Complicating the Simple Probability Principle: Developing a New Approach to Probabilistic Reasoning in Personal Injury Litigation

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COMPLICATING THE SIMPLE PROBABILITY PRINCIPLE: DEVELOPING A NEW APPROACH TO PROBABILISTIC REASONING IN PERSONAL INJURY LITIGATION

Nayha Acharya*

ABSTRACT

Canadian courts use simple probability reasoning inconsistently in personal injury litigation, subjecting litigants to irregular legal principles and potentially improper compensation. Turning to foundational principles of tort litigation, I suggest a new framework for the availability of simple probability that would promote greater coherence. Simple probability reasoning is understood as an alternative standard of proof that enables compensation for a loss proportional to the likelihood that the loss will occur. Accordingly, the availability of simple probability is thought to depend on which types of facts (past vs. future vs. hypothetical facts) are amenable to balance of probabilities proof versus simple probability. This is the ‘type of fact’ framework, but it is not applied consistently. Part 1 argues that the inconsistency is rooted in the mischaracterization of simple probability reasoning as a standard of proof. It is better conceived of as a method of enabling chances, in their own right, to become legally relevant facts. Understood this way, simple probability is available only where chances are relevant to the legal determination at stake. I apply this characterization in Part 2, concluding that while simple probability reasoning is irrelevant to liability determinations, it is crucial in appropriately assessing damages.

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INTRODUCTION

Canadian judges and scholars have mischaracterized the principle of ‘simple probability reasoning,’ resulting in irregular use of the doctrine, potentially improper compensation for injured plaintiffs, and erroneous liability for defendants. In this paper, I endeavour to provide the correct interpretation of simple probability by reverting to the fundamental principles of liability and compensation for negligently inflicted injury. This analysis results in a new framework for determining where simple probability reasoning should be available. Applying this framework results in a more coherent approach to using simple probability, which I hope will contribute to ensuring fair and consistent injury litigation.

Simple probability reasoning is conventionally understood as an alternative standard of proof. If the standard is met, then the fact in question is treated as true for the purpose of the legal determination; if not, then the alleged fact is treated as untrue. Simple probability reasoning is usually characterized as an alternative to the conventional approach to fact-finding. It allows for compensation for a loss proportional to the chance that the loss will occur. For instance, if a plaintiff can show that because of his injuries, there is a 30% likelihood of requiring a surgery in the future, then he will be compensated for 30% of the total losses associated with the surgery; if there is a 70% chance of surgery, then he will be compensated for 70% of the total assessed value, and so on. The supposed availability of these two approaches—the balance of probabilities/all-or-nothing approach and the simple probability approach—gives rise to the question of when one should be used over the other.

Two interrelated problems suggest the need for a new approach to simple probability in personal injury litigation. Firstly, Canadian courts apply the prevailing approach, which I call the ‘type of fact’ approach, inconsistently. Currently, courts categorize facts as past, hypothetical, or future, and the availability of simple probability depends on which of these types of facts is thought to trigger its use. The problem, as I will demonstrate, is that when it comes to assessing damages entitlements, courts are inconsistent in applying this categorization and are therefore inconsistent in their use of simple probability. Outside the damages context, courts have displayed a less wavering mettle. The judiciary’s unwillingness to apply simple probability when making liability determinations has been met with academic criticism, particularly in cases of medical injury. This suggests dissatisfaction with the limits placed on the availability of simple probability reasoning.

This indeterminacy must be remedied because the fairness of the adjudicative system depends on consistent application of legal principles. Otherwise, similarly situated litigants may be subjected to different principles without justification. Moreover, the lack of predictability in the application of legal principles can lead to significant disparity in monetary awards, making settlement more difficult and perhaps less likely.

The second problem is that none of the frameworks that arise out of the ‘type of fact’ approach can be applied consistently without compromising the fundamental principles of liability determination or damages assessment. This suggests that the inconsistency in the current approach is not merely the product of superficial confusion

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1 In this paper, “facts” denotes factual elements that must be proven, not that are proven.
over where to apply simple probability reasoning, but is grounded in something more fundamental.

In Part 1, I diagnose the root of the problem: the conventional ‘type of fact’ approach is based on a mischaracterization of simple probability reasoning. The characterization of simple probability as an alternative method of proving facts is, I argue, inaccurate, and has led to the incoherence surrounding its application. Simple probability is better described as a method of placing value on a chance, when that chance is first established as a legal fact. This re-characterization reframes the determination of where simple probability should be available. Its availability should not depend on whether the fact is past, future or hypothetical. When simple probability is understood as a quantification mechanism for chance, the question of its availability should be whether the demands of liability determinations and of damages assessments require that chance be established as a relevant legal fact. The foundational analysis in Part 1 explains the necessity of a new approach to the question of where to use simple probability reasoning, which will promote greater coherence in its application. Then, in Parts 2 and 3, I apply my proposed approach to demonstrate how simple probability should be used in injury litigation.

Characterizing simple probability as a chance-quantification tool, my focus shifts in Parts 2 and 3 to whether chances should be relevant for liability determinations and damages assessments. I revert to the foundational principles of liability and damages determinations throughout my analyses. In Part 2, I present the reasons why chances are not, and should not be, relevant facts for determining liability. Thus, simple probability should be unavailable in that context. Conversely, the significance of chance and the consequent role of simple probability in determining compensatory entitlements are demonstrated in Part 3.

PART 1: RE-CHARACTERIZING SIMPLE PROBABILITY REASONING

Simple Probability Reasoning and its Associated Confusions

One of the earliest articulations of the simple probability principle appears in a House of Lords decision, *Mallett v McMonagle*. This case has been cited by a significant number of Canadian trial and appellate decisions, and was quoted with approval and applied by the Supreme Court of Canada in *Janiak v Ippolito* and in *Athey v Leonati*.

In assessing damages which depend on [the court’s] view as to what will happen in the future or would have happened in the future if something had not happened in the past, the court must make an estimate as to what are the chances that a particular thing will or would have happened and reflect those

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2 At the time of publication, an unrefined Quicklaw search suggests that at least 168 Canadian cases of all levels of court have referred to *Mallett v McMonagle*, [1970] AC 166 HL (Eng) [Mallett].


chances, whether they are more or less than even, in the amount of damages which it awards.\(^5\)

Lord Reid’s comments contain the principle behind simple probability and how it is put into practice: the court must consider the chance of a future event whether or not the value of the chance is less than 50%. Once assessed, it is reflected in the damages awarded. For instance, if a plaintiff is able to establish a 30% chance of requiring a compensable future medical treatment, then 30% of the total assessed cost of that medical treatment will be awarded.

Simple probability has been applied in a number of Canadian appellate personal injury decisions. For instance, in *Conklin v Smith*,\(^6\) the Supreme Court awarded the plaintiff lost earnings based on the chance that he would have succeeded in securing a more lucrative pilot’s career. In *Kovats v Ogilvie*,\(^7\) the British Columbia Court of Appeal compensated for the chance of developing post-degenerative arthritis as a future consequence of the injury, rather than requiring proof on a balance of probabilities that the arthritic condition would occur in the future. In *Schrump v Koot*,\(^8\) the Ontario Court of Appeal opined that the chance of the future surgery is compensable, even if its future occurrence cannot be established on the balance of probabilities. The same court clarified in *Graham v Rourke*\(^9\) that simple probability is not only available for the plaintiff’s benefit. The loss of income award in that case was reduced by 25% based on a 25% chance that the plaintiff would have been unable to earn as much as anticipated, even had she not suffered the accident. Similarly, the cost of care award was reduced by 15% because of a 15% chance that the medical services would have been required even without the accident.\(^10\)

In *Athey v Leonati*, the Supreme Court of Canada confirmed that simple probability reasoning is available for hypothetical and future events:

Hypothetical events (such as how the plaintiff’s life would have proceeded without the tortious injury) or future events need not be proven on a balance of probabilities. Instead, they are simply given weight according to their relative likelihood. For example, if there is a 30 percent chance that the plaintiff’s injuries will worsen, then the damage award may be increased by 30 percent of the anticipated extra damages to reflect that risk. A future or hypothetical possibility will be taken into consideration as long as it is a real and substantial possibility and not mere speculation...By contrast, past events must be proven, and once proven they are treated as certainties.\(^11\)

Although judicial authorities endorse simple probability reasoning, Canadian courts have faced challenges in applying it. To determine when simple probability should be

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\(^5\) Mallett, supra note 2 at 191. This House of Lords decision involved a future dependency claim of a young widow whose husband died in an accident. The Court’s task in assessing the dependency claim was to estimate “how long the dependents would have continued to benefit from the dependency had the deceased not been killed and what the amount of the dependency would have been in each year of that period” (at 190).


\(^8\) *Schrump v Koot* (1978), 18 OR (2d) 337, 82 DLR (3d) 553 (Ont CA) [*Schrump*].

\(^9\) *Graham v Rourke* (1990), 75 OR (2d) 622, 74 DLR (4th) 1 (Ont CA).

\(^10\) Ibid at para 64.

\(^11\) *Athey, supra note 4 at paras 26-28 (references removed).*
used, courts have resorted to a three-part classification of facts as past, future, and hypothetical. Problematically, courts have not always agreed on which type(s) of facts attract simple probability reasoning. While many courts have used the past/future fact divide to determine when simple probability applies, some courts have held that the balance of probabilities standard is applicable to past as well as future facts.12 For instance, the Alberta Court of Appeal has held:

With respect to past and future earnings, much the same comments apply. The cross-appellant plaintiff advances questions of weight, and guessing about what would have occurred without an accident. He had no proven steady employment track record before the accident. There is no way to assess these heads of damages with certainty. In a civil case, a balance of probabilities suffices.13

The Ontario Court of Appeal endorsed a similar view in Lurtz v Duchesne.14 At trial, the court found that medical providers misdiagnosed the plaintiff, and were liable for her resulting injury. The quantification of the damages award was at issue on appeal. The Court of Appeal approved the trial judge’s comments:

I find that [the plaintiff] is entitled to future loss of income. On the balance of probabilities, I find that Donna is unlikely to return to remunerative employment at any time in the future.15

[...]

I find that considering the expert evidence of Dr. Benoit and Dr. Singer on the presence and the lasting stay and effect of the disease, Donna Lurtz is a disabled person and will not, on a balance of probabilities, return to work in the future.16

Along with confusion over the applicability of simple probability to future facts, the comment in Athey that simple probability can apply to hypothetical facts has also been interpreted inconsistently. Some appellate cases, like Courtney v Cleary17 and Gill v Probert,18 have concluded that past hypothetical facts warrant the use of simple probability reasoning. Courtney v Cleary centred on a misdiagnosis of mouth cancer, leading to extensive medical intervention and injurious disfigurement to the plaintiff’s face. The

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12 I do not intend to overstate this inconsistency. Canadian courts are fairly stable in refusing to apply the balance of probabilities standard to future injuries, usually citing the authorities noted in Section 2(a) above. For a sampling of such decisions, see Stenbakk v Funk, (1990) 46 BCLR (2d) 133, [1990] 5 WWR 365, (BCCA), (often cited for this principle in British Columbia), Nelson v Nelson, [1992] BCJ No 1576 (QL), Basque v Saint John (City), 2002 NBQB 131, 250 NBR (2d) 207.
13 Dubitski v Barbieri, 2006 ABCA 304 at para 14, 67 Alta LR (4th) 9 [emphasis added].
14 Lurtz v Duchesne (2005), 194 OAC 119, 136 ACWS (3d) 1055 (Ont CA). The relevant question on appeal was whether “trial judge should have drawn an adverse inference against the respondent in her claim for future loss of income because she did not call any of her treating physicians to give viva voce evidence.” According to the Court of Appeal, the trial judge committed no error when he found that based on the evidence presented, he was satisfied that the plaintiff has met the burden of proof for the claim for past and future losses.
16 Ibid at para 455.
17 Courtney v Cleary, 2010 NLCA 46, 322 DLR (4th) 10 [Courtney].
18 Gill v Probert, 2001 BCCA 331, 105 ACWS (3d) 254 [Gill].
defendant physician accepted liability but appealed the quantification of damages regarding lost earning capacity. In response, the Newfoundland Court of Appeal was

...satisfied that the trial judge stated and applied the wrong test (the balance of probabilities) in dealing with loss of earning capacity from September 2001 to trial. Given that the claim centers [sic] on a hypothetical situation she should have applied the simple probabilities test and applied the appropriate percentage to the per annum loss.19

In Gill v Probert, the plaintiff suffered a herniated disc in a car accident. The defendant appealed the trial judge’s award for past lost earnings. Relying on the Supreme Court’s comments in Athey, the Court of Appeal held:

In assessing hypothetical events there is no reason to distinguish between those before trial and those after trial. In making allowances for contingencies the trial judge was assessing the hypothetical events that could have affected the plaintiff’s employment earnings, according to the assessment to their relative likelihood.20

The Smith v Knudsen21 decision from British Columbia provides another example of the confusion about simple probability’s applicability to hypothetical facts. There, the plaintiff commenced an action for damages for injuries suffered in a car accident. He alleged that his injuries rendered him unable to prepare a bid for a government contract to build ambulances. He claimed compensation for this lost opportunity. The trial judge cited a number of cases on the standard of proof required to recover for the lost opportunity to submit the offer. The trial judge noted that the cases were inconsistent: while some seemed to suggest a simple probability approach, others suggested that he should apply a balance of probabilities standard.22

The trial judge found that cases with the most precedential value, including Athey, held that a balance of probabilities standard is applicable to past losses. Since the plaintiff’s claimed lost income would have been earned prior to the trial, the trial judge classified his claim as a “past” loss, and imposed the balance of probabilities standard. Accordingly, the plaintiff was required to prove that, absent his injuries, he would more likely than not have won the contract and, therefore, would have procured the earnings he claimed. If the plaintiff could prove this, then he would be entitled to recover all of the lost profits associated with the contract. However, the plaintiff was unable to meet this burden.

The plaintiff appealed, arguing that the trial judge “misdirected the jury on the burden of proof required to establish a loss of opportunity to be the successful bidder on a contact to build ambulances for the provincial government.”23 The Court of Appeal agreed. Applying Athey differently, it held that “the trial judge’s instructions do not accord with the case authorities regarding proof of hypothetical events.”24

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19 Courtney, supra note 17 at para 62.
20 Gill, supra note 19 at para 9.
21 Smith v Knudsen, 2004 BCCA 613, 247 DLR (4th) 256 [Smith].
22 Ibid at paras 7-9 and 11-15, reproducing para 22 of the trial decision.
23 Ibid at para 5.
24 Ibid at para 23.
The Court of Appeal held that authorities have drawn a distinction between proof of actual events and proof of future or hypothetical events. "What would have happened but for the injury," the Court opined, "is no more ‘knowable’ than what will happen in the future and therefore it is appropriate to assess the likelihood of hypothetical and future events rather than applying the balance of probabilities test that is applied with respect to past actual events." The Court of Appeal classified the plaintiff’s claim as a hypothetical event, which warranted the use of simple probability. The trial judge’s instruction to the jury to apply the balance of probabilities standard was overturned. According to the Court of Appeal, the jury should have been instructed to determine the likelihood that the plaintiff would have won the contract, and to award proportional compensation (i.e. to apply simple probability reasoning).

The discord between the trial and appellate decisions in Smith v Knudsen, despite citing many of the same authorities, indicates that the question of where to use simple probability reasoning is neither easy nor resolved. The BC Court of Appeal itself has expressed two different views on the availability of simple probability reasoning. In contrast, the appeal court’s conclusion in Smith v Knudsen suggests that the past/future divide does not account for the availability of simple probability reasoning because such reasoning should be available for hypothetical past facts, as well as future facts.

Evidently, some courts have adhered to the past versus future divide, where past facts are subject to the balance of probabilities standard, while future facts are subject to simple probability. Others attest to a past versus hypothetical and future divide, where future facts as well as hypothetical past facts are subject to simple probability. Still others have applied the balance of probabilities standard, even in respect of future losses. Depending on which approach is preferred, a plaintiff can receive significantly higher or lower compensation.

The inconsistencies described so far are situated within the damages context. In liability determinations, however, courts have consistently held that simple probability is unavailable, and proof of facts must be to the balance of probabilities standard. The outcomes resulting from this position have been met with some academic criticism. In Part 2, I provide reasons for endorsing this position.

The confusion and resultant inconsistencies over where simple probability reasoning should apply suggest that a new and more comprehensive framework for its use is required. The current situation allows for the possibility of subjecting similarly situated plaintiffs to different legal principles, leading to significantly different outcomes. Suppose, for instance, a plaintiff had a 40% prospect of getting a better job if her injury had not occurred.

26 Ibid at para 29.
27 Sales v Clarke (1998), 57 B.C.L.R. (3d) 36 at para 11, 165 DLR (4th) 241. The Court of Appeal in Smith, supra note 21 sought to distinguish Sales v Clarke on the basis that it concerned a causal relationship, as opposed to proof of loss. Whether or not that is a legitimate distinction, the quotation provided above is undoubtedly contrastable with the conclusion reached by the Court of Appeal in Smith, supra note 21.
not occurred. One judge could decide that simple probability applies to past hypothetical facts, so the 40% chance of a better job should be reflected in the damages award. Another might decide that simple probability does not apply to past facts, and since the chance of a better job could not be proven on a balance of probabilities (being that there is only a 40% chance), the plaintiff would not be compensated for that lost prospect. Despite the similar circumstances, the two plaintiffs would receive very different damages awards. Under the uncertain state of the current law, either of these outcomes could be justified.

Nevertheless, if inconsistency and uncertainty were the only concerns, then the analysis would be aimed at deciding which type(s) of facts (past, hypothetical, future) simple probability should apply to and arguing that these facts must receive consistent treatment; yet the problem is not simply that courts have been inconsistent. The more fundamental problem is that the ‘type of fact’ approach is conceptually incoherent.

The ‘type of fact’ approach is grounded in a misunderstanding of simple probability reasoning. When simple probability is understood as a way of proving facts, its availability would naturally depend on which types of facts warrant proof by simple probability, as opposed to the balance of probabilities. However, the characterization of simple probability as a method of proving facts is flawed. Simple probability reasoning is not a standard of proof. Its availability, therefore, should not depend on a classification of which facts are to be proven by simple probability rather than a balance of probabilities. The simple probability principle is not aimed at proving facts at all. As I will demonstrate, simple probability reasoning is better characterized as a method of quantifying chance.

Re-Characterizing Simple Probability

Simple probability reasoning is often understood to encompass a different standard of proof than the balance of probabilities. Cooper-Stephenson and Saunders subscribe to this description in Personal Injury Damages in Canada. For instance, in discussing proof of claims for cost of future care, they note that “[b]asic principles apply, and it must be emphasized that the standard of proof is ‘simple probability’—a different standard than the normal balance of probabilities test.” Similarly, in discussing damages assessment generally, Cooper-Stephenson and Saunders suggest that:

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28 The judicial authorities noted above lend themselves to this description and Canadian Courts virtually always refer to simple probability as a standard of proof when they discuss it expressly. For example, Grimard v Berry (1992), 102 Sask R 137, 33 ACWS (3d) 892 and Parent v Andrews, 2001 SKQB 266 at para 9, 105 ACWS (3d) 412, both citing Cooper-Stephenson and Saunders, state: “For the most part, in assessing damages, a court proceeds on a different standard of proof then it does when determining civil liability: simple probability as opposed to a balance of probabilities” [emphasis added]. The Alberta Court of Queen’s Bench stated in Ganderton v Brown, 2004 ABQB 366 at 261, 33 Alta LR (4th) 27 at para 271: “The applicable standard of proof for the assessment of damages in a personal injury action is simple probability Tat v Ellis (1999), 228 AR 263 (CA); Stevens v Okrainec (1997), 210 AR 161 (QB).” The British Columbia Court of Appeal in Reilly v Lynn, 2003 BCCA 49, 178 BCAC 69 stated at para 101: “The standard of proof in relation to future events is simple probability, not the balance of probabilities, and hypothetical events are to be given weight according to their relative likelihood: Athey v Leoni, [1996] 3 SCR 458 at para 27.”

At the root of damage assessment is a different standard or method of proof...The different standard of proof which governs most of a damage assessment may be termed “simple probability.” It involves the valuation of possibilities, chances and risks according to the degree of likelihood that events would have occurred, or will occur. This contrasts with the “balance of probabilities” standard, more familiar in civil actions, which involves an “all-or-nothing” approach.30

Presumably, the description of simple probability as a standard of proof arises because the impact of simple probability reasoning on future facts is often contrasted with the impact of balance of probability reasoning on past facts. The balance of probabilities standard is accompanied by an “all-or-nothing” impact because if a proposed fact is proven on the balance of probabilities, it is thereafter treated as a legal certainty. The subsequent determination will be based on that fact as though it were certainly true because it has become a legal fact. Conversely, if a fact is not proven on the balance of probabilities, it is taken to be untrue for the purpose of the legal determination. This allows uncertain fact to be translated into legal certainty, so the legal determination can be made on the basis of established facts.

When simple probability reasoning applies, however, the future or hypothetical events themselves are not translated into legal certainties. Instead, the possibility of the future or hypothetical event is relevant. If the occurrence of some future event (“future fact”) is 30% likely, for instance, this 30% likelihood has legal significance. And if the future fact is 60% likely, then this 60% likelihood has legal significance. In contrast, when the balance of probabilities applied, the likelihood itself has no substantive legal relevance.

The proportional impact of simple probability versus the all-or-nothing impact of the balance of probabilities causes an inclination to contrast the two approaches, as if they were both in the business of establishing legal facts. For example, after recounting the use of simple probability reasoning in Schrump v Koot, where the Court endorsed probabilistic damages founded on the likelihood of a future surgery, Cassels suggests:

[I]t is important to note that the court rejected an all-or-nothing approach under which the plaintiff receives 100 percent compensation if it can be shown that the loss is 'likely' to occur and nothing if it is 'unlikely' to occur. Instead, uncertainty about the future is reflected in the amount of the award, 'with the higher degree or the greater chance or risk of a future development attracting a higher award' [quoting Schrump v Koot].31

I agree that where a court compensates for a risk of a future event, it prevents the future fact itself from being subjected to the balance of probabilities and all-or-nothing approach. As Cooper has suggested, the use of simple probability reasoning indicates that the creation of a risk is really what is being compensated, not the future event.32 This idea has been well stated: “Where a defendant deprives a plaintiff not of an ex-

30 Ibid at 67.
pected future benefit, but of his chance to gain that benefit, then surely the loss suffered is plaintiff’s chance, not the benefit itself.”

What needs clarification is what must follow from the recognition that simple probability enables compensation for a risk, in its own right. If simple probability is a way to compensate for a risk, it follows that this risk itself is the legally relevant fact, not the potential future or hypothetical outcome. If the risk itself is legally relevant, then proving the outcome of that risk is not. Whether or not the outcome will occur is irrelevant to the question of whether there is a risk that the outcome will occur, and the value of that risk. Simple probability is a way to value a risk or chance, once its existence is established.

Where simple probability applies, future or hypothetical events avoid being subject to the balance of probabilities and all-or-nothing approach, not because simple probability reasoning is a different standard of proof for future or hypothetical facts, but because these facts are not subject to proof at all. Rather, simple probability allows us to understand chances as valuable and potentially relevant to legal determinations. If the chance is the fact that is relevant to the legal determination, then its existence must be established as a legal fact. Like all legal facts, the existence of the chance must be established on a balance of probabilities—the civil standard of proof that is applicable to all relevant legal facts. Then, simple probability applies as a method valuing the chance.

Leading cases are consistent with this explanation. For example, in Schrump v Koot, the Ontario Court of Appeal confirmed that the plaintiff is not obligated to prove that a future loss or damage will occur. Rather, the obligation is to establish, on a balance of probabilities, a non-speculative possibility of such a future loss. Similarly, in Kovats v Ogilvie, simple probability reasoning was employed to account for the possibility of developing “post traumatic arthritis resulting from the injury” in a serious motor vehicle collision. The British Columbia Court of Appeal explained that the balance of probabilities standard is applicable to establish the existence of a risk:

It is a fundamental rule that in civil cases questions of fact are to be decided on a balance of probabilities; this is a matter of proof...one can decide on a balance of probabilities that there is a risk of something happening in the future. In an appropriate case such a risk can be taken into account in assessing damages for the wrongful act or default that caused it.

In short, situations employing simple probability reasoning can be understood as follows: suppose a plaintiff claims that due to his injuries, there is a chance that he will require a future surgery. For this chance to be relevant to his damages entitlement, he has to establish, on a balance of probabilities, that the tortious injuries gave rise to a risk that he will require a future surgery. If established, then the existence of this chance will bear some impact on his damages entitlement. The extent of this impact is determined through simple probability reasoning.

The notion that simple probability is itself a standard of proof indicates a deep lack of conceptual clarity. The problem is not limited to semantic impropriety. Mischaracter-

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34 Schrump, supra note 8 at 4 (cited to QL page numbers).
35 Kovats, supra note 7 at 5.
36 Ibid at 6.
izing simple probability reasoning has substantive implications. Most significantly, misunderstanding simple probability reasoning has led to the ‘type of fact’ approach, which yields inconsistent application of the doctrine.

**The Problem of Mischaracterizing Simple Probability Reasoning**

Canadian courts invariably apply the ‘type of fact’ approach, which is based on a mischaracterization of simple probability as a method of proof, and which results in conceptual and practical trouble. The ‘type of fact’ approach yields four potential frameworks in which simple probability reasoning operates, but which courts have inconsistently adopted:

1. Apply simple probability to future facts and not to past facts, hypothetical or otherwise.
2. Apply simple probability to future and hypothetical facts, but not to past facts.
3. Abandon simple probability reasoning: apply balance of probabilities to all facts.
4. Abandon the balance of probabilities standard: apply simple probability to all relevant facts.

Problematically, consistent application of each one of these frameworks would compromise either the principle of liability determination or of damages assessment. Each one would ignore chances where they should be relevant, or consider chances where they should not be relevant.

Framework 1 cannot satisfy the demands of damages assessments because it would prevent courts from taking into account pre-existing conditions when assessing damages. In order to account for pre-existing conditions, a court must consider the hypothetical past fact of whether, even absent the tort, the pre-existing condition could have resulted in the plaintiff’s harm. Framework 1 requires that all past facts must be proven on a balance of probabilities, so pre-existing conditions and the potential harm they could have caused would have to be subjected to the balance of probabilities standard. This would effectively prevent pre-existing conditions from being taken into account at all.

It is inevitable that a pre-existing condition will have a less than 50% chance of having caused the plaintiff’s claimed harm. Otherwise, the requisite causal link between the defendant’s negligence and the plaintiff’s harm would be negated. In order to establish causation (and therefore liability), the plaintiff must show, on a balance of probabilities, that ‘but for’ the defendant’s negligence, the plaintiff’s harm would not have occurred. This would be impossible if a pre-existing condition gave rise to a greater than 50% likelihood of harm because it would be more likely that the harm resulted from the pre-existing condition, rather than the defendant’s negligence. Under framework 1, a pre-existing condition could never co-exist with a finding of liability, which is contrary to the demands of damages assessment. If pre-existing conditions are to have legal significance (as the compensation principle demands), they must be relevant in terms of the chance of harm they create. Simple probability, properly understood, must
be used when assessing the value of the chance of harm owing to the pre-existing conditions.\textsuperscript{37}

Framework 2 allows any hypothetical and future facts to be subject to simple probability reasoning. This is incompatible with the usual analysis for establishing causation under the ‘but for’ test, where the plaintiff must show that ‘but for’ the defendant’s negligence, her injury would not have occurred.\textsuperscript{38} This test requires that the court determine what would have occurred if, hypothetically, the defendant’s negligence had not occurred.\textsuperscript{39} Since the ‘but for’ analysis necessitates a hypothetical inquiry, Framework 2 would require all causal inquiries to be subjected to simple probability rather than the balance of probabilities. Accordingly, Framework 2 cannot be comprehensive because it cannot be applied consistently.\textsuperscript{40}

This leaves the more drastic options: Frameworks 3 and 4. Framework 3 requires exclusive use of the balance of probabilities. Framework 3 is agreeable to the extent that it requires the balance of probabilities to apply to all facts. However, Framework 3 contains the erroneous idea that if the balance of probabilities is the exclusive standard of proof, then simple probability must be abandoned altogether. When simple probability is properly understood as a way to value chances, rather than as a standard of proof, abandoning it means that chances would never count as legal facts. I already suggested that pre-existing chances of harm must be relevant to damages assessments; chances must also be relevant for determining compensatory entitlements. Therefore, abandoning simple probability altogether is incompatible with the demands of damages assessments.

Finally, under Framework 4, all facts would be subject to simple probability reasoning rather than the balance of probabilities. Although this option is implausible, it is a conceivable option that can arise from the erroneous conception of simple probability as a method of proof. At least in theory, exclusive reliance on simple probability would mean that all pertinent facts would be relevant only to the extent of their likelihood. Under this approach, no fact could be considered ‘established.’ Instead, the chance that some fact occurred would be relevant. This approach is entirely incompatible with the requirements of liability determination.

Given that none of the frameworks arising from the ‘type of fact’ approach is acceptable, it is hardly surprising that Canadian courts do not apply any one of them consistently. To be clear, I do not suggest that the ‘type of fact’ approach necessarily results in erroneous outcomes. My claim is that because courts rely on the ‘type of fact’

\textsuperscript{37} I elaborate on this argument below in Part 3.


\textsuperscript{39} As Black notes in “Not a Chance: Comments on Waddams, The Valuation of Chances” (1998) 30 Can Bus LJ 96 at 99: “It is uncontroversial that, regardless of the nature of the cause of action, future uncertainties should be assessed on a probabilistic basis. But to say that this is true of past hypotheticals seems to overlook that every application of the but-for test of factual causation necessarily involves a hypothetical.” [References removed].

\textsuperscript{40} This conclusion could provoke the argument that the causal analysis should be subject to simple probability, and if so, then Framework 2 could not be painted as incapable of consistent application. I evaluate this suggestion in Part 2.
approach, the only possible resulting frameworks would compromise some other legal principle. There is currently no coherent framework for the availability of the simple probability principle that could ensure its consistent use throughout personal injury adjudication. Depending on which legal principle is argued or emphasized, courts can conceivably reach different conclusions in similar circumstances. The result is a condition of overall incoherence, leaving litigants susceptible to inaccurate yet binding adjudicative outcomes.

A comprehensive framework for the use of simple probability is impossible while harbouring a mischaracterization of what simple probability actually accomplishes. When properly understood, where simple probability should be used depends on when chances should and should not have legal significance. Applying this characterization, I determine whether chances are relevant in the two ultimate legal determinations in a personal injury action: liability and damages assessments. These discussions culminate in a framework for where simple probability must and must not be available since it should only be available where chances are relevant.

**PART 2: CHANCES AND SIMPLE PROBABILITY IN LIABILITY STAGE**

**The Traditional Irrelevance of Chances**

Establishing liability for negligently inflicted harm is contingent on satisfying certain legal principles. First, only a defendant who owes a duty of care can be liable to a plaintiff. Second, a plaintiff can only recover against a defendant who negligently breached the standard of care owed. Third, the breach of the standard of care must have caused the plaintiff’s loss, and finally, the plaintiff must have suffered a compensable injury. Together, these principles form the substantive law that provides individuals with an enforceable legal right against another person who negligently inflicts an injury. The protection of that legal right is the purpose of a finding of liability.

The substantive principles that define the right against negligently inflicted injury translate into the factual elements that must be established for a finding of liability. These factual elements must be proven on the more-likely-than-not standard. Therefore, a 51% chance is relevant to the process of proof, but it does not influence the substance of the question at stake for a liability determination. The substantive questions are defined by the nature of the right that is protected by the law of liability for negligent infliction of injury. Liability is contingent on: (i) the existence of a duty of care, not the chance of a duty of care, (ii) the fact that a breach of a standard of care occurred, not the chance thereof, and (iii) the fact that an injury was caused by the negligence, not the chance that an injury was caused. A liability determination, therefore, demands proof of those factual elements. The chance of the fact is not substantively relevant. Accordingly, simple probability as a mechanism to give value to a relevant chance has no use in the traditional liability analysis. The question is whether or not the traditional approach can be justified.

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41 Arguably, the existence of a duty of care is not a factual question, but a policy question. Here, I do not presume a significant distinction between the question of the existence of a duty of care and the remaining factual elements that must be established for a finding of liability.
Causal Indeterminacy and the Perception of Unfairness

The problem of causal indeterminacy provides a fruitful ground to discuss the merits of the customary liability analysis. In that context, the irrelevance of chances has, to some, appeared unjust, leading to arguments in favour of accommodating chances in liability determinations. Addressing such arguments illustrates the wisdom of the current approach, where chances are not relevant, and simple probability has no function in making liability determinations.

Causal Indeterminacy: General

Typically, establishing causation requires that a plaintiff show that ‘but for’ the defendant’s negligence, the injury would not have occurred. Medico-scientific uncertainty can render the causal link between negligence and injury impossible to prove, and denying recovery to plaintiffs in that circumstance has appeared unfair to some. In a number of personal injury cases, the Supreme Court of Canada has deliberated over whether this situation of evidentiary uncertainty warrants a substantive change to establishing liability. Over the course of these decisions, the Supreme Court has rejected the proposal that establishing a ‘material increase in risk of harm’ should result in the onus shifting to the defendant to negate a presumption of causation; provided a number of reminders that scientific precision is not a pre-requisite to proof of causation on the balance of probabilities standard, advocated a ‘robust and pragmatic’ approach to the balance of probabilities standard of proof for causation; and reconfirmed that the test for causation is the ‘but for’ test, while introducing (arguably, quite ambiguously) the limited availability of the ‘material contribution’ test.

While these cases display the Supreme Court’s commitment to the fairness of the ‘but for’ test when the balance of probabilities is applied properly, they also reveal a recent trend of proposals that some change to the causal analysis is warranted. This trend has led to a class of causal indeterminacy cases that provides an arena for discussing the availability of simple probability reasoning, as well as the potential for the relevance of chances in the liability context. These are cases where plaintiffs suffer medical adversities after being misdiagnosed by their treatment providers. The ‘but for’ causal connection between the negligent misdiagnosis and the ultimate adverse outcome cannot be proven on the balance of probabilities, so the plaintiff is denied recovery. This circumstance incites what is known as the ‘loss of chance’ argument.

The loss of chance doctrine, and its proposed application are best explained through a hypothetical example. Suppose a doctor negligently fails to inform the plaintiff of a medical condition, causing a delay in treatment. Once the plaintiff’s condition

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42 This approach was adopted by the House of Lords in McGhee v National Coal Board, [1972] 3 All ER 1008 HL (Eng) and the Supreme Court of Canada was urged to adopt this reasoning in Snell v Farrell.


44 See Snell, supra note 43, generally, and at para 29.

45 Most recent confirmation appears in Ediger v Johnston, 2013 SCC 18, 356 DLR (4th) 575. In this case, the factual finding of causation was at issue, not the legal test for causation. At para 28, though, the Supreme Court briefly re-confirmed the ‘but for’ test for causation, referring to its earlier decisions in Resurfice and Clements, supra note 43.

46 Athey, supra note 4, Resurfice and Clements, supra note 43.
properly diagnosed, it becomes clear that her prognosis is poor, and she sues the doctor
in negligence. Eventually, the plaintiff dies of the medical condition. In order to estab-
lish liability, the plaintiff must prove that it is more likely than not that ‘but for’ the
doctor’s negligence, the adverse outcome (in this example, the patient’s death) would
not have occurred.

Where the plaintiff’s chance of survival prior to the misdiagnosis was less than
50%, it would not be possible for the plaintiff to establish on a balance of probabilities
that he would have survived ‘but for’ the doctor’s negligence because, even absent any
act of negligence, the adverse outcome was already more likely to occur than not. The
House of Lords and the Supreme Court of Canada have encountered this circumstance,
and have been presented with the argument that the reduction in the plaintiff’s chance
of avoiding the adverse outcome should be compensable.

The House of Lords most recently considered the loss of chance argument in Gregg
v Scott,47 but denied its applicability in British medical negligence law. In that case, a
claim was brought against Dr. Scott, who had acted negligently in failing to diagnose a
malignant lump that afflicted his patient. The failure to diagnose led to treatment being
delayed by nine months, during which, the cancer spread. The plaintiff claimed that the
doctor’s negligence, which led to the late treatment, prevented him from being cured of
his disease, or at least reduced his chances of being cured.

The evidence presented at trial indicated that the plaintiff’s chance of survival was
42%, prior to any act of negligence. These prospects were reduced to 25% by the time
of the trial.48 The trial judge dismissed the claim because causation could not be estab-
lished. The plaintiff’s chance of survival prior to the doctor’s negligence was already less
than 50%.49 On appeal to the House of Lords, the plaintiff argued that rather than
requiring proof that the delay in treatment caused the detrimental outcome, the reduc-
tion in his chance of being cured should be compensated. If this were an acceptable
analysis, then the causal link to be established would be between the negligence and the
reduction in the chance of recovery, rather than the doctor’s negligence and the actual
adverse outcome. The majority of the Lords rejected the invitation to apply the loss of
chance doctrine, preferring the traditional approach that requires proof that the negli-
gence caused the adverse outcome.

The Supreme Court of Canada considered the loss of chance doctrine in Lafferiere v
Lawson.50 There, Fortien-Depuis commenced an action in negligence against her doctor
for negligently failing to inform her of her cancerous condition. She died of generalized
cancer prior to the completion of the legal proceedings. Her estate argued that though it
was impossible to prove on a balance of probabilities that her fate would have been any
different absent the doctor’s negligence, it could be established that the doctor’s negli-
gence decreased her chance of a more positive outcome. That reduction in chance, the
plaintiff suggested, ought to be compensable. Writing for the majority, Gonthier J.
refused to apply the loss of chance doctrine by endorsing the traditional requirement to

47 Gregg v Scott, [2005] UKHL 2 HL (Eng) [Gregg]. The House of Lords has also considered the loss of chance
argument in Hotson v East Berkshire Area Health Authority, [1987] AC 750 HL (Eng) [Hotson], and Wilsher v Essex
Area Health Authority, [1988] AC 1074 HL (Eng).
48 Gregg, supra note 47 at para 5.
49 Ibid at para 6.
50 Lafferiere v Lawson, [1991] 1 SCR 541, 78 DLR (4th) 609. The Supreme Court affirmed this decision in St-Jean
prove the causal link between the negligence and the injury itself. The Court held that the defendant could not be liable because causation was not established.

Despite the Courts’ traditionalism, outcomes where a plaintiff is treated negligently and endures some adverse outcome, yet remains uncompensated, can lead to the perception that the causal analysis yields unfair results in liability for misdiagnosis. The perceived unfairness leads to two arguments. The first is the loss of chance argument advanced in the cases above. This argument would constitute a substantive change to liability determinations by allowing a chance of an injury to be a compensable damage and therefore a relevant fact. Under this approach, rather than escaping liability altogether, the extent of the defendant’s liability would be proportional to the value of the lost chance. This can be understood as using simple probability reasoning in the liability context. I explain why the loss of chance argument is undesirable below.

The second potential solution to the perceived unfairness is even more drastic. Loss of chance is fundamentally a criticism of the balance of probabilities and all-or-nothing approach to legal fact-finding. Dissatisfaction with the usual approach to fact-finding can lead to an argument for simple probability reasoning to replace the usual approach to fact-finding in the liability context. This approach is also unfeasible.

**The Difficulty with Loss of Chance**

The loss of chance argument has two components. First, proponents argue that lost chances should be compensable because chances constitute something of value. Urging more receptivity to the loss of chance argument, Waddams, for instance, comments that “people suffering from illnesses do, of course, often give money, even for an insubstantial chance of a cure.” Similarly, making a case for imposing liability for risks of future harm (or the loss of a chance of a better outcome) Porat and Stein persuasively explain that a chance or a risk has definite value:

Consider two people who happen to be equal in all respects except one: one of those people has a prospect of developing a serious illness in the future, while the other has no such prospect. The second person’s well-being outscores the well-being of the first person (if forced to live one of those people’s lives, a rational individual would prefer to be the second person than the first).

Given that chances are valuable, proponents argue that a lost chance or increased risk should be a compensable injury, whether or not a plaintiff suffered a physical injury. In Jane Stapleton’s terms, the lost chance becomes the ‘gist’ of the legal action. Defin-
ing the lost chance as the injury gives rise to the second component of the loss of chance argument. When the lost chance is the compensable injury, the problem of causal indeterminacy is resolved without any change to the traditional approach to establishing causation, which the Supreme Court is reluctant to alter. Under the loss of chance approach, all relevant facts, including causation, remain subject to the balance of probabilities, except now the loss suffered is not the outcome of the chance but the lost chance itself.

Joseph King and later Jane Stapleton both independently articulated this argument. They argued that when courts have rejected the loss of chance argument, they have been distracted by their commitment to treating causation as an all-or-nothing proposition.55 Over-emphasizing this commitment, King suggests, “most courts have misperceived the nature of the interest destroyed by failing to identify the destroyed chance itself as the compensable loss.”56 When the lost chance is understood as the compensable injury, the concern that the lost chance argument erodes the balance of probabilities standard is artificial. To the extent that the loss of chance approach does not advocate any abandonment of the balance of probabilities approach to legal fact-finding, it does not alter the analysis in this paper. However, I do not consider the loss of chance approach to be desirable, and it does not address the perception of unfairness that gives rise to it.

I take no issue with the premise that a loss of a chance (or increased risk) results in a valuable change in the plaintiff’s life.57 I disagree, however, that because a chance is valuable its loss should enable an imposition of liability. As Robert Stevens puts it, “the mere fact that [a chance] is a real loss is an insufficient reason to hold it to be always actionable where inflicted through fault.”58 Framing the question of actionability of damage in terms of the rights that are protected by a finding of liability, Stevens points out, “the rights we have against everyone else are in relation to the outcome of injury, not its risk of occurring in the future.”59 Where there is no right against others for increased risks or lost chances, it follows that there cannot be liability imposed for causing such harms. As Ernest Weinrib suggests:

Injury is essential to liability for negligence; no matter how culpable the defendant’s act, the defendant cannot be held liable for negligence unless the

55 Joseph King Jr, “Causation, Valuation, and Chance in Personal Injury Torts Involving Preexisting Conditions and Future Consequences” (1981) 90(6) Yale LJ 1353 at 1363; Ibid. Stapleton argues that the court’s rejection of the loss of chance argument in Hutson, supra note 47, did not provide an answer to the re-characterization of the plaintiff’s claim as a ‘loss of a chance.’ The House of Lords held that the plaintiff had to establish the causal link to the injury itself, on a balance of probabilities, and since this could not be done, the action failed.
56 King, supra note 55 at 1365.
57 Compare SR Perry, “Protected Interests and Undertakings in the Law of Negligence” (1992) 42 UTLJ 247 at 255-67. Perry argues that a lost chance cannot be defined as real loss at all. This view is inconsistent with my comments in Part 3, where I suggest that lost chances and increased risks are indeed compensable harms to be taken into account when assessing a plaintiff’s damages. I argue here that these losses cannot sustain a liability determination.
59 Ibid at 44.
defendant’s act resulted in an injury to the plaintiff. Thus, without the materialization of the risk into injury, no liability can arise.\textsuperscript{60}

If the creation of a risk constituted an enforceable right as against another individual, a person may have suffered no physical injury, yet still have a right to recover damages. Individuals could be liable to each other for creating any adverse risks. For instance, a speeding driver could be liable to all other drivers he shared a road with because he increased their risk of being harmed. Moreover, any possible cause of action for an injury could be framed as a ‘loss of a chance.’ In \textit{Gregg v Scott}, Baroness Hale pointed this out as follows:

\textbf{[A]}lmost any claim for loss of an outcome could be reformulated as a claim for loss of a chance of that outcome...That is, the claimants still has the prospect of 100\% recovery if he can show that it is more likely than not that the doctor’s negligence caused the adverse outcome. But if he cannot show that, he also has the prospect of lesser recovery for loss of a chance.\textsuperscript{61}

The loss of chance approach, as Baroness Hale comments, would shift personal injury law from a system of compensating injuries to one of compensating risks.\textsuperscript{62} So, while proponents suggest that the loss of chance proposal does not significantly alter the traditional legal analysis for establishing causation, their approach would cause a foundational change to determining liability for negligence as it does away with the requirement for a manifested injury. Despite its appeal in the misdiagnosis context, compromising the requirement for a manifested injury by allowing chances to constitute compensable harms would have objectionable implications for the law of liability for negligently inflicted injury.

If the loss of chance argument is rejected, then what of the perceived unfairness that arises in misdiagnosis cases? Stapleton has provided a telling criticism of the traditional analysis, referring to \textit{Hotson}.

\textsuperscript{63} In that case, the plaintiff had a 75\% chance of adverse outcome before any negligence. Consequently, he was denied recovery because he was unable to establish that, ‘but for’ the negligence, he would have been injury-free. Rather, he was ‘doomed’ to be injured, as far as the law was concerned, with or without negligence. Stapleton argues that ignoring the 25\% chance that the plaintiff was not doomed amounts to unfairness to the plaintiff, prompting the loss of chance argument.\textsuperscript{64}

If it is unfair to treat the 75\% chance that the inherent condition caused the injury as a legal certainty and to treat the 25\% chance that the injury would not have occurred despite the inherent condition as legally irrelevant, then balance of probabilities proof must be considered unfair altogether. The balance of probabilities standard always enables courts to ignore possibilities that the facts that are found for legal determinations may not correspond to factual reality. All legally relevant facts, including causation, are decided on the 51\% standard of proof, which allows courts to ignore possibilities of up

\textsuperscript{61} \textit{Gregg}, supra note 47 at 223.
\textsuperscript{62} Ibid at 222.
\textsuperscript{63} \textit{Hotson}, supra note 47.
\textsuperscript{64} Stapleton, “Gist”, \textit{supra} note 54 at 393.
to 49% that the fact that was found for legal purposes was not a fact in reality. The perception of unfairness that leads to the loss of chance argument can therefore be traced to a criticism of the process of legal fact-finding. But under the loss of chance approach, all legal facts must still be proven on the balance of probabilities. In fact, maintaining the traditional method of proof is presented as one of its virtues. Therefore, the loss of chance doctrine fails to address the criticism that renders it attractive in the first place.65

The standard of proof and all-or-nothing process of legal fact-finding are sometimes criticized. I turn now to consider the merits of such a critique. The alternative to the usual approach is probability-based fact-finding and proportional liability. This implicates simple probability reasoning throughout the liability determination, which I argue is an implausible approach.

The Impossibility of Simple Probability in the Liability Context

The usual approach to legal fact-finding, where a fact is proven to a standardized likelihood and then treated as if it were certainly true, can seem like an attempt to create an illusion of certainty in adjudication. Not only might a critic find this unduly artificial,66 it may also appear to cause arbitrary results because some chances (any chances more than 50%) lead to 100% compensation while other chances (any chances of 50% or less) lead to 0% compensation.67 As an alternative, one could suggest chance-based fact-finding where, rather than translating uncertain facts into legal certainties, the chance or likelihood of a fact would remain legally relevant, leading to proportionality instead of all-or-nothing outcomes throughout the adjudicative process. This would have undesirable implications for the substantive law of liability determinations. Moreover, a liability determination, by its nature, prevents chance-based fact-finding.

Chance-based fact-finding must not be understood as merely changing the process of fact-finding. Rather, this approach alters the substantive principles that form the basis of liability for personal injury. The principles of liability dictate that only if a defendant owes a duty of care to the plaintiff and breaches his standard of care resulting in an injury to the plaintiff, is the defendant liable to compensate the plaintiff. Although these facts must be proven to be more than 51% likely, the actual likelihood of the fact is not substantively relevant. A liability determination reflects only whether the requisite facts were proven or not; it does not reflect the extent to which they were proven. A

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65 Causal indeterminacy tends to provoke perceptions of unfairness more than factual uncertainty over any other element of a liability. That could imply something unique about causation, yet my comments above suggest otherwise. Whether or not there is any substantive difference between causation and the other factual elements, the critique of the causal analysis that leads to the loss of chance argument is situated within the process of proving causation, which is the same process of proof as all the other factual elements.

66 Consider Coons’ comment: “As with other men, uncertainty goes down hard with lawyers. Unable wholly to eradicate it, they are under an abiding temptation to disguise it. Where it persists, they have learned to sweep it under the rug with a grand gesture…Most splendid of the rules-and sheltered by a whole panoply of major premises-is 'winner-take-all.'” John Coons, “Approaches to Court Imposed Compromise – The Uses of Doubt and Reason” (1963-1964) 58 Nw UL Rev 750 at 755.

67 See for example King, supra note 55 at 1376-1377. See also Coons, supra note 66. Coons argues for a proportional liability approach where there is one determinative fact at issue, and its chance is evenly balanced. In this context, he suggests that the ‘winner-take-all’ approach should ‘trouble the conscience.’ Coons does not advocate an abandonment of the winner-take-all approach all together, but his comments echo the sentiment of unfairness that can accompany the all-or-nothing approach.
dramatic change would occur if chance-based fact-finding were introduced. Under that approach, the likelihood of the fact must bear impact on the substantive determination at stake. The proportionality of the fact must remain relevant to, and be reflected in, the ultimate legal outcome.

If the chance of a factual element were relevant, the substantive questions for a liability determination would become: was there a chance of a duty, a chance of a breach, and a chance that the defendant caused the injury? If these are the questions at stake in a liability determination, then by implication, individuals would have an enforceable right to be free from possible breaches of possible duties of care that have some likelihood of causing some potential injury. Not only is this contrary to established principles of what can be actionable in law, such an approach would obviously lead to increased exposure to liability, and a state of perpetual uncertainty over whether a cause of action exists. This unrealistic state of affairs would result if the usual fact-finding method were replaced with a simple probability and proportional outcome approach.

There is a second fatal problem with exchanging the balance of probabilities for simple probability. Using a probabilistic fact-finding model, a court could potentially come to the following conclusion: the evidence indicates a 100% chance that a duty of care exists, a 60% chance that the standard of care was breached, 10% chance of causation, and 90% chance of injury. Given these findings, what basis would a court have to find the defendant liable to the plaintiff?

Unless the proportionality of the factual elements can be reflected in the ultimate outcome, the likelihood of the event beyond the threshold level is substantively meaningless, just like the likelihood of a fact becomes meaningless if it passes the 51% standard of proof. But the proportionality of facts cannot be reflected in a liability determination. A liability determination is itself an “all-or-nothing” determination because there are only two possible outcomes: a defendant is either liable, or she is not. It is not possible for a determination that has only two possible outcomes to reflect the unique proportionality of all its necessary factual elements. A concoction of chances cannot be echoed in a liability determination, and so it becomes clear that only the all-or-nothing method of fact-finding can be applied.

The binary nature of liability determination may become masked by failing to conceptually separate the question of whether a defendant is liable, from the question of the extent of her liability. Whether a defendant is liable at all is the primary inquiry that must be satisfied before any question of how liable he is can even be entertained. What proportion of the plaintiff’s injury is compensable can only be considered after it is determined that the defendant owes anything at all. Whether a defendant owes anything to the plaintiff is contingent on the presence of each of the factual principles of liability. If any one of the requisite factual elements is not established, then liability is a ‘no’; if every factual element is established, then liability is a ‘yes.’ There is no room for proportionality in such an inquiry. Conversely, the second inquiry, where the extent of a plaintiff’s damages entitlement is determined, is not binary in nature. It is driven by distinct principles, and can reflect proportions.68 Accordingly, simple probability must

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68 One may point out the concept of contributory negligence leading to proportional liability as a contradiction to my contention that liability is a categorical ‘yes’ or ‘no’ question, and cannot reflect proportionality. In my view, proportional liability is a misnomer. When the contributory negligence principle applies, the extent of liability is proportioned, not the fact of liability. Even when contributory negligence applies, a plaintiff must establish that a defendant is legally liable to the plaintiff by demonstrating a duty of care, a breach of the
not and cannot be used at the liability stage. But the driving principles of the damages assessment stage demand that chances are, can, and must be substantively relevant to determine a plaintiff’s compensatory entitlements. In other words, simple probability reasoning lives here, as I substantiate next.

**PART 3: CHANCES AND SIMPLE PROBABILITY AT THE DAMAGES STAGE**

Once liability is established, the adjudicative inquiry shifts to determining damages. Unlike the liability analysis, which is driven by the defendant’s responsibility, the damages stage focuses on rectifying the plaintiff’s deprivation. I argue that the compensatory principle dictates that a plaintiff’s damages entitlement will depend on the existence of chances. Relevant chances must bear an impact on the quantification of the plaintiff’s damages entitlements. The valuation of those chances occurs through simple probability reasoning: the value of the chance is equal to the total value of the outcome associated with the chance, multiplied by the likelihood of the outcome occurring.

The improper characterization of simple probability has caused much confusion. I point to the Supreme Court of Canada’s decision in *Athey v Leonati* and the Ontario Court of Appeal’s decision in *Beldycki Estate v Jaiparagas* to illustrate this confusion. Finally, I suggest a new approach to the availability of simple probability reasoning in damages assessments, which may help to avoid erroneous compensation awards.

**The Damages Assessment Stage: General**

The following quotation summarizes the foundational principles that have driven damages assessment since the House of Lords articulated them in the 1880 decision of *Livingstone v Rawyards Coal Co*.

> I do not think that there is any difference of opinion as to its being the general rule that, where any injury is to be compensated by damages, in settling the sum of money to be given for reparation of damages you should as nearly as possible get at that sum of money which will put the party who has been injured, or who has suffered, in the same position as he would have been in if he had not sustained the wrong for which he is now getting compensation or reparation.

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standard of care, and injury and causation. Only if these elements are established can the defendant be held responsible to the plaintiff at all. How much the defendant owes is a subsequent inquiry. Proportionality based on contributory negligence bears its impact at the latter inquiry. When applicable, the ‘how much’ question will be proportional to the defendant’s contribution, but this is a distinct inquiry from whether there is liability at all.

69 Cooper-Stephenson and Saunders, *supra* note 29 at 4-5.

70 *Athey, supra note 4.*

71 *Beldycki Estate v Jaiparagas*, 2012 ONCA 537, 295 OAC 100 [Beldycki].

72 *Livingstone v Rawyards Coal Co* (1880), 5 App Cas 25 at 39 (HL). Cooper-Stephenson & Saunders, *supra* note 29 cite this quotation as containing the foundational principle of damages assessment at 109.
This statement provides the backdrop for determining damages entitlements: once liability is established, the plaintiff is entitled to be fully compensated or to be restored to her injury-free condition. This is known as the 
\textit{restitutio in integrum} principle.\(^{73}\)

The compensable loss can be conceptualized as ‘what has happened and will happen in the plaintiff’s life now that the tortious injury has occurred’ compared to ‘what would have happened in the plaintiff’s life, even if the injury had not occurred.’ Stated in a different way, to evaluate the plaintiff’s compensable loss the court must consider the difference between the plaintiff’s “original position” and “injured position.”\(^{74}\) In that effort, the Court must make findings of fact to establish what events have and will occur as a result of the injury (relevant to determining “injured position”), and what would have occurred if the injury had not occurred (relevant to “original position”).\(^{75}\) Of course, to define the compensable loss, the plaintiff must establish that the difference between her original and injured positions is a result of the negligent act. For instance, if a defendant’s tortious conduct causes a discrete neck injury, and the plaintiff subsequently breaks her leg, the leg injury is part of her post-injury condition, but it is clearly not part of ‘injured position’ relevant to defining her compensable loss.\(^{76}\)

Once the plaintiff has established that the harms she claims are properly compensable, she bears the additional onus of proving the monetary losses she suffered arising from those harms. These losses include non-pecuniary and pecuniary damages. Non-pecuniary damages are dollar amounts awarded to compensate the plaintiff’s pain and suffering. Pecuniary losses can be divided into pre-trial losses (sometimes called ‘special damages’) and future losses. Pre-trial pecuniary losses can be placed into two broad categories: cost of care and loss of working capacity. Pre-trial cost of care includes medical expenses related to the injury and any compensable harms arising from it. The loss of working capacity includes lost earnings, lost profits and loss of home making capacity. A plaintiff may additionally claim for future cost of care and prospective loss of earnings.\(^{77}\)

Based on the above, the damages stage can be seen as a two-phase project. Phase One establishes legal facts to help determine what is compensable by defining the original position versus the injured position. Phase Two concerns the valuation, or quantification of these losses. Suppose that a plaintiff establishes liability for the knee injury suffered in a car accident. At the damages stage, the plaintiff alleges that she developed arthritis in her knee and that she might need a knee surgery in the future. She

\(^{73}\) Cassels & Adjin-Tettey, supra note 31 at 11: the “normal measure of recovery in tort law is \textit{restitutio in integrum}: the plaintiff is entitled to be restored to the position she would have been in had the tort never been committed.” For a judicial example, see \textit{Milana v Cartsh} (1985), 49 BCLR (2d) 33 at 78, 30 ACWS (2d) 257, aff’d (1987), 49 BCLR (2d) 99 (BCCA): “The fundamental governing precept is \textit{restitutio in integrum}. The injured person is to be restored to the position he would have been in had the accident not occurred, insofar as this can be done with money.”

\(^{74}\) Athey, supra note 4 at para 32.

\(^{75}\) This is explained in Cooper, supra note 32.

\(^{76}\) Cooper-Stephenson and Saunders, supra note 29 at 7: “The concepts of ‘compensation’ or ‘loss’ for the purpose of a civil action for damages are not synonymous with their general usage, where the term ‘loss’ may describe a ‘detrimen’ unconnected with any wrongful conduct…However, for the purposes of civil actions for damages, the term ‘loss’ and therefore the concept of compensation, is causally tied to the wrongful event which produced the detrimental effects…”

\(^{77}\) Ibid, see generally chapter 4, Cassels & Adjin-Tettey, supra note 31 at 119-159 for more detailed account of special damages. See also Christopher Bruce, \textit{Assessment of Personal Injury Damages}, 4th ed (Markham, Ontario: LexisNexis Canada Inc, 2004) for a useful guide for demonstrating pecuniary losses.
seeks compensation for both. The court must determine whether the plaintiff is suffering from arthritis, whether the arthritis is attributable to the injury, and whether there is a chance of a future knee surgery owing to the injury. These factual findings occur in Phase One of the damages stage. Then, in Phase Two, the court considers the valuation of these losses. There, questions to be asked include: what medical expenses did the plaintiff have in relation to the arthritis? What were her lost earnings due to the arthritis? What costs will she incur in case of future surgery? How will her earning capacity be affected in case of the future surgery?

Based on established doctrines routinely applied in the damages stage, I argue that chances are relevant to the factual inquiry of Phase One. These doctrines are justified on the basis that they enable proper application of the compensation principle. The relevance of chances, however, is sometimes hidden in the language of these various doctrines that may suppress an understanding that chances are being taken into account.

**Future Harms, Contingencies, Pre-existing Conditions/Crumbling Skulls**

**Future Harms**

The routine compensation of future harms is the first indication that chances are relevant to damages assessments, and that their relevance ensures proper compensation. When a plaintiff claims for a possible future harm, she is not required to prove, on a balance of probabilities, that the future harm will occur, on a balance of probabilities. Rather, the plaintiff’s compensation will reflect the chance of the future harm occurring.78

Probabilistic compensation of future harms is often erroneously described as engaging a different standard of proof for future facts, as explained in Part 1 of this paper. The better interpretation is that when future harms are compensated, the plaintiff must show there is a *chance* of a future harm. The existence of this chance, proven Phase in One, is relevant to the plaintiff’s ‘injured position.’ In Phase Two, the chance is quantified, and the damages award will reflect the likelihood of occurrence of the future harm, in accordance with simple probability valuation.

In practice, the evidence relevant to the *quantification* of the chance (Phase Two) will also establish the *existence* of a chance (Phase One). Therefore, in many cases, the inquiry into the existence of a chance may be silent because it is presupposed. Nonetheless, this silent analysis underlies the quantification of the chance because, without establishing a relevant fact, there is nothing to quantify. Despite the potential silence, proof of a chance’s existence on a balance of probabilities must be kept in mind. It is impossible to determine when simple probability should apply without understanding what is happening when it is being used—chance has become a relevant legal fact.

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78 See for example Peter Cane, *Atiyah’s Accidents, Compensation and the Law*, 5th ed (Toronto: Butterworths Canada, 1993) at 109-110: “With certain types of injury there is always a risk of complications in the future, e.g. epilepsy is almost always a risk in brain damage cases, and arthritis is a common risk wherever bones are severely fractured…this means that the judge must calculate what sum would be appropriate if the risk materialized, and then award a fraction of this sum proportional to the risk occurring.”
Accounting for Contingencies

The second instance of chances being relevant to damages awards is in the form of contingency deductions for future cost of care and loss of income. McLachlin J. endorsed contingency deductions in Milina v Bartsch as follows:

In recognition of the fact that the future cannot be foretold, allowance must be made for the contingency that the assumptions on which the award for pecuniary loss is predicated may prove inaccurate. In most cases this will result in a deduction, since the earnings and cost of care figures are based on an uninterrupted stream which does not reflect contingencies such as loss of employment, early death, or the necessity of institutional care.79

These deductions, as McLachlin J. implies, are intended to account for the chance that ordinary life events may diminish the cost of care required or cause income reductions even if the injury had not occurred. For instance, a plaintiff may have a better-than-expected recovery, and therefore require less cost of care. Courts may account for this possibility by reducing the cost of care award by the percentage figure that represents the probability of a speedier recovery. Similarly, courts may reduce loss of earnings awards to account for the a chance that a plaintiff would have experienced a reduction in income for reasons other than the negligent act, like other illness, business failures, layoffs, etc.80

Although somewhat controversial, contingency deductions are endorsed by the courts.81 In Lewis v Todd, for instance, Dickson J. states that, “in principle, there is no reason why a court should not recognize, and give effect to those contingencies, good or bad, which may be reasonably foreseen…the court must attempt to evaluate the probability of the occurrence of the stated contingency.”82 Along with endorsing the use of contingency deductions generally, Dickson J.’s comments suggest that accounting for contingencies is a manifestation of the principle that chances (i.e. contingencies) are relevant to determining a damages award. That contingency is quantified using simple probability.83

79 Milina v Bartsch (1985), 49 BCLR (2d) 33 at para 79, 30 ACWS (2d) 257.
80 Cassels & Adjin-Tettey, supra note 31 at 125-126 and 143. See also SM Waddams, The Law of Damages, (Toronto: Canada Law Book, 2012) at 3.94. For a more detailed discussion of contingency reductions for future loss of working capacity, see Cooper-Stephenson and Saunders, supra note 29 at 375-394, and contingency reductions for future cost of care, 449-455.
81 Part of the controversy is that courts make deductions almost as a matter of course, without appropriate reliance on evidence. Indicating the impropriety of this, the Supreme Court of Canada in Thornton v School District No. 57 (Prince George) et al, [1978] 2 SCR 267 at 284, 83 DLR (3d) 480 commented that “the imposition of a contingency deduction is not mandatory, although it is sometimes treated almost as if it were to be imposed in every case as a matter of law. The deductions, if any, will depend upon the facts of the case…” As Cassels & Adjin-Tettey suggest in Remedies, supra note 31 at 143, despite these comments, courts seem to make contingency deductions almost automatically. The legitimacy of such deductions is questionable because adjudicative decisions should occur on the basis of evidence, as opposed to judicial inklings.
83 Cooper-Stephenson and Saunders, supra note 29 at 380, state that “the inclusion of contingencies is a manifestation of simple probability reasoning, since contingencies have regard to cumulated possibilities rather than probabilities, and are assessed on the degree of likelihood of their occurrence.” On its face, I agree. But I adopt a different characterization of what “simple probability reasoning” means and implies compared to Cooper-Stephenson and Saunders. This difference is reflected in the slightly different phrasing that I have used in the text above.
Translated into the language of ‘original position’ versus ‘injured position,’ making a contingency deduction reflects the court’s acceptance that there is a chance the plaintiff will endure some loss of income, or will require more or less medical expense. In order to ensure proper compensation, the defendant must return the plaintiff back to the original position, which includes the chance of detriment or windfall.

**Pre-Existing Injuries/Crumbling Skulls**

Accounting for pre-existing injuries is another example of the relevance of chances in assessing damages. Sometimes referred to as an application the ‘crumbling skull,’ accounting for pre-existing injuries ensures that the plaintiff is to be returned to the position he was in prior to the negligence, “with all of its attendant risks and shortcomings, and not a better position.”84 In light of this principle, the Court provides that, “if there is a measurable risk that the pre-existing condition would have detrimentally affected the plaintiff in the future, regardless of the defendant’s negligence, then this can be taken into account in reducing the overall award.”85

The way that pre-existing conditions are accounted for is similar to contingency deductions. In the same way as ordinary life events create a chance of harm inherent to a plaintiff’s original position, so too do pre-existing conditions. When determining damages entitlements, courts must consider the chance that owing to a pre-existing injury or conditions, the plaintiff would have experienced the same losses that she now claims. Pre-existing chances may cause a plaintiff’s award to be reduced through simple probability reasoning by the value of the chance of the harm created by the pre-existing injury.

Suppose, for example, that a plaintiff claims for losses arising out of depression suffered after a tortious head injury. The trial judge finds the depression is related to the head injury, so it is part of the plaintiff’s ‘injured position.’ What if there is also evidence that the plaintiff suffered from psychological illness prior to the injury? The defendant can argue that the pre-existing psychological illness created a chance that the plaintiff would have become depressed, irrespective of the negligence. If the defendant can prove that the inherent psychological illness gave rise to a chance of depression, then that chance is a legitimate part of the plaintiff’s ‘injured position.’ If so, the award for the losses related to the depression can be offset by the value of the pre-existing chance of depression owing to the pre-existing psychological illness. Accounting for pre-existing conditions is another manifestation of the principle that chances must be considered when determining the compensation entitlement.

Accounting for pre-existing conditions, however, can easily become confused with proving two different causal connections.86 First, when assessing damages, if a court

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84 Ibid at 35.
85 Ibid at 35.
86 See, for example, *Hosak v Hirst*, 2003 BCCA 42, 177 BCAC 30, where the BC Court of Appeal expressly noted that the trial judge made the error of conflating the legal analysis for causation and pre-existing injuries. At para 10, the BC Court of Appeal noted: “…that the learned trial judge…erred in law by conflating the issue of causation (whether the accident caused the pre-existing condition to be ‘activated or aggravated’) with an issue relevant to the assessment of damages (whether there was a measurable risk that the pre-existing condition would have detrimentally affected the plaintiff in the future, regardless of the respondent’s negligence). In other words, it is my respectful view that…the trial judge erred in law by not distinguishing between the principles of law that had to be applied in determining the issue of causation and those that apply to the assessment of damages.”
finds that a particular harm is causally connected to the injury (for instance, the court found a causal relation between the negligently inflicted head injury and the depression in the example above), then it may seem self-contradictory to also account for a pre-existing condition that may have caused the same harm (e.g. the depression).

Second, if liability is established, that means that a causal link between the defendant’s negligence and the plaintiff’s injury has been established in law. To then take into account a pre-existing condition that may have resulted in the same injury can also seem self-contradictory. That perception would allow for incorrect compensation of a plaintiff on the presumption that the chance of harm arising from a pre-existing condition cannot be relevant, because the causal link between the defendant’s negligence and the harm suffered has become a legal certainty.

The first problem arose in the Supreme Court of Canada’s decision in Athey. The second problem is demonstrable in the Ontario Court of Appeal’s Beldycki decision. I argue that an erroneous conception of simple probability reasoning and its application to pre-existing injuries is a critical reason for the errors in compensation that occurred in both decisions.

**Athey**

*Athey* brought a suit for recovery of damages for injuries sustained after two accidents. At trial, the accidents were treated as one and the defendants each admitted liability. Six months later, during an exercise warm up, Athey suffered a disc herniation that required surgery. At trial, Boyd J. found that the injuries from the accident were a 25% causal factor of the herniation. She awarded 25% of the total assessed award for the disc herniation.87 Athey appealed, arguing that he should have been awarded 100% of the damages arising from the disc herniation. Southin J.A. of the British Columbia Court of Appeal declined to consider the argument, and dismissed the appeal.88 The case was appealed further, and the Supreme Court considered whether the trial judge’s approach provided Athey with proper compensation.

The Supreme Court overturned the trial judge’s 75% reduction. According to Justice Major, “The only issue was whether the disc herniation was caused by the injuries sustained in the accidents or whether it was attributable to the appellant’s pre-existing back problems.”89 The Court held that since it was established that the herniation was caused by the injuries arising from the accidents, causation was a legal certainty. Therefore, there could be no legal finding that suggested that a pre-existing condition, as opposed to the tortious conduct, could have been behind Athey’s disc herniation. On that basis, Athey was compensated for all the losses that arose out of the herniation without accounting for his pre-existing condition.90

The Supreme Court considered a number of arguments for reducing Athey’s damages award, given his predisposition to back injury, including the ‘crumbling skull’ and ‘adjustments for contingencies’ arguments. The Court acknowledged that the crumbling skull argument was the defendants’ “strongest submission.” The crumbling skull principle “recognizes that the pre-existing condition was inherent in the plaintiff’s original

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88 *Athey*, supra note 4 at para 10.
89 *Ibid* at para 7.
90 *Ibid* at para 41.
position,” and “the defendant need not put the plaintiff in a better position than his or her original position.” Nevertheless, the Court concluded that the findings of fact made by the trial judge did not imply an obligation to reduce Athey’s award to account for the pre-existing susceptibility to disc herniation.91

Responding to the defendants’ argument that the trial judge’s approach could be considered a routine contingency reduction, the Supreme Court pointed to the distinction between, on the one hand, past facts, and on the other hand, future and hypothetical facts. While future and hypothetical facts can be accommodated through simple probability reasoning, the Court agreed that past facts must be proven on a balance of probabilities. Past facts would therefore be subject to ‘all-or-nothing’ treatment. The Court characterized the causal link between the injuries and the disc herniation as a past fact. Therefore, the contingency principle, which implies probabilistic reasoning, was not applicable. Instead, the causal link was to be proven on a balance of probabilities, and thereafter, treated as a legal certainty.92 Since the trial judge had found that this causal link was established on a balance of probabilities, no pre-existing condition that rendered Athey susceptible to disc herniation was taken into account.

The Supreme Court’s reasoning suggests that taking into account the pre-existing chance that Athey would have suffered the disc herniation somehow negates or compromises the usual process of proving a causal connection in law. However, proof of the causal link between the tortious injuries and herniation is not at issue. Properly understood, the question in Athey is “whether it was proper to take into consideration the pre-existing chance that Athey may have suffered the herniation absent any negligence.” The fact that the causal relation between the tortious injury and the disc herniation is established provides that Athey’s disc herniation will form a legitimate part of his ‘injured position.’ This does not preclude the relevance of the pre-existing chance of disc herniation in Athey’s ‘original position.’ The causal question that was relevant to defining Athey’s ‘injured position’ is not re-opened when defining his ‘original position.’

Undoubtedly, harms claimed as part of the ‘injured position’ must be causally connected to the tortious injury. For instance, a coincidental broken leg between the time of the accident and his trial would not be relevant to a plaintiff’s ‘injured position’ because it would not have been caused by the tortious injuries. Accordingly, when Major J. states that the issue at stake is whether the disc herniation was caused by the tortious injuries, and that this causal connection must be proven on a balance of probabilities, he is only partially correct, and the implication that he draws from the causal connection being established is not correct.

Athey is correct to the extent that the causal connection between the tortious injury and the herniation must be established, on a balance of probabilities, for the disc herniation to be relevant to Athey’s ‘injured position.’ However, once the causal connection was established, holding that the pre-existing chance of disc herniation was rendered irrelevant circumvented half of the requisite inquiry for the damages determination. Deeming the pre-existing chance of disc herniation irrelevant meant that the plaintiff’s

91 Ibid at para 35. As Dennis Klimchuk and Vaughan Black maintain in “A Comment on Athey v Leonati: Causation, Damages and Thin Skulls” (1997) 31 UBCL Rev 163, a better approach may have been to send the matter back to the trial judge to make appropriate findings with respect to Athey’s pre-existing susceptibility to disc herniation, which may have led to a deduction of the damages award.

92 Athey, supra note 4 at paras 26-30.
'original position’ was defined as significantly more valuable than it actually was because it ignored Athey’s pre-negligence back condition.

The source of this error can be traced to the misconception that surrounds simple probability reasoning. By contrasting past facts versus future/hypothetical facts, and suggesting that a different standard of proof applies to different types of facts,93 the Court displayed its misguided interpretation of simple probability. Misunderstanding simple probability as a method of proof, the Court thought that the requirement to prove causation on a balance of probabilities would be compromised if simple probability was applied to account for Athey’s pre-existing chance of back problems. The failure to recognize that the pre-existing chance of harm can itself be a legal fact caused the Court to wrongly apply the compensation principle, resulting in an erroneous damages award. The Court subsumed the question of determining Athey’s compensable loss within the question of defining Athey’s injured position (which required establishing a causal link between the tortious injury and the disc herniation). However, it is the difference between the original position and the injured position that truly constitutes the plaintiff’s compensable loss. The Supreme Court, however, did not define the plaintiff’s original position at all, at least not in reference to the disc herniation.

*Beldycki Estate v Jaiparaqgs*

The recent Ontario Court of Appeal decision in *Beldycki Estate v Jaiparaqgs*94 shows how easily proof of causation principles in liability determination can improperly creep into the question of whether pre-existing chances are relevant for damages assessments. There, the plaintiff underwent surgery to remove a malignant tumour from his colon. After the surgery, a radiologist failed to notice a liver lesion on his CT scan. No post-operative treatment was scheduled. Two years later, a medical examination revealed Stage IV colon cancer, giving Mr. Beldycki just 4–6 months to live without treatment or 20 months to live with treatment. The plaintiff died 4 months after the jury returned its verdict.

The jury found that the radiologist was negligent in misreading the CT scan, and that caused the plaintiff to be “not disease free” when the case was tried. Liability was therefore established, and damages were awarded.95 The radiologist did not contest his negligence. But he appealed the jury’s decision on two relevant grounds:

1. The jury’s finding of causation was erroneous because the evidence could not establish on a balance of probabilities that ‘but for’ his negligence, the plaintiff would have been disease free at the time of trial.

2. The jury improperly failed to reduce the loss of future income award on the basis of the chance that the loss could have occurred anyway even if the negligence had not occurred.

93 Ibid at para 27: “Hypothetical events (such as how the plaintiff’s life would have proceeded without the tortious injury) or future events need not be proven on a balance of probabilities. Instead, they are simply given weight according to their relative likelihood…by contrast, past events must be proven, and once proven they are treated as certainties.”

94 Beldycki, supra note 71.

95 Ibid at para 3.
The defendant’s appeal was dismissed. Answering the first ground of appeal, Justice Watt stated that “an action for delayed medical diagnosis and treatment, a plaintiff must establish on a balance of probabilities that the delay caused or contributed to the unfavourable outcome.”\textsuperscript{96} Given the evidence that the plaintiff’s chance of cure was greater than 50% before the misdiagnosis, it was open to the jury to conclude that the balance of probabilities test for causation was satisfied, and the radiologist could be found liable. This seems accurate.

Watt J.’s subsequent comments about the award for future income loss, however, mixed causation-for-liability principles and damages principles. Appealing for a reduction in the future loss of income award, the radiologist argued that the jury failed to account for adverse contingencies.\textsuperscript{97} He argued that the jury should have reduced the award by 30% to account for the hypothetical chance that even with proper treatment, it was possible that the same losses would have occurred anyway. The plaintiff responded that since the jury had found the doctor’s negligence to be the legal cause of the injury, he was liable for the full extent of the losses.

Like the Supreme Court in \textit{Athey}, Justice Watt referred to the principle that past facts are to be proven on a balance of probabilities, and are thereafter treated as legal certainties.\textsuperscript{98} On this basis, he found the defendant doctor’s argument flawed because once it is established that the doctor’s negligence caused the plaintiff’s injury, that fact is taken as legal certainty, and full compensatory damages are awarded. According to Justice Watt, no principle allows the defendant to discount the full measure of the damages to reflect the chance that the same losses would have occurred even absent the negligence.\textsuperscript{99} This also ignores the compensation principle, which requires that the plaintiff be returned to his original position, but not beyond.

In \textit{Beldycki}, the plaintiff’s original position included a quantifiable likelihood that he may not have been cured even if the doctor’s negligence had not occurred. Justice Watt’s finding that “at law, that [the plaintiff] would have been cured was therefore a certainty; that his cancer might still have metastasized was a legal impossibility.”\textsuperscript{100} On that account, Justice Watt’s refusal to consider chance in the damages assessment constitutes an error in the application of the compensation principle. It is true that causation was determined for the purpose of establishing liability, and when liability is established (and assuming no contributory negligence) a defendant is 100% liable to return the plaintiff to his pre-accident condition. This pre-accident condition must be determined, and this is part of the task of the damages stage. A finding of causation does not exclude the chance that the plaintiff would have suffered some earlier harm that overlaps with the harm now being claimed as part of his ‘injured position.’ The two are not mutually exclusive, and characterizing them as such results in inaccurate compensation.

As in \textit{Athey}, the \textit{Beldycki} error can be traced back, at least in part, to a problematic understanding of simple probability reasoning. Both courts point to the past/future divide as determining when simple probability reasoning is available. This prevents chances from being seen as relevant legal facts. Suggesting that simple probability is not available for past facts, but is only available for future (and sometimes for hypothetical)

\textsuperscript{96} Ibid at para 44.
\textsuperscript{97} Ibid at para 63.
\textsuperscript{98} Ibid at para 73.
\textsuperscript{99} Ibid at para 84.
\textsuperscript{100} Ibid at para 84.
facts results in a confusion between the principles that must be applied to establish liability and those applicable to assessing damages.

At the liability stage, if causation was established on a balance of probabilities, any chance that an injury was caused by some other factor is no longer relevant. Once a legal fact is proven on the requisite standard, it is thereafter treated as ‘established’ in law in accordance with the all-or-nothing method of fact-finding. But misinterpreting simple probability as a standard of proof can mask the fact that this method of fact-finding holds true in the damages stage as well. The valuation of harms is dependent on an underlying fact-finding process whereby the plaintiff’s original and injured positions are defined. These facts are subject to proof on a balance of probabilities, just like facts at the liability stage.

The difference, however, is that at the liability stage, there is an ‘all or nothing’ approach—either there is liability, or there is not.101 In this way, liability inquiry parallels fact-finding—if there is only one legal fact at issue (i.e. did the negligence cause the inquiry), then the answer to this legal question, which is to be proven on the balance of probabilities, will be determinative of the liability question as well. Accordingly, any chance that the injury was caused by some other factor becomes wholly irrelevant to the liability determination—once the causal link between the negligence and the injury is established, the defendant is liable.

In contrast, the damages stage does not culminate in an all-or-nothing outcome. It determines a dollar figure that represents the extent of the defendant’s liability. Legal facts, including the causal connection between the injury and harm, are found on the basis of the balance of probabilities and all-or-nothing approach in the damages assessment stage. For example, the causal link between Athey’s disc herniation and the tortious injury had to be proven on a balance of probabilities. If the balance of probabilities is met, the disc herniation becomes part of the Athey’s injured position. If the balance of probabilities is not met, the disc herniation cannot be part of the injured position at all. However, at the damages stage, there is no reason for this to preclude the relevance of a pre-existing chance of suffering the same harm. Rather, the compensation principle requires that pre-existing chance to be accounted for within the plaintiff’s original position.

Joseph King explains this divide in his discussion of the relationship between pre-existing injuries and the “thin skull” principle. The thin skull rule provides that a plaintiff should not be prevented from establishing liability because his pre-existing susceptibilities (his ‘thin skill’) caused the tortious harm suffered to be extreme.102 However, this does not mean that the pre-existing condition that caused the extreme consequences must be ignored when assessing a plaintiff’s damages.103 As King explains it, “[T]hat a terminally ill victim would have died on Tuesday, the next day, does not

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101 See Part 2, Section 3: The Impossibility of Simple Probability in the Liability Context, above.
102 For example, see John Munkman, Damages for Personal Injury and Death, 9th ed (London: Butterworths, 1993) at 39: “Where a plaintiff has some pre-existing weakness which renders him more liable to injury than other persons—such as a thin skull or a tendency to bleed—the defendant is liable for such injuries (assuming he is liable at all) although their extent could not be foreseen.”
103 King, supra note 55 at 1361. See also Cooper-Stephenson and Saunders, supra note 29 at 851: “The defendant may be able to show that the plaintiff’s condition, although it became worse than might normally be expected, would have deteriorated anyway: that is a ‘crumbling skull’ case. Thus, a plaintiff’s unusual susceptibility will not go unnoticed when the issue of quantum is reached.”
prevent the defendant’s conduct from being a cause of his death on Monday, but would obviously be quite relevant to the question of damages.\footnote{104}

If pre-existing conditions are to be taken into account for damages assessment, then the only logical approach is that they are relevant through the chance of harm that they engender. Otherwise, for a pre-existing condition to be relevant the causal connection between the pre-existing condition and the harm that it is alleged to have caused would have to be established on a balance of probabilities. That is, the pre-existing condition would have to be shown to be the cause of the harm itself (not just the chance of harm) in order to gain any relevance. If this were the approach to accounting for pre-existing conditions, then the Courts’ misgivings about negation of the causal analysis either at the liability stage or when defining a plaintiff’s ‘injured position’ would have merit. This approach would render it impossible for pre-existing conditions to bear any relevance to damages assessment without negating a causal relationship between either negligence and injury (Beldycki) or injury and harm (Athey). This leaves only two options: abandon the requirement to consider pre-existing injuries when considering a plaintiff’s damages entitlements, or make them relevant in terms of the chances of harm they create. The first option is undesirable. Pre-existing conditions must be relevant to damages assessments in order to ensure that defendants are not held accountable and then end up improving the plaintiff’s original position.

A pre-existing condition is relevant to the plaintiff’s original position to the extent that it disposed the plaintiff to a chance of harm, prior to his being subjected to any tortious conduct. That chance is the relevant legal fact. The existence of the chance must be proven on the balance of probabilities, just like any other legal fact. Once a pre-existing chance of harm is established, this chance becomes part of the plaintiff’s ‘original position.’ This chance gains relevance in the quantification of the plaintiff’s damages through simple probability reasoning. The total award for the relevant harm will be reduced by the percentage value of the chance.

**Summary**

The damages principles discussed above all aim to ensure proper compensation, and all necessitate the use of simple probability reasoning. Understanding simple probability as a method of making a chance a relevant fact in its own right better accords with the principle that a plaintiff’s damages should be full and accurate. By contrast, if simple probability were taken to be a method of proving future facts, then the compensation that would result would be invariably inaccurate. Consider a claim for a future surgery that has a 30% likelihood of being needed. Simple probability reasoning will provide 30% of the entire assessed value of the surgery to the plaintiff. Some time later, the surgery will either occur or not. In respect of the future event itself, the plaintiff will have been either over- or under-compensated—over-compensated if the surgery does not occur, under-compensated if the surgery does occur. The ‘chance as a legal fact’ interpretation avoids this inevitability of inaccuracy because that approach does not purport to ‘prove’ the uncertain outcome, but to quantify its chance or risk.

For example, when a plaintiff claims that a risk of future harm is part of her ‘injured position,’ she must establish the existence of this chance, and its causal connection.

\footnote{104 King, supra note 55 at 1361.}
to her tortious injuries, on a balance of probabilities. Similarly, if a defendant alleges that a plaintiff’s award should be reduced to account for a chance of harm created by a pre-existing injury, he must prove on a balance of probabilities that such a chance of harm existed in the plaintiff’s original position. The existence of these chances is proven in Phase One of the damages stage, where the facts that define the plaintiff’s original position and injured position are established. If a plaintiff proves, on a balance of probabilities, that the tortious injuries created a chance for future surgery, this chance will be relevant to the plaintiff’s “injured position.” If a defendant proves, on a balance of probabilities, that a pre-existing condition also caused a chance of future surgery, then this chance will be part of the “original position.”

If a chance of surgery is relevant to the injured position, or to both the original position and the injured position, then the value of these chances is quantified through the simple probability metric. For instance, consider a scenario where the tortious injury caused a 60% chance of future surgery and the plaintiff’s pre-existing condition caused a 20% chance of the same surgery. Comparing the injured position to the original position, the plaintiff’s compensable loss is a 40% chance of surgery. In accordance with simple probability reasoning, therefore, he should be awarded 40% of the total value of the surgery. Now suppose that a causal connection could not be established between the pre-existing condition and the chance of surgery. That means that the chance of a surgery is not part of the plaintiff’s original position. In that case, the plaintiff is entitled to 60% of the cost of the future surgery.

**CONCLUSION: THE BENEFITS OF A NEW APPROACH TO SIMPLE PROBABILITY**

The foundation of this paper is the argument that simple probability is mischaracterized as a standard of proof. It is better understood as a method of recognizing the value of a chance in its own right. This interpretation implies that when simple probability is used, a two-stage analysis takes place. First, the existence of a chance is proven on the balance of probabilities standard, so the chance itself becomes a legally relevant fact. Then, simple probability is used to quantify that chance. This is the ‘chance as a legal fact’ interpretation of simple probability. Not only is this interpretation more accurate, but it brings a number of constructive benefits.

First, the ‘chance as a legal fact’ model permits the existence of a chance to have a legally cognizable value, irrespective of the eventual outcome. A chance or risk in its own right does not bring value or detriment to a person’s life, so a principle that allows for that recognition in law is appreciable. In recognizing that value, the simple probability principle also mitigates any concern that it is unduly onerous to require a plaintiff to prove future or hypothetical events, which are naturally uncertain, because these events are not subject to legal proof at all. Simple probability reasoning provides an avenue to recognize the value of a potential future harm or a hypothetical occurrence, but does not require proof of the uncertain future or counter-factual event itself.

By expressly recognizing the value of a chance, the new interpretation of simple probability reasoning better ensures that chances and risks are taken into account when the legal determination at stake requires it. Parts 2 and 3 demonstrated how the misunderstanding of simple probability can result in erroneously considering chances to be
substantively relevant at the liability stage, or can result in failing to recognize their relevance at the damages stage. Understanding simple probability as a chance-valuation tool can circumvent such errors.

Another benefit is that the ‘chance as a legal fact’ interpretation preserves the consistency with which the adjudicative system accommodates factual uncertainties. The balance of probabilities and all-or-nothing approach to fact-finding is the legal system’s technique of converting factual uncertainty into legal certainty. Because it allows for legal facts to be proven to a standard that is less than certainty, the balance of probabilities and all-or-nothing approach contains the inherent risk that legal facts are factually inaccurate. Still, adjudicative decisions are made on the basis of those legal facts. The legitimacy of adjudicative outcomes is nonetheless maintained because the factual uncertainty is managed consistently: all litigants are equally subject to the balance of probabilities and all-or-nothing method.

The consistent application of the balance of proof and all-or-nothing approach is compromised when simple probability reasoning is interpreted as an alternative proof mechanism. The ‘chance as a legal fact’ interpretation avoids the alleged abandonment of conventional procedure for translating factual uncertainties into certain legal facts. Given that adjudicative legitimacy is contingent on factual uncertainty being accommodated consistently among litigants, a significant benefit of the ‘chance as a legal fact’ interpretation is that it upholds this consistency.

Finally, and most fundamentally, the ‘chance as a legal fact’ interpretation forces an approach to the application of simple probability that is grounded on the substantive demands of liability determinations and damages assessments. As a way to give legal relevance to a chance, simple probability reasoning must only be applicable where chances themselves are relevant to the legal determination at stake. Determining when chances are and are not relevant facts depends on the unique requirements of both the liability and damages determinations. Accordingly, the availability of simple probability could not clash with the demands of either liability or damages determinations, as inevitably occurs under the ‘type of fact’ approach, because its applicability is grounded on those very demands.

The ‘chance as a legal fact’ interpretation gives rise to an approach that can be employed more coherently than the current ‘type of fact’ frameworks. Simple probability reasoning should be used where chances are substantively relevant. I conclude that simple probability has no utility in liability determinations because chances are not relevant at that stage, but it is applicable in assessing damages to ensure that all the relevant chances, past or future, are taken into account.