reflective model such as that of Gibbs.[14] Use a recent example of patient education to try this. You might choose to talk this through with a trusted colleague. How might your patient education practice change in response to this reflection?

u0365 • Consider whether your teaching is based on a belief that knowledge can be transmitted between a teacher and a learner or whether you think of it as helping to facilitate learning. Thinking about the language you use when discussing your involvement in education with colleagues may be a guide. What sort of verbs and metaphors do you use? Use of terms such 'giving', 'delivery', 'getting it through' might suggest that your ideas and approach to teaching are closer to transmission than facilitation. Whereas 'support', 'guiding', 'working with' when related to education may indicate a more collaborative, facilitatory and patient-centred approach.

u0370 • Note the way that your peers and colleagues talk about patient education (the terms and figures of speech they use – their discourse) and the approaches they adopt. Is there a link between their discourse and their approach? Do they predominantly follow a transmission or a facilitation model?

s0090 SUMMARY

p0630 Developments in patient education are driven by an increasing emphasis on more patient-centred approaches to care, self-management of health and financial imperatives. Parallels have been identified here between patients as learners and students as learners, noting that the principles of student-centred education may be applied with patients. Approaches to patient education which include collaboration and facilitation of learning may be more effective in some situations than traditional transmission-based approaches alone with their heavy reliance on the 'provision' of information. Therapists are encouraged to reflect on their own educational practice with patients.

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sc0020 CHAPTER 27.3 ■ COMMUNICATING RISK

Roger Kerry

p0635 Risk is the probability that an event will give rise to harm.[1] As healthcare professionals, communicating risk is central to all our interactions. Risks associated with manual therapy might include rare and severe events (e.g. death, stroke), or common and mild ones (e.g. transient unwanted responses to treatment). Given these associations, we have a responsibility to consider and communicate risk as best we can. This section summarizes evidence on the best ways to communicate risk in order to optimize shared decision making.

p0640 Risk communication has become increasingly important with the publication of data and evidence-based practice. In contrast to traditional 'gut feelings' about risk, it is becoming possible to make data-informed judgements. Despite this numerical dimension, there is still uncertainty in understanding and communicating risk.[2] Paradoxically, communicating uncertain risk judgements using numerical ranges can worsen understanding, credibility, and perceptions of risk.[3] This section aims to provide some clarity and guidance on risk communication by focusing on three key areas: understanding risk; communication tools; and framing risk.

UNDERSTANDING RISK s0095

Healthcare professionals are poor at understanding numbers.[2,4] Gigerenzer et al reported only 25% of subjects correctly identified 1 in 1000 as being the same as 0.1%, coining the phrase 'collective statistical illiteracy' in relation to health statistics users.[5] Education and numeracy levels have little impact on risk judgement or understanding.[6,7] Consensus on the best ways for health professionals to communicate risk is lacking.[8] These facts p0645

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create barriers to communication, and can lead to aberrant use of research-generated data.[9] Regardless of this, a numerical interpretation of probability is an important aspect of the clinicians' understanding of risk. Risk communication should be inclusive of the numerical probability of an unwanted event happening, together with the effect of this on a patient; importance of the effect; and the context in which the risk might occur.[10]

p0650 *'every representation of risk carries its own connotations and biases that may vary according to the individual's perspective concerning the way the world works'*[11]

s0100 Understanding Probabilities

p0655 What does 5% mean? Is this the same as 0.05? Does 5 out of 100 mean the same thing as 50 out of 1000? Do the odds of 1 : 20–for say the same as 19 : 1–against? These are all mathematically valid expressions of the same data relating to probability judgement, but can and do *mean* different things. But what actually *is* a 5% risk? If I said you had a 5% chance of increased pain following intervention *X*, how do you interpret that? Does this mean you might be one of the 5 out of 100 people who will experience pain? Or that in every 100 patients I treat, 5 experience pain? Does it mean if you had 100 treatments, you would experience pain 5 times? Does it mean that in 5% of the time, people experience pain? Or that 5 out of every 100 manual therapists induce pain to all their patients? Is this 5% epistemological (i.e. it is already decided that you will have pain, but you just do not know it yet to the degree of 5%) or is it aleatory (i.e. a completely random notion to the degree of 5% that you will or will not experience pain)? These variables should be considered when communicating risk.

p0660 The first stage in effective communication is establishing the reference class to which the probability relates (e.g. time, location, person). In using population data for risk communication, most of the time the reference class will be historical (i.e. data from past events are used to inform the chance of the next event). Embedding a new individual event in data from a past population should carry some additional judgement, as new informative knowledge may be ignored. Spiegelhalter 's report of pre-Obama odds on a black US President is a good example: 43/43 of past US Presidents were white, indicating a statistical prediction of almost certainty of a 44th white President.[11]

s0105 Relative Versus Absolute Risk

p0665 Misinterpretations of absolute and relative risk contribute to data users' anxieties and misunderstandings.[12] Absolute risk (AR) can be the prevalence (or incidence), or indicate the absolute difference in risk between two groups. Relative risks (RR) – and their counterparts, odds ratios (OR) – are products of the division of AR in each group, to form a relative difference. RRs may help to make comparative judgements (e.g. 'this is riskier than that'). This way of communicating is encouraged in evidence-based medicine. However, RRs are more persuasive and make differences in risk appear larger than they are.[5] They are over-reported in lay-press and research reports where authors want to exaggerate differences.[13]

'If the absolute risk is low, even if the relative risk is significantly increased to exposed individuals, the actual risk to exposed individuals will still be very low'[14] p0670

p0675 A related statistic to absolute risk is number needed to harm (NNH). NNH are the inverse of the absolute risk difference. Although NNH might seem to hold informative content,[15] a recent Cochrane review concluded that this was poorly understood by patients and clinicians.[16] In summary both RR (including ORs) and NNH are poor means of communicating risk, and AR should be favoured.[4,17]

Probabilities Versus Natural Frequencies s0110

p0680 So far we have considered risk expressed as some sort of probability. Alternatively, natural frequencies (NF) can be a clearer way of representing risk.[16,18] NFs are joint occurrences of two events (e.g. positive result on a clinical test and the presence of a condition). In terms of risk prediction, we may be familiar with probabilistic ideas of specificity, sensitivity, positive predictive value, etc. Although commonly used (e.g. these form the core of clinical predication rules), these statistics are a consistent source of confusion and error.[19–21] Reports have suggested that the human mind might be better evolved to understand risk in terms of NFs.[22,23] NFs are absolute frequencies arising from observed data. Risk representation using NFs avoids the complex statistics of probability expression, while maintaining the mathematical rigour and Bayesian logic necessary to calculate risk.

COMMUNICATION TOOLS s0115

p0685 Stacey et al found that use of decision aids can improve patients' knowledge and perception of risk, and improve shared decision making.[24] Such aids include visual representations of risk, and these have many desirable properties (e.g. reveal otherwise undetected data patterns, attract attention and evoke specific mathematical operations).[25] Specific types of aids are useful for specific types of risk (e.g. bar charts for group comparisons, line graphs for temporal interactions among risk factors, pie-charts for showing risk proportions, etc.).[26] Icon arrays are also used to display population proportions, and rare events can be demonstrated in magnified or circular images. Figures 27-3 and 27-4 shows examples of graphical images used for communicating common and rare events.

FRAMING RISK s0120

p0690 The way risk is framed is considered important for effective communication.[1] Framing presents logically equivalent information in different ways. Generally, risks can be framed positively (gain-framed) or negatively (loss-framed). We might gain-frame the risk of stroke following manual therapy as 'you are very unlikely

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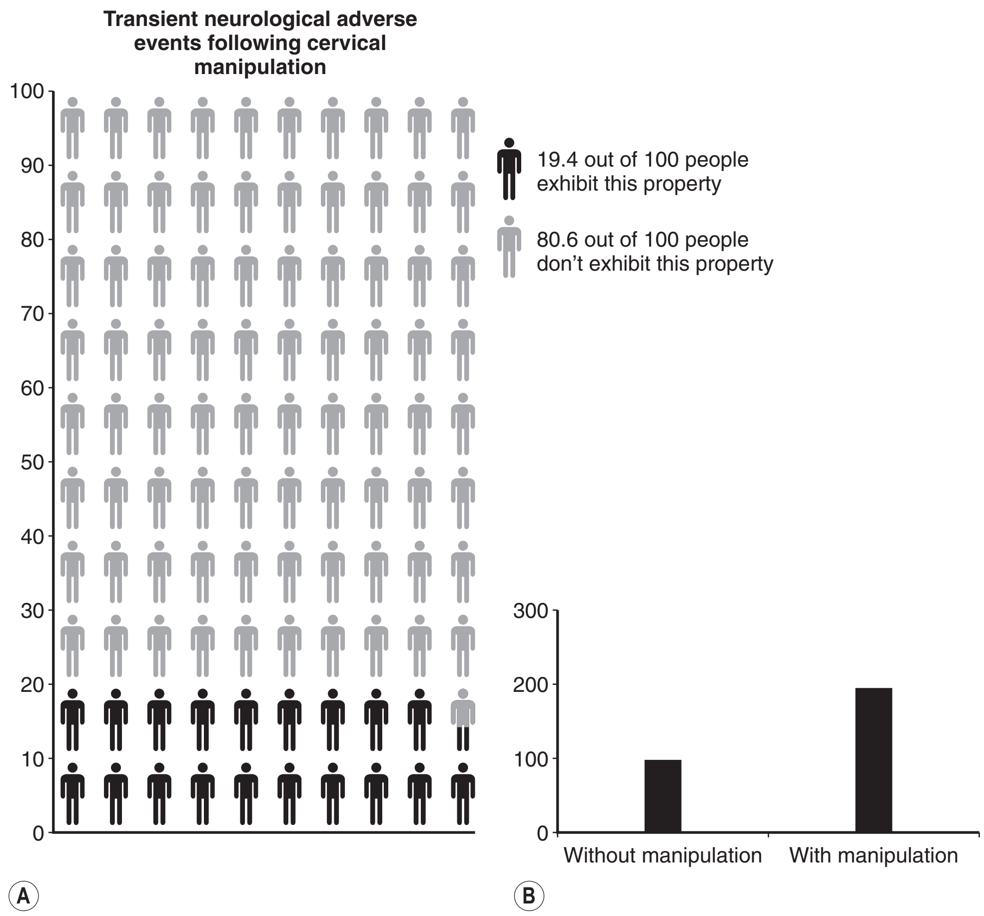

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FIGURE 27-3 ■ Representing risk of common minor adverse events following manipulation. Pooled relative risk (RR) from meta-analysis,[27] RR = 1.96, or 194 events per 1000 with manipulation versus 99 per 1000 with no manipulation (control). (**A**) icon array pictorially representing absolute risk; (**B**) bar-graph demonstrating difference between the two groups.

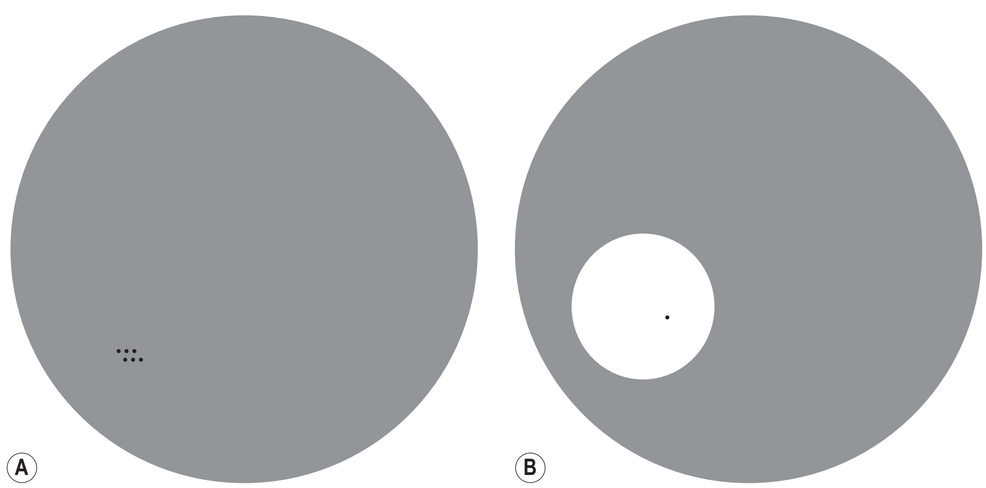

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FIGURE 27-4 ■ Representing rare risk events. (**A**) A circle diagram representing the absolute risk of serious adverse event following manipulation. The grey circle represents 100 000 units, and the back dots represent the number of cases per 100 000. (**B**) From prevalence data on vertebrosbasilar insufficiency (VBI)[28] and diagnostic utility of a VBI test,[29] this graph shows a population of 100 000 (the large grey circle), the proportion who test positive on a VBI test (16 000: the white circle), and the proportion of people who will actually have VBI (1: the black dot).

to experience stroke following this intervention', or loss-frame it as 'this treatment could cause you to have a stroke'. Gain-framing can be more effective if the aim is preventative behaviour with an outcome of some certainty[30] (e.g. 'exercising more will reduce cardiovascular risk' would be more effective than 'if you don't exercise, you will have an increased risk of cardiovascular disease'). However, loss-framing is generally more effective, and especially so when concerned with uncertain risks.[1]

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b0030 4 **BOX 27-4 Key Messages in Communicating Risk**

- p0705 Data can help our naturally poor understanding of risk
- u0380 Probabilities should be considered in relation to a reference class
- u0385 Gain-framing can be effective for communicating risk related to preventative behaviour which has an outcome of at least some certainty
- u0390 Loss-frame is generally most effective, especially with uncertain risks
- u0395 Relative risk (including odds ratios) and numbers needed to harm should be avoided in preference to pure absolute risk expressions
- u0400 Natural frequencies are better understood than probabilistic interpretations of risk
- u0405 Visual representations of risk improve understanding
- u0410 Risk data ultimately needs to be personalised and considered in the context of uncertainty

s0125 PERSONALISING RISK

p0695 Edwards et al (2000) reported that risk estimates based on personal risk factors were most effective in improving patient outcomes.[31] A subsequent Cochrane review reported that compared to generalized numerical risk communication, personalised risk communication improved knowledge, perception and uptake of risk-reducing interventions.[32] Personalised risk may include attempts to identify a smaller sub-group akin to the individual patient, and/or consideration of the individuals own risk factors for an event. This dimension of risk communication contextualizes population data estimates within single patients' risk factors, together with their values and world-view.

p0700 Ultimately, despite the data, most risk estimates are communicated in the context of uncertainty. Data helps inform decisions, but human nature and the complexity of the world make certainty impossible. This is an accepted difficult stance in risk communication.[33] Understanding uncertainty means accepting that risk communication is best done knowing that responses to risk depend on a patient's characteristics, values and experiences, and sociocultural worldviews.[11,33] This knowledge should be embraced, not ignored.

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