

# Communicating numeric risk information to patients

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## Unstructured Abstract

Risk information is increasingly available to health care providers and patients thanks to a growing body of health outcomes research and clinical prediction models. Meanwhile, communicating such information is encouraged for a variety of reasons. Yet clinicians often struggle to communicate risk information—or forego the task altogether due to various challenges. The challenges are real, and this paper briefly discusses six of them: (1) Clinician reliance on verbal risk descriptions, (2) Low patient numeracy; (3) Lack of meaningful numeric evidence; (4) Patient use of heuristics; (5) Uncertain risk information; and (6) The curse of knowledge. Specific strategies exist for clinicians, though, to overcome these complex challenges. In the paper, we present evidence-based best practices with examples of what clinicians can do to effectively communicate risk information to their patients (and what they should not do). The best practices include communicating with numbers, not only words; decreasing cognitive effort for patients; providing the meaning of numeric risk data important to decisions; acknowledging uncertainty; and testing communication with patients through teach-back techniques. We conclude by recommending that clinicians integrate these strategies into their existing scripts for patient encounters.

An 80-year-old man diagnosed with colon cancer faced a choice between two surgical treatments. The attending physician described the overall chances of survival as “high” and of possible serious side effects as “2-6%.” The patient felt confused and unable to make an informed choice despite receiving numeric risk information—i.e., quantitative estimates of the probability of future outcomes. To decide, he relied instead on a patient’s experience that he read on the internet.

Risk information is increasingly available thanks to a growing body of health-outcomes research and clinical-prediction models. Meanwhile, communicating such information is encouraged due to recognition of the importance of shared decision making<sup>1</sup>. Numeric risk information enables patients to weigh the expected benefits and harms of medical options, and to make decisions concordant with their preferences; empirical evidence supports its effectiveness in accomplishing these goals. Furthermore, people often prefer numeric risk information and find it useful<sup>2-4</sup>.

Yet clinicians often struggle to communicate risk information—or forego the task altogether due to various challenges. This paper examines six of these challenges and how they could be overcome. Further, it proposes five best practices with examples of how clinicians can effectively communicate numeric risk information to their patients.

## Six challenges in risk communication

Clinicians face several challenges in effectively communicating risk in clinical practice<sup>5,6</sup>.

(1) *Reliance on verbal risk descriptions*: Communicators, including clinicians, tend to favor using verbal, or qualitative, risk information rather than more precise numeric information. However, two clinicians may use the term “unlikely” or “common” to describe the same medical risks; further, patients’ interpretations of the verbal terms can vary substantially. Patients may also overestimate risks significantly when verbal, rather than numeric, terms are used. (2) *Low patient numeracy* (ability to understand and work with numbers): A sizeable minority of American adults (30% of working-age adults) struggle with simple numeric processes, cannot understand medical statistics, and prefer not to use numbers. They may need help to understand not only the magnitude of different health risks, but the deeper meaning of chance and of numeric estimates of probability—higher-order cognitive tasks that go beyond basic arithmetic. (3) *Lack of numeric meaning*: Even when people know what a number is, they may not understand its bottom-line, or “gist” meaning, for a given healthcare decision. For example, they may either overestimate or underestimate the significance of numerically small differences in the probability of different options (e.g., 16% vs. 20% mortality). (4) *Use of heuristics*: Patients may rely on various cognitive heuristics (mental short-cuts) which may bias or distort their interpretation of risk information<sup>7</sup>. Their medical choices can be inordinately swayed, for example, by their emotional reactions to diseases such as cancer, or by anecdotes about the health experiences of trusted family members or friends. Such heuristic use also can further lead patients to ignore or discount evidence-based, numerical risk information. (5) *Uncertainty about risks*: Risk information poses various uncertainties that need to be acknowledged and managed but are often ignored.

These uncertainties arise from various sources, including differences between individual patients and the study populations used to generate risk information (the “reference class problem”), data limitations that restrict the accuracy and precision of all risk estimates, and limitations in the applicability of population-based risk estimates to single events experienced by individuals. Potential harm can result if patients and clinicians fail to communicate about and understand these uncertainties. They may develop either excessive confidence in existing risk information, which could lead to impulsive, non-deliberative decisions, or insufficient confidence, which could lead to avoidance of decision making. (6) *Curse of knowledge*: Finally, like other experts, clinicians are prone to a cognitive bias whereby they incorrectly assume that nonexperts have a higher level of knowledge than they do<sup>8</sup>. With respect to risk communication, clinicians may assume that patients understand what numeric probability estimates represent and how they are derived from scientific studies. This assumption of knowledge may lead clinicians to use medical jargon and statistics, and to simply assume patients understand their true meaning without checking.

Compounding all of these major challenges, physicians lack knowledge of evidence-informed best practices in communicating risks, or lack confidence in the task. As a result, they often fail to communicate risk information effectively. Specific strategies exist, though, to overcome these complex challenges (see Table).

## Strategies to meet the challenges of risk communication

### Communicate with numbers, not only words

First, communicating with numeric risk estimates, in place of verbal terms (e.g., there is a 7% chance of headache vs headaches are common), reduces how much patients overestimate risks, and increases patient intentions to adhere to physician recommendations for more and less numerate people<sup>9-10</sup>. Furthermore, numeric risk information causes people to engage more with messages and increases both trust in the message and the perceived expertise of the messenger<sup>11-12</sup>.

### Decrease cognitive effort

Clinicians can increase patient comprehension of risks by presenting only the most important information, and excluding less important or irrelevant information<sup>13</sup>. For example, it may be nice to know that another medication exists; however, if it’s not a realistic option for this patient—or one she wants to hear about—it’s better not to mention it. Clinicians also should do any required math for patients. For example, when discussing risks for longer time periods, instead of explaining the one-year risk, calculate the risk over the expected time period. Understanding multiple-year risks requires a level of numeracy that most people do not have.

### Provide the numeric meaning

To help patients use numeric risk data in decisions, clinicians can help patients extract meaning from them by providing interpretive verbal terms (e.g., “a 6% risk is generally considered poor”) or by giving a comparative context (e.g., the patient’s 6% risk vs the

average 12% risk)<sup>5</sup>. Summary statistics such as relative risk reduction (RRR) and absolute risk reduction (ARR) provide further comparative context (e.g., a 50% RRR and 6% ARR for the example above). Interpretive verbal terms and comparisons convey value judgments that can help people make sense of risk information. However, for this same reason they can also be problematic, and require clinicians to acknowledge with patients that risk perceptions depend on value judgments. In particular, clinicians should explore the values that inform their own (and their patients') interpretations of the significance of different numeric risks. Clinicians concerned about the potential biasing effects of providing interpretive labels or comparative context should be aware that not doing so—or not communicating numeric risk information at all—are equally biasing, and can prevent patients from grasping the meaning of the risks at hand.

### Acknowledge uncertainty

To ensure that patients understand the limitations and the value of evidence-based risk information, clinicians need to help patients understand the inherent uncertainties that limit the accuracy and reliability of risk estimates. First, the clinician should clarify how the patients might differ from the reference class of patients for a given risk estimate, and how population-based risk estimates have limited applicability to single events and individuals. See Table for ways to talk about these issues. They should also identify other data limitations that restrict the accuracy and precision of risk estimates. When presenting numeric risk estimates, clinicians can convey uncertainty either non-numerically, using terms such as “approximately” or “roughly” in conjunction with the estimates, or numerically, using risk ranges or confidence intervals (if available) to convey imprecision.

### Test your communication through teach-back technique

Effective risk communication is a two-way street, involving the integration of evidence-based risk information with both experts' and patients' opinions about risk<sup>14</sup>. This process requires a sensitive, iterative exchange of information between clinicians and patients. Using teach-back techniques (“Can you tell me what you have understood so far”)—and asking for questions—can allow for immediate feedback and on-the-fly corrections that lead to better communication. They also help clinicians and patients to make meaning from different sources of risk evidence, and to understand each others' perspectives<sup>15</sup>. Using these techniques also may strengthen clinician-patient relationships and help the clinician evaluate and improve their communication skills.

### Discussion

Given busy practices and little time, it could be difficult for clinicians to use these strategies. However, clinicians often rely on the same scripts or conversation routines that they have developed over time. Doing so helps them describe a given condition and set of treatment choices repeatedly to many patients. Using scripts can powerfully enhance patient interactions, ensuring that clinicians in busy clinics and/or with less experience ask the important questions and provide key information. Scripts could be a ready place where clinicians could incorporate evidence-based principles of risk

communication into their routine practice using the strategies presented here (Table). Scripts can also serve as effective tools for teaching risk communication skills<sup>16</sup>.

Numeric risk information is only one aspect of clinician-patient communication but providing such numbers can help correct patients who have the wrong facts, modify inappropriate interpretations, improve patient trust in provided information, and motivate better patient decisions. Doing so is also consistent with the honest, transparent communication that is central to the ethos of shared decision making and that helps to maintain patient trust in clinicians. The key challenge for clinicians is to provide these numbers using evidence-based strategies that enable patients to understand and use them and to do so in ways that do not add to the soul-crushing conditions under which many clinicians work.

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## Challenges and effective strategies in presenting numeric risk information

Challenge to overcome	Strategy	Example of what it is (i.e., useful language “scripts”)	Example of what it’s not (i.e., language to avoid)
Reliance on verbal risk terms	Communicate with numbers, not only words	<p>“7% chance of headache.”</p> <p>“Headache is a common side effect and occurs in 7% of people.”</p>	“Headache is a common side effect.”
Low patient numeracy and use of heuristics	Decrease cognitive effort	<p>Provide the most important information structured in ways that are easy to understand.</p> <p>Calculate birth control risk based on the number of years the patient expects to use it.</p>	<p>Provide information not relevant to this specific patient.</p> <p>Share the annual risk of birth control pills that will be taken for many years.</p>
Lack of numeric meaning	Provide meaning to statistics	<p>“93% of patients survive with treatment A, which many patients would consider a poor chance compared to other available treatments.”</p> <p>“93% of patients survive with treatment A compared to 99% who survive with treatment B.”</p> <p>“Among patients similar to you, taking this drug reduces the risk of stroke from 12% to 6%. In other words, the risk of stroke among patients who take the drug is 50% lower than the risk of stroke among patients who don’t take it.”</p>	“93% of patients survive with treatment A.”
Uncertainty about risks	Acknowledge uncertainty	<p>“No matter what the studies show about a group of people, we don’t know what will happen to you. Even if the risk of a complication from surgery is 10 out of 100, we don’t know whether you will be one of the unlucky 10 who will suffer the complication, or the lucky 90 who will not.”</p> <p>“Your chances of developing colon cancer in your lifetime are most likely between [5-13%; 5/100 - 13/100], although they could be higher or lower. Estimates of risk or chance are not completely sure. It’s a best guess based on scientific studies.”</p> <p>“Estimates of the chance of something happening are only a best guess based on the scientific knowledge we have right now. We do not know your personal real risk, because of things about</p>	Present numeric risk information as unerringly precise and correct.

		you that have never been studied and we don't yet understand."	
The curse of knowledge and uncertainty about patient understanding of risk information	Test your communication through teach back technique	<p>"This can be hard to understand. I'd like to make sure I've explained it clearly. Could you tell me how you understand the pros and cons of taking Drug X?"</p> <p>"When you go home, what will you tell your family about the pros and cons of taking Drug X?"</p>	"What questions do you have?"