rehabilitation and wants to know how to handle oral anticoagulation on his job as carpenter. Failure: Surgeon did not discuss option of biological valve in the context of patients' needs as professional	Patient returns with INR 1.2 and embolic stroke 3 mo after receiving a device for INR self-testing which she did perform regularly. Failure: Physicians misperceived patients' unwillingness to meet doctors for INR testing as motivation for self-testing
4	Mrs. D, 21 yo, receives a stent-graft for aortic dissection type B	Patient shows up 13 mo after stent-graft placement with diagnosis of MFS and endoleak on follow-up imaging. Failure: Physicians did not consider MFS prior to stent-graft placement, where surgery rather than stent-graft is considered first choice of therapy	The patient had informed her physicians about her MFS, and she now leans on the internet about expert consensus not to deploy aortic stent-grafts into a native Marfan aorta. Failure: Physicians prioritized their personal preferences for non-surgical treatment over medical evidence without informing the patient	Patient shows up 6 ys after intervention with severe pain from a giant-aneurysm of the thoraco-abdominal aorta beyond the stent-graft. Since initial intervention she avoided physicians to obviate frightful memories of her hospital-stay during stent-graft placement. Failure: Physicians underrated the effect of emotional trauma during dissection and stent-graft placement on treatment.
5	Mrs. O, 57 yo, gets interventional treatment of mitral valve regurgitation by a MitraClip® procedure	The patient presents 3 mo after MitraClip® with dyspnea that results from recurrent mitral valve regurgitation. Failure: Physicians performed intervention in a Barlow valve that is inappropriate for this type of treatment (Boekstegers et al., 2013)	The patient is a perfect candidate for surgical valve repair, but physicians perform costly MitraClip® because the patient wants to avoid non-esthetical thoracic scars. Failure: Opportunism to patient's personal desire makes the physicians violate medical rationality and ethical demands of justice	The patient is a perfect candidate for surgical valve repair, but she is afraid to take the challenge of a major operation. Failure: Physicians failed to address their patient's emotions adequately and to motivate her taking a challenge that beneficial for her health and quality of life

Notes: AVR, aortic valve replacement; BAV, bicuspid aortic valve disease; ECG, electrocardiogram; ICD, implantable cardioverter defibrillator; MFS, Marfan syndrome; PEG, percutaneous endoscopic gastrostomy; HCM, hypertrophic cardiomyopathy; mo, months; PPM, patient prosthesis mismatch; yo, years of age; ys, years.

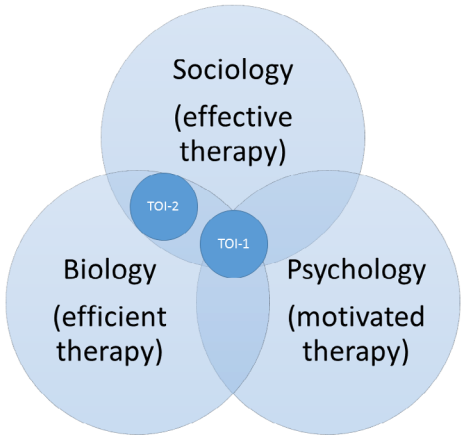

Figure 5. IMS seeks therapeutic success in the following three dimensions: (1) biology, (2) sociology, and (3) psychology.

Notes: IMS addresses these three dimensions of success (1) as efficiency by achieving biological goals such as medication that normalizes blood pressure or surgery that completely eradicates cancer ("doing things right"), (2) as effectiveness by achieving social goals such as satisfying guidelines, patients' purposes, and ethical demands ("doing the right thing" (Drucker, 1963)), and (3) as motivation by achieving psychological goals such as emotional support and identification of patients with therapy. IMS addresses (1) as technical dimension, (2) as normative dimension, and (3) as emotional dimension of success. All three dimensions are conflicting, where the target of intervention (TOI) may suffice all three demands equally well (TOI-1), or where TOI may be a compromise, where one dimension (psychology, for example) is not integrated (TOI-2).

of a target pathology. Second, an intervention is (2) effective, when the intervention is the right choice according to social demands, including (i) guidelines, (ii) individual patients' purposes and utilities, and (iii) institutional, economical, ethical, religious, cultural, and political demands. Finally, an intervention is (3) motivated, when patients overcome negative emotions such as anxiety, skepticism, or laziness, and instead are motivated to support the endeavors of intervention.

Obviously, all three dimensions of success have conflicting demands both within and among each other. Examples for conflicting demands within each dimension: (1) classical technical tread-offs may arise between alternative interventions, where one has better technical results but higher interventional risks, (2) trade-offs in the normative dimension may arise between patients desires, on the one hand, and ethical demands, or costs of intervention, or medical rationality, on the other hand, and (3) trade-offs in the emotional dimension may arise between the patients desire to be healthy and his motivation to perform diet, or exercise or take pills regularly. Examples for conflicting demands between different dimensions of success: it may be medically reasonable to perform open-heart aortic valve replacement (1), but patients may be afraid of surgery (3) and request transcatheter aortic valve implantation (2; TAVI), which generates higher costs (2).

As a consequence, to maximize therapeutic success requires compromise between conflicting demands within and between three different dimensions of success. To identify the ultimate goal of intervention, physicians must (i) inform and convince patients of the medical rationality, (ii) negotiate patients' purposes and other normative demands, and (iii) motivate patients to support intervention (Figure 6). Finally, medical therapy must identify goals of one or more intervention that together or alone serve the overall goal of therapy. IMS identifies the biomedical goal of an intervention as the target of intervention, and the biomedical goal of overall therapy as the goal of therapy.

Figure 6. I-SWOT matrix describes four principle types of strategic options, which have to be discussed with patients to identify an IMS of treatment (for detailed example, see von Kodolitsch et al., in press).

Internal / External	Strengths (S) related to therapy	Weaknesses (W) related to therapy
Opportunities (O) related to patient	SO (maxi-maxi) Maximize S & O All-maxi-strategy	WO (mini-maxi) Minimize W & maximize O Opportunity-focused strategy
Threats (T) related to patient	ST (maxi-mini) Maximize S & minimize T Strength-focused strategy	WT (mini-mini) Minimize W & T All-mini-strategy

7.3. Concept of intervention

Patents' purposes are individual and diverse as human life itself (Lindblad, Ring, Glimelius, & Hansson, 2002; Moons et al., 2005). In contrast, medicine attains primarily medical aims and it uses a single means to attain these: intervention. Intervention comprises all actions of physicians that serve the goal to surmount pathology, namely dialog, behavioral training of patients, prescribing medication, and performing percutaneous intervention or surgery. It is the task of medical rationality, to bring a medical aim in appropriate line with intervention, where medical evidence and guidelines provide the essential stock of knowledge, and where management organizes material and infrastructure.

8. Diagnostics

Diagnostic evaluation comprises diagnostics of the pathologic condition, of the person as human being, and an estimation of these findings as opportunity or threat for therapy.

8.1. Pathology

Excluding or defining pathologic conditions identifies one of the three major aims of medical rationality. Physicians follow this aim only with clear objectives, and they derive from these objectives the means and extent of diagnostic action. For instance, a patient in pain may not want therapy but only reconciliation that there is no serious pathologic condition: then diagnostic exclusion is the goal of intervention, and the dialog that reconciles the patient is the appropriate means to maximize the success of intervention. However, the same patient may have a serious pathologic condition such as cancer, but diagnostics may remain the sole means to maximize therapeutic success. This may be the case when the patient's purpose is not cure but only the desire to know how much time is left to live. Usually, however, defining a pathologic condition serves the goal to identify adequate interventions to cure or palliate this condition. Then, physicians need to protect themselves against their curiosity to obtain diagnostic information that is redundant to these purposes. Undue diagnostic measures strain and threaten the patient, they generate "diagnostic noise," consume valuable time and money, and distract from the purposes of strategy. Finally, patients may present with numerous pathologic conditions, where the patient's present complaints and prioritization according to medical rationality identifies a chief pathologic condition as target of intervention.

8.2. Person

Both pathology and intervention challenge patients' physical, social, and psychological integrity. Hence, therapeutic decisions require extending diagnostic assessment beyond the patient's pathologic condition to the patient's individual physical, social, and psychological capacity to buffer and cope with specific stressors related to pathology and intervention. Strategists keep emphasizing the decisive role of mind, virtue, and moral elements (von Clausewitz et al., 1989). Similarly, biomedical research confirms that the success in overcoming adversity varies substantially across individuals, and it identifies coping (Carver & Connor-Smith, 2010), adaption, resilience (Earvolino-Ramirez, 2007; Rutter, 2013), robustness, or anti-fragility (Taleb, 2012) as the individual's key capacity to surmount pathology. We determine the capacity of patients to passively tolerate stressors of pathology and therapy, and to actively surmount pathology or support intervention as patient's coping capacities that comprise physical, cognitive or social, and psychological dimensions.

Physical coping capacities include good status of health, high exercise capacity, high vital capacity, high cardiac index, absence of morbidity or frailty, good immunity status, and beneficial genetic, epigenetic, neural, and neuroendocrine make-up. The literature lists cognitive or social capacities include self-control, planning skills, self-efficacy, social intelligence, spirituality, effective communication style, productive critical thinking skills, supportive environment inside and outside the family, positive relationship, effective in work, play, love, and psychological capacities such as self-esteem, hope, extraversion, proactivity, optimistic explanatory style, intrinsic an extrinsic motivation, positive personality, confidence, focus, perceived social support, sense of personal worthiness, sense of control over fate, positive social orientation, ability to have close relationships, trust in others, sense of humor, high expectancy, and self-determination (Bowes & Jaffee, 2013; Earvolino-Ramirez, 2007; Rutter, 1985, 2013; Ryan & Deci, 2000; Sarkar & Fletcher, 2014).

8.3. Opportunities and threats

Finally, IMS diagnostics translates findings of pathologic condition and coping capacities into information for therapeutic action and decision. To this end, physicians estimate which feature of pathologic condition and of coping capacities supports or jeopardizes the efficient attainment of the potential medical aim to cure or to palliate pathology. IMS classifies features of pathology and coping capacities as opportunity (O) when they support attaining a medical aim, and as threat (T) when they jeopardize attainment of such aim. Systematic assessment of all O and T results in an opportunity-threats matrix that tabulates all relevant features of an individual patient according to the three dimensions of physiology, sociology, and psychology. The OT matrices are particularly useful when several medical options are available, when the life and crucial objectives of patients are at stake, and when the patient is stable and able to discuss without time pressure (von Kodolitsch et al., in press).

Conversely, when patients' lives are at acute stake, establishing an OT matrix may be too time-consuming or too complex. Instead of an OT matrix, IMS suggests adopting the strategic concept of "centre of gravity" (Echevarria, 2015; von Clausewitz et al., 1989). The center of gravity is a "focal point of force and movement, upon which the larger whole depends." When aiming at a quick collapse of an entire system, blows should be directed at the center of gravity (Echevarria, 2007b, 2015; von Clausewitz et al., 1989). Such centers are the "actual element that causes [forces] to concentrate and give them purpose and direction,", and they "draw energy and resources to themselves, and then redirect them elsewhere." IMS refers to the center of gravity as center of pathology (COP-1), and as center of personality (COP-2). Center of pathology identifies a focal point of pathology at which intervention can be directed to bring about immediate and decisive success. Examples for intervention at the center of pathology are rapid initiation of antibiotic therapy for septic inflammation, positioning of a tube in the pleural space for tension pneumothorax, reperfusion therapy at the culprit lesion of acute myocardial infarction, and surgical replacement of a dissection of the ascending aorta. Conversely, center of personality usually emerges with severe and long-lasting disease that thrusts a heavy strain on the patients' coping capacities. The center of personality is an essential element of personality that concentrates coping capacities and gives the whole person purpose and direction. Stabilization of this center enhances success of intervention, whereas its destabilization may bring the patient to collapse. Examples of a center of personality may be physical, like a strong and well-trained body, or social, like a loving and strong-minded spouse, or a wealthy and supportive family, or psychological, like a strong intrinsic motivation to carry on. Intervention should take advantage of the center of personality, for instance, by stabilizing this center, for example, by integrating a spouse or family into therapy, or by exploiting and enhancing patients' intrinsic motivation for therapy.

9. Identifying options

Physicians evaluate first pathology and person of the patient, and then they establish aims and options of intervention. Medical rationality establishes variants of optional strategies. Options only function as hypothetical imperatives, where physicians identify aims and means of treatment.

9.1. Aims and options of therapy

In a first step, physicians identify the aim of intervention for their patients' chief pathologic condition. For example, such condition may be an aneurysm of the ascending aorta, and the medical aim may be to prevent this aneurysm from rupture or dissection. Then, analysis of medical evidence identifies a spectrum of options for intervention, such as modification of lifestyle, medical treatment, a couple of different surgical interventions, or combinations (von Kodolitsch et al., in press).

9.2. Strengths and weaknesses

In this step of planning, physicians assess strengths and weaknesses of each therapeutic option, and tabulate these in a matrix of strengths and weaknesses related to each of these options. Assessing physicians' capacities include (1) material aspects such technology, equipment, supply, quality of rooms for operation or intervention; (2) organizational issues including training and scheduling of

staff, organizational processes, availability and qualification of hospital management, quality management systems, and the like (Lawton et al., 2012); and (3) psychological issues such as collaborative working attitudes, trustful relationships, shared sense of purpose and direction, democratic styles of leadership, and so on. For example, medical treatment may be of little stress for patients, but it also provides little protection against rupture of aneurysm; in contrast, a Bentall operation entails major stress and requires lifelong anticoagulation, but it provides definitive protection against aortic rupture in the segment that is replaced. We recommend preparing matrices of strengths and weaknesses for all common medical aims, especially those with a broad and complex spectrum of interventions. Such matrices can be standardized because they are not related to patients' conditional and normative individuality, but they reflect the medical evidence of well-known strengths and weaknesses related to interventions (von Kodolitsch et al., in press).

9.3. Options for strategy

A cross-tabulation of ST related to interventional options with OT related to individual patients identifies the classical SWOT matrix that Weihrich originally designed for strategic planning of organizations (Figure 7, Ghazinoory, Abdi, & Azadegan-Mehr, 2011; Weihrich, 1982), and which we adopted for IMS (I-SWOT; Casebeer, 1993; Farkas & Bernard, 2004; Pearce, 2007; von Kodolitsch et al., in press). This cross-tabulation matches standardized medical evidence with conditional individuality to identify an individualized strategy. Cross-tabulation identifies four distinct types of strategy: "SO-strategy," which maximizes strengths and opportunities (maxi-maxi), "WT-strategy," which minimizes weaknesses and threats (mini-mini), "WO-strategy," which minimizes weaknesses and maximizes opportunities (opportunity-orientated strategy), and "ST-strategy," which maximizes strengths and minimizes threats (strength-orientated strategy). Each distinct type of strategy may be considered for individualized treatment, as we exemplified in our previous work (von Kodolitsch et al., in press). Importantly, the I-SWOT matrix is still in the framework of medical rationality with HI and with optional means, aims, and objectives (Figure 4). Moreover, when patients' lives are at acute stake, the center of pathology identifies the major and often single threat, and focus on the center of personality identifies the major and often single opportunity in the OT matrix.

10. Maximizing therapeutic success

This point of analysis marks a turning point: Physicians leave the zone of well-defined and highly organized standards of medical rationality to face the chaotic, ill-defined, highly variable, full-of-unexpected, and changing world. Up to this point, medical rationality only defined options of therapy. However, options of therapy need to turn into firm plans of treatment, and then into actual deployment of therapy, and finally into overall success of treatment. We identify strategy as the use of interventions for the overall success of treatment. Strategy determines when and where to deploy which intervention (von Clausewitz et al., 1989). Hence, strategy has a key impact on the overall

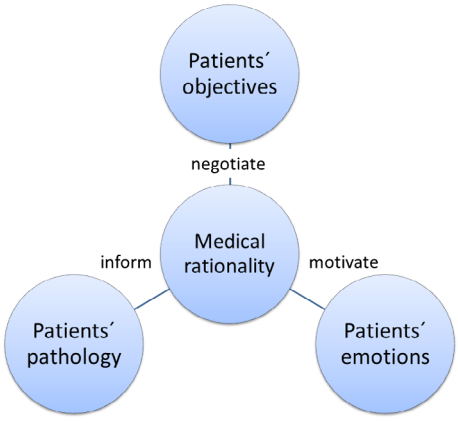

Figure 7. Patient–doctors' dialog for establishing a plan of treatment: IMS identifies medical rationality as physicians' firm standpoint.

Notes: Physicians act as agents of medical rationality, where they ***inform*** patients about their pathologic condition including options of treatment, and ***negotiate*** patients' objectives, and ***motivate*** patients to support therapy. Therefore, dialog is central to set up a plan of treatment that has the potential to maximize success.

success of treatment. In the following, we elucidate the role of strategy separately for planning treatment and for performing interventions to maximize therapeutic success.

11. Planning treatment

Planning overall therapeutic success requires to integrate patients' personal purposes and other external demands into goals and interventions, and to align several interventions into an overarching treatment plan. These functions of strategy are interpretative (Echevarria, 2007c), and they demand physicians to creatively align standardized medical rationality with varying demands of externality.

11.1. Dialog

What is "best" in terms of medical rationality may not be "best" in the light of the patients' conditional individuality, comprising physical, social, and psychological factors, and in the light of patients' normative individuality, comprising their personal utilities. Maximum success is possible only with maximal cooperation between physicians and patients to gain an optimal match of medical aims and means with individual conditions, where dialog is the essential instrument to bring patients and physicians into line (Figures 1 and 6). Assessing conditional and normative individuality requires merging the "hard facts" of b iomedical diagnostics with an interpretative understanding of the patient's physical, sociological, and psychological make-up. Patient–doctors' dialog is central for this interpretative task of strategy. Here we focus on the dialog's function to establish a plan of treatment that enables maximum success. To this end, dialog performs three distinct tasks:

First, it is necessary to inform patients and make them understand the medical rationale of treatment including goals, risks, and alternative approaches to treatment (Ahmed, Naik, Willoughby, & Edwards, 2012). Such information enables patients to estimate how therapy impacts their own objectives and to actively support therapy. Hence, this part of dialog aims at making therapy effective. Second, it is necessary to establish the patient's rational support of therapy. This part of dialog includes negotiation: (Fisher, Ury, & Patton, 1991; Lemieux-Charles, 1994) On the one hand, physicians convince the patient of medical rationality; on the other hand, physicians integrate the patients' objectives, where they have the duty to respect the patients' autonomy. This part of dialog makes therapy effective. Third, the patients' emotional support of therapy must be established. Emotions can pose major obstacles of success or can on the contrary provide a powerful source of success. Motivational interviewing evaluates and enhances the patients' emotional support (Burke, Dunn, Atkins, & Phelps, 2004; Rollnick, Miller, & Butler, 2008) to maximize the motivational dimension of therapeutic success. In sum, dialog balances medical rationality with patients' rationality and emotions to define targets of intervention and overall goals of therapy. In this sense, strategy uses dialog as a primer for three-dimensional therapeutic success (Figure 6).

11.2. Moral reasoning

Strategy must also consider demands external to the physician–patient relationship. Among these, ethical principles autonomy, non-maleficence, and beneficence are integral to medicine; only justice is somewhat more external to medicine. In the medical system today, hospital shareholders, management officers, quality managers, health insurances, health industries, politicians, and lawyers compete for leadership of claims. Physicians should not be referees between conflicting demands of multiple external parties and medicine since a social system should be organized and regulated in a way that the struggle of parties is kept outside the sphere of care for patients with disease. However, physicians may call on ethics and moral reasoning as guiding principle to classify correctly the diverse claims of stakeholders of medicine (Kassirer, 2007; Rosenbaum, 2015).

11.3. Aligning interventions

The aligning of interventions for a comprehensive treatment plan is a classical task of strategy that can be profoundly important for the overall medical success.

12. Performing intervention

In theory, we can separate the planning of therapy from performing intervention, or strategy from tactics. In practice, however, separating planning from performing or detaching strategy from tactics seriously jeopardizes success of therapy. For example, strategists may withdraw themselves from responsibility once a plan seems settled. But already during the very conference in which they set up plans, their patients may develop instability, refuse operation, or exhibit some previously unknown contraindications: the plan is crushed and treatment evolves without a sound strategy. Similarly, tacticians may quit once they have completed an operation or intervention. But patients usually do not die during an intervention but after it, and many complications evolve after a seemingly successful intervention. Hence we recommend with von Clausewitz that "strategy cannot, even for a moment, withdraw its hand from the task" (Echevarria, 2007c; von Clausewitz, 1991).

12.1. Preparing for success

It is strategy's critical task to create the best possible conditions for successful intervention (Echevarria, 2007c). Such conditions imply a general preparedness, as reflected by the physicians' capacities for treatment, and preparation of a particular intervention, as reflected by planning and timing of a intervention. For example, we may opt for an instantaneous intervention on a Saturday at 03:00 am to rescue a patient's life, or we may opt to transfer the patient to an expert center where top teams can perform the intervention with optimal results. Any of both strategies has strengths and weaknesses associated with opportunities and threats, all with potentially serious impact on the patient's outcome.

12.2. Performing for success

Tacticians tend to accept responsibility only for the technical results of their intervention, rather than maximizing the overall therapeutic success. Clearly, performing interventions is a domain of tactics, but even here adjustments of plans may become necessary, and decisions should be guided by an understanding of the overarching strategy. For example, the goal of performing an aortic-valve-sparing reimplantation operation according to David may turn out to be impossible during intervention, and then a surgeon must decide to replace the aortic valve either with a mechanical or a biological prosthesis. Here, he needs to know the patient's utilities to make an effective decision.

12.3. Exploiting success

Achieving the target of intervention is prerequisite for maximizing therapeutic success. However, tacticians tend to underestimate the importance of a thorough exploit of tactical success, while medical strategists may lose attention once they hand over to intervention. On the one hand, complications may develop in the aftermath of intervention: untrained staff blows post-operative results by undue handling of patients, early dismissal overlooks evolving complications, uninformed or unmotivated patients jeopardize success through inappropriate behavior, the patient does not show up for rehabilitation, rehabilitation is inappropriate, or general practitioners ignore or foil post-interventional treatment plans.

On the other hand, optimal exploit of an intervention may overcome suboptimal results of the intervention itself: a patient with delayed intervention for myocardial infarction gains increase in quality of life through maximum exploit of medical and behavioral options, physiotherapy surmounts misalignment of bones after orthopaedic surgery, or a patient who refuses lipid-lowering agents normalizes blood lipid levels through intensive exercise. In sum: strategy can maximize therapeutic success through determined exploit of the results of intervention.

13. Conclusion

IMS provides concepts to maximize therapeutic success. We discuss our concepts with many colleagues, and we address some of their frequently asked questions in Table 5. As major conclusions, we believe that physicians should not use one-sided definitions of "best medicine" according to medical standards alone, but that they should integrate normative and emotional dimensions of

Table 5. Frequently asked questions (FAQs) about IMS

FAQ	Explanation of the question	IMS' answers
Does the recommendation to individualize therapy counteract the demands of EBM?	Individual therapy is often identified as the practice of senior physicians who base therapy not on evidence, but on their individual beliefs or stances including eminence, vehemence, eloquence, providence, diffidence, nervousness, or confidence (Isaacs & Fitzgerald, 1999)	No, IMS understands individualized therapy not as "personal standards" of individual physicians, but as the translation of universal medical standards of EBM and guidelines to individual patients. This is what protagonists of EBM describe as "the integration of the best available evidence with our clinical expertise and our patients' individual values and circumstances" (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). Therefore, it is correct to describe IMS as evidence-based IMS
Why do we need IMS? Is it not enough to apply guidelines?	Guidelines tell us what we have to do. Therefore, all we need to do is to follow these guidelines	No, it is not enough to apply guidelines for two major reasons: First, it is unethical, because we need to consider the patients' autonomy. Second, we jeopardize therapeutic success or even risk patients' health or lives if we ignore their individual health conditions
I am a highly experienced physician. Do I need IMS to teach me the tricks of the trade?	There is not a single new piece of data in the entire manuscript, and most recommendations are mere platitudes	The question documents that IMS is in line with physicians' personal experiences and with commen sense. However, all experienced colleagues agree on two issues: First, they are unaware of other publications that conceptualize medical strategy. Second, they are unable to suggest how to teach their own medical strategy without using key concepts of IMS
Is IMS too time-consuming in my busy practice?	Dialogue and elaborate reflection are too time-consuming in my busy practice	We disagree. IMS is time-efficient for three reasons: First, dialogue and reflection are mandatory in every medical practice (Schön, 1983). Second, IMS does not require extensive dialogue and reflection in every encounter, but efforts adjust to the complexity of problems. Third, encounters that require IMS give us two choices: either we spend time with dialogue and reflection, or we spend time compensating failures, and struggeling with conflict and dispute. Studies show that high communication skills result in efficacious use of time (Ridsdale, Morgan, & Morris, 1992)
IMS seems to work well within a defined medical unit, but will it work in the fragmented organization of modern medical care?	IMS encourages physicians to take responsibility to maximize success of therapy, but consistency of care may disrupt through a patient journey that is complex, unstable or even moving at the edge of chaos (Martin et al., 2011)	This problem is fundamental. IMS offers two basic approaches (Oronsky et al., 2014; Wikipedia-contributors, 2015b): On the tactical level IMS provides concepts how to make full use of the physicians' own capacities to overcome the effect of chance, uncertainty and friction. On the strategical level IMS encourages physicians' initiative to organize their professional environment in a way that it can operate successfully. We will specify concepts in organizational medical strategy (OMS)
IMS focusses on the claims of individual patients, but how does IMS deal with rationing?	Medical resources are always limited, and physicians participate in their fair allocation (Scheunemann & White, 2011). Examples of physicans' rationing are rationing of time spent with patients, when they decide whome to see first and how much time to spend with each patient (Strech, Synofzik, & Marckmann, 2008), rationing of beds on the ICU (Truog et al., 2006), and rationing of organs for transplantation (Eberlein, Garrity, & Orens, 2011)	Allocation is an integral task of medical strategy, where moral and strategical reasoning are important. We will discuss these issues in organizational medical strategy (OMS)
IMS seems convincing, but do physicians really maximize therapeutic success rather than their own utilities?	Historically, physicians used to be highly idealistic, but economized medicine turns physicians into ordinary egoists who maximize nothing but their own utilities (Kassirer, 2007; Rosenbaum, 2015)	We agree: economy has the potential to corrupt medicine (Maio, 2008), and behavioral economy stimulates utilitaristic instincts to manipulate physicians' behavior (Khullar et al., 2015). In contrast, IMS designs physicians as duty-driven agents of medical rationality. Imagine physicians cleaning their hands only if they get incentive payments: therefore, IMS relies on duty ethics not because of naive idealism but because of pure necessity. IMS designs the physician as "homo sociologicus", where social norms have decisive impact on individual behavior. Homo sociologicus has as incentive therapeutic success, respect of colleagues, and gratefulness of patients
IMS opts for individualized dicisions, but does the industrialized health care system not preclude such freedom?	The hospital has an organization with rigid hierarchies, strict rules, and industrialized processes that puts iron chains on IMS (Rastegar, 2004)	Human organizations are efficious because they reduce individual choices of action. However, such systems do not necessarily forbid IMS: Physicians as leaders can encourage own thought and initiative (Achouri, 2010), hospital managers can organize processes in a patient-centered and variation-friendly way, and political regulations can protect and encourage patients' individual autonomy

Notes: EBM, evidence based medicine; ICU, intensive care unit; IMS, individualized medical strategy.

success. IMS identifies the patient–doctor dialog as central to maximize therapeutic success. We suggest IMS as a highly useful approach, where physicians integrate patients' utilities, ethical principles, and emotions to maximize therapeutic success.

Abbreviations

IMS	individualized medical strategy
POP	primacy of the patient
HI	hypothetical imperative according to Immanuel Kant
CI	categorical imperative according to Immanuel Kant
CI-1	Kant's first formulation of the categorical imperative
CI-2	Kant's second formulation of the categorical imperative
O	patient-related opportunity for efficient attainment of a medical aim
T	patient-related threat for efficient attainment of a medical aim
COP-1	center of pathology
COP-2	center of personality
S	strengths of therapeutic option
W	weaknesses of therapeutic option

Acknowledgments
The authors wish to thank Martin C. Wolff for his valuable comments on the paper, Fregattenkapitän Oliver Heinicke, Nadine Moeller, PhD, and Arnim Sachweh for their stimulating questions and suggestions. We also thank Michael Schlüter, PhD, for his thoughtful review of the manuscript.

Funding
The authors received no direct funding for this research.

Competing interest
The authors declare no competing interests.

Author details
Yskert von Kodolitsch[1]
E-mail: kodolitsch@uke.de
Alexander M. Bernhardt[1]
E-mail: al.bernhardt@uke.de
Tilo Kölbel[1]
E-mail: t.koelbel@uke.de
Christian Detter[1]
E-mail: detter@uke.de
Hermann Reichenspurner[1]
E-mail: hcr@uke.de
Eike Sebastian Debus[1]
E-mail: debus@uke.de
ORCID ID: http://orcid.org/0000-0002-0186-1166
[1] Centre of Cardiology and Cardiovascular Surgery, German Aortic Center Hamburg, University Heart Center, University Medical Centre Hamburg-Eppendorf, Martinistrasse 52, Hamburg 20246, Germany.

Citation information
Cite this article as: Maximizing therapeutic success: The key concepts of individualized medical strategy (IMS), Yskert von Kodolitsch, Alexander M. Bernhardt, Tilo Kölbel, Christian Detter, Hermann Reichenspurner & Eike Sebastian Debus, *Cogent Medicine* (2015), 2: 1109742.

References

Achouri, C. (2010). *Modern systemic leadership. A holistic approach for managers, coaches, and HR professionals*. Offenbach: Publicis.
Ahmed, H., Naik, G., Willoughby, H., & Edwards, A. G. K. (2012). Communicating risk. *BMJ,* 344, e3996.
Allen, J. L. (1963). The relation of strategy and morality. *Ethics, 73*, 167–178. http://dx.doi.org/10.1086/et.1963.73.issue-3
Amann, E. (2012). *Spieltheorie für Dummies: [ein Spiel für praktische Theoretiker; auf einen Blick: wie Sie spielend die Welt erklären, wie Sie sich strategisch verhalten, wie Sie auch komplexe Situationen spielerisch lösen, Mathematik als strategisches Werkzeug]* [Game theory for dummies] (1. Aufl. ed.). Weinheim: Wiley-VCH.
Arras, J. D. (2001). A method in search of a purpose: The internal morality of medicine. *The Journal of Medicine and Philosophy, 26*, 643–662. http://dx.doi.org/10.1076/jmep.26.6.643.2997
Bassler, D., Busse, J. W., Karanicolas, P. J., & Guyatt, G. H. (2008). Evidence-based medicine targets the individual patient, Part 1: How clinicians can use study results to determine optimal individual care. *Evidence-Based Medicine, 13*, 101–102. http://dx.doi.org/10.1136/ebm.13.4.101
Beauchamp, T. L. (2001). Internal and external standards for medical morality. *The Journal of Medicine and Philosophy, 26*, 601–619. http://dx.doi.org/10.1076/jmep.26.6.601.2995
Beauchamp, T. L. (2003). Methods and principles in biomedical ethics. *Journal of Medical Ethics, 29*, 269–274. http://dx.doi.org/10.1136/jme.29.5.269
Beauchamp, T. L., & Childress, J. F. (2013). *Principles of biomedical ethics*. New York, NY: Oxford University Press.

Bennemann, N. (2011). *Rezension zu: Stefanie Samida (Hg.): Inszenierte Wissenschaft. Zur Popularisierung von Wissen im 19 Jahrhundert*. Bielefeld: transcript Verlag, in: [reviewlution-net] 2012.

Boekstegers, P., Hausleiter, J., Baldus, S., von Bardeleben, R. S., Beucher, H., Butter, C., … Wunderlich, N. (2013). Interventional treatment of mitral valve insufficiency with the MitraClip® procedure. *Der Kardiologe, 7*, 91–104. http://dx.doi.org/10.1007/s12181-013-0492-5

Bowes, L., & Jaffee, S. R. (2013). Biology, genes, and resilience: Toward a multidisciplinary approach. *Trauma, Violence & Abuse, 14*, 195–208.

Brody, H. (1998). The internal morality of medicine: Explication and application to managed care. *The Journal of Medicine and Philosophy, 23*, 384–410. http://dx.doi.org/10.1076/jmep.23.4.384.2572

Brooks, P. M., & Buchanan, W. W. (1988). Academic medicine in crisis. *The Lancet, 331*, 1171. http://dx.doi.org/10.1016/S0140-6736(88)91991-5

Burke, B. L., Dunn, C. W., Atkins, D. C., & Phelps, J. S. (2004). The emerging evidence base for motivational interviewing: A meta-analytic and qualitative inquiry. *Journal of Cognitive Psychotherapy, 18*, 309–322. http://dx.doi.org/10.1891/jcop.18.4.309.64002

Callahan, D. (1996). The goals of medicine. *Setting New Priorities. Hastings Center Report, 26*, S1–S27.

Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology, 61*, 679–704. http://dx.doi.org/10.1146/annurev.psych.093008.100352

Casebeer, A. (1993). Application of SWOT analysis. *British Journal of Hospital Medicine, 49*, 430–431.

Charles, C., Gafni, A., & Whelan, T. (1999). Decision-making in the physician–patient encounter: Revisiting the shared treatment decision-making model. *Social Science & Medicine (1982), 49*, 651–661.

Clarke, G., Hall, R. T., & Rosencrance, G. (2004). Physician–patient relations: No more models. *The American Journal of Bioethics : AJOB, 4*, W16–19.

Coughlin, S., Wordham, J., & Jonash, B. (2015). Rising consumerism. Winning the hearts and minds of health care consumers. *Deloitte Review, 2015*, 164–179.

Daubert, J. P., Zareba, W., Cannom, D. S., McNitt, S., Rosero, S. Z., Wang, P., … Moss, A. J. (2008). Inappropriate implantable cardioverter-defibrillator shocks in MADIT II. *Journal of the American College of Cardiology, 51*, 1357–1365. http://dx.doi.org/10.1016/j.jacc.2007.09.073

Davidoff, F. (1997). Time. *Annals of Internal Medicine, 127*, 483–485. http://dx.doi.org/10.7326/0003-4819-127-6-199709150-00011

Degner, L. F., & Sloan, J. A. (1992). Decision making during serious illness: What role do patients really want to play? *Journal of Clinical Epidemiology, 45*, 941–950. http://dx.doi.org/10.1016/0895-4356(92)90110-9

Deveau, J. P., Lorenz, J. E., & Hughes, M. J. (2003). Emergency medicine resident work productivity and procedural accomplishment. *The Journal of the American Osteopathic Association., 103*, 291–296.

Drucker, P. F. (1963). Managing for business effectiveness. *Harvard Business Review, 3*, 53–61.

Dunn, N. (2003). Practical issues around putting the patient at the centre of care. *Journal of the Royal Society of Medicine, 96*, 325–327. http://dx.doi.org/10.1258/jrsm.96.7.325

Earvolino-Ramirez, M. (2007). Resilience: A concept analysis. *Nursing Forum, 42*, 73–82. http://dx.doi.org/10.1111/nuf.2007.42.issue-2

Eberlein, M., Garrity, E. R., & Orens, J. B. (2011). Lung allocation in the United States. *Clinics in Chest Medicine, 32*, 213–222. http://dx.doi.org/10.1016/j.ccm.2011.02.004

Echevarria, II, A. J. (2007a). *Clausewitz and contemporary war* (1st ed., pp. 61–83). New York, NY: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199231911.001.0001

Echevarria, II, A. J. (2007b). *Clausewitz and contemporary war* (1st ed., pp. 177–190). New York, NY: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199231911.001.0001

Echevarria, II, A. J. (2007c). *Clausewitz and contemporary war* (1st ed., pp. 138–141). New York, NY: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199231911.001.0001

Echevarria, II, A. J. (2015). *Clausewitz's center of gravity: Changing our warfighting doctrine—again! 2002*. New York, NY.

Egri, L., & Miller, G. (2007). *The art of dramatic writing. Its basis in the creative interpretation of human motives*. New York, NY: Simon & Schuster.

Ekman, P. (1992). An argument for basic emotions. *Cognition & Emotion, 6*, 169–200.

Emanuel, E. J., & Emanuel, L. L. (1992). Four models of the physician–patient relationship. *JAMA: The Journal of the American Medical Association, 267*, 2221–2226. http://dx.doi.org/10.1001/jama.1992.03480160079038

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196*, 129–136. http://dx.doi.org/10.1126/science.847460

Farkas, D. H., & Bernard, D. W. (2004). SWOT analysis for molecular diagnostics: Strengths, weaknesses, opportunities, and threats. *Biotechnology Healthcare, 1*, 46–51.

Fisher, R., Ury, W., Patton, B. (1991). *Getting to yes: Negotiating agreement without giving in*. Houghton: Random House Business Books.

Flam, H. (1990). Emotional "man": I. The emotional "man" and the problem of collective action. *International Sociology, 5*, 39–56. http://dx.doi.org/10.1177/026858090005001004

Flynn, K. E., Smith, M. A., & Vanness, D. (2006). A typology of preferences for participation in healthcare decision making. *Social Science & Medicine (1982), 63*, 1158–1169.

Fox, N. J., Ward, K. J., & O'Rourke, A. J. (2005). The "expert patient": Empowerment or medical dominance? The case of weight loss, pharmaceutical drugs and the Internet. *Social Science & Medicine (1982), 60*, 1299–1309.

Frankfurt, H. G. (1971). Freedom of the will and the concept of a person. *The Journal of Philosophy, 68*, 5–20. http://dx.doi.org/10.2307/2024717

Freud, S., Strachey, J., & Gay, P. (1989). *The ego and the id* (Standard ed.). New York, NY: Norton.

Gallagher, B. (2007). *Connecting with your patient's unique personality type*. Retrieved October 2, 2015, http://www.rsnhope.org/programs/kidneytimes-library/article-index/connecting-with-your-patients-unique-personality-type/

Ghazinoory, S., Abdi, M., & Azadegan-Mehr, M. (2011). Swot methodology: A state-of-the-art review for the past, a framework for the future. *Journal of Business Economics and Management, 12*, 24–48. http://dx.doi.org/10.3846/16111699.2011.555358

Greenhalgh, T., Howick, J., & Maskrey, N. (2014). Evidence based medicine: A movement in crisis? *BMJ, 348*, g3725. doi:10.1136/bmj.g3725

Groves, J. E. (1978). Taking care of the hateful patient. *New England Journal of Medicine, 298*, 883–887. http://dx.doi.org/10.1056/NEJM197804202981605

Han, P. K., Klein, W. M., & Arora, N. K. (2011). Varieties of uncertainty in health care: A conceptual taxonomy. *Medical Decision Making, 31*, 828–838. http://dx.doi.org/10.1177/0272989X10393976

Hanahan, D. (2014). Rethinking the war on cancer. *The Lancet, 383*, 558–563. http://dx.doi.org/10.1016/S0140-6736(13)62226-6

Hegglin, J., & Seeber, K. H. (2012). *Chirurgische Untersuchung* [Surgical examination]. Neuromedizin-Verlag.

Hill, Jr., T. E. (1971). Kant on imperfect duty and supererogation. *Kant-Studien, 62*, 55–76.

Huckman, R. S., & Kelley, M. A. (2013). Public reporting, consumerism, and patient empowerment. *New England Journal of Medicine, 369*, 1875–1877. http://dx.doi.org/10.1056/NEJMp1310419

Isaacs, D., & Fitzgerald, D. (1999). Seven alternatives to evidence based medicine. *BMJ, 319*, 1618. http://dx.doi.org/10.1136/bmj.319.7225.1618

Jameson, J. L., & Longo, D. L. (2015). Precision medicine—Personalized, problematic, and promising. *New England Journal of Medicine, 372*, 2229–2234.

Kassirer, J. P. (2007). Commercialism and medicine: An overview. *Cambridge Quarterly of Healthcare Ethics, 16*, 377–386; 439–342. http://dx.doi.org/10.1017/S0963180107070478

Khullar, D., Chokshi, D. A., Kocher, R., Reddy, A., Basu, K., Conway, P. H., & Rajkumar, R. (2015). Behavioral economics and physician compensation—Promise and challenges. *New England Journal of Medicine, 372*, 2281–2283. http://dx.doi.org/10.1056/NEJMp1502312

Klein, G. A., Orasanu, J., Calderwood, R., & Zsambok, C. E. (1993). *Decision making in action: Models and methods*. Norwood, NJ: Ablex.

Kleinman, A. (2008). Catastrophe and caregiving: The failure of medicine as an art. *The Lancet, 371*, 22–23. http://dx.doi.org/10.1016/S0140-6736(08)60057-4

Korsgaard, C. M. (1985). Kant's formula of universal law. *Pacific Philosophical Quarterly, 66*, 24–47.

Lane, H. P., McLachlan, S., & Philip, J. (2013). The war against dementia: Are we battle weary yet? *Age and Ageing, 42*, 281–283. http://dx.doi.org/10.1093/ageing/aft011

Lawton, R., McEachan, R. R., Giles, S. J., Sirriyeh, R., Watt, I. S., & Wright, J. (2012). Development of an evidence-based framework of factors contributing to patient safety incidents in hospital settings: A systematic review. *BMJ Quality & Safety, 21*, 369–380.

Lazaridis, K. N., MCAllister, T. M., Babovic-Vuksanovic, D., Beck, S. A., Borad, M. J., Bryce, A. H., ... Farrugia, G. (2014). Implementing individualized medicine into the medical practice. *American Journal of Medical Genetics Part C: Seminars in Medical Genetics, 166*, 15–23. http://dx.doi.org/10.1002/ajmg.c.v166.1

Lemieux-Charles, L. (1994). Physicians in health care management: 10. Managing conflict through negotiation. *CMAJ: Canadian Medical Association Journal/Journal de l'Association Medicale Canadienne, 151*, 1129–1132.

Lindblad, Å. K., Ring, L., Glimelius, B., & Hansson, M. G. (2002). Focus on the individual. *Acta Oncologica, 41*, 507–516. http://dx.doi.org/10.1080/028418602320807775

Loeb, D. F., Binswanger, I. A., Candrian, C., & Bayliss, E. A. (2015). Primary care physician insights into a typology of the complex patient in primary care. *The Annals of Family Medicine, 13*, 451–455. http://dx.doi.org/10.1370/afm.1840

Maio, G. (2008). From service of charity to profit center? An ethical critique of commodification of medicine. *Medizinische Klinik, 103*, 455–459. http://dx.doi.org/10.1007/s00063-008-1066-3

Maio, G. (2012). *Mittelpunkt Mensch: Ethik in der Medizin; ein Lehrbuch; mit 39 kommentierten Patientengeschichten* [Focus on people: Ethics in medicine. A teaching book]. Schattauer: Stuttgart.

Marcum, J. A. (2008). Reflections on humanizing biomedicine. *Perspectives in Biology and Medicine, 51*, 392–405. http://dx.doi.org/10.1353/pbm.0.0023

Martin, C. M., Grady, D., Deaconking, S., McMahon, C., Zarabzadeh, A., & O'Shea, B. (2011). Complex adaptive chronic care—Typologies of patient journey: A case study. *Journal of Evaluation in Clinical Practice, 17*, 520–524. http://dx.doi.org/10.1111/jep.2011.17.issue-3

Miles, A. (1997). Evidence-based medicine. *European Journal of Emergency Medicine, 4*, 156–164. http://dx.doi.org/10.1097/00063110-199709000-00008

Moons, P., Van Deyk, K., Marquet, K., Raes, E., De Bleser, L., Budts, W., & De Geest, S. (2005). Individual quality of life in adults with congenital heart disease: A paradigm shift. *European Heart Journal, 26*, 298–307.

Morimoto, T., & Fukui, T. (2002). Utilities measured by rating scale, time trade-off, and standard gamble: Review and reference for health care professionals. *Journal of Epidemiology, 12*, 160–178. http://dx.doi.org/10.2188/jea.12.160

Morrison, J. M., & Wood, D. F. (2004). Academic medicine in crisis. *Medical Education, 38*, 796–797. http://dx.doi.org/10.1111/med.2004.38.issue-8

Nida-Rümelin, J. (1995). *Kritik des Konsequentialismus* [Critique of consequentialism]. Berlin: Oldenbourg. http://dx.doi.org/10.1515/9783486829488

Oronsky, B., Carter, C. A., Mackie, V., Scicinski, J., Oronsky, A., Oronsky, N., ... Reid, T. (2014). The war on cancer: A military perspective. *Frontiers in Oncology, 4*, 1–5.

Paxton, J. M., & Greene, J. D. (2010). Moral reasoning: Hints and allegations. *Topics in Cognitive Science, 2*, 511–527. http://dx.doi.org/10.1111/(ISSN)1756-8765

Pearce, C. (2007). Ten steps to carrying out a SWOT analysis. *Nursing management (Harrow, London, England: 1994), 14*, 25.

Pellegrino, E. D. (1993). The metamorphosis of medical ethics. *JAMA, 269*, 1158–1162. http://dx.doi.org/10.1001/jama.1993.03500090094039

Pellegrino, E. D., & Thomasma, D. C. (1987). The conflict between autonomy and beneficence in medical ethics: Proposal for a resolution. *The Journal of Contemporary Health Law and Policy, 3*, 23–46.

Rastegar, D. A. (2004). Health care becomes an industry. *The Annals of Family Medicine, 2*, 79–83. http://dx.doi.org/10.1370/afm.18

Richardson, H. S. (2000). Specifying, balancing, and interpreting bioethical principles. *The Journal of Medicine and Philosophy, 25*, 285–307. http://dx.doi.org/10.1076/0360-5310(200006)25:3;1-H;FT285

Ridsdale, L., Morgan, M., & Morris, R. (1992). Doctors' interviewing technique and its response to different booking time. *Family Practice, 9*, 57–60. http://dx.doi.org/10.1093/fampra/9.1.57

Rollnick, S., Miller, W. R., & Butler, C. (2008). *Motivational interviewing in health care: Helping patients change behavior*. New York, NY: Guilford Press.

Rosenbaum, L. (2015). Understanding bias—The case for careful study. *New England Journal of Medicine, 372*, 1959–1963.

Rutter, M. (1985). Resilience in the face of adversity. Protective factors and resistance to psychiatric disorder. *The British Journal of Psychiatry, 147*, 598–611. http://dx.doi.org/10.1192/bjp.147.6.598

Rutter, M. (2013). Annual research review: Resilience–clinical implications. *Journal of Child Psychology and Psychiatry, 54*, 474–487. http://dx.doi.org/10.1111/j.1469-7610.2012.02615.x

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78. http://dx.doi.org/10.1037/0003-066X.55.1.68

Sackett, D. L., Rosenberg, W. M., Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence based medicine: What it is and what it isn't. *BMJ, 312*, 71–72. http://dx.doi.org/10.1136/bmj.312.7023.71

Sarkar, M., & Fletcher, D. (2014). Psychological resilience in sport performers: A review of stressors and protective factors. *Journal of Sports Sciences, 32*, 1419–1434.
Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information, 44*, 695–729. http://dx.doi.org/10.1177/0539018405058216
Scheunemann, L. P., & White, D. B. (2011). The ethics and reality of rationing in medicine. *CHEST Journal, 140*, 1625–1632. http://dx.doi.org/10.1378/chest.11-0622
Scholl, I., Zill, J. M., Haerter, M., & Dirmaier, J. (2014). How do health services researchers understand the concept of patient-centeredness? Results from an expert survey. *Patient Preference and Adherence, 8*, 1153–1160. http://dx.doi.org/10.2147/PPA
Schön, D. (1983). *The reflective practitioner, how professionals think in action*. München: Basic Books.
Shorter, E. (1991). *Das Arzt-Patienten-Verhältnis in der Geschichte und heute* [The physician–patient relationship in history and today]. Wien: Picus Verlag GmbH.
Sox, H., Blatt, M. A., Higgins, M. C., & Marton, K. I. (2007). *Medical decision making*. Philadelphia, PA: American College of Physicians.
Sprung, C. L., Eidelman, L. A., & Steinberg, A. (1995). Is the physician's duty to the individual patient or to society? *Critical Care Medicine, 23*, 618–620. http://dx.doi.org/10.1097/00003246-199504000-00004
Straus, S., Haynes, B., Glasziou, P., Dickersin, K., & Guyatt, G. (2007). Misunderstandings, misperceptions, and mistakes. *Evidence-Based Medicine, 12*, 2–3. http://dx.doi.org/10.1136/ebm.12.1.2-a
Strech, D., Synofzik, M., & Marckmann, G. (2008). How physicians allocate scarce resources at the bedside: A systematic review of qualitative studies. *Journal of Medicine and Philosophy, 33*, 80–99. http://dx.doi.org/10.1093/jmp/jhm007
Taleb, N. N. (2012). *Antifragile: Things that gain from disorder*. New York, NY: Random House.
Truog, R. D., Brock, D. W., Cook, D. J., Danis, M., Luce, J. M., Rubenfeld, G. D., & Levy, M. M. (2006). Rationing in the intensive care unit. *Critical Care Medicine, 34*, 958–963, 971. http://dx.doi.org/10.1097/01.CCM.0000206116.10417.D9
Unschuld, P. U. (2009). *Ware Gesundheit: das Ende der klassischen Medizin. Kapitel 3: Gesundheit als Mittel zum Zweck im 18 Jahrhundert*. München: Beck.
Veatch, R. M. (1972). Models for ethical medicine in a revolutionary age. *The Hastings Center Report, 2*, 5–7. http://dx.doi.org/10.2307/3560825
Veatch, R. M. (2001). The impossibility of a morality internal to medicine. *The Journal of Medicine and Philosophy, 26*, 621–642. http://dx.doi.org/10.1076/jmep.26.6.621.2996
von Clausewitz, C. (1991). *Vom Kriege* (19th ed.). Bonn: Ferdinand Dümmler Verlag.
von Clausewitz, C., Howard, M., & Paret, P. (1989). *On war* (Indexed edi.). Princeton, NJ: Princeton University Press.
von Kodolitsch, Y. (2010). Carl von Clausewitz, Kritik des Methodismus und Entscheidungsfindung in der Medizien. *Jahrbuch der Clausewitz-Gesellschaft, 2*. Retrieved April 18, 2011, from http://www.clausewitz-gesellschaft.de/uploads/media/Jahrbuch_2010.pdfHamburg
von Kodolitsch, Y., Bernhardt, A. M., Robinson, P. N., Kölbel, T., Reichenspurner, H., Debus, S., & Detter, C. (in press). Analysis of strengths, weaknesses, opportunities, and threats as a tool for translating evidence into Individualized medical strategies (I-SWOT). *AORTA*.
von Kodolitsch, Y., Overlack, C., von Kodolitsch, Y., Bernhardt, A., Detter, C., Epskamp, H., … Reichenspurner, H. (2013). Strategic thinking as the key to surgical excellence. Medical thought style in the tradition of Kant and Clausewitz. *Zeitschrift für Herz-,Thorax- und Gefäßchirurgie, 27*, 282–289. http://dx.doi.org/10.1007/s00398-013-1018-y
von Uexküll, T., & Wesiack, W. (1998). *Theorie der Humanmedizin: Grundlagen ärztlichen Denkens und Handelns* [Theory of human medicine: Basics of medical thought and action]. Munich: Urban & Schwarzenberg.
Weber, M., Roth, G., & Wittich, C. (1978). *Economy and society: An outline of interpretive sociology*. Berkeley: University of California Press.
Weihrich, H. (1982). The TOWS matrix: A tool for situational analysis. *Long Range Planning, 15*, 54–66.
Wikipedia-Contributors. (2015a, February 26). *Groundwork of the metaphysic of morals*. Retrieved April 1, 2015: http://en.wikipedia.org/w/index.php?title=Groundwork_of_the_Metaphysic_of_Morals&oldid=649006721
Wikipedia-Contributors. (2015b, April 7). *Consequentialism*. Retrieved May 13, 2015 from Wikipedia, The Free Encyclopedia: http://en.wikipedia.org/w/index.php?title=Consequentialism&oldid=655346786
Wikipedia-Contributors. (2015c, March 27). *Type D personality*. Retrieved from October 2, 2015, from Wikipedia, The Free Encyclopedia: https://en.wikipedia.org/w/index.php?title=Type_D_personality&oldid=653820393
Wikipedia-Contributors. (2015d, September 30). *Type A and Type B personality theory*. Retrieved October 2, 2015, from Wikipedia, The Free Encyclopedia: https://en.wikipedia.org/w/index.php?title=Type_A_and_Type_B_personality_theory&oldid=683506277.
Wikipedia-Contributors. (2015e, September 29). *Robert Greene (American author)*. Retrieved October 4, from Wikipedia, The Free Encyclopedia: https://en.wikipedia.org/w/index.php?title=Robert_Greene_(American_author)&oldid=683340925.
Wikipedia-Contributors. (2015f, September 25) *Game theory*. Retrieved October 3, 2015, from Wikipedia, The Free Encyclopedia: https://en.wikipedia.org/w/index.php?title=Type_A_and_Type_B_personality_theory&oldid=683506277